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Effects of Guided Compliance on the Disruptive Behavior of Two Students Diagnosed with Attention Deficit Hyperactivity Disorder

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Effects of Guided Compliance on the Disruptive Behavior of Two
Students Diagnosed with Attention Deficit Hyperactivity Disorder
(TITLE)

BY

Nicole L. Weber

THESIS

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2000

YEAR

I HEREBY RECOMMEND THIS THESIS BE ACCEPTED AS FULFILLING
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Running head: EFFECTS OF GUIDED COMPLIANCE ON DISRUPTIVE BEHAVIOR

Effects of Guided Compliance on the Disruptive Behavior of Two Students Diagnosed
with Attention Deficit Hyperactivity Disorder

Nicole L. Weber

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Abstract

The current study attempted to determine the effects of the environmental manipulations of partial task instruction, whole task instruction, and guided compliance on the disruptive behavior of two students diagnosed with Attention Deficit Hyperactivity Disorder (ADHD). The participants included two elementary-aged students diagnosed with ADHD who were referred by their parent or legal guardian to a university-based summer assessment program. A functional analysis established that the disruptive behavior of both participants was motivated by contingent peer attention. Students were exposed to treatment conditions consisting of whole versus partial tasks as well as the guided compliance. While a single subject multi-element design was used during the functional analysis phase of the study, a reversal (ABAB) design was utilized during the treatment conditions. Results of the study demonstrated that neither whole nor partial task instruction proved effective with either subject. However, preliminary support for the use of guided compliance was suggested.

Effects of Guided Compliance on the Disruptive Behavior of Two Students Diagnosed with Attention Deficit Hyperactivity Disorder

Functional assessment involves identifying potential relationships between problem behavior and its antecedent and consequent variables. The preponderance of existing research has focused on the functional assessment of developmentally delayed students' behavior; very little research has been conducted with normally developing children. Existing research has demonstrated that functional assessment is effective in identifying the "functions" that a particular behavior may serve for an individual. In addition, the research which has linked functional assessment to effective treatment has proven fruitful despite a limited amount of research. This study had two purposes: 1) to further extend research involving functional assessment of the behavior of normally developing kids and 2) to link functional assessment to effective treatment.

Investigating the environmental contingencies affecting behavior is important. For example, research has suggested that certain academic activities and educational stimuli are aversive for some students. Indeed, some students may lack the necessary skills to adequately deal with the demands of their educational setting, and may exhibit disruptive behavior in order to escape and/or avoid the task (Dunlap, Kern-Dunlap, Clarke, & Robbins, 1991; Gunter, Denny, Jack, Shores, & Nelson, 1993; DePaepe, Shores, Jack, & Denny, 1996). The theory is grounded in the notion of negative reinforcement; the student's disruptive behavior is negatively reinforced when s/he is successful in avoiding the aversive task (Gickling & Thompson, 1985; Gunter, et al., 1993). While not all students exhibit disruptive behavior when faced with an aversive situation, its occurrence

is nonetheless troublesome for many teachers. In addition, previous research has shown that teachers spend less time actively engaged in instructional activities with problem children (Carr, Taylor, & Robinson, 1991). Presumably, these interactions have proven aversive for the teachers, and consequently, they may avoid instructional engagement with disruptive students. Carr, Taylor, and Robinson (1991) also demonstrated that teachers may provide instructional activities to disruptive students that are below the target student's ability, presumably to avoid such disruptive responses on the part of the student. When the lower level of instructional activity is coupled with the disruptive behavior displayed by the student, a significant interruption of the learning process occurs. This phenomenon becomes an obvious concern and necessary focus of educators and educational consultants; it is essential for educators to assess the instructional demands placed upon students so that the curriculum effectively fosters academic success in students (Gickling & Thompson, 1985). Issues such as the instructional demands placed upon any given student may, thus, impact his/her behavior.

Children diagnosed with Attention Deficit Hyperactivity Disorder (ADHD) are often notoriously disruptive during instructional time. Douglas and Benezra (1990) found that boys with ADHD demonstrated deficits on measures which called for organized and deliberate rehearsal strategies, sustained strategic effort, and careful consideration of response alternatives. Given these deficits, it is possible that children with ADHD may experience difficulty within academic settings, which often require sustained effort and organized strategies. This combination of a decreased ability to effectively adapt to

environmental stimuli and a threatening environment may manifest itself in disruptive behavior.

Functional Assessment

While it has been demonstrated that one method of influencing the behavior of a student who has been diagnosed with ADHD is via psychopharmacological treatments, such as methylphenidate, environmental factors have also been implicated (Northup, Broussard, Jones, George, Vollmer, and Herring, 1995; Northup, Jones, Broussard, DiGiovanni, Herring, Fusilier, & Hanchey, 1997). For example, Northup, et al. (1995) manipulated the effects of teacher attention, peer attention, and medication for three children in an analogue academic setting. All three children were diagnosed with ADHD and were of at least average intelligence. Peer attention conditions resulted in substantially higher levels of disruptive behavior than did teacher attention for all three subjects. Thus, Northup and his colleagues concluded that teacher and peer attention did not serve the same function with respect to maintaining disruptive behavior for these three subjects. Instead, peer attention was a much more salient contingency for the students, although its effects appeared to be mitigated by methylphenidate.

In addition, Northup, et al. (1997) found, via functional assessment, that an eight-year-old boy diagnosed with ADHD exhibited disruptive behavior which was maintained by positive reinforcement in the form of peer attention. Northup and his colleagues also investigated the effects of methylphenidate. Regardless of whether methylphenidate was present, the student's levels of disruptive behavior were low during teacher attention and time-out (escape) conditions. When methylphenidate was present, low levels of disruptive

behavior were also found during peer attention conditions. However, when a placebo was given in lieu of methylphenidate, significantly higher levels of disruptive behavior were found during peer attention conditions. Thus, methylphenidate appeared to interact with the environmental factor of peer attention in maintaining disruptive behavior by possibly decreasing the reinforcing value of peer attention.

