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The Additive Effects of Components of an Intervention Package Targeting Compliance in Children With Hearing Impairments in a Classroom Setting

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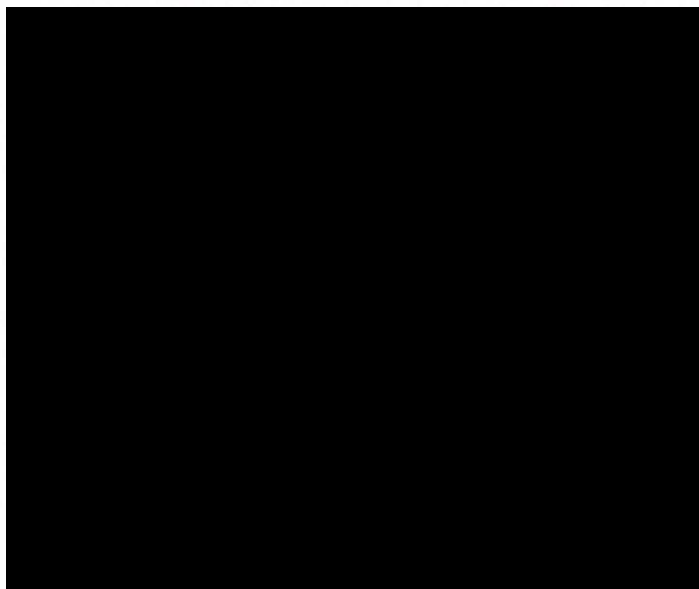
THE ADDITIVE EFFECTS OF COMPONENTS OF AN INTERVENTION PACKAGE
TARGETING COMPLIANCE IN CHILDREN WITH HEARING IMPAIRMENTS IN
A CLASSROOM SETTING

by

Laura Lynne Needelman

A Thesis
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of The University of Southern Mississippi
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ABSTRACT

THE ADDITIVE EFFECTS OF COMPONENTS OF AN INTERVENTION PACKAGE TARGETING COMPLIANCE IN CHILDREN WITH HEARING IMPAIRMENTS IN A CLASSROOM SETTING

By Laura Lynne Needelman

August 2010

The present study investigated the sequential introduction of a compliance training package based on the Compliance Training for Children (CTC) Model developed in the School Psychology Program at The University of Southern Mississippi. Participants were three deaf students in the classroom setting who were referred by their teachers for exhibiting noncompliance. The teachers in this study were also deaf. A nonconcurrent multiple baseline across participants design was used to assess the effectiveness of Effective Instruction Delivery (EID), EID with contingent praise for compliance, and EID with contingent praise for compliance and time-out contingent on noncompliance. One participant reached 100% compliance with the introduction of EID alone. The other two participants reached 100% compliance with the introduction of EID plus contingent praise and time-out, although time-out was never implemented. Findings indicate that the use of these compliance training procedures may be applied to individuals with hearing impairments or deafness to increase compliance. Potential limitations and directions for future research are discussed.

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CHAPTER I

INTRODUCTION

According to the American Speech-Language-Hearing Association, 5,775,722 school-age children, ages 6-21, received special services through the Individuals with Disabilities Act during the 2000-01 school year (n.d.). Of that number, a combined 1.2 % of those children received special services under the disability categories of Hearing Impairment and Deafness.

Among children without disabilities, common reported behavior problems include aggression, tantrums, inappropriate vocalizations, and refusal to comply with parental requests (i.e., noncompliance). Of those previously mentioned behavior problems in typically developing children, noncompliance is the most frequently reported behavior problem resulting in parents' seeking psychological/mental health services (Bernal, Klinnert, & Schultz, 1980; Everett, Hupp, & Olmi, 2010; Ford, Olmi, Edwards, & Tingstrom, 2001; Marlow, 1996). With respect to children with hearing impairments, it is likely that they will present with similar behaviors during childhood. In fact, these behaviors, in addition to destructive behaviors and lack of self-help skills are behavior problems that are also commonly reported for children with hearing impairments (Berrett & Kelley, 1975; Forehand, Cheney, & Yoder, 1974; Knutson, Johnson, & Sullivan, 2004; Mira, 1972; Sahasi, 1989).

Sahasi (1989) conducted a study in which the parents of 79 children with hearing impairments completed a 15-item checklist describing their child's behavior problems. Fifty-one children were excluded from the study because of below average intelligence. Of the remaining parents, it was found that 39.28% of parents of 28 average

cognitive functioning children with hearing impairments in the study endorsed that their child exhibited behavior problems (i.e., fidgety, hyperactive, clings to mother, suspicious, temper tantrums, specific fears, withdrawn, licking objects, obstinate, and untruthful). Effectively treating childhood noncompliance may generalize to the improvement of other presenting problem behaviors (Ducharme & Popynick, 1993; Wierson & Forehand, 1994). Noncompliance is thought to be a keystone behavior. By decreasing noncompliance, other behaviors are likely to improve as well.

Rhode, Jensen, and Reavis (1993) suggested that noncompliance to adult requests is also a common problem in school settings, indicating that compliance levels under 40% may have a negative impact and “disable a student” (4). Furthermore, Martens and Kelly (1993) suggested that student learning might actually depend on compliance to adult presented instructions.

Targeting noncompliance early may potentially prevent later behavior problems. Early childhood noncompliance is the basis for the development of subsequent behavior problems. After reviewing 28 studies, Forehand and Wierson (1993) proposed a developmental model for disruptive behaviors. The proposed developmental trajectory indicates that early childhood noncompliance is the first problem behavior in a series of problem behaviors that could lead to later juvenile delinquency. Early childhood noncompliance is often accompanied by a cycle of coercion whereby the child is negatively reinforced for exhibiting undesirable behaviors following a request (Eddy, Leve, & Fagot, 2001; Patterson, 1982). If, through noncompliance, the child is allowed to escape the task, he or she is more likely to exhibit the undesirable behaviors in the

future in an effort to escape the demand. These early coercive parent-child interactions can lead to coercive peer and teacher interactions in middle childhood.

The negative interactions with peers and teachers often lead to the child being rejected by peers and teachers and is often accompanied by poor school performance (Eddy et al., 2001; Forehand & Wierson, 1993). During early adolescence, this child will likely be at greater risk to begin to associate with deviant peers and, in turn, become involved in minor delinquency. As the child becomes involved with delinquent peers, they become more likely to engage in more serious delinquent acts throughout middle and late adolescence. Consequently, this speaks to the importance of addressing noncompliance in children with and without disabilities. The following portion of the literature review will address foundations of compliance training procedures and the various investigations of particular components of those packages.

Compliance Training

Standard compliance training packages typically have common features. Such intervention packages tend to focus on altering the behaviors of the primary change agents (i.e., the parents and/or teacher) and may include direct instruction on how to consequence appropriate behavior, how to deliver instructions, and how to consequence inappropriate behavior. Compliance training combines both antecedent and consequent procedures to increase compliance and decrease noncompliance and other inappropriate childhood behaviors.

Origins of Compliance Training

Compliance training is a widely used treatment for childhood noncompliance. Forehand and McMahon's original compliance training package, the forerunner of other

standardized approaches and protocols, consisted of training parents in two phases (1981). Phase I consists of providing differential attention to child behaviors through the Child's Game and consists of three specific parenting skills: Attends, Rewards, and Ignoring.

Attending consists of providing the child with a description of his or her appropriate behavior. There are two types of attending, a general description of the child's behavior and a description of prosocial behaviors in which the child is engaged (Forehand & McMahon, 1981).

Rewards consist of three different types of praise or physical contact rewards: (a) Physical Rewards (e.g., hugs, kisses, pats on the back); (b) Unlabeled Verbal Rewards (e.g., "Nice!"); and (c) Labeled Verbal Rewards (e.g., "I like the way you put the books on the shelf."). Forehand and McMahon provided four guidelines for rewarding a child: (a) reward immediately; (b) use specific rewards with the child's behavior clearly labeled; (c) use rewards consistently, especially when a behavior is first being acquired; and (d) reduce frequency of rewards after desired behavior is consistent (Forehand & McMahon, 1981).

Ignoring consists of the following: (a) no eye contact or other nonverbal cue with the child (e.g., parents are instructed to turn away from child); (b) no verbal contact (e.g., explaining to the child that he or she will be ignored during misbehavior at a time when he or she is exhibiting appropriate behavior); and (c) no physical contact (e.g., parents are instructed to stand so that the child cannot climb on them or leave the room in order to avoid physical contact). However, the authors provided the caveat that ignoring should not be used if the child is a danger to him or herself, others, or is causing damage to

property. During Phase I, parents are trained to increase positive social attention (e.g., verbal praise, positive touch) and refrain from commands, questions, and criticisms during the Child's Game (Forehand & McMahon, 1981).

Phase II of Forehand and McMahon's compliance training package consists of training parents to deliver commands in an effective manner and to implement time-out (i.e., the Parent's Game) (1981). Phase II is comprised of three parenting skills: (a) delivering commands, (b) reinforcing compliance, and (c) the appropriate use of time-out.

The commands component of Phase II instructs the parents on how to deliver appropriate commands (Forehand & McMahon, 1981). Several guidelines for issuing commands were presented: (a) commands should be specific and direct, (b) commands should be given one command at a time, and (c) there should be a 5-s wait period after the delivery of a command. Being specific and direct includes: (a) establishing eye contact, (b) using a firm voice that is slightly louder than normal, (c) stating the command as a "do" command, (d) being brief, and (e) delivering the command in a manner that the child understands. Commands should be issued one at a time and should be complied with before moving on to the delivery of the next command. Additionally, parents should wait 5 s for compliance before any other verbalizations. This 5-s latency period gives the child a reasonable opportunity to initiate compliance.

The reinforcing compliance component of Phase II teaches parents to use skills learned in Phase I to reinforce compliance (Forehand & McMahon, 1981). Parents are taught to attend to the child and reward the child frequently and immediately contingent on initiation of compliance within 5 s, in addition to completion of compliance.

The time-out procedure is the final component of Phase II (Forehand & McMahon, 1981). The parent is taught to place the child in time-out if the child does not begin to comply with the command within 5 s. If the child does not initiate compliance with the command within 5 s, the parent is instructed to issue a warning to the child (i.e., an "If...then..." statement). If the child still does not comply within an additional 5 s, the child is then placed in time-out. The parent physically guides the child to a chair facing the corner of a room and states the reason for placement in time-out. The parent is taught to ignore the child during time-out. The child is required to remain in time-out for 3 min and until he or she is quiet for the last 15 s before release from time-out. After the child is released from time-out, the original command is re-presented (i.e., escape-extinction). This procedure is repeated if the child continues to not comply with the command. If the child elopes from time-out, the parent is instructed to immediately return the child to the chair and issue a one-time warning that the child will be spanked if they attempt to leave the chair again. If the child does leave the chair again, the parent is instructed to spank the child twice with an open hand and tells the child that it will happen again if the child leaves the chair again.

After training the parent on the time-out procedure, the child is then trained in a similar fashion (Forehand & McMahon, 1981). Specifically, the time-out procedure is explained to the child at a developmentally appropriate level. The parent and therapist role-play the procedure with the therapist playing the part of the child. At each step, the child is asked to indicate the next step in the process.

Forehand and McMahon's original compliance training package teaches the parent antecedent and consequent procedures to increase compliance combined with a

collateral effect of improving interactions between the parent and child (1981). This parent training package served as the forerunner of later developed compliance training packages.

In an earlier study that predated the aforementioned publication, Forehand et al. (1974) evaluated the effects of a compliance training package on a 7-year-old male with hearing impairment in a case study. Treatment services were sought for general noncompliance. Two treatment phases were employed. During Treatment A, the mother was instructed to engage in an activity chosen by the child. Additionally, during that activity, the mother was instructed to increase social rewards for generally appropriate behavior and to eliminate commands and questions. During Treatment B, the mother engaged in an activity with the child in which she chose and established the rules. Additionally, the mother was trained to implement time-out. Components of this phase included: (a) tapping the child on the shoulder to get his attention; (b) delivering a direct command in a loud voice with gestures to insure understanding; (c) providing social rewards (i.e., verbal, nonverbal, or physical) for compliance; (d) issuing a warning for the first instance of noncompliance; and (e) implementing time-out for subsequent instances of noncompliance (i.e., placement in a time-out chair in a corner, a warning that he would be spanked if he left time-out, two quick spanks if he ignored the warning by leaving time-out again, returning to the task following time-out, and a social reward for compliance with the command).

Treatment A resulted in increases in the mother providing social praise (e.g., affectionate physical contact, smiling, head nodding, handclapping) (Forehand et al., 1974). For Treatment A, praise increased from an average of 0.2 per minute during

baseline to 8.2 per minute during treatment. Treatment B resulted in increases of compliance from 20% in baseline to 73% in treatment. This study provides evidence that a compliance training package can increase parent rates of providing social praise and, more importantly, the levels of compliance in a child with deafness. The next section of the literature review will briefly detail antecedent and consequence procedures that comprise specific compliance training packages.

