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Training New Instructors to Implement Discrete Trial Teaching Strategies With Children With Autism in a Community-Based Intervention Program

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Training New Instructors to Implement Discrete Trial Teaching Strategies with Children with

Autism Spectrum Disorder in a Community-Based Intervention Program

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Abstract

This study examined the effects of training and supervision on new instructor knowledge and

performance of discrete trial teaching (DTT) within three domains (DTT Technical Skills; Work

Session Preparation/Conclusion; and Student Engagement/Management). Eight undergraduate

student instructors received an eight-hour training in DTT and support skills accompanied by a

pre- and post-test of knowledge. The instructors then taught a variety of skills and behaviors to

six students with ASD in a community-based preschool, where instructor competence was

tracked and performance feedback provided using the Discrete Trial Teaching Competency

Checklist for Instructors (DCCI). Competence in all three domains improved over time with

performance feedback. However, significant variability was observed both within and between

instructors, and performance in some areas remained below optimal levels even with regular

supervision and performance feedback. Implications for training and supervising instructors to

implement DTT with children with ASD in community-based settings are discussed.

Keywords: Training, Discrete Trial Teaching, Supervision, Preschools

Training New Instructors to Implement Discrete Trial Teaching Strategies with Children

with Autism Spectrum Disorder in a Community-Based Intervention Program

The number of preschool-age children (i.e., between 3-5 years) with autism spectrum

disorder (ASD) receiving special education in publicly funded programs 2008 was 44,934, and

the total number of preschoolers with developmental disabilities served was 257,029 (IDEAdata,

2010). It is important to note the number of children with developmental disabilities because

many students with ASD are initially served under the category of developmental disability.

Given the number of young children with ASD in need of special education and the requirements

of the Individuals with Disabilities Education Improvement Act (IDEA; US Department of

Education, 2006), there has been a significant increase in the number of community-based early

intervention programs serving infants, toddlers, and preschoolers identified with ASD (Heflin &

Simpson, 1998; Hurth, Shaw, Izeman, Whaley, & Rogers, 1999). Whereas having early

intervention programs available is important, it is perhaps equally important that such programs

utilize interventions that have been proven to effectively promote development in children with

ASD. A requisite component of implementing effective intervention programs is having well

trained staff. Therefore, in addition to identifying evidence-based practices for educating

individuals with ASD, it is also critical to examine how to best train school personnel (e.g.,

teachers, support staff, and paraeducators) to implement evidence-based instructional methods

with students with ASD in community-based settings.

To date, significant progress has been made toward establishing evidence-based practice

in the field of ASD intervention (Lord, Wagner, Rogers, Szatmari, Aman, Charman, et al., 2005;

Weisz, Chu, & Polo, 2004). An example of an evidence-based intervention is discrete trial

teaching (DTT). DTT has been proven to significantly improve the developmental and

educational outcomes of children with ASD and developmental delay (Lovaas, 1987, 2003;

McEachin, Smith, & Lovaas, 1993; Smith, 1999). Grounded in the experimental analysis of

behavior, DTT is a specific type of teacher-directed instruction that utilizes simple instructional

cues, prompting, positive reinforcement, and a continuous formative assessment to shape

behavior and improve children's learning (see Smith, 2001 for a description of DTT). DTT has

proven particularly effective in helping young children with ASD acquire a wide range of new

skills (Coe, Matson, Fee, Manikam, & Lanarello, 1990; Howlin, 1981; Krantz & McClannahan,

1981; Lovaas, 1977; Young, Krantz, McClannahan, & Poulson, 1994; Risley, Hart, & Doke,

1972). Recently, DTT also has been used to facilitate skill development in preschoolers with

developmental disabilities other than ASD (Downs, Downs, Johansen, & Fossum, 2007; Downs,

Downs, Fossum, & Rau, 2008).

        Due to its many demonstrated strengths and proven effectiveness, it is likely that DTT

will continue to be an important component of educational interventions for children with ASD

and other developmental disabilities. Indeed, DTT, within the broader category of behaviorally-

based intervention, has been classified as a proven evidence-based practice by the National

Autism Center (2010) and the National Research Council (2001), and parents of children with

ASD have increasingly demanded that their children be provided publicly funded DTT-based

educational programming (Choutka, Doloughty, & Zirkel, 2004).