Lewis and Sugai (1996) also studied the use of functional assessment with students of average intellect. While only one of three subjects was diagnosed with ADHD, the students were from the general education setting and the study was conducted within the naturally occurring academic environment. The results of Lewis and Sugai's research support the use of functional assessment within the regular education setting with students who may be at-risk for behavioral problems. All three subjects in their study proved to be highly sensitive to the influences of peer attention. In contrast, the effects of teacher attention and escape from aversive tasks were not as salient for the three subjects.

Linking Functional Assessment to Treatment

A potentially effective intervention strategy includes functional assessment and applying implicated environmental manipulations as means of decreasing disruptive behavior. Munk and Repp (1994) reviewed studies on instructional variables and their effect on disruptive behavior. Instructional variables in their review included several antecedent variables: student choice of task, task variation, pace of instruction, interspersal of high-probability tasks, partial versus whole task training, decreasing task difficulty, and multi-element packages. Nonaversive interventions which assess the controlling function of the factors and revise these instructional variables accordingly have

proven to be highly effective. Thus, possible contingencies maintaining the behavior can be identified and altered so as to preclude the occurrence of the disruptive or target behavior (Dunlap, Kern, dePerczel, Clarke, Wilson, Childs, White, & Falk, 1993; Kern, Childs, Dunlap, Clarke, & Falk, 1994). Nonetheless, while many of these antecedent and consequent variables have been studied in developmentally delayed populations, very little research with normally developing children or with children diagnosed with ADHD exists.

For example, DePaepe et al. (1996) demonstrated that when curricular revisions regarding the level of difficulty of the task were implemented, the rate of off-task behavior displayed by a student with severe behavior disorders decreased, while his rate of on-task behavior increased. The authors theorized that the difficult tasks were aversive for the student, and the disruptive behavior served as a possible means of avoiding the task. Similarly, Gickling and Thompson (1985) found that when instruction was matched to the student's individual abilities according to level of difficulty, the rate of task completion, percentage of on-task behavior, and levels of task comprehension improved dramatically. Comparable results have been witnessed when other curricular variables including the amount of praise, choice of tasks, physical proximity of school staff, and the presence of self-monitoring have been manipulated (Dunlap et al., 1993). Thus, the opportunity to significantly improve a student's behavior solely through the use of functional assessment and environmental manipulations has been demonstrated in populations other than normally developing children.

Treatment of Disruptive Behavior Maintained by Negative Reinforcement

One of the potentially effective manipulations of antecedent variables is the use of partial versus whole task training in the instructional setting. Partial versus whole task training involves altering the presentation of the task; presumably the presentation of a whole task may result in different behavior than presentation of a partial task. However, research concerning the effects of partial task instruction versus the whole task instruction is limited. Nettelbeck and Kirby (1976) studied partial training methods and whole training methods with mildly mentally handicapped women when teaching them how to thread an industrial sewing machine. They found the whole task instruction to be inferior to partial task instruction with respect to the number of errors made while learning the task, and the time necessary to achieve mastery of the task. Similarly, Weld and Evans (1990) found a greater degree of disruptive behavior to be demonstrated during the whole task training method when teaching moderately and severely handicapped students to either make a sack lunch or to create a greeting card. Indeed, the authors theorized that “excess behaviors may be a function of the student’s inability to generate appropriate, alternative behaviors of overcoming obstacles. Students lacking an effective communication system may resort to inappropriate behavior as their means of asking for help” (p. 384). Thus, it seems that partial task instruction may prove more immediately rewarding; success is more readily achieved because the task is broken down into discrete and easily mastered elements. Whole tasks themselves may prove frustrating for some students, and may result in the exhibition of disruptive behavior as a means of avoiding the task.

Additionally, previous research concerning length of a task has proven fruitful with students diagnosed with severe emotional and behavioral disorders in terms of reducing the rates of disruptive behavior and increasing on-task behavior (Dunlap et al., 1993; Kern et al., 1994). Dunlap et al. (1993) used functional analysis to improve the behavior of a student diagnosed with severe emotional disturbance. Specifically, it was demonstrated that when the student was presented with shorter tasks, he displayed disruptive behavior less frequently. In addition, the participant exhibited more desirable behavior (e.g., appropriate verbalizations in a normal tone of voice) during shorter tasks than he did when presented with longer tasks. Dunlap, et al. (1991) demonstrated similar effects with an adolescent female who was multiply handicapped and had a history of severely disruptive behavior. This participant displayed a significantly higher degree of on-task behavior during short conditions and more disruptive behavior during longer conditions. Thus, curricular revision has been proven effective with individuals displaying the topography of disruptive behavior.

Another potentially useful behavioral intervention involves the use of guided compliance; this involves physically assisting with task completion upon the exhibition of noncompliance in response to a request. For example, if a student refuses to put a block in its storage container, the student is physically guided to do so. Thus, escape from the task is effectively avoided and the disruptive behavior is effectively extinguished. Blum and colleagues studied the effects of methylphenidate and guided compliance, when used in combination and separately, on disruptive behavior with three students diagnosed with severe to profound mental retardation (Blum, Mauk, McComas, & Mace, 1996). The

study took place within an inpatient hospital unit for students with developmental disabilities who also exhibited severe behavior disorders. Guided compliance reduced disruptive behavior and increased task engagement for all three subjects. In addition, in two of three subjects, high dosages (.6mg/kg) of methylphenidate were also effective in reducing levels of disruptive behavior. Nonetheless, no evidence was found suggesting that methylphenidate in addition to guided compliance produced additive or synergistic effects.