Antecedent Procedures

Antecedent procedures are those that occur prior to a target behavior. Often, antecedent strategies are manipulated to affect behavior change. Antecedent strategies such as time-in and Effective Instruction Delivery (EID) are antecedent procedures that are commonly used to increase compliance. Previously, time-in was conceptualized as “Catch ’em Being Good” and later referred to as time-in (Becker, as cited in Christophersen, 1988). “Catch ‘em Being Good” refers to providing physical contact and praise for generally appropriate behavior and ignoring undesirable behaviors. Time-in is described as providing high levels of praise for generally appropriate behavior (Bellipanni, 2003; Benoit, Edwards, Olmi, Wilczynski, & Mandal, 2001; Christophersen, 1988, 1990; Ford et al., 2001; Mandal, Olmi, Edwards, Tingstrom, & Benoit, 2000; Marlow, Tingstrom, Olmi, & Edwards, 1997). The praise can take the form of either verbal praise or physical contact in response to appropriate behavior. It is important to note that time-in is provided for generally appropriate behaviors and is not restricted to compliance to a delivered instruction. For example, a parent might praise a child for using eating utensils properly. Time-in functions as an establishing operation in that

providing the individual with regular access to a reinforcer for appropriate behavior may cause satiation and decrease the motivation for that reinforcer.

EID is another antecedent procedure that has been used by parents and teachers to increase compliance (Bellipanni, 2003; Benoit et al., 2001; Everett, 2003; Everett, Olmi, Edwards, & Tingstrom, 2005; Ford et al., 2001; Roberts, Tingstrom, Olmi, & Bellipanni, 2008). The term EID was originally used by Ford et al. EID is based on the early work of Forehand and McMahon (1981), who noted two command or instruction types: alpha and beta commands. Alpha commands are commands that are clear, direct, and descriptive. Beta commands are those that are unclear, vague, or are repeated rapidly in a chain.

Ford et al. (2001) described the components of EID to include the following: (a) obtaining eye contact before command delivery, (b) delivering the instruction in close proximity to the child, (c) delivering the instruction as a directive, (d) using a quiet-toned voice to deliver the instruction, (e) allowing a 5-s latency following a command (i.e., allowing the child 5 s to initiate the command before the adult responds), and (f) praising verbally or physically the child following compliance (Everett et al., 2005; Ford et al., 2001; Roberts et al., 2008). This procedure is consistent with that of Forehand and Long (2002).

Eye contact is one component of EID that has been studied for its effectiveness on compliance levels. Hamlet, Axelrod, and Kuerschner examined the effects of eye contact on compliance (1984). Two 11-year old students participated in the study. During baseline, the teacher called the student's name and maintained visual contact with the student throughout the command, however the student was not required to make eye contact with the teacher. During the Demand Eye Contact phase, the teacher called the

student's name with a moderately firm toned voice and required eye contact throughout the entire instruction. If eye contact was broken, eye contact was reinstated, and the command was repeated. Compliance levels for Student 1 increased from a mean of 30% during baseline to a mean of 70% during the Demand Eye Contact phase. Compliance levels for Student 2 increased from a mean of 20% during baseline to a mean of 60% during the Demand Eye Contact phase. Establishing eye contact substantially increased compliance levels above baseline.

Proximity, a component of EID, and other nonverbal parental behaviors have been studied for its effects on compliance levels. Hudson and Blane (1985) used eight clinical and eight nonclinical mother/child pairs to assess the effects of distance from child, body orientation of the mother, eye contact, tone of voice, and the mother's visual orientation towards the object of instruction on child compliance. Each mother/child pair was assessed via a 20-min videotape. Similar to the procedure presented by Forehand and McMahon (1981), the pair engaged in the Child's Game for the first half of the session and the Mother's Game (i.e., Parent's Game) the second half of the session. The parents were instructed to direct their child in three specific activities: (a) building a tower, (b) having a tea party, and (c) drawing a picture of a house. A comparison of the clinic sample and non-clinic sample showed a difference in compliance (i.e., 31.6% and 69.2%, respectively).

Statistically significant differences were found for the number of commands delivered regarding distance, with most commands occurring within 3 feet of the child (Hudson & Blane, 1985). Regarding eye contact, most of the commands resulted in parent looks only. Parents used a neutral tone of voice with most of the commands.

Significant effects for compliance were found for all five variables. Compliance was greater when the instruction was delivered in close proximity, if the mother was kneeling or squatting, if there was more eye contact, if the mother used a pleasant tone of voice when delivering commands, and if the mother was physically oriented to the object involved in the instruction. Results must be taken with caution as they were analyzed via chi square and, therefore, are only correlational and not causal in nature.

Williams and Forehand (1984) examined predictor variables leading to compliance. Fifty-six mother/child pairs who were referred to a clinic for displaying noncompliant behaviors participated in the study. Four mother behaviors were recorded: (a) alpha commands, (b) beta commands, (c) positive attention, and (d) questions. Compliance and noncompliance were the child behaviors that were recorded.

A multiple regression analysis was used to assess correlations (Williams & Forehand, 1984). The delivery of beta commands was found to be the best maternal predictor of child noncompliance. Regarding child antecedent behaviors as predictors of future child behavior, child compliance was the best predictor of future child compliance, and child noncompliance was the best predictor of future child noncompliance. Results suggest that using alpha commands will result in higher levels of compliance. A chain of commands was a predictor of noncompliance, although the delivery of beta commands was the best maternal predictor of child noncompliance. Maternal attention (e.g., descriptions of the child's behavior, encouragement, hugs) did not predict compliance.

Green, Forehand, and McMahon (1979) assessed the effects of type of command delivery with twenty mother/child pairs of which the children were exhibiting noncompliance. Mother behaviors that were assessed included: (a) offering rewards; (b)

asking questions; (c) labeled commands (i.e., a command which details exactly what the child is supposed to do); (d) question commands; (e) stop commands; (f) vague commands; (g) interrupted commands; (h) criticisms; and (i) contingent rewards. Child behaviors that were assessed included: (a) negative child behavior, not including noncompliance; (b) compliance; and (c) noncompliance. Parents were simply told to engage in behaviors that make their child look either compliant or noncompliant. Experimenters split the children into two groups, deviant and non-deviant children.

Negative child behaviors (e.g., whining, pouting) were greater in the deviant sample than the non-deviant sample (i.e., 34.5 and 11.4, respectively) (Green et al., 1979). Labeled commands were higher with the parents of deviant children as compared to the non-deviant group (i.e., 3.84 and 2.40, respectively). Question commands were significantly higher in the non-deviant group than the deviant group (i.e., 0.76 and 0.21, respectively). Stop commands were significantly greater in the deviant group than the non-deviant group (i.e., 0.51 and 0.22, respectively). There was also a significant difference in total commands delivered (i.e., 4.92 for the deviant group and 3.61 for the non-deviant group). Although some of these data seem counterintuitive, it may be that different types of children respond differently to different types of commands. For example, non-deviant children may be more compliant with question commands. Therefore, question commands were used more often in the non-deviant group.

Several significant differences were also found between the "Look Compliant" and "Look Noncompliant" phases (Green et al., 1979). Compliance was highest in the "Look Compliant" phase (i.e., 51% compared to 31.5%). Noncompliance was highest in the "Look Noncompliant" phase (i.e., 22.5% compared to 9.5%). Negative child

behavior was highest in the "Look Noncompliant" phase (i.e., 37% compared to 12.0%). Results suggest that mothers are able to change their behavior in order to increase compliance. Mothers engaged in such behaviors as using vague commands, stop commands, and criticisms during the "Look Noncompliant" phase, which had the highest negative child behavior. Mothers engaged in such behaviors as using question commands, rewards, and contingent rewards during the "Look Compliant" phase, which resulted in the highest rates of compliance. Again, it is important to know that child temperament may have had an influence on the way each child responds to the type of command.

"Do" commands are a component of EID that have been studied in contrast with "don't" commands to assess effects on compliance levels. "Do" commands are those that indicate the initiation of a task. "Don't" commands are those that indicate the termination of a task. Neef, Shafer, Egel, Cataldo, and Parrish (1983) examined the effects of "do" and "don't" requests on compliance levels for six children with developmental disabilities. Compliance levels for each student were examined across four phases: (a) baseline, (b) training "do" requests, (c) training "don't" requests, and (d) follow-up. During baseline, no response was given for compliance. During the training "do" requests phase, each child was individually trained to comply with an arbitrary "do" request by providing social reinforcement contingent on compliance and providing a reason as well as a remedial trial in which the child was physically guided to comply with the request contingent upon noncompliance, as well as a social reward contingent upon eventual compliance. During the training "don't" requests phase, each child was individually trained to comply with an arbitrary "don't" request by providing social

reinforcement contingent upon compliance and providing a reason as well as a remedial trial in which the child was guided away from the object contingent upon noncompliance. During the "do" and "don't" training phases the child was verbally praised and either given physical touch or an edible contingent on compliance for the respective phase and reprimanded contingent on noncompliance. Follow-up consisted of reinforcing compliance for both "do" and "don't" commands on a variable ratio schedule.

Following training sessions for "do" and "don't" commands, probe sessions were conducted which consisted of an equal amount of "do" and "don't" commands (Neef et al., 1983). Data were collected for compliance in response to "do" requests and compliance in response to "don't" requests separately. Therefore, each student had two sets of data. The order of training sessions was counterbalanced across participants so that Students 1-3 received "do" training first and Students 4-6 received "don't" training first.

For each participant, compliance increased for "do" or "don't" commands contingent on the type of training that occurred just prior to the probe session (Neef et al., 1983). That is, compliance with "do" commands increased following training with "do" requests and compliance with "don't" commands increased following training with "don't" requests. Compliance decreased for the training of the opposite type of command and either increased or remained stable during follow-up.

Compliance levels for "do" or "don't" requests either remained the same or decreased following the training session of the other type of request (Neef et al., 1983). Results suggest that reinforcement for either "do" or "don't" commands increases levels

of compliance similarly. However, the differentiation in behavioral responding between the two suggests that individuals differentiate between "do" and "don't" commands.

Elrod (1983) assessed the impact of direct and indirect requests as a function of development in young children (i.e., ages 3 to 6). Each child was read short stories that used either nonconventional indirectives or conventional directives. Nonconventional indirectives are those statements that are not stated in the imperative form and do not clearly state the demand. An example of a nonconventional indirective is saying, "I'm saving these cookies." Conventional directives are those that are clearly stated in the imperative form. An example of a conventional directive is, "Please leave the cookies alone." After the story was read, the child was asked, "Why did they say that?" The child's response was scored based on their interpretation of the command. Results of the study showed no differences between responses to nonconventional indirectives and conventional directives in young children. This may, however, be due to the children's developmental level. The ability to understand directives may not be fully developed in children this young.

Similarly, Elrod (1986) also investigated young children's understanding of direct and indirect requests. Using a similar procedure to that of Elrod (1983), the author divided the children into three groups. Group A received pictures and a verbal description of the story. Group B received the verbal explanation of the story, but no drawings. Group C received a large drawing of the story and a very brief explanation. The children in each group were asked the nature of the parent statement (Task 1) and were asked to pick a drawing indicating what the child might do to comply with the request (Task 2).

Groups A and B responded correctly more often to direct requests for Task 1 (Elrod, 1986). A significant main effect for age was also found for Task 1, meaning that older children were better able to respond to indirect requests. Task 2 also yielded a significant main effect for age with older children performing better regardless of the type of directive. Results of this study suggest that older children are more likely to understand indirect requests than younger children. Additionally, older children may understand any request issued by an adult better than younger children, which may be a result of developmental level.

Although several antecedent procedures have been detailed because of their effectiveness in increasing compliance, consequent procedures such as contingent praise and time-out have also been shown to increase compliance. These procedures will be discussed in the following sections.

Consequent Procedures

Consequent procedures are those that occur immediately following the occurrence of behavior. Contingent praise and time-out are two consequent procedures that are commonly used to affect compliance. Contingent praise is praise that is delivered immediately following the occurrence of behavior. Time-out is a procedure in which access to reinforcement is not available to the child for a period of time. These procedures will be discussed in the following sections.

Contingent Praise

Schutte and Hopkins (1970) examined the effects of contingent praise on the compliance levels of five kindergarten students. During baseline, the teacher delivered a predetermined command approximately every 2 min to establish mean levels of

compliance. Following baseline, a contingent teacher attention (i.e., praise), followed by a withdrawal phase and a reintroduction of contingent teacher attention phase were introduced. During the contingent teacher attention phase, the teacher provided a praise statement or positive physical touch to each child that complied with the command contingent on compliance.

As a group, mean compliance levels increased from 60% during Baseline I to 78% during Contingent Attention I, decreased to 68.7% during Baseline II, and increased to 83.7% during Contingent Attention II (Schutte & Hopkins, 1970). This early study provides evidence that contingent praise alone can be effective at increasing compliance.