        Importantly, DTT is only effective when it is implemented correctly, and it seems that a

significant gap exists between what is recommended in the literature and what is actually

practiced in the field (Downs & Downs, 2010; Lord et al., 2005; Weisz et al., 2004). Research

suggests that many teachers either do not use research-based interventions (Stahmer, Collings, &

Palinkas, 2005), or do not implement the interventions effectively (Stahmer, 2007). Perhaps due

to this research-to-practice gap, community-based educational settings for children with ASD

have not always been able to show efficacy in terms of student learning outcomes (Chasson,

Harris, & Neely 2007). As more educators and paraeducators seek to use DTT to enhance the

learning and educational outcomes of their students with ASD and other developmental

disabilities it is critically important to evaluate the extent to which individuals with no prior

training or experience can be efficiently and effectively trained to use DTT. It is also necessary

to examine whether learning to implement DTT via training translates into the ability to teach

children with ASD important skills linked with desired learning outcomes *in vivo* in community-

based intervention programs.

Numerous studies have shown that previously naïve instructors can be taught to correctly

implement basic DTT procedures with children with ASD and other developmental disabilities.

Unfortunately, most research conducted thus far has somewhat narrowly examined instructor

performance of the basic DTT procedural skills following training, while ignoring the various

support behaviors needed to effectively implement DTT in community-based classroom settings

(Belfiore, Fritts, & Herman, 2008; Bolton & Mayer, 2008; Crockett, Fleming, Doepke, &

Stevens, 2007; Gilligan, Luiselli, & Pace, 2007; Koegel, Glahn, & Nieminen, 1978; Koegel,

Russo, & Rincover1977; Leblanc, Ricciardi, & Luiselli, 2005; Sarakoff & Sturmey, 2004).

Research suggests that this rather narrow focus on the basic DTT skills is somewhat misguided

because when instructors use DTT the amount of student learning that occurs is directly related

to instructor competence in both the specific DTT procedures and the skills that are needed to

support DTT implementation (Downs, Downs, & Rau, 2008). Because of this, it is critical to

assess not only instructor proficiency in the DTT procedural skills, but *also* the various support

skills (e.g., preparing for and concluding sessions, effectively managing student behavior, etc.)

needed to implement DTT programs within the school setting so that students with ASD learn and make progress toward desired outcomes across an academic year.

In addition to examining the full range of skills needed to implement DTT it is also crucial to identify training procedures that can be used to efficiently and effectively train the numerous educators, paraeducators, and parents who work with children with ASD in community-based settings. Some of the training procedures for new DTT instructors have involved 25 hours or more of direct contact between trainers and new instructors (Koegel, Russo, & Rincover, 1977; Ryan & Hemmes, 2005). Though such extensive trainings are effective in teaching the basic DTT procedures they also carry a rather significant cost in terms of money and time. Because of those costs, researchers have recently called for identification and evaluation of more efficient and cost-effective training procedures (Fazzio, Martin, Arnal, & Yu, 2009. Thomson, Martin, Arnal, Fazzio, & Yu, 2009) that can be more readily adopted in real-world settings.

Efforts to streamline DTT training procedures have demonstrated some initial success, with studies suggesting that training lasting three hours or fewer can effectively teach new instructors to implement the basic DTT procedures (Bolton & Mayer, 2008; Gilligan, Luiselli, & Pace, 2007; Leblanc, Ricciardi, & Luiselli, 2005), as well as some of the DTT support skills (Fazzio et al., 2009). However, it is important to note that due to their design none of those studies demonstrated that new instructors were able to correctly implement the full range of DTT instructional and support skills across different learning tasks and children following training. This is a critical issue when one considers that instructors in community-based classrooms serving children with ASD will often be asked to use DTT to teach a wide range of skills from acquisition through mastery to many different children who may demonstrate quite variable

behaviors and abilities. That is, it is not enough for instructors to know how to effectively use

basic DTT procedures. They must be able to manage challenging behavior, keep to a timely and

efficient schedule, and manage curricular materials and programs at the same time they are

effectively using the basic DTT procedures.

