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AN EVALUATION OF BEHAVIORAL SKILLS TRAINING ON TRAINEE PERFORMANCE OF JOBS SKILLS: A DEMONSTRATION OF GENERALIZING BEHAVIORAL SKILLS TRAINING TO ORGANIZATIONAL TRAINING PROGRAMS

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Master's Thesis

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TABLE OF CONTENTS

ABSTRACT

Organizations have an ongoing need for adequate training. This need is prevalent regarding both knowledge and performance-based skills. This paper describes the effects of behavioral skills training on the performance of 3 graduate students in a university practicum course to correctly implement discontinuous measurement procedures using instruction, video modeled role-playing scenario consisting of a client and a therapist, rehearsal, and feedback. None of the students had any previous training implementing or demonstrating discontinuous measurement procedures. A Multiple baseline experimental design across participants was used to evaluate the effectiveness of the training.. Results showed significant improvement when compared to baseline. Post behavioral skills training probes showed training generalized to the natural work environment.

DESCRIPTORS: behavioral skills training, registered behavior technician task list, skills training, university training, graduate training, curriculum development.

LIST OF ABBREVIATIONS

ABA	Applied Behavior Analysis
RBT	Registered Behavior Technician
BST	Behavioral Skills Training
IN-SITU	In Situation
IN-VIVO	Via video instruction

INTRODUCTION

Organizations and subsequently training managers are continuously looking for the most cost effective, useful, and valid training methods to use within their organizations to meet their training needs. A significant amount of the studies on training effectiveness has focused on factors within the formal training context or the natural environment. These factors include such variables as the design and content of the training (Noe, 1986). Few studies have attempted to measure the extent to which training learned in a simulated environment transfer to the actual work environment (Baldwin & Ford, 1988). There is growing recognition of a "transfer problem" in organizational training today (Michalak, 1981). This information is useful due to the fact that research that examines the influence of the work environment on post training behaviors is valuable, it helps to move beyond the question of "does training work" and more towards a better understanding of "why training works" (Campbell, 1988; Tannenbaum & Yuki, 1992).

Behavioral skills training is a teaching package consisting of a combination of methods that when used together create an effective technique for teaching individuals via instructions, modeling, rehearsal, and feedback (Ward-Horner, 2017. pg.75). The first step is instruction which can be provided via written or verbal form. Most of the reason for this step is to ensure that the trainee has been provided with a sufficient amount of information before attempting to engage in the task. The next step is modeling or demonstration. In this step trainees are shown how to correctly engage in the task and or complete the task according to mastery criteria. In the third step the trainee is required to demonstrate or imitate the trainer's behavior in an attempt to mirror exactly what the instructor did just previously. After the trainee has had an opportunity to engage in the behavior specific feedback is provided depending on how accurately the

participant reached the mastery criteria set for the specific task or goal. Recycle or repeat would be an informal fifth step to the behavioral skills training package. In this step, steps 1-4 would be repeated over and over again until the trainee had reached a specified mastery criterion.

Behavioral skills training was founded within the field of Applied Behavior Analysis. "Some current dimensions of applied behavior analysis" by Bear, Wolf, and Risley outline and defined the seven dimensions of Applied Behavior Analysis. One of these dimensions is "Effective." The article states "If the application of behavioral techniques dos not produce large enough effects for practical value, then application has failed." (Bear, Wolf, & Risley, 1968. P 96). This passage stressed that in order for a training technique to be effective the results need to be relevant to future research, study, or applications. This focus on many studies have shown that behavioral skills training can be used to train human services staff in various training settings. This research has included training oral care staff to conduct a basic preference assessment in order to increase the efficacy of providing oral care to individuals who have difficulty completing necessary dental examinations such as those with autism or other developmental disabilities (Graudins, 2012). Training educators to conduct mand and tact training (Nigro-Bruzzi & Strurmey, 2010). Training bachelor's degree students to conduct multiple step behavior analytic procedures in completing functional analysis (Iwata et al, 2002). Training young children safety skills to prevent injuries due to a firearm (Miltenberger, 2008). Despite the success of these studies little research has been done to confirm that behavioral skills training can be applied to adults within formal organizational training programs and obtain similar success.

Despite the fact that the need for effective training has been demonstrated in a wide range of job environments and regarding a wide range of skills. Practitioners still seem to lag behind the

research. Implementing little in the way of practical hands on training for the specified tasks targeted as needing to be changed. Most of the focus seems to still be on providing people with motivational seminars and more and more and more and more instruction. Instruction that does not advocate for or include a component where an individual actually has to practice the skill required. This might be due to several reasons. These reasons include that it is time consuming to attempt to train multiple individuals in a repetitive fashion up to a specified criterion. May times the skills needed to be trained are lengthy and numerous. Many times the number of skills within what is called a behavioral chain include multiple steps. These behavioral chains create issues in a training environment where there is often limited time and where time is money as is said.

In addition to time constraints other factors that often inhibit human resources or training staff from implementing the practical training that is needed in order to reach an effective level of staff performance is resources and training for the trainers. If the trainers have a rich history of learning from didactic teaching, speeches, explaining the tasks, and then assessing the degree to which a person or trainee can recite vocally when the task is and how to accomplish that task then they is the style of instruction they are likely to offer. Didactic teaching or talking at a trainee is much easier than addressing the performance of each individual as what is necessary with behavioral skills training. Trainers need to be compensated, trained, and prepared to provide the level of effort required to implement behavioral skills training properly, adequately, and completely.

The purpose of this research is to explore the efficacy of a behavioral skills training treatment package to teach university practicum students to independently and correctly engage in multistep measurement procedures during a graduate program practicum course, and to test to what extent

those results will generalize to on the job work environments. The research also provides evidenced that suggests behavioral skills training can be a useful, highly generalizable, cost effective training method that can be used to meet the training needs of organizations such as the needs of higher education job training or practicum training courses. The present study provides evidence that suggests using behavioral skills training outside of its current applications within human services settings, during the course of on the job training, can be used effectively in simulated training settings. The study demonstrates that classroom training that includes a simulated video component can provide valuable learning opportunities that allow for skills to transfer to the actual on the job work environments. Training conducted using instruction, video training models, imitation or rehearsal, and feedback that are similar to those that have been used in similar research or in everyday HR training environments where training is conducted away from the environments where the job skills being trained are intended to be used can yield significant and valuable results in the way of providing organizations and human resource training departments an evidenced based, cost effective or cost neutral training package that is able to train a variety of skills in a variety of different environments to a variety of different populations of trainees in order to successfully fulfill the training needs of that organization.

1. SKILLS TRAINING WITHIN ORGANIZATIONS

1.1 Skills training within organizational training programs

One of the most important benefits of training for an organization is that, it provides skills inside the organization which can reduce the costs regarding an organization's operating budget (Miri, S. A. 2014). (Becker, 1998) suggest, "effective training certainly has the potential to increase knowledge, skills, and abilities (KSAs) and to enable employees to leverage their KSAs for organizational benefit. It is estimated that while American industries annually spend up to 100 billion on training and development and not more than 10% of these expenditures actually result in transfer to job (Georgenson, 1982). These points stress the importance training has on an organization as it includes the stated goal of reducing overall costs and highlighting that training is an essential and critical area in which to influence organizational effectiveness.