Similarly, Handen and colleagues investigated the effects of guided compliance versus time out on compliance with requests in an analogue setting (Handen, Parrish, McClung, Kerwin, & Evans, 1992). Five children exhibiting mild developmental delays to mild mental impairment served as the subjects. Time out proved to be the most effective in increasing rates of compliance with requests. Guided compliance resulted in improvement, although gains in compliance were not as significant as those with time out. The authors speculated that time out may have been experienced by the subjects as more aversive than guided compliance or that time out was more easily differentiated from play interactions than was guided compliance. In either case, adult attention for oppositional behavior was minimized during time out which may have accounted for the increased effectiveness of time out.

Thus, the current study attempted to replicate the little amount of research with normally developing subjects and functional assessment of their disruptive behavior. Children who had been diagnosed with Attention Deficit Hyperactivity Disorder were selected as subjects because it was presumed that they would have an increased propensity

to engage in disruptive behavior; in addition, previous research indicated a need for further study of this population and alternatives to psychopharmacological intervention. Linking the functional assessment to effective treatment was also an important focus of this study. Specifically, the behavioral interventions of guided compliance and whole versus partial tasks were studied.

Method

Participants and Setting

The participants included two eight year old elementary students who had been previously diagnosed and labeled with ADHD by the appropriate multidisciplinary evaluation team or the child's medical doctor. Each participant participated in an intellectual screening as well as educational and behavioral screening. An article in the local newspaper was utilized to seek out potential participants for the study; the article promoted a three-week summer academic program for children with ADHD. Each participant was referred by their parent or legal guardian to a university-based clinic for a thorough assessment of Attention Deficit Hyperactivity Disorder. Each legal guardian was given a brief description of the procedures to be used during the summer program (see Appendix A) and provided informed written consent for their child's participation (see Appendix B). The study took place within an analogue setting in a university psychoeducational assessment clinic. The classroom activities consisted of language arts and math assignments and were conducted in a 10 X 10 therapy room resembling a natural classroom. The author played the role of teacher for most conditions. In order to

maximize discrimination, a second graduate student served as the teacher for other conditions.

Rick

Rick was an eight-year-old male subject who had been diagnosed with ADHD and had also been identified as educably mentally handicapped (mild mentally impaired) by the local school system. Rick was taking the following medications throughout the three-week program: Sustained Release Ritalin (20 mg BID) and Welbutrin (75 mg BID). Rick's intelligence was assessed via the Kaufman Brief Intelligence Test (KBIT). During formal testing, Rick was not fully cooperative and was easily distracted. Results should be interpreted with caution; nonetheless, his performance was most likely representative of his performance on any standardized test. It is not believed that more accurate results could easily be obtained on standardized assessment measures. On the KBIT, a brief intellectual screening measure, Rick's score fell within the Lower Extreme at a standard score of 65. Standardized achievement testing using the Woodcock-Johnson Tests of Achievement Standard Battery (WJ-R) found Rick to be functioning significantly below average compared to his same age peers in all academic areas. His overall skills in Broad Reading, Broad Math, Broad Written Language, Broad Knowledge and Skills were all at pre-academic levels. Informal, curriculum-based assessment, was also conducted with Rick in reading and math. Rick was asked to identify initial consonant sounds of words when shown a picture of a particular object. Overall, he was able to correctly identify 61% of initial consonant sounds. Of those words in which he correctly identified the initial consonant letter, he was able to correctly identify the sound of the letter 99% of the time. Thus, it was apparent that Rick was consistently familiar with slightly more than one-half

of the consonant sounds. In math, Rick's performance was inconsistent. He was able to rote count past twenty-five although he could not meaningfully count up to twenty-five on a consistent basis. He was able to correctly identify basic colors and shapes when asked.

Rick's behavior was assessed via the Behavior Assessment for Children (BASC), the Social Skills Rating System (SSRS), and the ADHD Rating Scale. The BASC was completed with Rick's mother as the informant. The scales of Hyperactive and Attention Problems as well as the overall Externalizing Problems scale yielded clinically significant results. In addition, the Conduct Problems scale fell within the at-risk range. Rick's Adaptive Skills on the BASC (Adaptability, Social Skills, and Leadership) were all within the at-risk range as well. The SSRS was also completed by his mother and yielded similar results: Rick displayed elevated levels of Externalizing and Hyperactive behavior and depressed levels of social skills. The ADHD Rating Scale's results were consistent with Rick's diagnosis of ADHD; his mother rated him as highly inattentive and highly impulsive. According to rating scales completed by his mother, Rick consistently displays hyperactivity, impulsivity, and weak social skills. In summary, assessment of Rick's intelligence and academic achievement yielded scores that were significantly below average compared to his same-age peers.

Sam

Sam was an eight-year-old male subject who had also been diagnosed with ADHD and was taking Adderall (20 mg BID), Zoloft (exact dosage unknown), and Risperdal (.5 mg at bedtime). He had just finished the second grade when he was enrolled in the summer program. Sam had no other educational diagnoses and had not been receiving

special education services. The usual prescribed dosages of medication were adhered to throughout the three-week program.

Sam was very cooperative during all formal assessment measures. He appeared to put forth adequate effort and results are believed to be reliable and valid. On the KBIT, a brief screening of intelligence, Sam scored within the Well Above Average range with a standard score of 125. On the Woodcock-Johnson Tests of Achievement Standard Battery (WJ-R), Sam scored within the Superior range compared to other students his age in the areas of Broad Reading, Broad Knowledge, and Skills. In the areas of Broad Math and Broad Written Language, Sam scored within the Average range. The areas of Math and Written Language appear to be relative weaknesses for him although it should be noted that his scores were, nonetheless, indicative of Average functioning.