Time-Out

Forehand (1985) defined time-out as “a procedure whereby positive reinforcement is not available to an individual for a period of time” (222). The procedure is most effective when implemented in the context of a highly reinforcing environment. Essentially, time-out implies that reinforcement is a preexisting condition in the environment in which the individual is operating. The effectiveness of time-out is dependent on the existence of a regular rate of reinforcement for appropriate behavior in the absence of time-out. Time-out has been employed with a variety of procedural variations which will be addressed later in this review.

Types of Time-Out

The three main forms of time-out are as follows: (a) isolation, (b) exclusion, and (c) nonexclusion (Harris, 1985). Isolation time-out involves the removal of the child from the room and placement in a room absent of reinforcement for a predetermined period of time. Alberto and Troutman suggest several safety guidelines that need to be

followed in order to safely use isolation time-out (1999). These guidelines include: (a) an awareness of local and state policies regarding time-out; (b) written policies regarding time-out being readily available to all concerned parties; (c) written permission from parents prior to use; (d) involvement of the Individualized Education Program (IEP) committee for students receiving special education services; (e) an educational function served by use of the procedure; (f) appropriate use of time-out (e.g., proportionate to the behavior); (g) accurate records of the details of each instance of time-out; and (h) data-based monitoring and evaluation of the procedure. Additionally, Alberto and Troutman also provide guidelines for the room in which seclusion time-out is used: (a) 6 x 6 foot minimum, (b) lighting which can be accessed from outside the room, (c) proper ventilation, (d) free from harmful objects, (e) ability to monitor the child visually and auditorily, and (f) cannot be locked, however, a latch may be appropriate. For these reasons, isolation time-out is typically used in institutional settings, but could be used in school settings with appropriate consultation.

Exclusion time-out involves removing the child from the reinforcing environment, but not from the room. The child is placed in an area in which he or she does not have access to view the reinforcing activity (Harris, 1985). Often this type of time-out involves having the child face a corner or a wall in the same room in which the activities are still occurring.

The least intrusive type of time-out, nonexclusion time-out involves allowing the individual to remain in the ongoing activity while removing all positive reinforcement from the individual (Harris, 1985). With nonexclusion time-out, the child in time-out is able to observe the reinforcing environment to which the other children have access.

According to Harris (1985) there are three subtypes of nonexclusion time-out: (a) contingent observation, (b) ignoring, and (c) removal of stimulus conditions. Contingent observation allows the child in time-out to observe the activities of the other children. By allowing the child in time-out to view the activity, it allows them to observe appropriate modeled behavior.

With ignoring (Harris, 1985) the assumption is that the problem behavior is maintained by attention. Ignoring involves removal of all social attention from the child exhibiting noncompliance or other inappropriate behaviors. Ignoring does not require that the child be removed from the situation, only that they do not receive attention. One of the difficulties with successfully implementing ignoring time-out is that it is often difficult to control peer attention. It may be necessary for teachers to simultaneously implement some type of reinforcement program for peers who successfully ignore problem behavior. Ignoring can also be problematic when the target behavior is dangerous and may cause safety concerns if ignored.

A third type of nonexclusion time-out is contingent removal of reinforcing stimulus conditions (Harris, 1985). This procedure involves withholding or removing any tangible items that are reinforcing to the child such as food, activities or other tangibles such as toys. It is important that the child has the opportunity to regain access to the removed stimuli. This type of time-out is another procedure in which the child is not removed from the location. Although Harris describes this as a separate time-out procedure, it may be that all types of time-out include "removal of reinforcing stimulus conditions" (280).

Another model for time-out is presented by Alberto and Troutman (1999) who also offer three types of time-out: (a) nonexclusionary time-out, (b) exclusionary time-out, and (c) seclusionary time-out. In discussing nonexclusionary time-out, Alberto and Troutman suggest Foxx and Shapiro's (1978) "time-out ribbon" as an illustrative example. In this variation of nonexclusionary time-out, each student wears a ribbon (Foxx & Shapiro). Contingent on misbehavior, the ribbon is removed to signal the end of access to teacher attention, activities, and reinforcement for a 3-min period. After the 3-min period is over, the ribbon is returned to the student to signal the availability of teacher attention, activities, and reinforcement. Although the time-out ribbon was not studied in isolation, when used in combination with social praise (e.g., praise statement, touch) problem behaviors were reduced to near zero levels for all participants.

Contingent observation is yet another variation of nonexclusionary time-out (Alberto & Troutman, 1999). With contingent observation, the child is removed to the edge of an activity but still able to observe the activity. Another variation mentioned in Alberto and Troutman typically used with more severe behavior problems, is facial or visual screening. Facial or visual screening involves covering the individual's eyes with an object (e.g., hand, towel, sweatshirt) contingent on misbehavior. The purpose of visual or facial screening is to block visual contact with potentially reinforcing stimuli.

Alberto and Troutman (1999) defined exclusionary time-out as removal of the individual from the reinforcing activity contingent on misbehavior. This is often done by placement of the child facing a corner or in a screened off area of the room. With this procedure, it is not necessary to remove the child from the room, but it is necessary for

the child to not be able to observe ongoing activities from which access has been removed.

Seclusionary time-out, as defined by Alberto and Troutman (1999), is a procedure in which the individual is removed to a time-out room contingent on misbehavior. Seclusionary time-out consists of total social isolation and is usually used for destructive or aggressive behaviors. As with Harris's (1985) isolation time-out, several procedural safeguards are recommended (e.g., proper lighting, proper ventilation, free of harmful objects, constant supervision, no lock on door unless necessary and with careful monitoring).

Procedural Variations of Time-Out

It is important to consider the parameters of each time-out procedure. Alberto and Troutman (1999) propose least to most restrictive intervention approaches to decrease noncompliance. Exclusion time-out and isolation time-out are more intrusive procedures (Harris, 1985) requiring the removal of the child from the setting. Nonexclusion time-out does not require that the child be moved and is therefore considered the least intrusive form of time-out.

Shriver and Allen (1996) developed a Time-Out Grid as a resource for teachers and school psychologists to use when implementing time-out. The authors suggested that it is impossible to create a universal time-out protocol that is effective for all children because of individual child and classroom differences. An example of this may be a child with severe orthopedic impairments may not be able to perform the tasks required for time-out. The basic premise for the Time-Out Grid is that time-out is most effective when there is a high level of reinforcement (time-in) and low levels of reinforcement

during time-out. The greater discrepancy between the reinforcing qualities of the time-in environment and time-out, the more likely time-out will function as an effective intervention.

Time-out, as a reductive strategy, has a variety of procedural variations. Some of the variations include the use of a verbal warning (Roberts, 1982), escape contingencies from time-out (Roberts & Powers, 1990), escape-extinction (Everett, Olmi, Edwards, Tingstrom, Sterling-Turner, & Christ, 2007), and the duration of time-out (Hobbs, Forehand, & Murray, 1978), as well as the release from time-out (Bean & Roberts, 1981). Although it has not been studied in isolation, the use of a verbal reason is another procedural variation (Everett et al., 2010). A detailed account of each of these procedural variations of time-out implementation can be found in the following sections.

The Use of a Verbal Warning

Roberts (1982) examined the effects of warned and unwarned time-out procedures. Participants were 24 mothers and their children who had been exhibiting noncompliance. Each parent/child dyad was assigned to one of three conditions: (a) No-Warn Group, (b) Warn Group, and (c) Standard Treatment Group. All groups began with a baseline phase that consisted of issuing commands every 15 s with no actions for compliance or noncompliance.

When a child was noncompliant in the No-Warn Group, the mother provided the child with a verbal reason and immediately placed the child in time-out (Roberts, 1982). The mothers were instructed not to respond to compliance in both the No-Warn Group and the Warn Group. If a child was noncompliant in the Warn Group, the mother provided a contingency statement as a warning. If the child did not comply with the

warning, the mother immediately delivered a verbal reason and placed the child in time-out. Procedures for the Standard Treatment Group were the same as in the Warn Group with the exception of a brief praise statement provided contingent on compliance in the Standard Treatment Group.

No significant differences were found between treatment groups for mean percentage of compliance: 77.1% for the No-Warn Group, 78.8% for the Warn Group, and 79.8% for the Standard Treatment Group (Roberts, 1982). However, an analysis of the mean time-outs per group yielded significant group differences with fewer time-outs in the Warn Group (1.8) and Standard Treatment Group (2.1) as compared to the No-Warn Group (7.0). Further investigation is warranted to determine if it is more or less beneficial to provide a warning when implementing time-out.

The Use of Verbal Reason

Providing a verbal reason is another procedural variation of time-out. Forehand (1985) described a verbal reason as a brief statement indicating why the child is going to time-out. An example of this is telling the child, "You have to go to time-out because you pinched your sister." There is controversy on whether it is necessary to provide a verbal reason. Harris (1985) believes that the attention that a verbal reason provides might actually reinforce the child. Therefore, in order to minimize the potential reinforcing qualities of a verbal reason, it is necessary to keep the verbal reason brief if one is used. However, it is unclear whether it is the brevity of the reason or the use of the reason altogether that produces the change. It is important to note that the use of a verbal reason in a time-out procedure has not been studied in isolation in the past 30 years (Everett et al., 2010).

Escape Contingencies from Time-Out

Sometimes it is necessary to use additional procedures to enforce time-out. Sterling-Turner and Watson (1999) describe different methods for enforcing time-out: (a) spanking, (b) holding, (c) barrier, and (d) repeated returns. Although spanking has been shown to be an additive element that may be used to diminish escape efforts from time-out, the authors strongly discourage the use of spanking because of the potential negative side effects (e.g., aggression, escape, fear). The holding procedure involves the individual being physically restrained in a time-out area. A barrier method consists of blocking off a time-out area so that the individual cannot escape, and the individual is not allowed access to reinforcers. The repeated returns method consists of the child being physically guided back to time-out each time he or she leaves the area without permission (Sterling-Turner & Watson, 1999). No warnings or reprimands are given during the physical guidance.

Roberts and Powers (1990) examined four different methods of enforcing time-out (i.e., Spank, Hold, Barrier, and Child Release). Participants were randomly assigned to one type of time-out enforcement procedure. Mean compliance levels increased for all four groups: from 18% to 56.9% during treatment for the Spank group, from 18.3% to 51.6% for the Hold group, from 16.8% to 79.8% for the Barrier group, and from 23.9% to 67.9% in the Child Release group.

Results of the study indicated that all four methods of enforcing time-out were effective (Roberts & Powers, 1990). Although Child Release is not technically a method for enforcing time-out, it was effective in increasing compliance. The Hold procedure, which required restraining the child, seemed to be the least practical procedure. The

reasons for this include: (a) the enforcer has to be physically able, (b) there is a risk of injury to the child or the adult, (c) the size of the child may be problematic, and (d) there may be parents who do not wish to engage in restraint procedures.

Escape-Extinction

Everett et al. compared the effectiveness of two time-out procedures, with and without escape-extinction (2007). Participants were four parent/child dyads in which the children exhibited escape-maintained noncompliance in response to delivery of commands. In the escape-extinction procedure, the parents were trained to re-present a command to a child after releasing the child from time-out. One child's median percent compliance increased from 20% during baseline to 40% during the time-out phase and to 70% during the time-out with escape-extinction phase. Another child's median percent compliance increased from 20% during baseline to 45% during the time-out phase and to 70% during the time-out with escape-extinction phase. Additionally, another child's median percent compliance increased from 15% during baseline to 60% during the time-out phase and to 90% during the time-out with escape-extinction phase. For the last participant, median percent compliance increased from 15% during baseline to 90% during the time-out phase and 90% during the time-out with escape-extinction phase.

Everett et al. found that although time-out alone was effective in increasing compliance, time-out with escape-extinction produced the highest levels of compliance (2007). Benshoof (2009) and Needelman (2008) also examined the use of escape-extinction and found similar results. These studies suggest that time-out can be effective with escape-maintained noncompliance, a finding that contradicts the conventional

wisdom previously suggesting that using time-out with escape-maintained behaviors is not appropriate (Shriver & Allen, 1996; Taylor & Miller, 1997).

Duration of Time-Out

Various durations of time-out have been examined. In an experimental manipulation of duration of time-out, Hobbs et al. (1978) divided participants into four treatment groups (i.e., 4-min time-out, 1-min time-out, 10-s time-out, and Feedback Control). During baseline, mothers issued commands to the child to determine base rates of behavior and to determine if the case was appropriate for study participation. During treatment, mothers issued commands to their child. If the child did not comply with a command in the 4-min, 1-min, or 10-s time-out groups, the child was given a verbalized reason and was told to go to time-out. The child was required to remain in time-out for the corresponding time interval. In the Feedback Control group, the child was provided with a statement related to the problem behavior regarding noncompliance contingent on noncompliance. A withdrawal of treatment phase followed the treatment phase in which no time-out was issued.