Despite the stated importance mentioned above, definitions and examples of effective staff training and methods include a wide range of methods and styles. These methods and styles can include those of a didactic nature or passive instruction, and or those of a more practical nature, such as experiential learning and or more specifically behavioral skills training. When defining training objectives, the terms knowledge, skills, values, beliefs and attitudes often times do not go far enough to specify exactly what actions or results are expected. training programs should focus on specific skills that are operationally and functionally defined before attempting to implement interventions to effect performance. It is necessary to have a clear idea of what specific behaviors will be considered correct and which behaviors or series of behaviors will not be correct.

One area of application where behavioral skills training is currently being used is in the field of applied behavior analysis during the provision of job training to human service personnel who are

learning to implement various procedures and techniques during the course of early intervention training for children with disabilities. Practitioners in the field of applied behavior analysis regularly are asked to train other staff to implement complex procedures or actions. Social services and human services organizations place an especially important focus on training due to the fact that Human Resources training programs are estimated to cost on average of $1,252 per employee in the way of training and development initiatives in 2015 in the united states, a $23 increase from 2014 (state of the industry report, 2016). These training environments and training tasks vary from one industry, position, and company to the next, however the need for adequate training is pervasive regardless of the specific industry or position. Justification for training is evident in that organizations depend on training to prepare new hire candidates for positions, prevent turnover, and maintain costs due to errors, injury, or illness. Effective training can also have carry over effects that go beyond how effectively the skill is trained and transferred, but also that it can increase the understanding of the organizational culture for the new hire employee (Industrial Training Report, 2006).

Additional areas of application where behavioral skills training has shown promising results was demonstrated with four unassertive children in the areas of eye contact, loudness of speech, speech duration, and requests for new behavior (Bornstein et al., 1977). The study showed the effectiveness of instruction, demonstration, rehearsal, and feedback to increase assertive conversational skills and general social conversation skills. The components of behavioral skills training was also used together before the term was used. Of the four treatment groups used in this study, the SST group scored the highest on the behavior interview rating score posttest given immediately following treatment. This study also found that when the components used were

combined with other training methods the high rating scores maintained across 3 months, 6 months, and twelve month probes (Oci and Jackson, 1982). The study represents just another example of combining training components to create and effective treatment package.

Another great example of the wide range of applications of behavioral skills training include simulation based medical education or (SBME) as an educational strategy and for improving patient safety. SBME is considered to be a complicated training method. SBME is described by Isenberg et al. as "in broad, simple terms a simulation is a person, device, or set of conditions which attempts to present education and evaluation problems authentically. The trainee is expected to respond to the challenges as he or she would under natural circumstances. Simulation techniques and devices can comprise, for example of high tech virtual reality simulations settings, and SBME can be applied in various settings target individuals, teams or both, but also aim for organizational learning, such as e.g. practical changes in equipment guidelines or the physical clinical environment (Sorensen, 2017). SBME is an additional example of how behavioral skills training which is essentially if not partially a simulated training method, can be expanded and applied in ways, in environments, and with participants from a wide range of service sectors and job tasks.

Iwata et al. (2000) focused on skills acquisition when teaching undergraduate students to implement a functional analysis. The students were first given a written description of each situation and how to run a function analysis session then a graduate student reviewed the components of each condition and a video model of each condition. In the last two steps the student took a quiz and precited running a functional analysis. The results suggested that the methods used,

although complicated and dynamic, successfully increased performance above baseline levels. This study is one of a few that has shown that behavioral skills training can be applied to different populations and still work effectively. The majority of the studies mentioned thus far has focused specifically on using behavioral skills training to increase the performance of children with autism or to increase the performance of persons tasks with providing early interventions therapy to students with autism to engage in said procedures more accurately. This study breaks with this tradition and tests the effectiveness of using behavioral skills training to increase the performance of typically developing adults in an environment specifically intened to train adults in what would and or could otherwise be considered environments consistent with that of a human resources training environment. All of the components of behavioral skills training were used to train staff to conduct paired stimulus preference assessments before the term behavioral skills training was coined. In 2002 Lavie and Sturmey added extra steps to this behavioral skills training model to include providing verbal and written instructions as well as repeating the steps of modeling, rehearsal, and feedback until the steps were performed to criterion. This study highlighted the similarity between competency and performance-based trainings.

Lawson, 2002 states that “Staff Organizational Training” is defined as acquisition and application of knowledge, skills, values, beliefs, and attitudes to improve the maintenance and development of organizations. This definition broadly defines what organizations consider regarding the trainable attributes of a staff member. Behavioral skills training, however, has a more specified criterion as to what attributes or skills are targeted for training and how we measure success. (Guise, 2016) defines performance training as, "the action or process of performing a task or function, and a task or operation seen in term of how successfully it is performed and continues

by saying. "Performance is often confused with an effort which refers to energy expended whereas performance is measured in terms of results."

Behavioral skills are skills that can be observed and or measured. Behavioral skills are any skills that require action and or movement. (Rainsbury, 2002,) States, "Whatever the definition of competency, individuals hold and seek to enhance their individual attributes via education, particularly cooperative education." Individual attributes fall into two categories, cognitive and behavioral. Attributes which are drawn on to perform tasks competently consist of cognitive skills, such as technical knowledge, skills, and abilities. Behavioral skills, on the other hand, are built up such as how someone responds and handles various situations, interpersonal skills, organizational skills". Rainsbury continues to further refine the definition of behavioral skills by composing a list of "hard skill" or more behavioral skills and "soft skills" or more cognitive skills. The skills listed under hard skills included computer literacy, technical expertise, organizational awareness, analytical thinking, personal planning, organizational skills, and written communication. From this list, we can see the very behavioral nature of the skills described. Each skill can be trained, through feedback, for example, due to the fact that it involves some observable and thus measurable aspect occurring in the physical environment. Behavioral skills training targets these types of skills through a systematic process of instruction, demonstration, rehearsal, and feedback.

Examples of behavioral skills and the use of behavioral skills training in social service industries include staff in a dental clinic as described by (Graudins et al., 2002). The purpose of the study was to use behavioral skills training to teach dental hygiene students and staff to implement basic function-based behavior analytic strategies to reduce noncompliance and increase their success in

performing oral care exams and cleanings. The study concluded, ”all three participants immediately demonstrated criterion performance during post-test probes: Julie, Janet, and Erica all performed with higher than 90% steps correct for two consecutive post-training sessions. Julie performed with 94% and 98% accuracy; Janet performed with 92% and 95% accuracy; and Erica performed with 94% accuracy during both post-training sessions (Graudins et al., 2002).