In addition to formal standardized testing, Sam's academic skills were assessed via curriculum-based assessment. In Reading, Sam was asked to read randomly selected passages from a literature-based reading text used within the local curriculum. The number of correctly pronounced words within a one minute time frame were then calculated. Thus, fluency and word recognition were assessed, but comprehension was not. Based upon the informal curriculum-based assessment, it was determined that Sam's fluency was at a minimum eighth grade level. Even at an eighth grade level, Sam read with 97% accuracy. A curriculum beyond the eighth grade level was unavailable, and thus, it is possible that Sam was capable of reading at higher levels. In spelling, Sam was asked to randomly spell words in a rapid fashion from varying grade levels. Sam had reached a mastery level in the second grade level and his true instructional level fell

between a third and fifth grade level. Sixth grade spelling words were within a frustrational range for him. Sam's Written Expression was also calculated informally by asking Sam to compose a story based upon an introductory sentence that was given to him by the examiner. He was asked to write as many words as he could within two minutes. Sam was capable of writing twelve words within two minutes. Although this measure was perhaps the least "formal" of the CBA probes, with no real guidelines available for determining instructional level, Sam's writing fluency appears to be lower than expected for his age level. Finally, in math Sam seemed to be functioning at the middle to ending second grade level. He was given math worksheets with math problems and his percentage correct was calculated. Third grade level worksheets fell within the frustrational range for Sam.

Sam's behavior was also assessed via several rating scales for which his mother served as the informant; the Behavior Assessment System for Children (BASC), Social Skills Rating System (SSRS), and ADHD Rating Scale were all utilized. On the BASC, scores which fall within the clinically significant range indicate a high level of maladjustment and scores within the at-risk range are indicative of a need for careful monitoring. Scales which fell within the clinically significant range for Sam were Hyperactive, Aggression, Depression, Attention Problems, and the overall composite scores of Externalizing Problems and Internalizing Problems. In addition, the scales of Conduct Problems, Anxiety, Somatization, and Atypicality were within the at-risk range. Finally, the BASC also yielded clinically significant Adaptive Skills. Sam's Adaptability and Social Skills were clinically significant and his Leadership skills were at-risk. The

SSRS assesses how often appropriate social skills are exhibited by the subject. According to the informant, Sam was exhibiting low levels of social skills and high levels of externalizing behavior. These results are consistent with those of the BASC. The ADHD Rating Scale also suggested high levels of impulsivity and high levels of inattentiveness which is consistent with Sam's diagnosis of Attention Deficit Hyperactivity Disorder.

Thus, while the goal of the study was to focus on normally developing children diagnosed with ADHD, the subjects did not strictly adhere to those guidelines. Clearly one subject functioned intellectually and academically below that of his peers while the other subject functioned intellectually above that of his peers. Both subjects were rated as experiencing significant difficulties with respect to inattentiveness, hyperactivity, and impulsivity as well as poor possessing poor social skills. In that respect, they were excellent subjects for the study.

Response Measurement

Disruptive behavior was operationalized in accordance with each individual subject's disruptive behavior. However, a general definition was as follows: behavior that interrupted the ongoing educational activities or completion of assigned tasks, or that was potentially harmful or distracting to the other students or peers (DePaepe et al., 1996). Prior to beginning the treatment evaluation, hyperactivity included talking out and out of seat behavior. Talking out was defined as any behavior which resulted in a noise (e.g. talking, tapping a pencil) and was not preceded by raising a hand and receiving acknowledgment from an adult. Out of seat behavior was defined as the child's full body weight not being supported by the chair.

Partial interval recording was utilized. Each condition was ten minutes in duration and was divided into continuous 10-second intervals; the intervals were cued by an audiotape with inconspicuous earphones. (See Appendix C for sample recording sheet.) Observations were conducted by two trained observers of disruptive behavior who watched from either behind a one-way mirror or from an unobtrusive place within the classroom. Observer training was conducted prior to the three week program. Prior to beginning the program, a minimum proficiency of 85% agreement during practice observations was achieved.

Interscorer Reliability

A total of 40% of observations included interrater reliability measures as well as kappa coefficients of interobserver agreement. Interobserver agreement was calculated on an interval by interval basis by comparing each interval across raters. If both observers agreed as to the occurrence or non-occurrence of the target behavior within a given interval, it was counted as an agreement. Similarly, if a particular interval was not rated consistently by both observers, it was scored as a disagreement. Interrater reliability was calculated by the following formula: total number of agreements across intervals divided by the total number of agreements plus disagreements, and then multiplied by 100 (Kazdin, 1982). Interobserver agreement across all subjects and all conditions resulted in an average of 97% (range, 87% to 100%) agreement between observers as to the occurrence or nonoccurrence of disruptive behavior. In addition, Kappa coefficients were calculated to measure interobserver agreement; this involves a statistical correlation of whether the observers agreed upon the presence of hyperactivity during any given interval

and accounts for chance agreement between observers. The average Kappa percentage across both subjects and all conditions was 90% (range, 78% to 100%).

Experimental Conditions for Functional Analysis

In order to determine the motivation for each child's disruptive classroom behavior, a functional analysis was conducted prior to the treatment phase that assessed the effects of (a) positive reinforcement in the form of teacher attention, (b) positive reinforcement in the form of peer attention, and (c) negative reinforcement in the form of escape from task. A multi-element design was used. The purpose of this functional analysis was to determine if either of the two participants' disruptive behavior was motivated by escape from task. The functional analysis was continued until one or more conditions produced a reliable (i.e., replicable) increase in disruptive behavior. According to the procedures outlined by Northrup, et al., (1997), each child was exposed to the following conditions:

Contingent teacher attention. The teacher ignored the target student except to provide a reprimand contingent upon the occurrence of a target behavior (e.g., talking out, out of seat, or off-task behavior). Reprimands consisted of a brief neutral statement related to the task directions (e.g., "you need to stay in your seat"). Only the teacher and the target student were present in the classroom for this condition; it was designed to resemble a classroom situation wherein the child's disruptive behavior accesses teacher attention.

Contingent peer attention. The teacher was not present within the classroom for this condition. Rather, the target student and a "peer confederate" were alone in the

classroom with a teacher standing just out of sight beyond the classroom door to monitor activity. The confederate peer was asked to provide assistance in the form of “reminders” only when the target child was disruptive. The peer confederate was privately instructed to “pay attention to what (the student) is doing, and if you see him/her (engaging in the specified target behavior), say something to them about that.” This condition was designed to resemble a classroom situation wherein the child’s disruptive behavior accesses peer attention.