There was significantly less noncompliance in all of the time-out conditions as compared to the Feedback Control condition (Hobbs et al., 1978). Although no specific data were presented, the authors indicated several other outcomes. Slight increases in noncompliance were found when treatment was withdrawn. The 4-min time-out group had the greatest reductions in percent noncompliance. Additionally, the 1-min time-out group had significantly lower levels of noncompliance than the 10-s time-out group. However, because specific data were not presented, the clinical significance of these findings is unknown.

Release from Time-Out

Another very important parameter of time-out that has been investigated is the method of release from time-out. The release from time-out is either based on a time interval or is contingent on the display of specific behaviors. Release that is based on a time or duration requires the child to remain in time-out for a specified period of time regardless of the displayed behaviors at the point of release. However, in some circumstances, release from time-out could be based on the passage of time and meeting specific behavioral criteria, in which case both criteria would have to be met before the child is released from time-out (Bean & Roberts, 1981).

Bean and Roberts (1981) investigated time-out release contingencies. Twenty-four children and their mothers were randomly assigned to a group: (a) Child Release, (b) Parent Release, or (c) Control. In the Child Release group, the child was instructed that they could come out of time-out when they were ready to comply with the adult command. In the Parent Release group, the child was required to meet a duration criteria (i.e., 2 min) and a behavioral criteria (i.e., quiet for the last 15 s of time out) in order to be released from time-out. In the Control group, commands were delivered to the children, but there were no contingencies for noncompliance.

Bean and Roberts found that both the Parent Release group and the Child Release group resulted in significant increases in levels of compliance (1981). However, children in the Parent Release group (i.e., release based on duration and behavioral criteria) had substantially higher levels of compliance than the Child Release group (i.e., release based on a child's decision). The importance of this study is unclear because there is a confound in the release method and whether the increases in level of compliance were

due to the duration of time-out or the requirement that the child display appropriate behavior before being released from time-out.

Compliance Training at The University of Southern Mississippi

The compliance training package developed at The University of Southern Mississippi, hereto referred to as the Compliance Training for Children (CTC) Model, has several components including time-in, EID, contingent praise for compliance, and time-out. The CTC Model also endorses a functional assessment component designed to hypothesize the function of the presenting noncompliance. The target of the CTC Model is to minimize inappropriate behavior and maximize appropriate behavior, while providing parents/teachers with sound instruction surrounding effective approaches to addressing child behavior. Researchers at The University of Southern Mississippi have investigated several variations of the model (Bellipanni, 2003, 2005; Benoit et al., 2001; Benshoof, 2009; Everett, 2003, 2006; Everett et al., 2007; Faciane, 2001, 2003; Ford et al., 2001; Mandal et al., 2000; Marlow, 1996; Marlow et al., 1997; Needelman, 2008; Olmi, Sevier, & Nastasi, 1997; Roberts, 2003, 2005). Although several studies are referenced, not all studies will be detailed in the literature review. Many of these studies combined time-out with other procedures such as time-in, effective instruction delivery (EID), and contingent praise. Briefly, time-in involves providing attention and/or praise (verbal or physical) for generally appropriate behavior. EID includes requesting eye contact, being in close proximity, delivering commands as a directive, using a quiet-toned voice, and allowing a 5-s latency when delivering commands. Contingent praise involves providing a praise statement contingent upon compliance. Time-out includes providing a verbalized reason for time-out, prompting the child to go to time-out, ignoring the child

while in time-out, using repeated returns if necessary, releasing the child from time-out contingent on 3-5 s of appropriate behavior, and re-presenting the same command upon release from time-out if the original command was a "do" command.

Olmi et al. (1997) evaluated the effects of time-in and time-out on the noncompliance of two children with disabilities. Jeremy was a 4-year-old male with severe receptive and expressive language deficits. There were unsubstantiated indications of other developmental issues as well, including mental retardation and autism. Jeremy's problem behaviors consisted of noncompliance, tantrums, aggression, and elopement. Jenny was an 8-year-old female who was nonverbal, had a moderate mental disability, and cerebral palsy. Jenny's reported problem behaviors consisted of tantrums and throwing objects. The intervention program consisted of two phases: time-in and time-out. Time-in consisted of contingent touch and verbal praise in response to following instructions and the display of appropriate behavior. Time-out consisted of placing the child in a non-reinforcing location for a very brief period of time until appropriate behavior was displayed. If the child complied with the command within 5 s, the child was praised. If the child did not comply with the command, the child was verbally or physically directed to time-out. The time-out procedure consisted of several steps. If the child did not initiate compliance within 5 s, the child was issued a brief verbal reason and was removed from the activity by approximately two to three feet. During time-out, the child did not receive any verbal or physical attention and was released from time-out following a brief period of time. Following the contingent release, the child was reissued the command. If the command was followed, the child resumed receiving time-in. The intervention remained in effect during follow-up.

Initially, parent and teacher report were used to estimate the levels of the target behaviors for baseline (Olmi et al., 1997). Jeremy's compliance levels rose from approximately 10% at baseline to 98% with first-time requests during intervention, and this level was sustained during follow-up. In addition, aggression and elopement decreased to a rate of 0.0 per minute. Jenny's frequency of throwing objects decreased from 8.2 per 2-min interval to 1.4 per 2-min interval during follow-up in which intervention was still in effect. A combination of time-in and time-out was found to be effective for both Jenny and Jeremy. But, one must be cautious regarding the treatment effects of the time-in condition due to the combined treatments of time-in and contingent praise in this condition and the lack of real baseline data.

Marlow et al. (1997) investigated the use of time-in and time-out with three children with speech and language difficulties in a classroom setting. Two of the students were 11 years old and the other was four years old. All three students had low mean levels of compliance during baseline (i.e., 21%, 27%, and 37%). Substantial increases in compliance were found with the introduction of time-in. Student 1 showed mean level increases from 21% to 66% with the introduction of time-in and to 91% during the combination of time-in/time-out. Student 2 showed mean level increases from 27% to 60% with the introduction of time-in and to 70% during the combination of time-in/time-out. Student 3 showed mean level increases from 37% to 66% with the introduction of time-in and to 93% during the combination of time-in/time-out. Follow-up data used to assess the maintenance effects of the compliance procedure indicated maintenance effects for two of the three participants. The intervention was still in effect during follow-up, although there was no integrity data to support this assertion by the

authors. Student 2 showed a decrease in the level of compliance during follow-up (i.e., 70% during the combination of time-in/time out to 47% compliance during follow-up). It is important to note, however, that there was a substitute teacher during follow-up for student 2 and integrity data could not be collected. Again, the use of contingent praise within the time-in condition may have confounded the treatment effects of the time-in condition.

In an effort to evaluate the additive effects of the training package, Ford et al. (2001) sequentially evaluated the components of the compliance training package with four children in the classroom setting. The participants were between five and six years old. Following baseline, teachers implemented EID with praise for compliance, followed by EID plus contingent praise and time-in, followed by a phase of EID plus contingent praise, time-in, and time-out.

Substantial increases in levels of compliance were evident with the introduction of EID (Ford et al., 2001). Time-in further increased levels of compliance. With the introduction of time-out, compliance levels increased further. Compliance levels for Student 1 increased 21% from baseline to EID, 17% from EID to EID plus time-in, and 24% from EID plus time-in to EID plus time-in and time-out. Compliance levels for Student 2 increased 30% from baseline to EID, 13% from EID to EID plus time-in, and 19% from EID plus time-in to EID plus time-in and time-out. Compliance levels for Student 3 increased 43% from baseline to EID, 12% from EID to EID plus time-in, and 7% from EID plus time-in to EID plus time-in and time-out. Compliance levels for Student 4 increased 44% from baseline to EID, 18% from EID to EID plus time-in, and 0% from EID plus time-in to EID plus time-in and time-out. However, it should be noted

that there were only two instances total across two of the subjects in which time-out was actually administered because compliance was so high, making it difficult to decipher the effect of time-out. Follow-up data were collected to assess maintenance of effects and integrity of intervention implementation. Follow-up data indicated high maintenance levels for three participants (i.e., decreases of 14% for Student 1, 5% for Student 2, and 12% for Student 4 from the EID plus time-out and time-in phase to the 4-month follow-up). Follow-up data for Student 3 were unavailable. Given the high levels of compliance during follow-up, it is likely that intervention was continued, however maintenance of treatment was not assessed.

Although Everett et al. (2007) was previously discussed, it merits further discussion because of its focus on escape-extinction. Everett et al. compared the use of time-out with and without escape-extinction with four children. The children were between the ages of four and five and were referred due to noncompliance. The experimenter conducted a brief functional analysis to determine that the behavior was escape maintained. A nonconcurrent multiple baseline design across participants was used to evaluate the effects of time-out without escape-extinction and time-out with escape-extinction.

Baseline consisted of the parent presenting 10 instructions to the child (Everett et al., 2007). In all cases, the parents were not instructed on how to consequence compliance or noncompliance and were free to do as they wished. During the time-out phase, parents were directed to praise compliance and to use time-out for noncompliance. Following a 5-s latency period, the parent was instructed to provide a verbal reason to the child for going to time-out (e.g., "You did not sit in the chair. Time-out."). The parent then

directed the child to time-out with either a verbal or physical prompt. While the child was in time-out, the parent was instructed to ignore inappropriate behavior, unless the child escaped and repeated returns were necessary. When the child exhibited appropriate behavior (i.e., 3 to 5 s of quiet feet, hands, and mouth), he or she was released from time-out. After being released from time-out, the parent waited approximately 30 s to 1 min before presenting a new, different command. During the time-out with escape-extinction phase, procedures were the same as in the time-out without escape-extinction phase with the exception of the release from time-out. In the time-out with escape-extinction phase, the child was re-presented with the same command that sent them to time-out in the first place immediately following the release of time-out. Praise was issued for compliance and time-out continued until the child complied with the command. Following praise for compliance, the parent delivered a new command (Everett et al., 2007).

Small increases were evident from baseline to the time-out without escape-extinction phase (Everett et al., 2007). Further increases in the level of compliance were shown for all four children with the introduction of the escape-extinction component to time-out. Participant 1's median percent compliance increased from 20% during baseline to 40% during time-out and to 70% during escape-extinction. Participant 2's median percent compliance increased from 20% during baseline to 45% during time-out and to 70% during escape-extinction. Participant 3's median percent compliance increased from 15% during baseline to 60% during time-out and to 90% during escape-extinction. For Participant 4, median percent compliance increased from 15% during baseline to 90% during time-out and remained at 90% during escape-extinction. The investigation by Everett et al. provided evidence that the negative reinforcing properties of escape-

maintained behaviors can be overcome. The study also suggests that time-out can be effective regardless of the function of behavior.

Purpose of the Present Study

Because childhood noncompliance is a problem many parents and teachers of children with hearing impairments face, it is important to examine the effectiveness of compliance training with this population. Studies pertaining to this population are relatively few in the child behavior literature. As suggested in Forehand and Wierson (1993) treating noncompliance at an early age is critical. Increasing compliance decreases the chances of a child experiencing problems at school, being rejected by peers, and becoming involved in subsequent delinquent behavior. The effects of the compliance training package developed at The University of Southern Mississippi have not yet been studied with children with hearing impairments or children who are deaf.

The purpose of this study is to expand the research pertaining to the CTC Model of The University of Southern Mississippi. Specifically, the purpose is to evaluate the effectiveness of the compliance training package with children with hearing impairments or deafness in a classroom setting.

Research Questions

The following research questions will be evaluated in the current study:

1. Will EID increase compliance above baseline levels for students with hearing impairments or deafness in a classroom setting?
2. Will a compliance training package including EID plus contingent praise increase compliance above levels of effective instruction delivery alone for students with hearing impairments or deafness in a classroom setting?

3. Will a compliance training package including EID plus contingent praise and time-out increase compliance above levels of a compliance package containing EID and contingent praise for students with hearing impairments or deafness in a classroom setting?

CHAPTER II

METHOD

Participants

Participants were three students who were nominated by their teachers due to noncompliance to first-time teacher delivered instructions. All participants were receiving Special Education Services under the category of Hearing Impaired or Deaf and were between 7 and 8 years of age at a residential school for the deaf in the southeastern United States. Although the school was a bilingual (i.e., American Sign Language and English) program, sign language was the primary mode of communication for all students. Participant 1, Janice, was a 7-year-old African American female. Participants 2 and 3, Maurice and Isaiah, were 8-year-old African American males. Janice and Isaiah were profoundly deaf and had cochlear implants. Maurice had bilateral moderate to severe hearing loss and used two hearing aids. Maurice was a dormitory student meaning that he resided at the school dormitory during the week. Janice and Isaiah were day students meaning that they traveled back and forth to school daily. Students with orthopedic impairments were excluded from the study due to potential problems completing tasks and transitioning to and from the time-out area.

Participants' teachers were profoundly deaf and bilingual in English and American Sign Language. Isaiah's teacher was a Caucasian male with a master's degree in Deaf Education. Janice and Maurice's teacher was a Caucasian female with a bachelor's degree in Deaf Education.