Research has been conducted to test the ability of behavioral skills training to generalize to other new and novel work and training environments. Research conducted by (Randi A. 2002) titled, "The effects of behavioral skills training on staff implementation of discrete trial teaching" demonstrated how behavioral skills training was effective in increasing the performance of practitioners during the provision of early intervention applied behavior analysis therapy services. The study found that "The mean baseline proportion of possible correct teaching responses for Teachers 1, 2, and 3 increased from 43%, 49%, and 43%, respectively, during baseline to 97%, 98%, and 99%, respectively, following training. The study by (Randi et al., 2004) also states that “ These data indicate that the training package consisting of instructions, feedback, rehearsal, and modeling produced rapid and large improvements in the teachers’ implementation of discrete-trial teaching.”

1.2 Current problems in developing skills

Often times when the term behavioral skills are used in reference to training, there is motivation to confine the usefulness of such a rigid training package to highly repetitive or mechanical industries, business sectors, skill, and job tasks that look similar to the very bold and mechanical skills required for example a factory setting. The misconception is that behavioral skills training is less useful with training tasks that need more theoretical or cognitive skills as said. This research

argues that many of these academic or cognitive skills are actually composed of smaller components that are indeed behavioral and thus can be trained or targeted for change with instruction, modeling, rehearsal, and feedback.

Many times training takes the form of didactic teaching or, talking at the students and providing verbal descriptions of the procedures required in hopes that adequate performance of a skill will be verbally transferred from the teacher to the trainee. In the field of behavior analysis this responsibility to frontline staff by trainers such as licensed behavior analysts has become standard practice and a, "professionally expected responsibility of licensed behavior analysts" (Lerman, 2009.) Because behavior analysts train new practitioners in a wide variety of environments skills need to be performed not described, it's critical that a training package focuses on actually having the trainee perform the task and receive feedback until the performance reaches criteria. Often times these training environments include role play, insitu-training, pre-employment training, and as part of university training at both the undergraduate and graduate levels.

This need for practical training that is transferable or generalizable to actual work environments echo the viewpoints of researchers who have inquired as to how to best transfer or generalized skills trained in a contrived environment to work environment or to new novel work environments. "Positive transfer of training is defined as the degree to which trainees effectively apply the knowledge, skills, and attitudes gained in a training context to the job (Newstrom, 1984; Wexley &Latham, 1981). This concept of transfer of training is a critical challenge for organizational training programs. Often times in context or in-situ training where the training occurs in the actual environment were the skill will need to be used on the job is very costly and logistically

challenging when there are several individuals that need to be trained. This challenge suggests that providing training that transfers or generalizes to the actual work environment would help to address this issue and make training more effective.

Most research regarding the efficacy of behavioral skills training has been focused on its use in the area of on the job training within the field of applied behavior analysis during the provision of early intervention services for children with autism or other developmental disabilities. Within these training environments, very specific and conditional procedures are required to be implemented with a high level of accuracy. In this work setting the child's training program has already been designed by a graduate level or doctoral level clinical supervisor. This clinical director observes an entry-level practitioner implementing a procedure and then initiates behavioral skills training as described. However little research has been conducted in the way of determining the effectiveness of using behavioral skills in a university training environment. Questions remain regarding if and how behavioral skills training can generalize and meet the training needs of workers who have job skills training needs in other industries.

Challenges organizations experience with training staff to perform at high levels of performance include the pervasiveness of didactic teaching. There is a common misunderstanding that simply convincing someone by telling them what they need to do and testing and assessing their performance in regard to how they are able to describe the tasks they will need to do, will inevitably transfer to the participant being able to actually perform the task. And with only a fraction of job training actually and successfully transferring to the actual work environment its necessary for researchers and human resources trainers to look into why training works not only if it works.

Human resources personal specifically trainers need to understand why and how training can be successfully transferred from clinical training environments to the natural work environments. Providing the trainee with vocal instruction on how to describe a task is not adequate in so far as to successfully teach the trainee to independently and correctly perform the task. The point here is that the training should fit or match the performance required. If the trainee is indeed going to be required to recite information about a specific task during the course of their work, then didactic teaching may be adequate to provide the necessary skills via a question and answer Socratic teaching environment were vocal explanations of the behavior are the focus of training.

The challenges faced with practical training methods such as university practicum courses is that the logistics and costs of training multiple trainee's concurrently can sometimes prove to be insurmountable. The use of video modeling and permanent product recording were key features regarding the research conducted in this study because this removed some of the time-consuming work from the trainer and placed it on the trainee's. Considering that the goal of the training was to increase the proficiency of correctly logging partial interval recording events, these steps had the effect of not only playing into the spirit of the study in that it increased the practical effort required on the part of the trainee. This also decreased the amount time consumer attention consuming work for the trainer, This approach could both maintained measurement validity and allow for the use of behavioral skills training to be applied to a larger group of persons at the same time. In this study three participants were successfully trained with the use of permanent product recording and video modeling more participants could potentially be trained at the same time. Training more participants at the same time would help to address some of the shortcomings or limitations mentioned below regarding this research.

1.3. Organizations goals for conducting skills training.

Professional mental health licensing organizations such as the Behavior Analyst Certification Board (BACB) require potential certificants of the organizations Registered Behavior Technician credential to demonstrate proficiencies in engaging in the task listed on the Registered Behavior Technician Tasks list (RBT task list). The skills required for demonstration are behavioral in nature and include tasks across six different content areas, Measurement, Assessment, Skill Acquisition, Behavior Reduction, Documenting and reporting, and professional conduct and scope of practice. The scope of this study will focus on training one task within one of these content areas. The task is conducting an independent and successful discontinuous measurement procedure, for the sake of this experiment the procedure was a partial interval recording procedure. Partial interval recording is accomplished when an event is broken up into separate equal time intervals, and then the occurrence of a behavior is measured. The ability to measure behavior is often viewed as the single most important prerequisite skill for entry-level behavioral practitioners or registered behavior technicians. This allows them to adequately perform during the course of their work. This is due to the fact that all other content areas require the practitioner to measure behavior in some way shape or form.

Many times, organizations are faced with difficulties to address the need for active generalizable skills training. These difficulties in meeting the requirements of quality evidenced-based practices in training include limited resources in the way of time, money, and logistics. The costs of delivering services to individuals with autism and other disabilities total more than $137 billion annually and grow exponentially. Given this figure, service delivery organizations are under

pressure to ensure staff are well-prepared to deliver services through the provision of training. Providing adequate staff training and performance management is also necessary for the delivery of evidence-based practice (Reed 2015). Organizations such as universities are also under pressure to minimize cost and maintain a high level of performance among teaching staff. The Costs to the university included the use of room, salary for instructor seven hundred euros/semester, costs to students thirty-five euros time two and a half hours per week for sixteen weeks or one semester.

The purpose of the present study is to explore the efficacy of using behavioral skills training to teach university students job-related skills in a university practicum environment and identify whether or not those skills generalize to the actual work environments of the students who received the training. More generally the aim of this study is to address the need for more evidence-based practice within the management as stated by (Pfeffer & Sutton, 2006; Rousseau, 2006). The training was entirely conducted in the university classroom, or clinical environment with the exception of 1 session were a behavioral skills training workplace probe occurred to test whether or not skills had generalized to the natural job environment. Students were taught using behavioral skills training (instruction, demonstration, rehearsal, and feedback) to conduct a "discontinuous measurement procedure) during the course of data collection in a simulated job environment via video modeled scenarios.