Brief Contingent Escape. This condition was designed to resemble a classroom situation wherein the child’s disruptive behavior allowed them to temporarily escape their work. Once again, only the student and the teacher were present within the classroom. Contingent upon the occurrence of disruptive behavior, the target student’s worksheet was immediately removed, the teacher said “time out” and moved the student’s chair away from the work. After 20 seconds, the teacher placed the worksheet back on the student’s desk.

Instructional Intervention Conditions

A second purpose of the study was to link functional assessment to treatment of escape-maintained problem behavior. Two possible methods were selected for this approach: altering establishing operations by reducing the task presentation and extinction through guided compliance. Altering the presentation of the task was studied by varying the presentation of tasks: either whole or partial tasks. Extinction of disruptive behavior was studied via guided compliance.

Whole Task. The whole task condition was comprised of a packet of assigned work being presented to the subject with the instructions to complete the entire packet of work. The packet consisted of two to three worksheets stapled together; each worksheet included problems associated with a consistent level of difficulty and in accordance with the student's instructional level. The condition was termed "whole task" because task was presented in its entirety at the outset. Each session lasted approximately ten minutes and the task was expected to require the entire session for completion. The academic probes were conducted by the author while other members of the research team observed the child's disruptive behavior.

Partial Task. The partial task condition consisted of an assignment which was similar in level of difficulty to that of the whole task condition. This assignment consisted of one worksheet to be handed to the student; upon completion of the first worksheet another worksheet was immediately assigned. Each of the partial task conditions was designed so that they would take approximately five minutes to complete, and upon completion of the first task another task would immediately follow. Thus, the task was broken up into segments and was not presented in its entirety initially. Therefore, the condition was termed "partial task." In that manner, the entire session of the condition was spent on working on the assignment. During each condition the amount of disruptive behavior was recorded. The preceding condition was based on DePaepe et al. (1996).

Both whole task and partial task conditions included brief contingent escape as described above to ensure internal consistency within the study. That is, the escape contingency was continued for two reasons: 1) so that the whole task conditions during

the functional analysis could be used as baseline and 2) to ensure that the consequences of disruptive behavior during whole versus partial task conditions were held constant. The conditions of whole task and partial task were conducted in a one-to-one (teacher and child) setting.

Guided Compliance. The guided compliance condition utilized the same packet of assignments as the whole task condition. The packet was handed to the subject with the instructions to complete the entire packet of work. The first time that the participant displayed disruptive behavior, a verbal prompt of “Get back to work or I will have to help you,” was given by the “teacher”. The succeeding occurrence of disruptive behavior displayed by the participant resulted in the “teacher” physically standing over the subject and using hand-over-hand guidance to prompt work completion. While the therapist was actively assisting the participant, disruptive behavior was not coded. If disruptive behavior occurred again, the participant once again received a verbal prompt to resume working. The next occurrence of disruptive behavior resulted in guided compliance. This pattern of verbal prompting followed by physical guiding by the therapist continued throughout the condition as many times as warranted by the subject’s behavior.

Procedural Integrity

Procedural integrity was assessed by determining the probability that disruptive behavior was followed by an appropriate consequence (e.g., that during the peer attention condition, disruptive behavior was followed by peer attention). This measure of integrity was designed to identify how well the research team adhered to the predetermined procedures. It was calculated by counting all intervals in which disruptive behavior

occurred and in which the appropriate consequence followed within the same or immediately subsequent interval. This figure was then divided by the number of intervals in which disruptive behavior occurred. The resulting figure was an indication of the probability of disruptive behavior being followed by the appropriate consequence. The following tables depict the conditional probabilities for each subject in the study. For example, during the Peer Attention conditions for Rick, disruptive behavior was followed by peer attention an average of 66% of the time.

Table 1: Conditional Probabilities for Rick

| Condition | Mean | Range |
|-------------------|-------------|--------------|
| Peer Attention | 66% | 26% - 100% |
| Teacher Attention | 90% | 80% - 100% |
| Escape/Time Out | 89% | 63% - 100% |
| Guided Compliance | 58% | 20% - 78% |

Table 2: Conditional Probabilities for Sam

| Condition | Mean | Range |
|-------------------|-------------|--------------|
| Peer Attention | 86% | 60% - 100% |
| Teacher Attention | 50% | 0% - 100% |
| Escape/Time Out | 40% | 0% - 100% |
| Guided Compliance | 56% | 24% - 100% |

Design

During the functional analysis, a multi-element design was utilized which involved the conditions of contingent teacher attention, contingent peer attention, and brief contingent escape. A brief reversal design (ABAB) was utilized to evaluate the treatment

conditions of whole task versus partial task. Finally, an extended reversal (ABAB) design was used to evaluate the guided compliance conditions.

Procedures

The functional analysis conditions of teacher attention, time-out, and peer attention were presented in an arbitrary order until the within conditions trends were clear. Once general trends in each of these conditions were identified for each subject, the treatment conditions of whole and partial task were alternated. If these effects were unclear, then guided compliance conditions were explored. Data were collected daily over the course of twelve days.

Results

Appendices D and E are graphs depicting the percentage of intervals where hyperactive behavior occurred in each of the conditions for each subject. Each graph compares the levels of hyperactive behavior displayed during the functional analysis phase (peer attention, teacher attention, and time-out) of the study to the levels displayed during the treatment conditions of whole task, partial task, and guided compliance.

Rick

For Rick, the condition of peer attention consistently produced the highest levels of hyperactivity during the functional analysis phase of the study ($M=99\%$; range, 98% to 100%). Teacher attention conditions resulted in sporadic levels of hyperactivity which were considerably lower than those of the peer attention conditions ($M=51\%$; range 12% to 72%). Time out, or escape from task, resulted in moderately high levels of hyperactivity initially, but its effects seemed to diminish as the study progressed and

resulted in the lowest amount of hyperactivity overall ($M=31\%$; range, 7% to 87%). Therefore, since the peer attention condition yielded consistently high levels of hyperactivity for Rick, it was concluded as the primary function of his hyperactive behavior. Escape was not determined to be a function of Rick's hyperactivity in these academic tasks.