In order to address that gap in the literature, Downs, Downs, and Rau (2008) conducted a

study examining the effects of an eight-hour training and performance feedback on instructor

performance of the full range of DTT and support skills when teaching a wide variety of skills

and behaviors to preschoolers with a range of developmental disabilities. The eight-hour training

was designed to approximate a typical in-service training for educators and paraeducators in

public preschool settings and consisted of didactics, live modeling of correct and incorrect

procedures, and skill practice with corrective feedback. Instructor proficiency following training

was evaluated with a 30-item checklist assessing the basic DTT procedural skills (e.g., present

discriminative stimulus (SD) correctly in each program) and the various DTT support skills

needed to actually implement DTT correctly and effectively over time within the classroom (e.g.,

within each program check 'Current Items' and select appropriate items). The results indicated

that new instructors correctly implemented the DTT instructional and support skills at a rate of

63-80% post-training.

When intensive supervision and performance feedback was provided, all six instructors

achieved 90% proficiency by their second session working in the classroom and 97-100%

proficiency by the fourth session. The high levels of instructor proficiency were maintained over

10 weeks, during which time the instructors each taught well over 100 different skills to at least

two different children with developmental disabilities in the classroom. Importantly, improved

instructor performance was associated with both more efficient use of instructional time and

significantly improved student performance such that the children were clearly learning more when instructors became better at implementing DTT.

Despite the apparent efficacy of the training and feedback procedures used in the Downs, Downs, and Rau (20008) study, it was not completely clear that the results would generalize to other classroom settings. This is because the study was implemented using an extremely high level of supervisory support. Specifically, each new DTT instructor was observed and rated by one or two supervisors throughout each of their work shifts. Such a high level of supervision is unlikely to be present in public school and community-based settings. Thus, the main purpose of the present study was to extend the Downs, Downs, and Rau study by evaluating the effectiveness of similar training procedures in a setting that more closely approximates the real-world conditions in which many children with ASD receive intervention.

In addition to evaluating the real-world effectiveness of the training procedures, we also sought to extend the Downs, Downs, and Rau (2008) study in three additional ways. First, we added an assessment of instructor knowledge as part of the training procedure. This involved assessing instructor knowledge of the DTT procedural and support skills prior to and following training, and investigating how instructor knowledge following training was related to actual performance when working with children with ASD in a community-based intervention program. Second, rather than computing overall instructor proficiency scores, we examined the effects of training and supervision on instructor knowledge and performance of DTT within three specific domains (DTT Technical Skills; Work Session Preparation/Conclusion; and Student Engagement/Management), thus allowing us to evaluate which aspects of providing DTT were most challenging for instructors to learn to implement correctly. Finally, within the domain of Technical Skills we examined which skill area (i.e., Discriminative Stimulus, Reinforcement,

Prompting) proved most challenging for new instructors to learn. By conducting a more

comprehensive and specific analysis of the various technical and support skills needed to

effectively implement DTT, we sought to shed light on which skills may require more attention

when training and supervising instructors who are implementing DTT *in vivo* with students with

ASD for the first time.

Method

Participants and Setting

Participants were eight undergraduate research assistants (instructors) and six children

(students) who were enrolled in a multidisciplinary developmental publicly funded preschool

program in the Pacific Northwest. All eight instructors were junior or senior psychology or

special education majors between 20 and 24 years of age who had demonstrated solid academic

performance (i.e., GPA over 3.0) and an interest in working with preschoolers with

developmental disabilities. None of the instructors had experience working with young children

with developmental disabilities, and none had previously taught children in any formal

educational setting. The instructors had no prior exposure to DTT methods and were not known

to the students before participating in this study.

The students were between the ages of three and five and each had a diagnosis of ASD.