2. BEHAVIORAL SKILLS TRAINING

2.1 Behavioral Skills Training

Before the term behavior skills training (BST) was coined for using instruction, modeling, rehearsal, and feedback to teach a skill. There were many researchers who used the components of behavioral skills training independently and together to achieve great results. (Braukmann, Fixsen, Phillips, Wolf, and Maloney. 1974) found that reading instructions, sometimes demonstrating a behavior, allowing for practice of the behavior, and providing feedback were effective in teaching interview skills to two adolescent boys. An important training tool for many licensed board certified behavior analysts is behavioral skills training. Behavioral skills training is an evidence-based approach for training human service personnel to implement behavior change and related procedures (Parsons, Rollyson, & Reid, 2012). Behavioral skills training consists of five separate components including instruction, modeling, rehearsal, feedback and in-situ training.

2.2 Instruction

The first component of behavioral skills training includes providing the student with a written and or verbal instruction of the task to be completed. Often time this written and verbal instruction takes the form of a written task analysis which breaks down larger tasks into a chronological list of steps and competent responses. Instructions can also take the form of a visual display, sign, or signal. Research done via a component analysis by (Buck, 2014) found that giving only written instructions produced slight increase in performance of participants. These further stresses the need for the actions and steps of a single training task to be clear and concise. The instruction must be salient or easily understood/noticed including operational definitions of the target behavior. In 1983 Yeaton and Bailey analyzed the effectiveness of

individual components of their previously established training model which consisted of tell them, show them, ask them, let them, with a feedback step afterwards. The study revealed that the tell them and show them components alone did not produce significant changes in performance. Instruction and a video were used to increase correct trainer behavior and response prompting by individuals working with children with severe intellectual disabilities (Van vonderen, Didden, & Beeking, 2012).

2.3 Modeling

The second component of behavioral skills training involves the trainer providing a demonstration of the correct responses required by the trainee. After the trainer provides the trainee with proper verbal or written instruction the trainer demonstrates or models with correct behavior or sequence of behaviors. The justification for modeling is so that the trainee can observe the correct response in so that he or she can imitate that response (Miltenberger, 2008). An additional note regarding modeling is that it can be conducted via in situ, role play, or simulated such as using video modeling (Wurtele, 1987). The effectiveness of modeling to teach multiple components of social interactions to nursery school children who were socially withdrawn. Children were shown films where the appropriate behavior was modeled displayed increases in "social responsivity," level of interaction, and a slight increase in the performance in the follow-up when compared to post film assessment(O'Conner, 1972). Video modeling conducted by (charlop & Milstein, 1989) found that the video model was very effective in teaching conversational speech to the three children with autism. During probes for generalization all of the children demonstrated generalization of conversational skills. Video modeling was also successfully used to improve form in gymnastics

skills. Four female gymnasts were shown a video model to improve execution of three gymnastics skills on the uneven bars (Boyer, Miltenberger, batsche. And fogel, 2009).

2.4 Rehearsal

The third component in behavioral skills training is providing an opportunity for the trainee to rehears the desired task or job skill. Rehearsal provides an opportunity to demonstrate the behavior learned through the previously experienced instruction and modeling components. The rehearsal component to behavioral skills training is critical in that it provides the trainer with an opportunity to measure the accuracy of the trainee's performance objectively. Additionally, the rehearsal component is crucial in that provides the trainee a chance to receive feedback regarding their performance of the desired skill. Rehearsal is often the component that is most challenging to impalement and often due to this is the first component to be left out or neglected. Despite this fact the rehearsal component is often considered one of the most important. Allowing the trainee an actual opportunity to engage in the skill as opposed to simply talking about the topic should seem logical in order to achieve a high quality of trainee performance.

2.5 Feedback

The feedback component of behavioral skills training typically consists of either reinforcing positive praise if the response was made independently and correctly and or corrective feedback that takes the form of providing corrective instructions and if necessary potentially recycling the behavioral skills training back to the instructional component and again modeling, and rehearsing. The feedback component has been found to be one of the most critical steps in behavioral skills training in that it can increase the speed of skill acquisition and improve maintenance effects

(Alavosius & Sulzer-Azaroff, 1990). It is also necessary to continue providing feedback in in-situ environments or natural work environments to ensure that any performance gains are maintained and generalize to non-simulated on the job work environments. Emphasis within this component of the training package has been specified in that the feedback should be specific performance-based corrective and positive feedback (Iwata, 1981).

2.6 In-Situ/Behavioral skills generalization probes

In-situ training or generalization trainings are essentially brief follow-up training and observations that occur on the job in the natural environment. The first step in in-situ training is informing the participants about the purpose of the training objectives before the training begins. These follow-up trainings are necessary to ensure that the training that was conducted in a simulated or clinical training environment indeed transfer to the natural work environment. Developing and successfully implementing a safe in-situ training environment involving highly realistic scenarios requires complex decision making and interaction with multiple personnel (Miller, 2008). If the trainee is not able to perform the task as previously demonstrated in the training environment, additional training sessions in the natural environment would then occur in-situation (Miltenberger, 2008).

3. METHODS

3.1 Participants and Settings

Participants included three graduate students at an Estonian university. All three were female special education graduate school students. The students were identified for the study due to the fact that they were all registered and attended a university practicum course in applied behavior analysis also referred to as ABA. The experimenter was the participant's lecturer for the course. Students in this course had previously taken a theoretical course in behavioral psychology. This previous coursework discussed some of the basic underlying assumptions regarding the content of the behavioral skills training research conducted in this paper. None of the students had had previous training performing the specific measurement technique (partial interval recording) before. Partial interval recording served as the dependent variable for the study. All sessions took place in the student's regularly scheduled university classroom. The classroom included an overhead projector, chairs, desks, and whiteboard. Classrooms were exceptionally spacious, and each class on average included 14 students. The class and tuition for the course included the instruction from a single lecturer who also served as the experimenter. No additional staff was included, and the course occurred for 2 hours every Friday evening at 6 pm from January 2018-March 2019.

3.2 Materials

The author used the registered behavior technician task list also referred to as the RBT Task list (Appendix A) and selected task list item A-03: Implement discontinuous measurement procedures (e.g., partial interval recording procedure). A partial interval recording procedure includes dividing a specific time period up into equal time intervals or parts and marking whether or not a particular

behavior has occurred at any time during that interval. Role-playing, video models presented via projector and videos included actual situations where you would need to take this type of data or engaged in such a data collection procedure. PowerPoint presentation via video projector was used to provide preliminary instruction on conducting the various tasks within the Registered Behavior Technician Task List. Additional resources and materials included access to the said task list and other data collection sheets via the universities online education service Moodle.