As a requirement for inclusion in the study, informed consent from each student's parent or guardian (Appendix A) and his or her teacher (Appendix B) was requested.

Classroom observations were used to verify low levels of compliance. Baseline levels of compliance were required to be less than 40% with first-time teacher delivered instructions (Rhode et al., 1993). One participant was excluded from the study based on baseline compliance levels above 40%. A university Institutional Review Board (IRB) approved these procedures to protect the participants (Appendix C).

Setting and Materials

Each session took place in the student's classroom during regular classroom activities. Each participant was in a class of five to six students, all with hearing impairments or deafness. Additionally, each classroom contained a teacher assistant. Observations were conducted during whole group instruction or independent seat work time.

The Functional Assessment Informant Record for Teachers (FAIR-T) is a semi-structured interview developed at the University of Southern Mississippi School Psychology program (Edwards, 2002). The FAIR-T examines antecedent variables that may occasion the problem behavior and consequent behaviors that may be maintaining problem behavior. The FAIR-T was used as part of the functional behavior assessment in conjunction with conditional probability data from obtained during baseline. The FAIR-T, along with direct behavioral observations, has been shown to be effective in arriving at hypothesized functions of behavior (Doggett, Edwards, Moore, Tingstrom, & Wilczynski, 2001; Mueller, Sterling-Turner, & Moore, 2005; Needelman, 2008). This process has been shown to converse with comprehensive functional assessments that include functional analyses.

Data Collection

Observation Form

An observation form was used to record teacher and student data as well as consequences of behavior (Appendix D). Teacher behaviors that were recorded on the observation form include behaviors associated with the nature of the instructions delivered and specific aspects of time-out. Those included the following: (a) obtained eye contact, (b) close proximity, (c) directive, (d) quiet-toned voice, (e) 5-s latency, (f) praise for compliance, (g) brief reason, (h) prompting procedures, (i) ignoring, (j) repeated returns, (k) time-out release, and (l) escape-extinction. The student behavior that was recorded on the observation form was compliance (i.e., initiates within 5 s). Consequences following behavior that were recorded included the following: (a) teacher attention, (b) peer attention, (c) escape, and (d) tangible. The observation form was duplicated so that trained observers were able to complete the form and obtain interobserver agreement data. Behaviors were recorded using an event recording procedure.

Dependent Measure

The dependent measure across all phases was initiation compliance. Initiation compliance was defined as the student initiating behaviors within 5 s of command delivery that would lead to compliance.

Design

A nonconcurrent multiple baseline design across participants was used to evaluate the components of the compliance training procedure (Hayes, Barlow, & Nelson-Gray, 1999). Although a nonconcurrent multiple baseline does not control for effects of time or

maturation, its advantages are that it allows for several replications and it does not require treatment to be withheld for long periods of time (Hayes, 1981, 1985). After a student was determined to be eligible for the study via the screening and following the teacher interview, the order of implementation of phases was as follows: (a) baseline, (b) EID, (c) EID plus contingent praise, and (d) EID plus contingent praise and time-out. Before a phase change occurred, a stable, variable, or decreasing trend needed to be evident for each phase. Phase changes were staggered.

Procedure

The procedure was modified from the CTC Model developed at the University of Southern Mississippi and modified for students with hearing impairments. Time-in was not included in this study. Other modifications of the package were based on consultation with teachers responsible for teaching the students selected for study participation. This package was modified to include the use of sign language. Study conditions were as follows:

Functional Assessment

Prior to collection of baseline data, an interview was conducted with the teachers using the FAIR-T (Edwards, 2002). A sign language interpreter was used for this process. The FAIR-T examines antecedent variables that may occasion problem behavior and consequent behaviors that may be maintaining problem behavior. The FAIR-Ts were independently verified by a trained graduate student.

As an additional component of the functional behavior assessment, observers recorded consequences that immediately followed noncompliance during baseline. Conditional probability data were calculated to determine the possible function of

noncompliance in conjunction with the results of the FAIR-T (Edwards, 2002).

Conditional probability data for attention were calculated by dividing the number of instances that noncompliance was followed by attention by the total number of instances of noncompliance and multiplying by 100 for each session. The same procedure was used to calculate conditional probability data for escape. It was hypothesized that noncompliance was maintained by a consequence if mean level was greater than 30% for that consequence.

Janice received attention following noncompliance within 88% to 100% of instances of noncompliance (mean = 92%). Janice escaped task demands following noncompliance within 13% to 25% of instances of noncompliance (mean = 17%). Maurice received attention following noncompliance within 57% to 83% of instances of noncompliance (mean = 71). Maurice escaped task demands following noncompliance within 17% to 43% of instances of noncompliance (mean = 33%). Isaiah received attention following noncompliance within 25% to 100% of instances of noncompliance (mean = 72). Maurice escaped task demands following noncompliance within 86% to 100% of instances of noncompliance (mean = 95%). It was hypothesized that Janice's noncompliant behavior was maintained primarily by teacher attention. Mixed results were obtained for Maurice and Isaiah, suggesting dual functions of noncompliance, attention and escape from task demands.

Baseline

The purpose of the baseline phase was to determine the student's initial level of compliance with first-time delivered teacher commands, as part of the selection and screening procedure. In order to be eligible for participation in the study, the mean level

of compliance for each child had to be approximately less than or equal to 40%. During this phase, the teacher delivered 10 commands at a rate of approximately one per minute. Event recording was used to record child and teacher behaviors. Compliance levels per session were calculated by dividing the number of times the child initiated compliance by the number of commands and multiplying by 100.

Although the teachers were not given directions on how to consequence student behavior during this condition, data were collected on teacher behaviors to assess the level of teacher behaviors evident during baseline. Teacher behaviors were recorded as percentage of treatment components implemented. Teacher behaviors were calculated by dividing the number of components implemented by the total components possible and multiplying by 100. Each instruction was evaluated for a minimum of 80% treatment integrity or better. Although no feedback was delivered to the teacher during baseline, subsequent phases consisted of a requirement that each instruction be delivered with a minimum of 80% treatment integrity in order for the teacher to be deemed proficient (i.e., 4 out of 5 components for the EID phase, 5 out of 6 components for the EID plus contingent praise phase, and either 5 out of 6 components in the EID plus contingent praise and time-out phase if the student complied with the command or 8 out of 11 components if the student did not comply because there is a different number of components depending on whether the student complied or not).

Teacher Training

Before beginning each phase, teachers were trained by the primary investigator to implement the corresponding procedures for that phase. Teachers were trained using written instructions, modeling, practice, and performance feedback (Appendixes F, G,

and H). The teachers were provided with written instructions regarding the procedure for each phase. The experimenter modeled the procedure prior to each phase. After the experimenter modeled the procedure, the teacher practiced the procedure prior to implementation of each phase. Performance feedback was provided to teachers to increase treatment integrity. A sign language interpreter was present and interpreted for all teacher training and performance feedback sessions. Each statement made by the experimenter was immediately interpreted for the teacher. Likewise, each statement or question made by the teacher was immediately interpreted for the experimenter.

Effective Instruction Delivery

During this phase, compliance and teacher behaviors were recorded and calculated the same as in baseline (Appendix D). Teachers needed to maintain 80% treatment integrity (i.e., 4 out of 5 treatment components). If treatment integrity fell below 80%, the experimenter retrained the teacher on missed steps. That is, if overall treatment integrity was less than 80%, performance feedback was delivered and the teacher was retrained on the missed components. Teacher behaviors in this phase included: (a) establishing eye contact before command delivery (e.g., saying "Look at me"); (b) delivering the instruction in close proximity (i.e., within 3 feet); (c) delivering the instruction as a directive rather than question; (d) using a quiet-toned voice to deliver the instruction; and (e) allowing a 5-s latency period following a command. The teacher delivered each instruction using both American Sign Language and English.

For each session under each condition, the teacher delivered a total of 10 commands. For each command, the teacher employed the corresponding procedure that they were trained to use during teacher training (Appendix F).

Effective Instruction Delivery Plus Contingent Praise

Compliance and teacher behaviors were recorded and calculated the same as in baseline (Appendix D). Teachers needed to maintain 80% treatment integrity. If treatment integrity fell below 80% (i.e., 5 out of 6 components and the necessary contingent praise component), the experimenter retrained the teacher on missed steps.

For each session, the teacher delivered a total of 10 commands. For each command the teacher employed the corresponding procedure that they were trained to use during teacher training (Appendix G). EID procedures were still in effect. In addition, the teacher provided a praise statement (e.g., "I like the way you put away the toys.") contingent on initiation compliance. The teacher delivered each instruction and praise statement using both American Sign Language and English.

Effective Instruction Delivery Plus Contingent Praise Plus Time-Out

Compliance and teacher behaviors were recorded and calculated the same as in baseline (Appendix D). Teachers needed to maintain 80% treatment integrity. If treatment integrity fell below 80% of the component steps (i.e., 8 out of 11 total treatment components with a minimum of 5 out of 6 time-out components for noncompliance in addition to contingent praise for compliance), the experimenter retrained the teacher on missed steps.

For each session, the teacher delivered a total of 10 commands. For each command the teacher employed the corresponding procedure that they were trained to use during teacher training (Appendix H).

EID and contingent praise procedures were still in effect. In addition, the following time-out procedure was used. These steps included: (a) waiting 5 s after

command delivery to assess noncompliance; (b) providing a brief reason for being placed in time-out; (c) verbally or physically prompting the student to go to time-out; (d) appropriately ignoring the student while in time-out; (e) replacing the student in time-out if the student attempts to escape; (f) contingently releasing the student following 3 to 5 s of appropriate behavior (i.e., quiet feet, hands, and mouth); (g) re-presenting the original command immediately upon exiting time-out when applicable (i.e., the original command was a "do" command); and (h) placing the student in time-out again if necessary, and repeating as necessary until the student complies with the command. The teacher delivered each instruction, praise statement, and time-out directive using both American Sign Language and English.

Interobserver Agreement .

As a reliability check, interobserver agreement (IOA) was measured for 45% of sessions across each phase. A trained observer simultaneously observed and recorded data using the same procedure as the primary data collector. Advanced level graduate students who had completed behavior observation training and had been deemed competent within the School Psychology Program conducted the observations. A brief session occurred to train the observer on the observation form. IOA was calculated as total agreement. Agreement on the occurrence and nonoccurrence of compliance was calculated as the total number of agreements divided by the total number of agreements and disagreements and multiplied by 100. IOA data were collected for teacher and student behaviors as well as treatment integrity. If IOA data fell below 80%, the observer would have been re-trained. However, this procedure was not necessary.

Interobserver agreement data were collected for treatment components by a trained graduate student. Interobserver agreement for treatment integrity was calculated as total agreement. Agreement on the occurrence and nonoccurrence of treatment components was calculated as the total number of agreements divided by the total number of agreements and disagreements and multiplied by 100. If IOA data fell below 80%, the observer would have been re-trained. However, this procedure was not necessary.

IOA data were collected for 45% of all sessions and participants. Overall mean IOA was 98% across all measured variables. IOA for individual measures and their mean percentages obtained included: (a) 99% agreement for compliance (range = 90 - 100%) and (b) 96% agreement for adult behaviors (range = .85% - 100%).

Treatment Integrity

Treatment integrity checks are an important tool to monitor the successful implementation of treatments (Barlow & Hersen, 1984). During each session, integrity was assessed by the primary investigator. That is, teacher behaviors were recorded as percentage of treatment components implemented. Communication components of treatment were assessed verbally and did not assess signed language. Treatment integrity was recorded for all sessions in the same fashion as baseline using the observation form (Appendix D). Teacher behaviors were calculated by dividing the number of components implemented by the total components possible and multiplying by 100. If at any point integrity fell below 80% for any given component of any given session, feedback was given immediately following the session. Feedback regarding the contingent praise component was given once during the EID plus contingent praise phase for Maurice and

Janice, once during the EID plus contingent praise and time-out phase for Maurice and twice during the EID plus contingent praise and time-out phase for Janice. Tables 1, 2, and 3 describe the mean percentages of occurrences of treatment components across all phases for each teacher/student dyad.

Table 1

Mean Percentages of Treatment Components and Compliance across Phases for Janice

Teacher	Phase			
	Baseline	EID	EID+CP	EID+CP+TO
Janice's teacher				
EID	70	91	94	93
Eye Contact	100	100	100	100
Proximity	37	87	70	77
Directive	87	90	100	100
Tone	57	93	87	93
5 s Latency	70	83	100	100
Contingent Praise	0	0	82	67
Time-Out	0	0	0	---
Reason	0	0	0	---
Ignore	0	0	0	---
Return	0	0	0	---
Release	0	0	0	---
Escape-Extinction	0	0	0	---
Janice				
Compliance	23	70	87	100

Note. --- = There was no opportunity for time-out due to the absence of noncompliance.