All of the students were boys who were demonstrating significant developmental delays (i.e.,

two standard deviations below the mean) in the areas of language, cognition, adaptive

functioning, and social skills. The students were referred to the community-based preschool

program as a result of their diagnostic status and developmental delays. Students attended the

preschool four hours per day, four days per week. As part of their interdisciplinary programming

at the preschool, each student received approximately one hour of DTT per day that was

delivered by the instructors. Prior to the start of this study none of the students had ever received

any DTT.

Materials

      DTT Competence Checklist for Instructors (DCCI). The 35-item DCCI, developed as

part of a previous study (Downs, Downs, & Rau, 2008; Appendix), was modified for use in this

study to assess the specific procedural skills required to conduct DTT, as well as the numerous

support skills needed to implement DTT programming properly. Specifically, the DCCI was

used to rate instructor performance as unsatisfactory, in progress/needs improvement, or

satisfactory in three skill areas. The first skill area was comprised of 10 items and titled *Work*

Session Preparation/Conclusion (e.g., be prepared with all materials before students arrive and

before initiating each program). The second skill area included 19 items and assessed *Technical*

Skills (e.g., deliver reinforcing stimulus [Sr] immediately following correct responses). The third

skill area included 6 items and was titled *Student Engagement/Management* (e.g., Ignore

inappropriate student behavior when applicable).

      Instructors were rated on the DCCI by advanced graduate students or faculty (raters) who

had extensive experience and training in implementing DTT procedures and using the DCCI.

For some DCCI items satisfactory performance was simply based on instructor performance of

the necessary skill (e.g., read behavioral/clinic notes before session begins). For skills that could

not be rated on a presence/absence basis because they occurred numerous times throughout each

session (e.g., Sd is clear, concise, uninterrupted) the skills were rated as follows: satisfactory

performance ratings were based on at least 90% correct performance; needs

progress/improvement ratings were based on 50-90% correct performance, and unsatisfactory

ratings were based on 0-49% correct performance of the skill across all daily sessions.

Participant scores in each of the three skill areas were calculated by summing the number of items on which the participant was rated as demonstrating satisfactory performance and dividing the result by the total number of items within that skill area.

DTT Theoretical Assessment (DTA). The DTA is a 33-item written assessment that was developed for use in this study in order to assess instructor knowledge of the same three DTT and support skill areas assessed by the DICC. Specifically, the DTA contained 10 items assessing Work Session Preparation/Conclusion; 17 items assessing Technical Skills; and 6 items assessing Student Engagement/Management. Instructors completed the DTA prior to and immediately following training.

Procedures

DTT Training. The lead experimenters, a clinical psychologist and a special educator with extensive training and experience in DTT provided training in DTT and support skills to instructors at the beginning of the academic year. After completing a pre-training DTA to assess instructors' pre-existing knowledge of DTT procedures and support skills, the instructors were trained in one eight-hour session. The training procedures were designed to approximate a typical in-service training that might be provided to educators and paraeducators in school settings and were consistent with those used in the Downs, Downs, & Rau (2008) study. As such, the training consisted of didactics, live modeling of correct and incorrect procedures, and skill practice with corrective feedback. By the end of the training each instructor had twice practiced implementing a 30-minute DTT session from beginning (e.g., selecting and organizing stimuli and reinforcers) to end (e.g., summarizing data and writing behavioral notes for the sessions). Following the training, instructors again completed the DTA to assess the extent to which their knowledge of DTT procedures and support skills increased as a result of the training.

Implementation of DTT. Following consultation with caregivers and preschool staff,

and utilizing the students' individualized family service plans (IFSPs), a DTT-based curriculum

was developed for each student that included skills in the areas of receptive and expressive

language (e.g., identification of objects, behaviors, emotions, colors, shapes), socialization (e.g.,

conversational skills, turn-taking), pre-academics (e.g., letters, numbers, counting), imitation

(e.g., gross and fine motor), daily living skills (e.g., following directions), and fine motor skills

(e.g., drawing, cutting). Due to their varying strengths and weaknesses not every student

received instruction in every domain (e.g., some children who did not yet speak did not receive

instruction in expressive language programs). Whenever possible, the curriculum was balanced

across developmental areas for each student and explicitly linked to desired learning objectives.