3.3 Design

A Multiple baseline design across participants was used for this research. The participants received behavioral skills training as part of their instructional coursework. The various measurement procedures outlined in the Registered Behavior Technician task list, including didactic instruction regarding how to implement the dependent variable measured in this research which again was the implantation of a partial interval recording procedure. The Phases included baseline (didactic instruction), behavioral skills training (Independent variable), and in-situ training (generalization of results to the natural work environment). The implementation of the independent variable or treatment (behavioral skills training) occurred across the three participants at a staggered interval. The first participant received the intervention/training after 3 sessions of baseline. The second participant received the intervention/training after 6 sessions of baseline, and the third participant received intervention after 9 sessions of baseline. Staggering the implementation of the intervention helps to ensure that any changes we see in the dependent variable can ultimately be attributed to the introduction of the independent variable and not to some sort of setting event or other environmental variable occurring in the environment during training.

3.4 Dependent measures and data collection systems

During Behavioral skills straining participants engaged in video modeling to simulate a scenario where they could take partial interval recording. Trainee's watched a video that had been previously chosen by the researcher for which the research already knew the correct answer. This allowed for the students to simply score the datasheet provided (appendix 2). Partial interval recording includes 1. Creating a data table that divides a specified time into the specified time intervals, 2. Mark Correctly in which intervals the specified target behavior occurred and in which intervals it did not, 3 calculate or divide the number of intervals where the behavior occurred by the number possible. The percentage that each participant inevitably comes up with determines the degree or percentage correct the participant performed. The data provided by each trainee is then compared to data initially collected on the video models and the degree to which the research participants results agree with the mastery criteria document confirms to what extent the participants training was successful. Partial interval recording is defined as a time sampling method for measuring behavior (Cooper, 2018). The observation period is divided into series of brief time intervals (typically from 5 to 10 seconds). The trainee is then required to mark in which interval behavior occurred and inversely refrain from marking when the specified target behavior did not occur. Partial interval recording differs from other time sampling techniques in that with partial interval recording the trainee is required to mark an interval were the target behavior occurred regardless of the amount of time it occurred during the interval. For this reason, partial interval recording can often times overestimate the occurrence of behavior. However, for the sake of this research we are only concerned with whether or not the trainee was able to perform the measurement technique adequately or as to criterion which in this study was 80% or better across 3 consecutive trials.

3.5 Procedures

The procedures for implanting this experimental design included taking data on the performance of the dependent variable across 3 separate distinct phases. The first of which is baseline where the dependent variables (taking partial interval recording data) is measured in the absence of any intervention and or before any training is provided. For the sake of this study baseline included the standard vocal didactic instruction of how and what was to be done. The intervention phase included behavioral skills training, and the post behavioral skills training probes were conducted in a different environment from the training environment specifically in the on the job environment to see if the skills would maintain and generalize to new and novel performance situations. Each of these phases was conducted at differentiated times across all three research participants.

3.5.1 Baseline.

Each participant was provided with a brief instruction on what partial interval recording required using simple didactic teaching strategies; this included describing the actions verbally to the students. Baseline sessions occurred in the university classroom with the teacher working with a group of 14 students. The students' performance of the dependent variable was measured and graphed in terms of the percent of steps performed independently and correctly on the task analysis describing partial interval recording. (Appendix 4).

3.5.2 Behavioral Skills Training. The participants received written and verbal descriptions of the target responses immediately before each role-playing session. The trainer demonstrated to each participant how to implement each step of the partial interval recording procedure (Appendix B).

Following a demonstration, each participant was allowed an opportunity to rehearse the skill as demonstrated all by themselves while the trainer observed and marked either correct or incorrect on the task analysis for that student. The trainer would then immediately provide feedback regarding the students' performance providing positive social praise if a step was conducted correctly, and corrective feedback and remodeling of the target skill before allowing the student to rehearse the step again and once again receive feedback regarding performance. The goal was that students would reach a level of performance that reflected 80% accuracy across three consecutive trials.

3.5.3 Behavioral Skills Training Probes. Probes that took the form of observations and data collection that occurred during baseline were completed after behavioral skills training at the end of the study. The probe was conducted in the natural environment or workplace of the trainee in order to ensure that the skills and performance obtained in the classroom training environment generalized successfully to the trainee's actual work environment. Trainees were instructed to take partial interval measures of a behavior during the observation period. The same task analysis of conducting partial interval recording was used to score the performance of the teacher in the natural environment. The purpose of the post training probes was to ensure that the training transferred or generalized to the actual natural work environment where the skill would necessarily be used for example in the classroom, at the clinic, or in the home. All Three participants were primary school classroom teachers and due to this the post training probes confirmed that this training can and does generalize or transfer from a university training practicum conducted in a classroom environment to a primary school classroom environment.

3.5.4 Social validity and participant satisfaction A participant satisfaction survey was conducted in order to assess the social validity of the training, whether or not the participant found the training to be helpful, worthwhile, necessary, and effective. The questions within the participant satisfaction survey confirmed social validity of the study in that respondents confirmed by scoring either agree or highly agree regarding questions such as "Do you feel more capable of engaging in the tasks listed on the RBT Task list?", "Do you believe this training will end up benefiting the students you work with in your work environments?", and "How helpful was the training provided?" See (Appendix C), Due to these results not only can we demonstrate that the behavioral skills training worked but also that the training was perceived by the participants to be helpful, useful, and successfully. In other words, according to these trainee's, the training was socially relevant. The last question of the participant satisfaction survey allowed participants to provide a short answer description of what it was that they enjoyed most about the training. To a large extent in that the majority of respondents mentioned that they enjoyed the practical nature of the class and the real-life examples provided by the trainer in the way of the video models of real world situations were these practitioners may need to actually collect the data the training was designed to teach them to take.

4. RESULTS

4.1 Participant 1

4.1.1Baseline.(Figure 1) Participant 1 implemented partial interval recording with an average of 22% accuracy during the baseline phase. Data shows a variable trend during baseline with a relatively low level of correct responding.

4.1.2 Behavioral Skills Training. (Figure 1) Participant 1 was the first triad to receive behavioral skills training. Participant 1 received behavioral skills training together with the trainer(the class lecturer), Participant 1 engaged in behavioral skills training for 30 minutes during a 2-hour graduate practicum course. Two trials were conducted during each session. Performance mastery criterion was an average of 3 consecutive trials at 80% correct. Participant 1 met mastery criteria at training trail 10 with an average across three trials at 88.66% accurate.

4.1.3 Post behavioral skills training probes. (Figure 1) Participant 1 implemented partial interval recording on average 83% accurate across two trials during behavioral skills training follow-up probes. The level of precise implementation of partial interval recording improved compared to baseline. Post behavioral skills training show a slight decrease in performance as compared to performance during behavioral skills training.

4.2 Participant 2

4.2.1Baseline. (Figure 1) Participant 2 implemented partial interval recording with an average of 33% accuracy during the baseline phase. Data shows a variable trend during baseline with a relatively low level of correct responding.

4.2.2 Behavioral Skills Training. (Figure 1) Participant 2 was the second triad to receive behavioral skills training. Participant 2 received behavioral skills training together with the trainer (the class lecturer). Participant 1 engaged in behavioral skills training for 30 minutes during a 2-hour graduate practicum course. Two trials were conducted during each session. Performance mastery criterion was an average of 3 consecutive trials at 80% correct. Participant 2 met mastery criteria at training trail 11 with an average across three trials at 88.66% accurate.