During the functional analysis phase of the study, it became apparent that in addition to the hyperactive behaviors of talking out and being out of seat, various non-hyperactive, yet off-task, behaviors were also being displayed. These other behaviors, such as staring into space and drawing on papers, did not meet the previously identified criteria for hyperactivity (Northup, et al., 1997). However, it appeared that these "passive" off-task behaviors served to escape the immediate academic demands.

Although a formal functional analysis was not conducted, we approached treatment evaluation as if this broader class of hyperactive behavior (including passive off-task) was maintained by escape from tasks. Thus, the definition of hyperactive behavior was modified to include such "off-task" behavior for the treatment evaluations. Off-task behavior was defined as looking away from assigned task for more than three consecutive seconds. The modification of the definition became effective during the treatment evaluation portion of the study.

The treatment conditions of whole task and partial task were initially implemented on an alternating basis during the treatment phase of the study for Rick. Whole task conditions yielded moderately low levels of hyperactivity ($M=36\%$; range, 20% to 51%) and partial task conditions yielded moderate levels of hyperactive behavior ($M=55\%$;

range, 47% to 63%). However, when whole and partial task conditions were analyzed together, there was an obvious increasing trend in hyperactive behavior. (See Appendix D. During the Escape phase of the study, whole task conditions are represented by the first and third data points while partial task conditions are represented by the second and fourth data points.) Neither of the whole or partial task conditions appeared to be a powerful variable. The weakness of the whole and partial task conditions dictated a modification of the study's focus. Thus, guided compliance was added as a focus of the study and the whole and partial task conditions were combined to serve as baseline conditions for evaluation of guided compliance.

Thus, when whole and partial conditions were combined, they yielded moderate levels of hyperactivity ($M=45\%$; range, 20% to 63%). The treatment condition of guided compliance resulted in lower levels of hyperactivity than baseline conditions ($M=31\%$; range, 12% to 74%). A mini-reversal to baseline conditions, once again, produced a markedly higher level of hyperactivity at 86%. When guided compliance was again implemented, for one data point, the hyperactivity level for Rick returned to a moderate level at 43%. Overall, guided compliance appeared to result in lower levels of hyperactivity than did escape conditions for Rick.

Sam

During the functional analysis phase of the study for Sam, peer attention conditions resulted in the highest levels of hyperactivity ($M=86\%$; range, 60% to 100%). Teacher attention conditions yielded consistently low levels of hyperactivity ($M=3\%$; range, 0% to 7%) as did the escape conditions ($M=2\%$; range, 0% to 4%). Thus, neither

teacher attention nor escape appeared to be contingencies for Sam's hyperactive behavior. Peer attention produced the highest levels of hyperactivity for Sam and served the primary function of his hyperactive behavior according to functional analysis.

Once again, during the treatment analysis phase of the study it became apparent that Sam was also exhibiting passive off-task behavior. These behaviors, such as staring into space and drawing on assignments, appeared to allow escape from the immediate academic environment. No formal functional analysis was conducted; nonetheless, the definition of hyperactivity was altered during the treatment analysis phase to include "off-task" behavior as well as disruptive behavior.

During the treatment analysis phase, it became apparent that altering the task presentation via whole or partial tasks did not result in powerful changes in levels of hyperactivity. Both whole and partial tasks yielded moderately high levels of hyperactivity ($M=78\%$; range 73% to 82% and $M=85\%$; range, 76% to 93%, respectively). Thus, whole and partial task conditions were combined to serve as baseline for the evaluation of the treatment condition of guided compliance. When combined to serve as a baseline, whole and partial task conditions produced moderately high levels of hyperactivity in an escape condition ($M=81\%$; range, 73% to 93%). Guided compliance was then implemented and yielded lower levels of hyperactivity ($M=28\%$; range, 5% to 57%). The reversal back to baseline, or escape conditions, resulted in higher levels of hyperactivity ($M=53\%$; range, 24% to 79%). Finally, reversal back to guided compliance conditions yielded only slightly lower levels of hyperactivity ($M=48\%$, range 8% to 80%).

Discussion

Results of the functional analysis suggested that, for both subjects, peer attention served as the primary function of hyperactive behavior. Levels of hyperactivity were consistently high in peer attention conditions and subsequently low in teacher attention and escape conditions for both subjects. The treatment evaluation phase of the study consistently indicated that altering the presentation of whole or partial task conditions was relatively ineffective in lowering levels of hyperactivity. Guided compliance produced somewhat lower levels of hyperactivity in both subjects, which suggested preliminary support for its use.

This study made three potential contributions to existing research. First, it advanced the limited number of studies involving the application of functional assessment in normally developing populations. Certainly, the use of functional assessment can be deemed useful in identifying the functions of behavior in normal populations as well as the previously identified developmentally disabled populations. In normally developing populations, peer attention has been consistently implicated (e.g., Northup, et al., 1995; Northup et al., 1997) as a primary function of disruptive behavior. This study further supports existing research in that both subjects invariably displayed high levels of disruptive behavior during peer attention conditions. These results are notable given that, most often, solutions which do not address peer attention are recommended within the regular education classroom. For example, manipulation of teacher attention (either in the form of planned ignoring of inappropriate behavior or reinforcement of appropriate behavior) and modification of medication, are two of the most often prescribed solutions

for problem behavior. Results of this study, coupled with previous research, suggest that greater credence need be given to the powerful effects of peer attention.