Approximately one week following completion of the training instructors began using

DTT on a one-to-one basis with the students in the program. Instructors conducted two 30-

minute DTT sessions each day they worked in the classroom, and each instructor worked an

average of two days per week. In each of the two daily DTT sessions, instructors typically

conducted between 50 and 100 discrete trials. Instructors conducted DTT with the same student

for each of the two daily sessions; however, instructors worked with different students on

different days. This was done in order to give instructors experience working with students who

were displaying a range of developmental levels and behaviors, as well as to ensure that

instructor DTT skills generalized across students and the various skills taught to the students.

Rating Instructor DTT Performance. The raters observed each instructor throughout

their work shift in the preschool and rated their performance as satisfactory, in progress/needs

improvement, or unsatisfactory across all DCCI checklist items. It is important to note that

because previous studies conducted using multiple baseline designs have found that new

instructors do not display high levels of competence in DTT without being provided additional performance feedback (Arnal, Fazzio, Martin, Yu, Keilback, & Starke, 2007; Belfiore et al., 2008; Downs, Downs, & Rau, 2008; Fazzio, Martin, Arnal, & Yu, 2009) corrective feedback was provided to each instructor immediately following completion of their first day in the classroom. This allowed us to ensure that instructors were providing adequate intervention services to the students in the program. Thus, each instructor completed one initial day of DTT that provided a post-training assessment of their DTT skills, followed by several subsequent days of DTT over the course of the academic quarter that allowed us to track the progress the instructors made in achieving competence across the three skill areas assessed by the DCCI.

Because there were a greater number of instructors than raters in the classroom, each instructor was not rated during every work shift across the quarter. Rather, following their initial day in the classroom the instructors were each rated approximately one day per week that they were in the classroom resulting in each instructor being rated on six different days across the academic quarter. Summary feedback and ratings were provided to each instructor at the end of the work shifts during which they were rated using the DCCI and complimentary oral feedback. In this way, each instructor received positive written and oral reinforcement for satisfactory skill performance and corrective written and oral feedback contingent upon unsatisfactory skill performance.

Inter-rater Reliability.   Two independent raters observed and rated each instructor's performance with the DCCI for one out of six of their rated work shifts across the academic quarter. Inter-rater reliability was calculated by dividing the number of agreements by the total number of items on the DCCI and multiplying the result by 100. Mean inter-rater agreement across all instructors was 94.6% (range, 88.6% to 100%).

Results

Effects of Training on Instructor Knowledge and Performance

Pre- and post-training DTA scores for the eight instructors are presented in Table 1. Paired-samples *t*-tests indicated that instructor DTT knowledge increased significantly across each of the three skill areas following the eight-hour training. Pearson product-moment correlational analyses were conducted in order to determine whether DTA scores were associated with actual DTT performance of instructors following training and prior to receiving performance feedback. DTA Work Session Preparation/Conclusion scores were strongly correlated with DCCI Work Session Preparation/Conclusion scores on instructors first day working with students, albeit not at a statistically significant level, $r(8) = .63, p = .09$. Similarly, DTA Technical Skills scores were moderately, but not significantly, correlated with DCCI Technical Skills scores on instructors' first day working with students, $r(8) = .51, p = .19$. In contrast, DTA Student Engagement/ Management scores were inversely, but not significantly, correlated with DCCI Student Engagement/Management scores, $r(8) = -.24, p = .57$.

<Table 1 here>

Instructor DTT Performance Across Time

Figure 1 shows the percentage of DTT and support skills exhibited at satisfactory levels (i.e., 90% or better) by the eight instructors when working with students with ASD across six sessions. Following the eight-hour training, instructor proficiency scores on the DCCI in session 1 ranged from 60% to 100% (mean = 77.50%) in the area of Work Session Preparation/Conclusion, from 37% to 79% (mean = 56.63%) in the area of Technical Skills, and from 33% to 100% (mean = 70.75%) in the area of Student Engagement/Management. As seen in Figure 1, mean instructor proficiency scores improved relative to baseline across the six

sessions in all three skill areas. However, significant variability in proficiency was observed

across individual instructors and time both within and across the three skill areas. After being

provided corrective feedback orally and in writing with the DCCI following five work shifts,

instructor proficiency in session 6 ranged from 70% to 100% (mean = 86.67%) in Work Session

Preparation/Conclusion, from 68% to 95% (mean = 80.67%) in Technical Skills, and from 50%

to 100% (mean = 72.30%) in Student Engagement/Management.