4.2.3 Post Behavioral Skills Training Probes. (Figure 1) Participant 2 implemented partial interval recording on average 100% accurate across two trials during behavioral skills training follow-up probes. The Level of accurate implementation of partial interval recording improved compared to baseline. Post behavioral skills training probes shows a slight increase in performance as compared to performance during behavioral skills training.

4.3 Participant 3

4.3.1 Baseline. (Figure 1) Participant 1 implemented partial interval recording with an average of 33% accuracy during the baseline phase. Data shows a variable trend during baseline with a relatively low level of correct responding.

4.3.2 Behavioral Skills Training. (Figure 1) Participant 3 was the third triad to receive behavioral skills training. Participant 3 received behavioral skills training together with the trainer (the class lecturer), Participant 3 engaged in behavioral skills training for 30 minutes during a 2-hour graduate practicum course. Two trials were conducted during each course.

Performance mastery criterion was an average of 3 consecutive trials at 80% correct. Participant 3 met mastery criteria at training trail 12 with an average across three trials at 100% accurate.

4.3.3 Post behavioral skills training probes. (Figure 1) Participant 3 implemented partial interval recording on average 100% accurate across two trials during behavioral skills training follow-up probes. The level of accurate implementation of partial interval recording improved compared to baseline. Post behavioral skills training show a slight increase in performance as compared to performance during behavioral skills training.

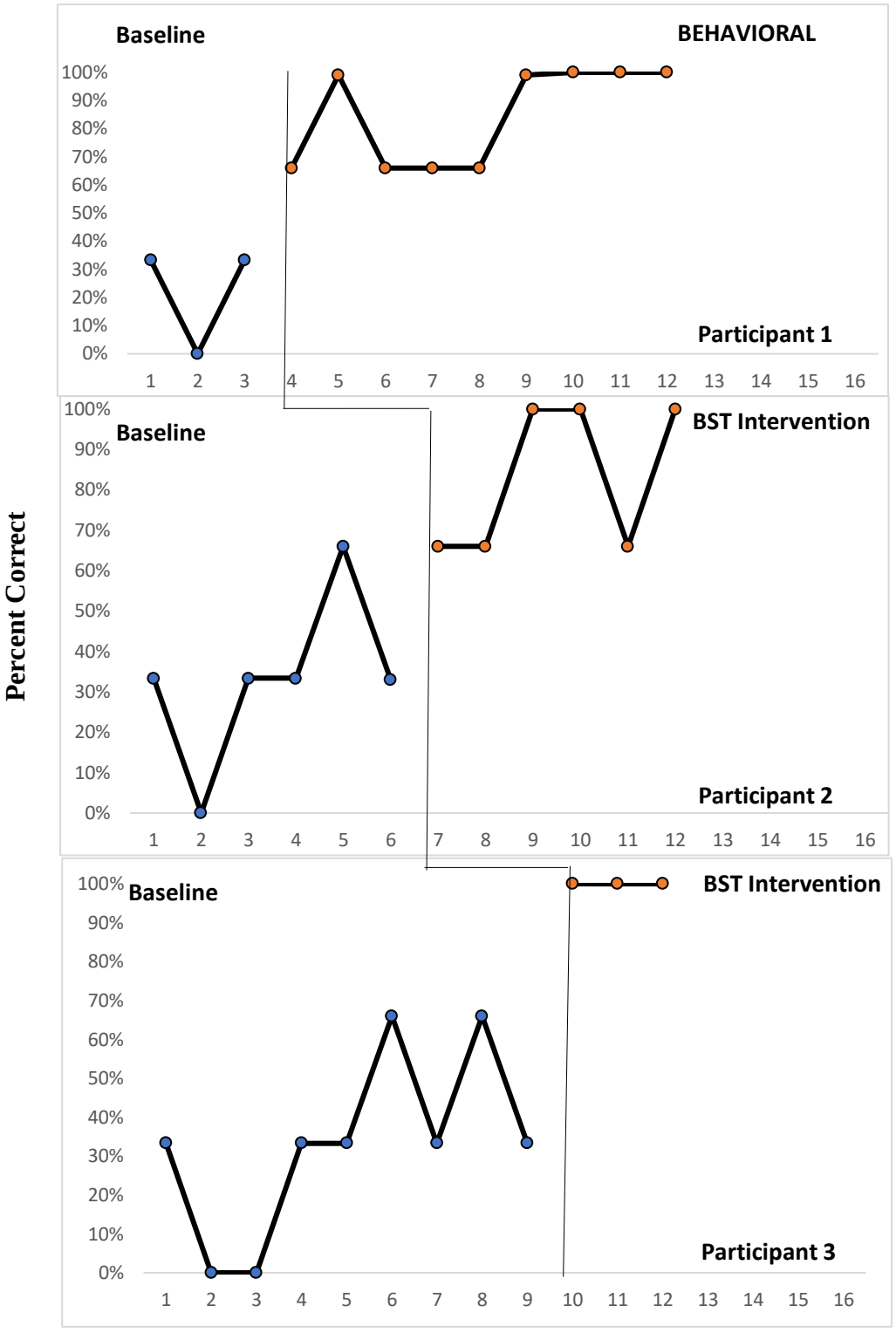

Figure 1: The chart above represents percent of partial interval measurement procedure components implemented accurately for one participant from each triad across 13 trials.