In addition, this study pointed to the continued need for conceptualization of ADHD not only in terms of excessive amounts of hyperactivity-impulsivity, but also in its marked deficits in attentiveness. The initial focus of this study was on hyperactive, or disruptive behavior, and how it precluded academic task engagement. However, functional analysis revealed that despite an absence of hyperactive behavior, task engagement was not necessarily guaranteed. Even within the larger scope of behaviors associated with ADHD, individual behaviors may serve varying functions for different individuals within unique settings. Specifically, hyperactive-impulsive behavior (e.g., out of seat and talking out) may serve a different function than attention deficits (e.g., passive staring). The functions of individual behaviors must be identified via sound functional analysis.

Finally, very little research has sought to link assessment to treatment. This study identified the primary motivation for hyperactive behavior in both subjects and then effectively eliminated whole and partial tasks as an effective treatment for disruptive behavior in these two subjects. In addition, guided compliance was shown to have moderate effects on levels of disruptive behavior. Thus, while the treatments studied in this program may not have proven entirely effective, it does support existing research confirming the importance of linking assessment to treatment.

Despite the successes of the current study, it is not without its limitations. It took place within a simulated classroom setting and with simulated teachers. It is conceivable

that within a natural classroom setting, the effects of peer attention, academic and/or instructional variables, and teacher attention would yield very different results. This setting allowed for attention from only one peer within the simulated classroom and it is possible that certain peers may or may not be reinforcing for any individual child. Thus, while peer attention appeared to be very motivating for both subjects within this setting, it is conceivable that within a natural classroom setting other contingencies of hyperactive behavior may be identified.

One other point of contention can be made with respect to the last two reversal phases for Rick. During the last escape and guided compliance conditions, only one data point was obtained for each condition. Thus, truly stabilized trends were not obtained within each condition and it could be that other data points could have yielded varying trends in the data. This constraint on the study was dictated by a lack of time; it would have been helpful to conduct an extended analysis of escape and guided compliance conditions.

In addition, while Sam's hyperactivity was initially influenced by guided compliance, its effects were not maintained during the second reversal. The sessions for the second reversal of guided compliance were all conducted on the last day of the summer program. Significantly more sessions were conducted on the last day than during any other day of the summer program, and this proved to be especially grueling for the subjects. The rapid succession of sessions may have increased the effectiveness of escape as motivation, and thus, decreased the effectiveness of guided compliance. Indeed, Sam's general behavior and attitude during the last day had markedly deteriorated, presumably

due to the intensity of the day and the knowledge that it was the last day of the three-week program. This compromised the results of the study of guided compliance.

Another obvious limitation of the study is its limited number of subjects. Two subjects represent the bare minimum for investigating the effects of peer attention. The study of peer attention with a larger number of peers would likely prove fruitful. In addition, a greater number of subjects would have provided greater variability and the possibility of more in-depth investigation of other contingencies which maintain disruptive behavior. While this study sought to advance the study of normally developing populations, one of its subjects was clearly functioning within the mild range of mental impairment while the other was clearly above average. Although this approximates normal intellectual functioning compared to other research utilizing severely impaired subjects, it would have proven more beneficial to have a truly average range of functioning.

Finally, functional analysis suggested that, for both subjects, hyperactivity was maintained by peer attention, and not escape. Therefore, guided compliance was evaluated in terms of its effects on a larger response class that included passive off-task, which anecdotal observation suggested may be maintained by escape. On the one hand, this points to the need for functional analysis of children diagnosed with ADHD to focus on individual behaviors, because with the total class of "ADHD" behaviors, some may be maintained by different contingencies. However, this is also a limitation because treatment in this case was not directly linked to functional analysis. Altering access to peer attention

would have been a useful and interesting avenue of exploration as far as viable treatment options.

Future avenues of research should continue to investigate the effectiveness of utilizing functional assessment with normally developing kids. This would be especially beneficial if conducted within a natural setting, instead of a simulated analogue environment. In addition, considering off-task behavior within the larger class of disruptive behavior would produce a truer representation of the functions of disruptive behavior. Despite the lack of support for the alteration of task presentation via whole and partial tasks in this study, this approach should not be abandoned. With a greater number of subjects and a refinement of the definition of hyperactive behavior, it is entirely conceivable that escape may function as a contingency for hyperactive behavior. Indeed, previous research would support that possibility. Finally, future research should continue to explore functional assessment and its associated treatments as a means of identifying effective interventions for problem behavior. That should be, after all, the goal of any research - practical applications of its results.

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Appendix A

Description of Procedures

The School Psychology Program at EIU is conducting a research project that will feature a 3 week academic program for children aged 7 - 9 who exhibit serious emotional and behavioral challenges. The purpose of the project is to provide parents and teachers with a comprehensive evaluation of participating children's