Table 2

Mean Percentages of Treatment Components and Compliance across Phases for Maurice

Teacher	Phase			
	Baseline	EID	EID+CP	EID+CP+TO
Maurice's teacher				
EID	79	86	91	93
Eye Contact	100	100	100	100
Proximity	68	58	84	77
Directive	88	90	90	94
Tone	63	85	90	93
5 s Latency	75	98	93	100
Contingent Praise	21	12	67	73
Time-Out	0	0	0	---
Reason	0	0	0	---
Ignore	0	0	0	---
Return	0	0	0	---
Release	0	0	0	---
Escape-Extinction	0	0	0	---
Maurice				
Compliance	33	83	90	100

Note. --- = There was no opportunity for time-out due to the absence of noncompliance.
Table 3

Mean Percentages of Treatment Components and Compliance across Phases for Isaiah

Teacher	Phase			
	Baseline	EID	EID+CP	EID+CP+TO
Isaiah's teacher				
EID	73	90	---	---
Eye Contact	98	100	---	---
Proximity	46	61	---	---
Directive	80	100	---	---
Tone	84	100	---	---
5 s Latency	58	87	---	---
Contingent Praise	13	7	---	---
Time-Out	0	0	---	---
Reason	0	0	---	---
Ignore	3	0	---	---
Return	0	0	---	---
Release	0	0	---	---
Escape-Extinction	0	0	---	---
Isaiah				
Compliance	22	94	---	---

Note. --- = These phases were deemed unnecessary due to high levels of compliance in the previous phase.

Data Analysis

Data were graphed for visual inspection (Parsonson & Baer, 1986). Compliance was assessed through a within-subject comparison. Mean levels of compliance were used to evaluate and compare changes in student compliance across phases.

CHAPTER III

RESULTS

Results of the functional behavior assessment suggested that noncompliance was primarily maintained by teacher attention for Janice. For Maurice and Isaiah, results were mixed; suggesting that noncompliance for these two was dually maintained by attention and escape from task demands.

Figure 1 shows compliance percentages for the three participants across baseline and all intervention phases. During baseline, mean compliance levels were 23% for Janice, 33% for Maurice, and 22% for Isaiah. Substantial increases were evident for all three participants with the introduction of the EID phase. During EID, mean compliance levels were 70% for Janice, 83% for Maurice, and 94% for Isaiah. Isaiah's compliance reached 100% during the last three sessions of the EID phase. Therefore, it was determined that there was no need for further intervention and subsequent phases were not introduced for Isaiah. Further increases in mean levels of compliance were evident for Janice and Maurice with the introduction of contingent praise. During the EID plus contingent praise phase, mean compliance levels were 87% for Janice and 90% for Maurice. Mean compliance levels increased to 100% for both Janice and Maurice during the EID plus contingent praise and time-out phase. Mean compliance levels across phases for each participant are represented in Tables 1, 2, and 3.

Janice's baseline level of compliance was low with little variability. With the introduction of EID, an immediate change in level was evident, however data were somewhat variable. Further increases in level were evident with the introduction of

contingent praise to the already existing EID. During EID plus Contingent Praise and Time-Out, Janice's compliance stabilized at 100%.

Similar to Janice, Maurice also had a low level of compliance and low variability during baseline. An immediate change in level with little variability was established with the introduction of EID. Compliance level remained consistent with the addition of contingent praise. Similar to Janice, Maurice's compliance stabilized at 100% in the final treatment phase.

Arguably, the most dramatic changes occurred for Isaiah. Compliance was variable but low for Isaiah during baseline. Substantial increases were evident with the introduction of EID although still somewhat variable. Compliance eventually stabilized at 100% for Isaiah. Therefore it was unnecessary to progress to other treatment phases.

Each participant demonstrated substantial increases in mean levels of compliance with the introduction of EID. Although overall mean levels of compliance increased with subsequent phases, data overlapped and were more difficult to differentiate.

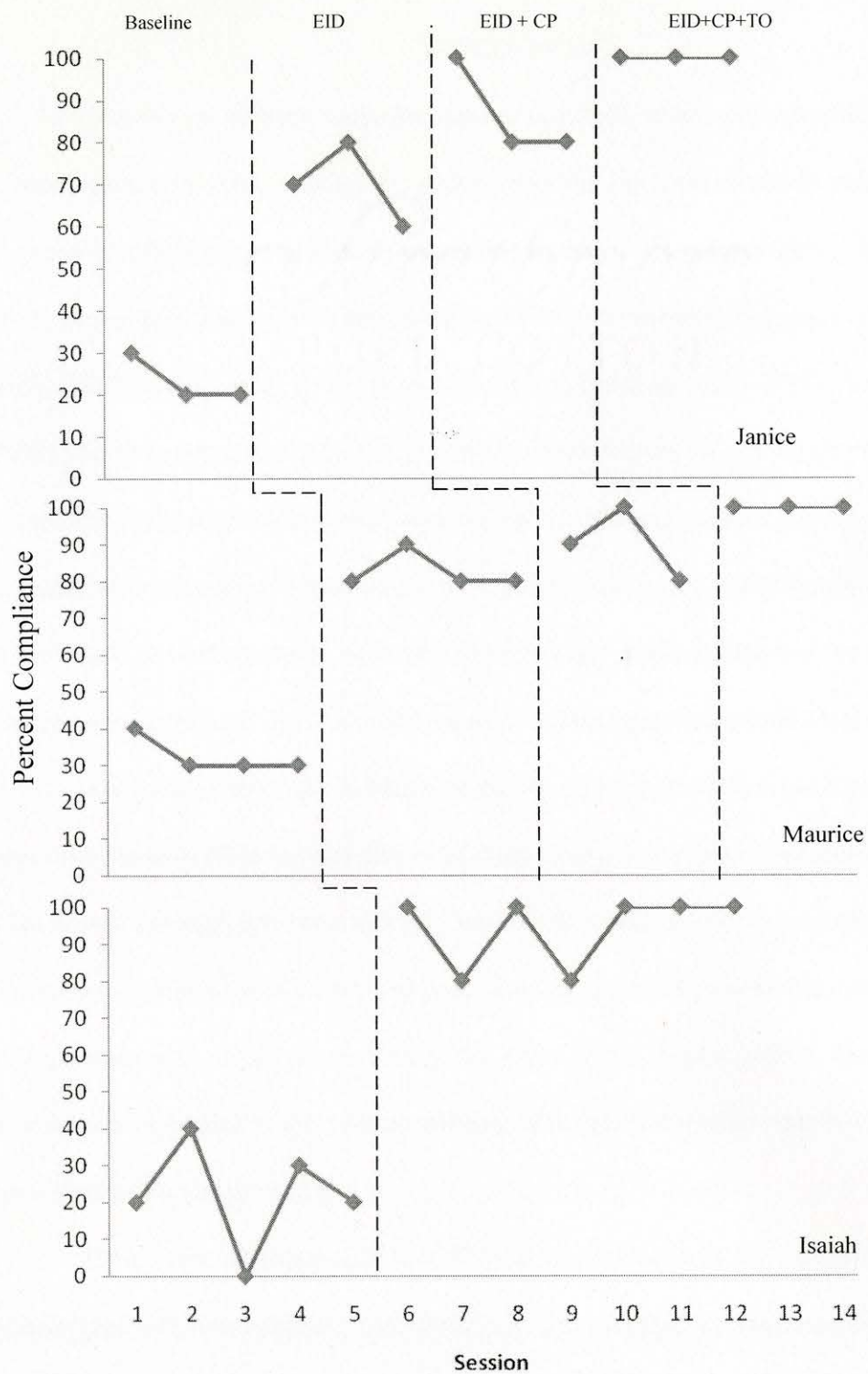


Figure 1. Compliance Percentages for All Participants across Phases.

CHAPTER IV

DISCUSSION

Compliance training packages that include antecedent and/or consequent procedures such as EID, contingent, praise, and time-out have provided evidence that they can be effective procedures in increasing levels of compliance (Bean & Roberts, 1981; Bellipanni, 2003, 2005; Benoit et al., 2001; Ducharme & Popynick, 1993; Everett, 2003, 2006; Everett et al., 2007; Ford et al., 2001; Forehand et al., 1974; Mandal et al., 2000; Marlow et al., 1997; Olmi et al., 1997). However, to date, no study has examined the effects of the sequential introduction of EID, contingent praise, and time-out for individuals with hearing impairments or deafness, hence, this study makes an important contribution to the literature. Also noteworthy was the fact that two of the participants had cochlear implants. Additionally, teachers in this study were profoundly deaf.

Historically, there has been limited research on intervention packages targeting noncompliance in children with hearing impairments or deafness (Forehand et al., 1974). This area of research has been lacking despite noncompliance being a common presenting problem behavior for children with hearing impairments (Berrett & Kelley, 1975; Forehand et al.; Knutson et al., 2004; Mira, 1972; Sahasi, 1989). To date, only one study has investigated a compliance training package with a child with hearing impairment (Forehand et al.).

The current study applied the CTC Model developed at the University of Southern Mississippi with three children with deafness. The sequential introduction of EID, and contingent praise increased compliance levels above the previous phase. The mere introduction of time-out contingencies in conjunction with EID and contingent praise

immediately increased compliance levels to 100% and never decreased. Because compliance levels reached 100% with the first session of the phase, the students never actually experienced time-out. However, Janice and Maurice's teacher made a precorrection statement informing them of the time-out procedure immediately prior to the EID plus contingent praise and time-out phase (i.e., after session 9 for Janice and after session 11 for Maurice). This suggests that precorrection, a form of behavior management, can be effective at managing behavior by making the contingency salient.

The results of the current study suggest that a compliance training package including EID and contingent praise can substantially increase compliance to desirable levels. Subtle changes in teacher behavior resulted in meaningful changes in child behavior. The contributions of the time-out procedure remain unclear due to the fact that participants never experienced time-out. Compliance percentages were 40% or less during baseline and never fell below 60% during any of the treatment phases for any of the participants. These results are remarkable in that the verbal component of the CTC Model had the potential to be lost with children who are deaf. This brings to question the contributions of the verbal components of the compliance training package. However, it is important to note that all participants were in a bilingual program and were able to effectively communicate with their teachers with the use of American Sign Language. The original research questions will be discussed further.

Research Question 1

The original research question asked whether EID would increase compliance above baseline levels for students with hearing impairments or deafness in a classroom setting. Compliance levels increased substantially for all three participants from baseline.

These results are similar to other studies that have employed EID to affect compliance with typically developing children (Everett, 2003; Ford et al., 2001; Mandal et al., 2000).

An interesting finding was that the student with the lowest mean compliance level during baseline, Isaiah, exhibited the most substantial gains in compliance. In fact, compliance reached levels of 100% by the end of the EID phase for Isaiah. No further treatment components were introduced due to the high levels of compliance.

Another interesting finding with regards to EID is that many of the treatment components were already in place during baseline. The relatively high levels of EID components demonstrated a small increase in percentage of treatment components implemented with the introduction of EID. When examining the individual components of EID, the data indicate that eye contact and the use of a directive were present at high levels during baseline. It might have been that the addition of the other components (i.e., proximity, quiet tone, 5 s latency) was responsible for the effect, although this is a mere hypothesis. The greatest changes in teacher behavior for Janice and Isaiah were for proximity, tone, and the 5-s latency. The greatest changes in teacher behavior for Maurice were for tone and the 5-s latency. Allowing 5 s for the child to initiate compliance allows for more opportunity to comply and may have been a significant contribution to changes in compliance. Also, it is possible that tone may have had a more significant impact on the two children with cochlear implants, Janice and Isaiah. It may be the case that relatively small changes in adult behaviors contributed to substantial improvements in child behavior.

Teacher behaviors that required communication (i.e., English or American Sign Language) were assessed verbally (i.e., English). It is unknown whether the sign

language was equivalent to the English, making it difficult to determine whether the signed instructions were delivered as intended.

It may be that treatment integrity for EID was inflated. Although eye contact is a typical component of compliance training packages, it is essential for communication with individuals with hearing impairments or deafness. Therefore, this component was in place with every command except one, inflating treatment integrity for EID.

Research Question 2

The second research question asked whether a compliance package including EID plus contingent praise would increase compliance above levels of effective instruction delivery alone for students with hearing impairments or deafness in a classroom setting. As mentioned previously, because Isaiah had reached 100% compliance for three consecutive sessions, it was deemed unnecessary to add additional treatment components to his treatment package. Janice and Maurice demonstrated minimal increases in mean levels of compliance from EID alone to the EID plus contingent praise phase. Although there were increases in mean levels, there was also some overlap in the data. These participants may have experienced ceiling effects due to relatively high levels of compliance in the previous phase.

Contingent praise occurred at 0% for Janice and near-zero levels for Maurice during baseline and the EID alone phases. This behavior improved substantially following teacher training of contingent praise with both participants. However, each student's teacher failed to meet minimum criteria at one point for this component in this treatment phase and needed to be retrained. It could have been the case that an intermittent schedule of contingent praise was effective at reinforcing compliance.