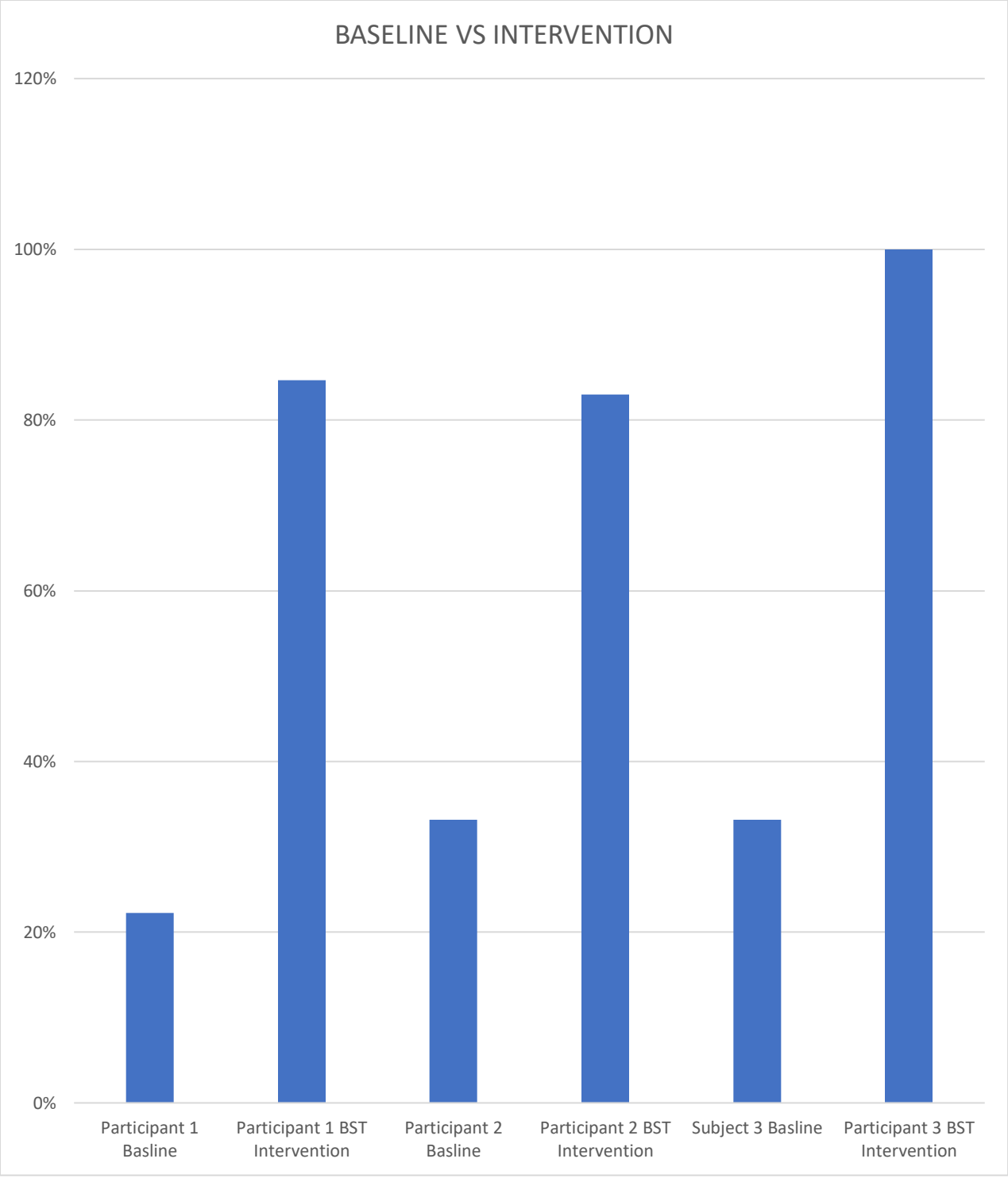

Figure 2: The graph above shows the change in performance from each participants baseline phase compared to the intervention phase.

4.4 Social Validity and Participant Satisfaction

Research participants were asked to complete a short survey at the end of the research. (Appendix C). A Likert scaled was used and ranged from 1-5. Five being highly agreed, and one being least agree. When asked, "Do you feel more capable of engaging in the tasks listed on the RBT Task list? 80% answered either agree or highly agree. The participant's responses also showed that 80% highly agreed that this training would end up benefiting the students they work with. Also when asked, “would you participate in training like this again if the university offered it” 80% of students answered either four agree or 5 highly agree, while the remaining students chose three not sure. When asked, “what did you like least about the course." The most common criticism was in regards to the English language requirement and the difficulty was learning technical English terminology considering English was not the mother tongue of any of the research participants. The positive comments mentioned when asked, “What did you like most about the course” included that they, “enjoyed the empirical nature of the course content" and "the practical nature in which the subject matter was presented."

5.5 DISCUSSION

Behavioral skills training increased performance regarding implementing complex multistep job skills often required within human services organizations. Participants were able to perform the components in the correct sequential order correctly at master criteria of 80% or higher across three consecutive sessions. Increases in participant performance seen in (figures 1) within baseline phases immediately after the first participant received behavioral skills training. These findings suggest that there may have been carryover effects due to the fact that these participants who had not technically received BEHAVIORAL SKILLS TRAINING. The participants were indeed being provided or exposed to the behavioral skills training components of modeling and instruction during there baseline phase as a result of behavioral skills training being offered in the same room with other participants/members of the class who were entering their intervention phase of the research.

Behavioral skills training was effective in improving participants ability to perform complicated job tasks that are highly important and necessary in human resources organizations. The research described above demonstrates the contrast between the necessity of knowing how to do something via didactic style training and thus being able to accurately explain how to do a job skill and receiving practice via a training package that includes the step by step use of instruction, modeling, rehearsal, and feedback, that results in the trainee adequately performing the required job skill or task. Knowing about vs. knowing how. Many times trainees, managers, and human resources personnel are confused as to why teaching people to describe how verbally does translate to staff performance of said specified skills.

Mastery criteria in behavioral skills training phase occurred quickly in all 3 participants following the implementation of behavioral skills training. Each participant was exposed to 2

training trials during the initial intervention phase. Intervention phases for each participant were staggered in order to account for possible setting events, confounds, and to highlight, and compare the multiple baselines to confirm causal effects due to the independent variable.

5.1 Limitations of Study

Limitations of this study include that the graduate students who participated in this study were regularly tardy for class and due to this the start and stop time for training trails were often interrupted and or changed due to the fact that a participant had not arrived yet. It's worth noting that in addition to conducting the study the class had to continue to be relevant to the rest of the class in the way of training and instruction regarding the broader aim of the course which was to train multiple tasks across multiple content areas. The researcher was also required to choose 1 task to train out of an expected 12. This suggests that the amount of resources in the way of additional training hours, the improved structure of behavioral skills training could help to address the issue of being limited in regard to the amount of training content or training tasks that can be trained with the given amount of training personnel and costly training time. Additional limitations to this study is that the general area of application is already in the provision of training within the job of early intervention service providers. This study tested the effectiveness of how behavioral skills training would generalize to typical classroom teachers and whether the skills learned would transfer to those participants natural working environments. Because these students for the most part tended to be either a special education teacher, some kind of therapist, or a typical education teacher, the results we achieved generalized from the typical audience of research trainee's however these trainee's jobs, age, professional background, and academic background did not vary that much compared to individuals previously shown to be successfully trained using behavioral skills. These participants worked with children, had a

history of working with children, and had taken most of the introductory materials and instructional course work that typical and previous research participants have engaged in before showing success via behavioral skills training.

5.2 Suggestions for further research

The broader implications of the study suggest that because behavioral skills training has demonstrated the ability to effectively generalize to a novel training environment, needs, skills and then generalize to the actual work environment of the trainee, behavior skills training is a worthwhile investment for organizations that need competent staff who are capable of being fluent across a multitude of skills sets. This research also showed that 3 people could be trained effectively with behavioral skills training out of a class of 15. Further research could look to how behavioral skills training can be used in a way that is more time efficient. One suggestion might be to have participants engage in what is called permanent product recording. This would still allow the participant to demonstrate the necessary data collection skill, however it will also take a large amount of work off of the hands of the researcher. Due to the fact that the research participants would then be filling in the data for their own performance this would help to solve some of the inter-observer agreement issues and or the lack thereof that occurred during this study. This permanent product data collection would take the form of a data collection sheet that the student fills out themselves which can then be checked at a later date for accuracy and independence. This would free the researcher from the need to track the performance of each individual participant and simply allow him to ensure that each participant is actively participating in the exercise and understands the instructions.