<div align="center">**<Fig. 1 here>**</div>

 Instructor DTT Technical Skills Across Time

        Figure 2 shows the mean percentage of DTT technical skills exhibited at satisfactory

levels (i.e., 90% or better) by the eight instructors when working with students with ASD across

six sessions. Following the eight-hour training, instructor proficiency scores on the DCCI in

session 1 ranged from 40% to 100% (mean = 75%) in the area of Discriminative Stimulus, from

0% to 100% (mean = 60%) in the area of Reinforcers, and from 33% to 83% (mean = 52%) in

the area of Prompting. As seen in Figure 2, mean instructor proficiency scores improved relative

to baseline across the six sessions in all three technical skill areas. However, significant

variability in proficiency was again observed across individual instructors and time both within

and across the three technical skill areas. After being provided corrective feedback orally and in

writing with the DCCI following five work shifts, instructor proficiency in session 6 ranged from

70% to 100% (mean = 93.75%) in the area of Discriminate Stimulus, from 80% to 100% (mean

= 93.33%) in Reinforcers, and from 67% to 83% (mean = 77.67%) in the area of Prompting.

<div align="center">**<Fig. 2 here>**</div>

Discussion

The present study had several purposes. The first was to evaluate the effectiveness of the training and supervision procedures that were efficacious in the Downs, Downs, and Rau (2008) study when applied in real-world conditions that more closely resemble those in which many children with ASD receive intervention. We also sought to extend the research literature on DTT training by examining the effects of training and supervision on instructor knowledge and performance of DTT and support skills within three specific domains (DTT Technical Skills; Work Session Preparation/Conclusion; and Student Engagement/Management), allowing for an evaluation of which aspects of providing DTT in real-world settings are most challenging for new instructors. Finally, we evaluated which of the basic DTT technical skills (Discriminative Stimulus, Reinforcement, Prompting) were most challenging for instructors to learn and display correctly over time. To do so, we utilized a comprehensive checklist, the DCCI, to examine the effects of training and supervision on instructor performance of DTT in a community-based classroom when working with children with ASD *in vivo*.

This is the first study we are aware of that has reported results from a theoretical assessment of instructor knowledge used as part of a DTT training program. As expected, the results indicated that the eight-hour training session led to large increases in participants' knowledge of how to implement DTT with children with ASD. However, post-training knowledge scores were far from perfect suggesting the possibility that new instructors who are provided an in-service type training in DTT may leave such a training without a comprehensive understanding of the various technical and support skills required to implement DTT effectively. Post-training scores in the domain of Work Session Preparation/Conclusion were particularly low. This is an important finding because most studies examining the effects of training on new

instructors' readiness to implement DTT have focused somewhat narrowly on assessing only the

DTT technical skills (Belfiore et al., 2008; Bolton & Mayer, 2008; Koegel et al., 1978; Koegel et

al., 1977; Leblanc et al., 2005; Ryan & Hemmes, 2005; Sarakoff & Sturmey, 2004). The results

of this study highlight the need for training that focuses explicitly on not only the specific DTT

technical skills, but also on support skills such as selecting and organizing curricular materials

and accurately tracking which skills are in the mastery or acquisition phase. Further, the results

strongly suggest the need for additional support and supervision *in vivo* post-training.