At present, no study has examined the effects of the sequential introduction of contingent praise following EID with children with deafness. Typically contingent praise for compliance has occurred in the context of a time-in phase (Ford et al., 2001; Marlow et al., 1997; Olmi et al., 1997) or in conjunction with time-out procedures for noncompliance (Everett et al., 2007; Needelman, 2008; Roberts, 1982). In this case, the addition of contingent praise resulted in increases in mean compliance levels for children with deafness.

Research Question 3

The third research question asked whether a compliance package including EID plus contingent praise and time-out would increase compliance above levels of a compliance package containing EID and contingent praise for students with hearing impairments or deafness in a classroom setting. As mentioned previously, Isaiah was never introduced to time-out or contingent praise. For Janice and Maurice, compliance levels immediately increased to 100% with the introduction of the time-out phase, although neither ever experienced time-out. Therefore, conclusions regarding the use of time-out with students with hearing impairments or deafness cannot be made.

Although not part of the treatment protocol, Janice and Maurice were told by their teachers that they would be placed in time-out if they did not follow teacher instructions the first time they were told to do something. This occurred after the EID plus contingent praise phase, but prior to the start of the time-out phase. Stating the contingencies for noncompliance may actually have served as an establishing operation. By altering the environment with the contingency statement, the teacher may have inadvertently affected behavior. This finding is interesting and counterintuitive in that time-out is a consequent

procedure and, therefore, should affect behavior after it has been introduced to the environment. These findings were similar to that of Ford et al. (2001) in which compliance levels of 100% were attained for all four participants, with only two participants ever experiencing time-out.

As with the EID plus contingent praise phase, teachers struggled to meet minimal criteria for contingent praise. Maurice's teacher was re-trained once and Janice's teacher was re-trained on this component twice during the EID plus contingent praise and time-out phase. Even though the contingent praise was not implemented with a desirable level of integrity on some occasions, high levels of compliance were maintained across participants. Further research is warranted to investigate barriers to treatment implementation.

Limitations

Although the findings in the present study suggest that a compliance training package involving EID, contingent praise, and time-out may be an effective intervention for the treatment of noncompliance, several limitations should be noted. One limitation concerns the substantial improvements in compliance from baseline to the EID phase. Substantial increases in compliance were evident despite the minimal increases in treatment components. Treatment components were present at a relatively high level prior to teacher training of EID components, specifically eye contact and the use of a directive. As noted earlier, this may have been inflated by the requirement of eye contact for communication purposes for individuals with hearing impairments or deafness. As previously mentioned, it is hypothesized that the increased levels of the other EID components (i.e., proximity, quiet tone, 5 s latency) in the EID phase were responsible

for the change in compliance. Small, subtle changes in adult behavior resulted in large increases in child behavior. Future investigations should evaluate the unique contributions of individual components of EID and the amount of change necessary to affect change.

Another limitation may have existed with the potential for a language barrier between the primary investigator and the teachers. Teachers in the present study were deaf. The primary investigator was not fluent in American Sign Language, however the teachers were fluent in English and American Sign Language. Additionally an interpreter was available. Although there was potential for a language barrier impacting consultation with the teacher, it is unlikely that this was true. This was evidenced by the teacher demonstrating treatment procedures with high integrity during training sessions and subsequent intervention sessions. It remains unknown why contingent praise fell below the minimum 80% during treatment sessions. One possible explanation is that the teacher did not fully comprehend the procedure during training and was uncomfortable asking questions.

Another limitation is the inability to draw strong conclusions regarding the contributions of contingent praise. Because contingent praise was not reliably implemented, conclusions regarding contingent praise must be made with caution. Because treatment integrity has been found to be positively correlated with child outcomes (Gresham, Gansle, Noell, & Cohen, 1993), the extent to which contingent praise affects compliance remains unknown. Likewise, because time-out was never implemented, data from the EID plus contingent praise and time-out phase should be evaluated with caution.

As previously discussed, treatment components were sequentially introduced, posing another potential limitation. The effectiveness of each component can only be discussed in terms of EID alone, contingent praise following EID, or time-out following contingent praise and EID. It is impossible to discuss contingent praise and time-out in isolation in the context of this study. Although this is not truly a limit given the purpose of this study, further investigation may be beneficial. Evaluating the sequential introduction of these components in a different order has the potential to yield different results.

Summary

The purpose of the present study was to expand the research pertaining to the CTC Model of The University of Southern Mississippi, specifically to evaluate the effectiveness of the compliance training package with students with hearing impairments or deafness in a classroom setting. The present study sought to evaluate the effects of the sequential introduction of EID, contingent praise, and time-out but did not include the time-in component. Given that at times treatment integrity fell to less than optimal levels, conclusions regarding the addition of contingent praise to the compliance training package must be made with caution. Likewise, this is true regarding the evaluation of the time-out procedure as well.

Despite limitations, compliance increased to desirable levels for all three participants with the use of this compliance training package. School psychologists, interventionists, administrators, and teachers should consider the use of these procedures when treating noncompliance in children with hearing impairments. Future research should explore variables that affect the delivery of contingent praise for children with

hearing impairments. Further, this compliance training package should be applied and to and evaluated with children with hearing impairments or deafness in different settings such as a dormitory and evaluated for its effectiveness with different change agents.

APPENDIX A

PARENT CONSENT FORM

The University of Southern Mississippi
Consent Document for Research Participants

Title of Study:

The additive effects of components of an intervention package targeting compliance in children with hearing impairments in a classroom setting

Purpose:

You are being asked to allow your child to participate in a study that is studying the effects of an intervention package on students' noncompliance. This study will evaluate the effects of effective instruction delivery, praise, and time-out following child noncompliance. This study is important because it may provide teachers with another intervention to increase the compliance levels of their students.

Participants:

Your child must be between the ages of 4 and 9 to take part in this study. In addition, your child must comply with 40% or less of commands during a baseline session. Your child cannot be in this study if the time-out procedures used at USM have been used with your child in the past. If your child does not meet criteria, a school psychologist-in-training at USM may still provide your child's teacher with assistance in the classroom or your child may be referred to the school's Teacher Support Team.

Procedure:

If you agree to have your child be in this study and if your child is selected for the study, your child's teacher will be asked to give instructions to him/her in the same manner that he or she does on a regular basis. If your child's compliance is less than 40%, the next step would be for the teacher to deliver instructions in a specified manner, praise the child, and to use time-out procedures to affect your child's compliance. The experimenter and a trained graduate student will observe your child's behavior and his/her teacher's behavior to see if there is a difference in your child's compliance based on the procedure used.

Benefits/Risks to Participant:

Your participation in the study will help your teacher increase your child's level of compliance in the classroom. The potential risks is that the time-out procedure may frustrate or anger your child as he/she will not be allowed access to preferred items and activities while in time-out. Your child also will be presented with many demands and instructions from his/her teacher and may become frustrated by the expectation of compliance. Because of this your child will be praised for compliance and other positive procedures will be implemented including components of effective instruction delivery.

Voluntary Nature of the Study/Confidentiality:

Your participation in this study is entirely voluntary and you may refuse to complete the study at any point during the experiment, or refuse to answer any questions with which you are uncomfortable. In addition, all information obtained during the study will be kept confidential. All information that may identify your child will be withheld. Your child's name and other identifying information will not be used in the research papers, any submission to a professional journal for publication, or presentation. The only circumstances in which we would release information about you or your child would be if your child tells us he/she is a harm to self or others, if your child is abused, if the release of information is court ordered, or if there is a medical emergency in which release of information is important for someone's safety.

Contacts and Questions:

At any time you may withdraw from the study or ask any questions you may have regarding this study. Questions concerning the research should be directed at Laura Needelman or Dr. D. Joe Olmi at (601) 266-5255 or via email at Laura.L.Patterson@eagles.usm.edu or d.olmi@usm.edu. This project has been reviewed by the Human Subjects Protection Review Committee, which ensures that research projects involving human subjects follow federal regulations. Any questions or concerns about rights as a research subject should be directed to the chair of the Institutional Review Board, The University of Southern Mississippi, 118 College Drive #5147, Hattiesburg, MS 39406-0001, (601) 266-6820. A copy of this form will be given to the participant.

Participant's Consent:

I have had the purposes and procedures of this study explained to me and have had the opportunity to ask questions. My questions have been answered to my satisfaction, and I am voluntarily signing this form for my child to participate in this research study. My signature shows my willingness to allow my child to participate in this study under the conditions stated.

This Section to be Completed by Parents

_____	_____	_____
<i>Name of Child</i>	<i>Child's Birth Date</i>	<i>Age of Child</i>
_____	_____	
<i>Parent or Legal Guardian's name (please print)</i>	<i>Relationship to Child</i>	
_____	_____	
<i>Parent or Legal Guardian's signature</i>	<i>Date</i>	

APPENDIX B

TEACHER CONSENT FORM

The University of Southern Mississippi
Consent Document for Research Participants

Title of Study:

The additive effects of components of an intervention package targeting compliance in children with hearing impairments in a classroom setting

Purpose:

You are being asked to participate in a study that is studying the effects of effective instruction delivery, praise, and time-out on students' noncompliance. This study is important because it may provide teachers with another intervention to increase the compliance levels of their students.

Participants:

Your student must be between the ages of 4 and 9 to take part in this study. In addition, your student must comply with 40% or less of your instructions during a baseline session. Your student cannot be in this study if the time-out procedures used at USM have been used with your student in the past. If your student does not meet criteria, a school psychologist-in-training at USM may still provide you with assistance for other ways to address your student's problem behavior in the classroom.

Procedure:

If you agree to be in this study and if your student is selected for the study, you will be asked to give instructions to him/her in the same manner that you do on a regular basis. If your child complies with less than 40% of the teacher-delivered instructions the next step would be to deliver instructions in a specified manner, praise the child, and to use time-out procedures to affect your student's compliance. The experimenter and a trained graduate student will observe your student's behavior and your behavior to see if there is a difference in your student's compliance based on the procedure used.

Benefits/Risks to Participant:

Your participation in the study will help you increase your student's level of compliance in the classroom. The potential risks include possible frustration and anger of your student because of the time-out procedure, as he/she will not be allowed access to any preferred items or activities while in time-out. Your student also will be presented with many demands and instructions and may become frustrated by the expectation of compliance. Because of this your student will be praised for compliance and other positive procedures will be implemented including components of effective instruction delivery.

Voluntary Nature of the Study/Confidentiality:

Your participation in this study is entirely voluntary and you may refuse to complete the study at any point during the experiment, or refuse to answer any questions with which you are uncomfortable. In addition, all information obtained during the study will be kept confidential. All information that may identify you will be withheld. Your name and other identifying information will not be used in the research papers, any submission to a professional journal for publication, or presentation. The only circumstances in which we would release information about you or your student would be if your student tells us he/she is a harm to self or others, if your student is abused, if the release of information is court ordered, or if there is a medical emergency in which release of information is important for someone's safety.

Contacts and Questions:

At any time you may withdraw from the study or ask any questions you may have regarding this study. Questions concerning the research should be directed at Laura Needelman or Dr. D. Joe Olmi at (601) 266-5255 or via email at Laura.L.Patterson@eagles.usm.edu or d.olmi@usm.edu. This project has been reviewed by the Human Subjects Protection Review Committee, which ensures that research projects involving human subjects follow federal regulations. Any questions or concerns about rights as a research subject should be directed to the chair of the Institutional Review Board, The University of Southern Mississippi, 118 College Drive #5147, Hattiesburg, MS 39406-0001, (601) 266-6820. A copy of this form will be given to the participant.

Participant's Consent:

I have had the purposes and procedures of this study explained to me and have had the opportunity to ask questions. My questions have been answered to my satisfaction, and I am voluntarily signing this form for me to participate in this research study. My signature shows my willingness to allow me to participate in this study under the conditions stated.

This section to be completed by teacher.

Name of Teacher

Date

APPENDIX C

IRB APPROVAL FORM



THE UNIVERSITY OF SOUTHERN MISSISSIPPI

Institutional Review Board

118 College Drive #5147
 Hattiesburg, MS 39406-0001
 Tel: 601.266.6820
 Fax: 601.266.5509
 www.usm.edu/irb

**HUMAN SUBJECTS PROTECTION REVIEW COMMITTEE
 NOTICE OF COMMITTEE ACTION**

The project has been reviewed by The University of Southern Mississippi Human Subjects Protection Review Committee in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the "Adverse Effect Report Form".
- If approved, the maximum period of approval is limited to twelve months.
 Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: **29022401**

PROJECT TITLE: **The Additive Effects of Components of an Intervention Package Targeting Compliance in Children with Hearing Impairments in a Classroom Setting**

PROPOSED PROJECT DATES: **03/01/09 to 09/30/09**

PROJECT TYPE: **Dissertation or Thesis**

PRINCIPAL INVESTIGATORS: **Laura Needelman**

COLLEGE/DIVISION: **College of Education & Psychology**

DEPARTMENT: **Psychology**

FUNDING AGENCY: **N/A**

HSPRC COMMITTEE ACTION: **Expedited Review Approval**

PERIOD OF APPROVAL: **04/14/09 to 04/13/10**

Lawrence A. Hosman

 Lawrence A. Hosman, Ph.D.
 HSPRC Chair

4-15-09

 Date

APPENDIX D
OBSERVATION FORM

Child's Code #: _____ Date: _____

Observer: _____ Session: _____

Phase: _____

COMMAND

Adult Behaviors	1	2	3	4	5	6	7	8	9	10
Eye Contact										
Close Proximity										
Directive										
Quiet-Toned Voice										
5-s Latency										
Praise for Comply										
Brief Verbal Reason										
Prompting Procedure										
Ignoring										
Repeat Return, if needed										
TO Release										
Escape-Extinction										
Child Behavior										
Initiates w/in 5-s										
Consequences										
Teacher Attention										
Peer Attention										
Escape										
Tangible										

APPENDIX E

FUNCTIONAL ASSESSMENT INFORMANT RECORD FOR TEACHERS
USM School Psychology Service Center

If information is being provided by both the Teacher and the Classroom Aide, indicate both respondents' names. In addition, in instances where divergent information is provided, note the sources of specific information.