Appendix B
Parental Consent Form

Appendix C

Sample Recording Sheet

Name of student: _____ Date: _____ Observer: _____ Rel: Y N Session Code: _____

Interview Code: _____ t1 = _____ t2 = _____

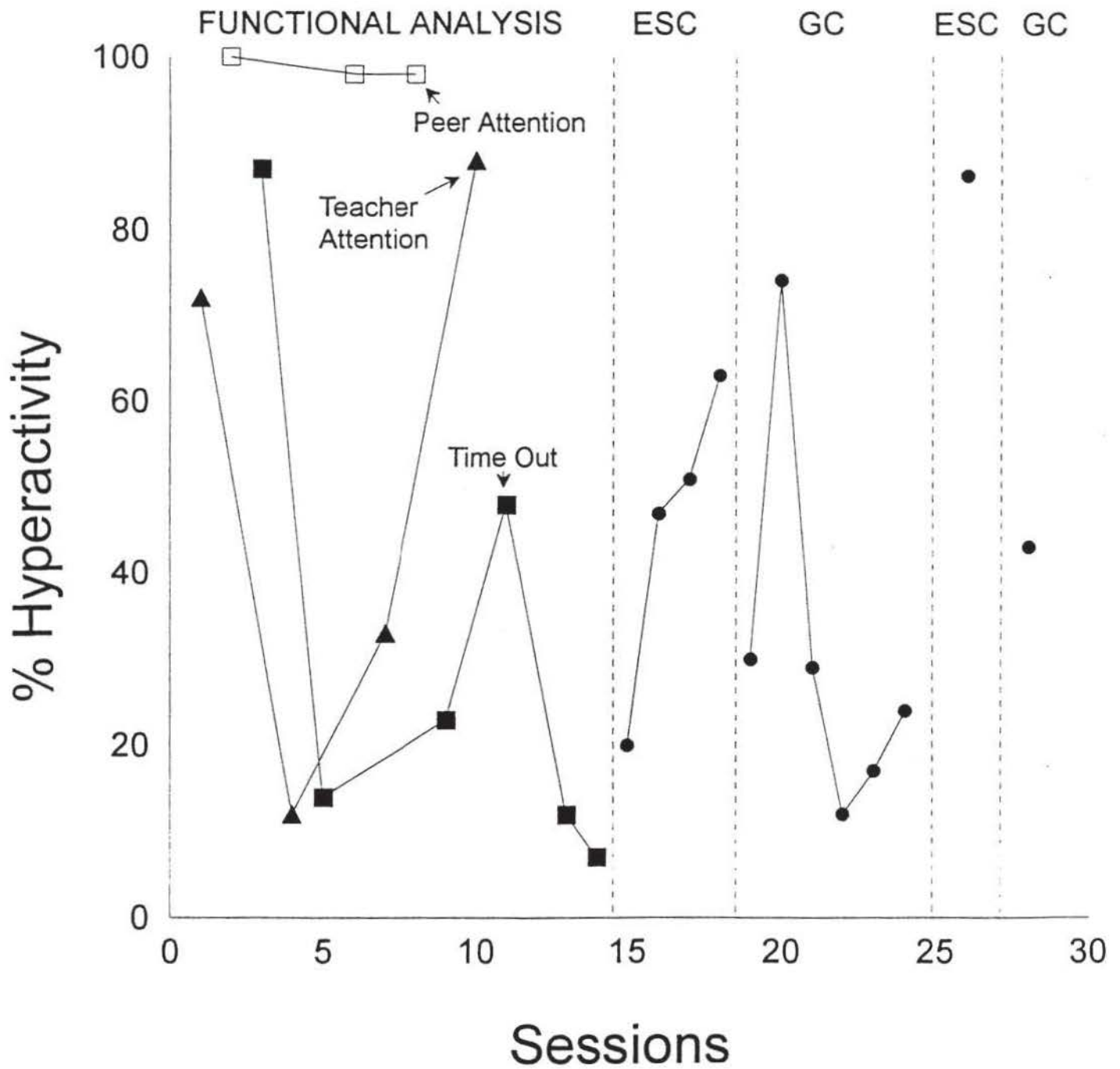
ISW = independent seatwork

TDWC = Teacher-directed whole class

| | | | | | | | | |
|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| 1 on off tk os T ES PA | 2 on off tk os T ES PA | 3 on off tk os T ES PA | 4 on off tk os T ES PA | 5 on off tk os T ES PA | 6 on off tk os T ES PA | 7 on off tk os T ES PA | 8 on off tk os T ES PA | 9 on off tk os T ES PA |
| 10 on off tk os T ES PA | 11 on off tk os T ES PA | 12 on off tk os T ES PA | 13 on off tk os T ES PA | 14 on off tk os T ES PA | 15 on off tk os T ES PA | 16 on off tk os T ES PA | 17 on off tk os T ES PA | 18 on off tk os T ES PA |
| 19 on off tk os T ES PA | 20 on off tk os T ES PA | 21 on off tk os T ES PA | 22 on off tk os T ES PA | 23 on off tk os T ES PA | 24 on off tk os T ES PA | 25 on off tk os T ES PA | 26 on off tk os T ES PA | 27 on off tk os T ES PA |
| 28 on off tk os T ES PA | 29 on off tk os T ES PA | 30 on off tk os T ES PA | 31 on off tk os T ES PA | 32 on off tk os T ES PA | 33 on off tk os T ES PA | 34 on off tk os T ES PA | 35 on off tk os T ES PA | 36 on off tk os T ES PA |
| 37 on off tk os T ES PA | 38 on off tk os T ES PA | 39 on off tk os T ES PA | 40 on off tk os T ES PA | 41 on off tk os T ES PA | 42 on off tk os T ES PA | 43 on off tk os T ES PA | 44 on off tk os T ES PA | 45 on off tk os T ES PA |
| 46 on off tk os T ES PA | 47 on off tk os T ES PA | 48 on off tk os T ES PA | 49 on off tk os T ES PA | 50 on off tk os T ES PA | 51 on off tk os T ES PA | 52 on off tk os T ES PA | 53 on off tk os T ES PA | 54 on off tk os T ES PA |
| 55 on off tk os T ES PA | 56 on off tk os T ES PA | 57 on off tk os T ES PA | 58 on off tk os T ES PA | 59 on off tk os T ES PA | 60 on off tk os T ES PA | 61 on off tk os T ES PA | 62 on off tk os T ES PA | 63 on off tk os T ES PA |
| 64 on off tk os T ES PA | 65 on off tk os T ES PA | 66 on off tk os T ES PA | 67 on off tk os T ES PA | 68 on off tk os T ES PA | 69 on off tk os T ES PA | 70 on off tk os T ES PA | 71 on off tk os T ES PA | 72 on off tk os T ES PA |
| 73 on off tk os T ES PA | 74 on off tk os T ES PA | 75 on off tk os T ES PA | 76 on off tk os T ES PA | 77 on off tk os T ES PA | 78 on off tk os T ES PA | 79 on off tk os T ES PA | 80 on off tk os T ES PA | 81 on off tk os T ES PA |

Appendix D
Graph of Functional Analysis
and Guided Compliance for Rick

Rick: FA/GC



Appendix E
Graph of Functional Analysis
and Guided Compliance for Sam

Sam: FA/GC