When evaluating how instructor knowledge was related to actual performance when

working with children with ASD we found that instructors' post-training knowledge scores on

the DTA were moderately to strongly correlated with their performance in session 1 in the areas

of DTT Technical Skills and Work Session Preparation/Conclusion. These results suggest that a

knowledge assessment such as the DTA may have some value when training new instructors to

provide DTT to children with ASD. Such an assessment may be particularly helpful as an

adjunct to the performance assessments typically utilized in trainings, as it would allow trainers

to assess new instructor knowledge of skills and procedures that that are not readily observed in a

time-limited training session where children with ASD are not present (e.g., reviewing

previously written clinic notes before sessions, ignoring inappropriate student behavior when

applicable, etc.). Use of an assessment such as the DTA may also help community-based

intervention programs to reduce the significant costs associated with providing intensive and

ongoing performance feedback to numerous instructors by providing an alternative,

complementary method of assessing instructor competency.

In contrast to the apparent relationship between instructor knowledge and performance in

the areas of Work Session Preparation/Conclusion and DTT Technical Skills, post-training DTA

scores were weakly correlated with instructor performance in the area of Student

Engagement/Management. This result suggests that effectively managing student behavior is a

skill area where knowledge may not translate into performance when new instructors are

working with children with ASD who may display a range of challenging behavior that can vary

significantly across both students and time. Because of this, many new instructors are likely to

need additional post-training supervision and support specifically focused on helping them to

engage with students with ASD in such a way that will allow them to properly implement the

DTT technical skills they have learned in training.

        The results from the performance assessments conducted in this study further reinforce

the notion that training and supervision of new instructors should intentionally focus on not only

the basic DTT technical skills, but also the support skills needed to prepare for and conclude

DTT sessions and to manage challenging student behavior. Consistent with the results of the

Downs, Downs and Rau (2008) study, the instructors in the present study were not displaying

high levels of proficiency in any of the three DTT technical and support skill areas immediately

following training. Unfortunately, in the absence of the extremely high level of supervisory

support that was present in the Downs, Downs, and Rau study, the instructors in the present

study continued to display some inconsistency across all three of the skill areas assessed

throughout the study. Indeed, the mean instructor proficiency ratings in this study never reached

the 90% level that was achieved relatively quickly in the Downs, Downs, and Rau study,

suggesting that training procedures that are proven efficacious in more tightly controlled settings

may not generalize as well as would be hoped for in real-world classrooms where children with

ASD actually receive services. As early intervention programs for children with ASD continue to

proliferate and use DTT as an intervention tool, it will be absolutely critical to further examine

the extent to which training and supervisory procedures lead to desired instructor performance of

the entire range of DTT and support skills in classrooms where children with ASD are served.

The final purpose of this study was to evaluate which of the specific DTT technical skills

were most difficult for new instructors to learn. The vast majority of studies examining DTT

training have reported aggregated assessment data across all of the various DTT technical skills

(Arnal et al., 2007; Babel, Martin, Fazzio, Arnal, & Thomson, 2008; Belfiore et al., 2008; Bolton

& Mayer, 2008; Fazzio et al., 2009; Downs, Downs, & Rau, 2008; Gilligan, Luiselli, & Pace,

2007; Sarakoff & Sturmey, 2004; Thomson, Martin, Arnal, Fazzio, & Yu, 2009). Because of

this focus on the DTT procedures as a whole, little is known about which of the DTT technical

skill areas (discriminative stimulus, reinforcement, and prompting) may require more attention

when training and supervising new instructors. Following training, the instructors were not

displaying high levels of competency in any of the three technical skill areas, with prompting

procedures proving particularly challenging (i.e., 52% correct across instructors). After two

months of providing DTT in the classroom and receiving individual supervision and performance

feedback during five sessions the instructors were displaying over 90% correct performance in

the technical skill areas of discriminative stimulus and reinforcers. However, mean instructor

performance in the area of prompting reached 80% accuracy in only one of the six sessions.

These results suggest that prompting procedures are the most difficult for new instructors to learn

and implement consistently over time and should receive extra attention when training and

supervising new DTT instructors.