Student: _____ Respondent(s): _____

School: _____ Age: _____ Sex: M F Date: _____

1. Describe the referred student. What is he/she like in the classroom? (Write down what you believe is the most important information about the referred student.)

2. Pick a second student of the same sex who is also difficult to teach. What makes the referred student more difficult than the second student?

- 3. a. On what grade level is the student reading? _____
- b. On what grade level is an average student in the class reading? _____
- 4. a. On what grade level is the student performing in math? _____
- b. On what grade level is an average student in the class performing in math? _____
- 5. a. What is the student's classwork completion percentage (0 - 100%)? _____
- b. What is the student's classwork accuracy percentage (0 - 100%)? _____

6. Is the student taking any medications that might affect the student's behavior?
_____ Yes _____ No If yes, briefly explain:

7. Do you have any specific health concerns regarding this student?
_____ Yes _____ No If yes, briefly explain:

8. What procedures have you tried in the past to deal with this student's problem behavior?

9. Briefly list below the student's typical daily schedule of activities.

Time	Activity	Time	Activity
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

10. When during the day (two academic activities and times) does the student's problem behavior(s) typically occur?

Academic Activity #1 _____
 Time _____

Academic Activity #2 _____
 Time _____

11. Please indicate good days and times to observe. (At least two observations are needed.)

<u>Observation #1</u>	<u>Observation #2</u>	<u>Observation #3 (Back-up)</u>
Date _____	Date _____	Date _____
Time _____	Time _____	Time _____

Problem Behaviors

Please list one to three problem behaviors in order of severity. Do not use a general description such as "disruptive" but give the actual behavior such as "doesn't stay in his/her seat", or "talks out without permission".

1. _____

2. _____

3. _____

1. Rate how manageable the behavior is:

- | | | | | | |
|-----------------------|--------------|---|------------|---|---|
| a. Problem Behavior 1 | 1 | 2 | 3 | 4 | 5 |
| | Unmanageable | | Manageable | | |
| b. Problem Behavior 2 | 1 | 2 | 3 | 4 | 5 |
| | Unmanageable | | Manageable | | |
| c. Problem Behavior 3 | 1 | 2 | 3 | 4 | 5 |
| | Unmanageable | | Manageable | | |

2. Rate how disruptive the behavior is:

- | | | | | | |
|-----------------------|--------|---|---|---|------|
| a. Problem Behavior 1 | 1 | 2 | 3 | 4 | 5 |
| | Mildly | | | | Very |
| b. Problem Behavior 2 | 1 | 2 | 3 | 4 | 5 |
| | Mildly | | | | Very |
| c. Problem Behavior 3 | 1 | 2 | 3 | 4 | 5 |
| | Mildly | | | | Very |

3. How often does the behavior occur per day (please circle)?

- | | | | | | |
|-----------------------|------|-----|-----|-------|-----|
| a. Problem Behavior 1 | <1-3 | 4-6 | 7-9 | 10-12 | >13 |
| b. Problem Behavior 2 | <1-3 | 4-6 | 7-9 | 10-12 | >13 |
| c. Problem Behavior 3 | <1-3 | 4-6 | 7-9 | 10-12 | >13 |

4. How many months has the behavior been present?

- | | | | | | |
|-----------------------|----|---|---|---|--------------------|
| a. Problem Behavior 1 | <1 | 2 | 3 | 4 | entire school year |
| b. Problem Behavior 2 | <1 | 2 | 3 | 4 | entire school year |
| c. Problem Behavior 3 | <1 | 2 | 3 | 4 | entire school year |

Antecedents: Problem Behavior # _____: _____ Yes No

1. Does the behavior occur more often during a certain *type* of task? _____
2. Does the behavior occur more often during *easy* tasks? _____
3. Does the behavior occur more often during *difficult* tasks? _____
4. Does the behavior occur more often during *certain subject areas*? _____
5. Does the behavior occur more often during *new* subject material? _____
6. Does the behavior occur more often when a request is made to *stop* an activity? _____
7. Does the behavior occur more often when a request is made to *begin a new activity*? _____
8. Does the behavior occur more often during *transition* periods? _____
9. Does the behavior occur more often when a *disruption* occurs in the student's normal routine? _____
10. Does the behavior occur more often when the student's *request has been denied*? _____
11. Does the behavior occur more often when a *specific person is in the room*? _____
12. Does the behavior occur more often when a *specific person is absent from the room*? _____
13. Are there any other behaviors that usually *precede* the problem behavior? _____
14. Is there anything you could do that would *ensure* the occurrence of the behavior? _____
15. Are there any events occurring in the child's *home* that seem to precede occurrence of the behavior at school? _____
16. Does the behavior occur more often in *certain settings*? _____
(circle all that apply)

large group small group independent work one-to-one interaction

bathroom recess cafeteria bus other: _____

Consequences: Problem Behavior # _____ : _____

1. Please indicate whether the following consequences occur after the behavior is exhibited.

<u>Consequence</u>	Yes	No
Access to Preferred Activity	_____	_____
Termination of Task	_____	_____
Rewards	_____	_____
Peer Attention	_____	_____
Teacher Attention	_____	_____
Praise	_____	_____
Ignore	_____	_____
Re-direction	_____	_____
Interrupt	_____	_____
Reprimand	_____	_____

2. Is there any task you have stopped presenting to the student as a result of the problem behavior?

_____ Yes _____ No

If yes, describe: _____

3. Are there other problem behaviors that often occur after the behavior is exhibited?

_____ Yes _____ No

If yes, describe: _____

4. Does the student typically receive praise or any positive consequence when behavior occurs that you would like to see instead of the problem behavior?

_____ Yes _____ No

Comments: _____

Antecedents: Problem Behavior # _____ : _____ Yes _____ No _____

1. Does the behavior occur more often during a certain type of task? _____
2. Does the behavior occur more often during easy tasks? _____
3. Does the behavior occur more often during difficult tasks? _____
4. Does the behavior occur more often during certain subject areas? _____
5. Does the behavior occur more often during new subject material? _____
6. Does the behavior occur more often when a request is made to stop an activity? _____
7. Does the behavior occur more often when a request is made to begin a new activity? _____
8. Does the behavior occur more often during transition periods? _____
9. Does the behavior occur more often when a disruption occurs in the student's normal routine? _____
10. Does the behavior occur more often when the student's request has been denied? _____
11. Does the behavior occur more often when a specific person is in the room? _____
12. Does the behavior occur more often when a specific person is absent from the room? _____
13. Are there any other behaviors that usually precede the problem behavior? _____
14. Is there anything you could do that would ensure the occurrence of the behavior? _____
15. Are there any events occurring in the child's home that seem to precede occurrence of the behavior at school? _____
16. Does the behavior occur more often in certain settings? _____
(circle all that apply)

large group small group independent work one-to-one interaction

bathroom recess cafeteria bus other: _____

Consequences: Problem Behavior # _____ : _____

1. Please indicate whether the following consequences occur after the behavior is exhibited.

<u>Consequence</u>	Yes	No
Access to Preferred Activity	_____	_____
Termination of Task	_____	_____
Rewards	_____	_____
Peer Attention	_____	_____
Teacher Attention	_____	_____
Praise	_____	_____
Ignore	_____	_____
Re-direction	_____	_____
Interrupt	_____	_____
Reprimand	_____	_____

2. Is there any task you have stopped presenting to the student as a result of the problem behavior?

_____ Yes _____ No

If yes, describe: _____

3. Are there other problem behaviors that often occur after the behavior is exhibited?

_____ Yes _____ No

If yes, describe: _____

4. Does the student typically receive praise or any positive consequence when behavior occurs that you would like to see instead of the problem behavior?

_____ Yes _____ No

Comments: _____

<u>Antecedents:</u> Problem Behavior # _____ :	Yes	No
1. Does the behavior occur more often during a certain <u>type</u> of task?	_____	_____
2. Does the behavior occur more often during <u>easy</u> tasks?	_____	_____
3. Does the behavior occur more often during <u>difficult</u> tasks?	_____	_____
4. Does the behavior occur more often during <u>certain subject areas</u> ?	_____	_____
5. Does the behavior occur more often during <u>new</u> subject material?	_____	_____
6. Does the behavior occur more often when a request is made to <u>stop</u> an activity?	_____	_____
7. Does the behavior occur more often when a request is made to <u>begin a new activity</u> ?	_____	_____
8. Does the behavior occur more often during <u>transition</u> periods?	_____	_____
9. Does the behavior occur more often when a <u>disruption</u> occurs in the student's normal routine?	_____	_____
10. Does the behavior occur more often when the student's <u>request has been denied</u> ?	_____	_____
11. Does the behavior occur more often when a <u>specific person is in the room</u> ?	_____	_____
12. Does the behavior occur more often when a <u>specific person is absent from the room</u> ?	_____	_____
13. Are there any other behaviors that usually <u>precede</u> the problem behavior?	_____	_____
14. Is there anything you could do that would <u>ensure</u> the occurrence of the behavior?	_____	_____
15. Are there any events occurring in the child's <u>home</u> that seem to precede occurrence of the behavior at school?	_____	_____
16. Does the behavior occur more often in <u>certain settings</u> ? (circle all that apply)	_____	_____
large group small group independent work one-to-one interaction		
bathroom recess cafeteria bus other: _____		

Consequences: Problem Behavior # _____ : _____

1. Please indicate whether the following consequences occur after the behavior is exhibited.

<u>Consequence</u>	Yes	No
Access to Preferred Activity	_____	_____
Termination of Task	_____	_____
Rewards	_____	_____
Peer Attention	_____	_____
Teacher Attention	_____	_____
Praise	_____	_____
Ignore	_____	_____
Re-direction	_____	_____
Interrupt	_____	_____
Reprimand	_____	_____

2. Is there any task you have stopped presenting to the student as a result of the problem behavior?

_____ Yes _____ No

If yes, describe: _____

3. Are there other problem behaviors that often occur after the behavior is exhibited?

_____ Yes _____ No

If yes, describe: _____

4. Does the student typically receive praise or any positive consequence when behavior occurs that you would like to see instead of the problem behavior?

_____ Yes _____ No

Comments: _____

APPENDIX F

TEACHER HANDOUT

Guidelines for Effective Instruction Delivery

- ❑ Place yourself in close proximity of the student (e.g., within 3 feet).
- ❑ Solicit eye contact before presenting an instruction (e.g., “Look at me.”).
- ❑ Use a quiet-tone when presenting the command.
- ❑ After eye contact is established, present an instruction in the form of a directive (e.g., use a start command instead of a stop command).
- ❑ Allow the student 5 s to initiate compliance.

APPENDIX G

TEACHER HANDOUT

Guidelines for Contingent Praise

- If the student initiates compliance within 5 s, provide praise to the student.
 - e.g., “I like the way you picked up the blocks.”
 - e.g., “You did a nice job getting out your crayons.”
 - e.g., “Thanks for passing out the papers.”

APPENDIX H
TEACHER HANDOUT
Guidelines for Time-out

- Present instruction to the student and allow a 5-s wait period for response to occur.
- If noncompliance, provide a brief reason as to why time-out will be initiated (e.g., “You did not follow my instruction, time-out.”).
- Begin the prompting procedure by directing the student to time-out in a chair 2-3 ft from the ongoing activity.
- If the student does not go to the time-out area, physically place the student in a time-out spot in a chair 2-3 ft from the ongoing activity with as little physical assistance as required.
- Completely ignore the student while they are in time-out, except to repeatedly return the student to the time-out spot if he or she attempts to escape prior to release.
- Once the student has shown appropriate time-out behavior (i.e., quiet hands, feet, mouth) a 3-5 s behaviorally contingent release period begins.
- Following 3-5 s of contingent quiet time-out behavior, release the student from time-out (e.g., “You are quiet, out of time-out.”).
- After leaving time-out re-present the same instruction that led to placement in time-out, and provide either praise or another instance of time-out depending on their response.

From Needelman (2008).

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