Research on the use of behavioral skills training as it relates to the training of the registered behavioral technician task list is relatively scarce. Due to the ongoing need in the field of applied

behavior analysis provision of early intervention autism services for high quality effected training, further research should focus on how a behavioral skills training package could address more or all of the tasks listed on the registered behavior technician task list. The Registered behavior technician task list delineates the many tasks that are together crucial in the delivery of early intervention services at the entry level position. Further research in how to increase the time effectiveness of behavioral skills training in university practicums for example like mentioned above by designing the training so that students log their own data and there performance is then scored based on the students own performance as opposed to having a researcher walk around and look over each research participants shoulder would allow for more skills to be learned or put into skill acquisition during the course of a typical one semester university practicum training course.

Additional research could be conducted to continue to test to what extent this training will continue to generalize to new participants, settings, and training task or behaviors. This study was limited by the fact that the participants were all relatively close regarding demographics to the bulk of the previous research that's been conducted regarding behavioral skills training. It would be healthy and interesting to test to what extent behavioral skills training works to train data entry personnel, or airport security personnel. These jobs are work tasks are considerably different from the typical participants for which behavioral skills training worked for well. Additional research regarding to what extent behavioral skills training can generalize and to what extent those new novel generalized environments allow for the transfer of training from the training environment to the natural work environment would help to further facilitate the dissemination of this research and or help to test what limits behavioral skills has regarding effectiveness.

Conclusion

In conclusion this research demonstrates that behavioral skills training can be applied successfully in the university training environment via a standard practicum course. The implementation of behavioral skills training did not require any additional resources aside from the materials mentioned above. Students who participated in behavioral skills training for the specific task listed and described above showed a distinct and marked increase in independent correct responding of the skill trained, i.e. the correct and independent implementation of partial interval recording. This research helps to further generalize a training package consisting of instruction, demonstration or modeling, rehearsal, and feedback to a broader audience of participants. A large majority of the research conducted regarding behavioral skills training has been conducted using single subject research designs. Many who cite the limitations with single subject research designs or small n designs note that due to the small sample size and lack of randomizing the sample there are questions of external validity. These questions regarding external validity require researchers interested in the whether or not behavioral skills training will generalize to novel populations, environments, and behaviors to continue to test the efficacy of using behavioral skills training under these for mentioned conditions in order to overcome any concerns regarding the extent to which behavioral skills training is a viable option under said conditions.

Behavioral skills training by and large has been restricted to the field of applied behavior analysis regarding the training of services providers who have been designated the task of providing early intervention services for children with autism. The skills required during this services provision are dynamic, involve what is typically described as “cognitive skills”, and are not always the skills that one would believe lends themselves to a training package that focuses

on observable and measurable behaviors. It is often said that skills such as these advanced cognitive skills are better trained via didactic teaching. This research however demonstrates that even skills that are often considered outside the reach of such a training package can indeed be an ideal skills training area where behavioral skills training can be effective.

Behavioral skills training assists the researcher and the practitioner to search for the behaviors and or actions that typically coincide with what are often described as "cognitive skills" and directs them to focus rehearsal, feedback, demonstration, and instruction towards those behaviors. If it is indeed the goal of training to increase the likelihood that an individual will engage in a specific response or behaviors correctly and independently then behavioral skills training may continue to demonstrate itself as relevant regarding those specific skills training needs.

Additional conclusions regarding this research include a positive analysis of the extent to which training transferred to the natural work environment. This is often referred to as "transfer of training". Regarding these participants, this training environment, and the specific behaviors or independent variables behavioral skills training once again has shown that it is a robust and versatile training method. Dental care clients, individuals with autism spectrum disorders, undergraduate and graduate students, children learning about gun safety. All of these participants have been proven viable candidates for behavioral skills training. With the addition of this research we can add classroom teacher to the list of trainees' likely to benefit from behavioral skills training.

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APPENDICES

Appendix 1. Registered Behavior Technician Competency Assessment Form

Registered Behavior Technician™ (RBT®) Competency Assessment Form

Measurement

	Task	Initials	Assessment Type *(check one)*
1	Implement continuous measurement procedures (e.g., frequency, duration).		☐ In-Vivo ☐ Role-Play
2	Implement discontinuous measurement procedures (e.g., partial and whole interval, momentary time sampling).		☐ In-Vivo ☐ Role-Play
	Implement permanent product recording procedures.		
3	Enter data and update graphs.		☐ In-Vivo ☐ Role-Play

Assessment

	Task	Initials	Assessment Type *(check one)*
4	Conduct preference assessments.		☐ In-Vivo ☐ Role-Play
5	Assist with functional assessment procedures.		☐ In-Vivo ☐ Role-Play

Skill Acquisition

	Task	Initials	Assessment Type *(check one)*
6	Use contingencies of reinforcement (e.g., conditioned/unconditioned reinforcement, continuous/intermittent schedules).		☐ In-Vivo ☐ Role-Play
7	Implement discrete-trial teaching procedures.		☐ In-Vivo ☐ Role-Play
	Implement naturalistic teaching procedures (e.g., incidental teaching).		
	Implement task analyzed chaining procedures.		
8	Implement discrimination training.		☐ In-Vivo ☐ Role-Play
	Implement stimulus control transfer procedures.		
	Implement stimulus fading procedures.		
	Implement prompt and prompt fading procedures.		

Appendix 2. Interval Recording Sheet

Interval Recording Sheet

(Used to estimate length of time engaged in a behavior or instances of a behavior)

Student: ________________________ Interval Length (in seconds): ______________

Behavior: ____

❒ Baseline ❒ Intervention

Observation Date: _________ Beginning Time: __________ Ending Time: _________

Observation Date: _________ Beginning Time: __________ Ending Time: _________

Observation Date: _________ Beginning Time: __________ Ending Time: _________

Observation Date: _________ Beginning Time: __________ Ending Time: _________

How to Record:

- "Partial-Interval" Recording: Mark a plus (+) if the behavior occurred at any point during the interval; record a minus (-) if the behavior did not occur at any point during the interval.
- "Whole-Interval" Recording: Mark a plus (+) if the behavior occurred throughout the entire interval; record a minus (-) if the behavior did not occur throughout the entire the interval.
- Scoring: calculate the percentage of possible intervals that the behavior occurred (ex. 50/60 = 83%)

Notes:

Data Sheet created by Nicole Caldwell, www.PositivelyAutism.com

Appendix 3. Behavioral Skills Training Survey

Behavioral Skills Training Survey

Please circle the number that best describes how you feel about that training you received.
1-Not at all 2-Not very 3-Undecided 4-Somewhat 5-Very Much

1.) Do you feel more capable of engaging in the tasks listed on the RBT Task list?
1-2-3-4-5
2.) Do you believe this training will end up benefiting the students you work with in your work environments?
1-2-3-4-5
3.) Would you take additional training/coursework like this if the university offered it?
1-2-3-4-5
4.) What did you like least about the training?
1-2-3-4-5
5.) How helpful was the training provided?
1-2-3-4-5
6.) What did you like most?

7.) What did you like least?

Appendix 4. Task Analysis of Partial Interval Recording & Measurement Form

Task Analysis of Partial Interval Recording & Measurement Form

Participant:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Independently and correctly created an interval data sheet with the correct # of intervals															
Independently and correctly mark correctly when behavior occurred															
Independently and correctly refrained from marking when behavior did not occur															
Calculate % correct															