Conclusions and Recommendations

Discrete trial teaching is an instructional strategy with a demonstrated ability to facilitate

learning and development in children with ASD (Lovaas, 1987; McEachin et al., 1993; Smith,

1999) and other developmental disabilities (Downs et al., 2007; Downs, Downs, Fossum et al.,

2008). As educators and paraeducators seek to use DTT in community-based settings it is

critical that they receive the training and supervision needed to allow them to implement DTT in

the manner in which it has proven effective. Based on the results of the present study we make

the following recommendations for programs training individuals to provide DTT to young

children with ASD and other developmental disabilities.

1.   In-service or similar trainings in DTT must be supplemented by performance feedback

        that is provided to new instructors after they begin implementing DTT in the classroom

        with children with ASD. Providing training without any subsequent supervision and

        performance feedback will almost certainly result in less than optimal instruction and

        student learning.

2.   Knowledge assessments such as the DTA may be used as part of training and supervision

        when providing ongoing (i.e., daily or weekly) intensive individual supervision and

        performance feedback is not possible. Importantly, such knowledge assessments should

        be used as an adjunct to, not a substitute for, performance assessments.

3.   DTT trainers and supervisors should intentionally and systematically train and provide

        feedback to new instructors across the full range of skills needed to implement DTT

        (work session preparation and conclusion, DTT technical skills, and student engagement

        and management).

4.   Trainers and supervisors should pay particular attention to new DTT instructors' ability

        to correctly use prompting procedures, as these appear to be the most difficult of the DTT

        technical skills for new instructors to learn and implement consistently.

Implementation of these recommendations has the potential to help ensure that community-based intervention programs that wish to use DTT are able to do so in the manner in which such methods have proven effective. By improving treatment integrity in this way professionals working with young children with ASD can help to bridge the gap between research and practice. More importantly, using training and supervision procedures that maximize instructor competency will very likely help to improve the developmental and educational outcomes of children with ASD who are served in community-based intervention programs.

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Appendix

Discrete Trial Teaching Competency Checklist for Instructors (DCCI)

Instructor: _____   Date: _____   Supervisor: _____

0 = Unsatisfactory (less than 50% correct)
1 = In Progress/Needs Improvement (50%-90% correct)
2 = Satisfactory (greater than 90% correct)

Work Session Preparation/Conclusion
_____Sign in for work session
_____Read Behavioral Notes before session begins
_____Check Program Checklist to see what you will work on with student
_____Within each program check "Current Items" and select appropriate items
_____Be prepared with all materials before students arrive and before initiating each program
_____Program checklist completed
_____Record date and number of hours worked with student on sign-in sheet
_____Check for and record any mastered/newly introduced items
_____Complete behavioral notes at end of shift (description of student's behavior, successful and
         unsuccessful programs, free play activities, effective reinforcers)
_____Put away all materials at end of shift

DTT Technical Skills
  Present Sd correctly in each program/item
          _____1. Child attending
          _____2. Sd is clear, concise, uninterrupted
          _____3. Sd is consistent (presented the same way every time)
          _____4. Sd is NOT repeated
          _____5. Give student approximately 3-5 seconds to respond
  Consequences used correctly in each program/item
          _____1. Deliver reinforcing stimulus (Sr) immediately following correct responses
          _____2. Primary reinforcers accompanied by social reinforcers
          _____3. Use effective reinforcers (child responds positively to reinforcer)
          _____4. Use "no" correctly
          _____5. Only reinforce correct responses
  Correct prompting/prompt fading procedure followed in each program
          _____1. Timing: prompt given immediately following Sd
          _____2. Least intrusive prompt used
          _____3. Prompted trial followed by non-prompted or reduced prompt trial
          _____4. Prompts faded appropriately (less intrusive, removed)
          _____5. Avoid inadvertent prompts
          _____6. Prompts used to avoid repeated failures
_____Trials paced correctly (1-3 seconds in between trials)
_____Avoid excessive verbalizations when interacting with students at acquisition level
_____Data collection correct

Student Engagement/Management
_____Ignore inappropriate student behavior when applicable
_____Reinforce appropriate student behavior
_____Follow-through with all instructions given to student
_____Give re-direction instruction for off-task student behavior and follow through as needed
_____Engage appropriately with students (do not use verbal or physical aggression with students)
_____Reinforce student attention and effort