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# The Effects of Scripts on Treatment Integrity

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THE EFFECTS OF SCRIPTS ON TREATMENT INTEGRITY

An Ed.S. Field Project

Presented to the

Department of Psychology

and the

Faculty of the Graduate College

University of Nebraska

In Partial Fulfillment

of the Requirements for the Degree

Education Specialist

University of Nebraska

by

Kyle S. Hesser

March 2004

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ED.S. FIELD PROJECT ACCEPTANCE

Acceptance for the faculty of the Graduate College,  
University of Nebraska, in partial fulfillment of the  
Requirements for the degree Ed.S.,  
University of Nebraska at Omaha.

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# THE EFFECTS OF SCRIPTS ON TREATMENT INTEGRITY

Kyle S. Hesser, EdS

University of Nebraska, 2004

Advisor: Michael Bonner, Ph.D.

The extent to which teachers carry out interventions as designed, called treatment integrity, is an important area that has recently received an increase in attention. Without treatment integrity, any behavior change that may occur cannot be confidently linked to the intervention. There have been few studies attempting to increase treatment integrity using scripts. Scripts are collaboratively developed step-by-step outlines of treatment components that aid the teacher in implementing the intervention. Two general education elementary teachers used scripts to implement an intervention and monitor treatment integrity. Student performance was moderately improved once the intervention was implemented. Scripts did not significantly change treatment integrity in either case. Practitioners must find a suitable method to assess treatment integrity as a part of the decision-making process.

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## The Effects of Scripts on Treatment Integrity

Numerous intervention strategies are attempted for a wide range of referral reasons with varying degrees of success. However, few consultants and teachers assess if the intervention strategies are being executed as it was intended (Bahr, 1994). How can it be determined that an intervention was a failure or success if implementation is not monitored? Several researchers have called for more focus to be placed on the assessment of treatment integrity (Bahr, 1994; Gresham, Gansle, Noell, Cohen, & Rosenblum, 1993; Gresham & Kendell, 1987; Shapiro, 1987)

The present study will attempt to examine the effects of scripts on treatment implementation. Specifically, scripts are collaboratively created by the consultant and the teacher to outline treatment components. Scripts serve as a checklist for teachers that allow them to identify elements of the intervention that may have been omitted or need to be addressed next in the treatment sequence. There have been only two studies examining the benefits of scripts on treatment integrity and student performance (Ehrhardt, Barnett, Lentz, Stollar, & Reifin, 1996; Hiralall & Martens, 1998). The studies suggest possible benefits but they have been limited to early childhood settings. In addition, the studies have failed to compare results in scripts and no-script conditions so conclusions made about the effectiveness of scripts are limited. The present study attempted to isolate the effects of scripts by using a multiple baseline design to determine if scripts improve levels of treatment integrity over non-script conditions. Treatment integrity and student performance were monitored separately but concurrently throughout the study. Therefore,

it can be determined if the treatment was effective at changing student performance and if scripts improved the level of treatment integrity.

Treatment integrity should be assessed as part of the intervention evaluation phase of consultation. If a plan leads to student progress, the consultant can not be sure that improvements were caused by the intervention or some other variable without treatment integrity data. Conversely, if a student fails to make progress, the consultant cannot be certain that the intervention was not the correct strategy. Before deciding to attempt another treatment, the intervention team should first assess whether or not the treatment was implemented as prescribed. (Sterling-Turner, Watson, Wildmon, Watkins, & Little, 2001).

#### *Lack of Treatment Integrity Assessment in Research*

Gresham, Gansle, and Noell (1993) reviewed articles in the *Journal of Applied Behavior Analysis (JABA)* between 1980 and 1990 to evaluate how many studies tracked the implementation of the independent variable. They reviewed all published articles in *JABA* that studied children during that decade. Of the 158 studies reviewed, only 54 included an operational definition of the independent variable. Moreover, only 15.8% of the reviewed studies reported systematically recording integrity of the independent variable. The mean of treatment integrity that was reported in the 25 studies was 93.8%. The low occurrence of operationally defining variables is concerning, especially in a credible and popular journal such as *JABA*. It is impossible to replicate studies with any accuracy if the variables are not well defined. More care must be exercised to ensure accurate and detailed descriptions of the independent variables.

Gresham, Gansle, Noell, Cohen, and Rosenblum (1993) extended their literature review to include six other journals in addition to *JABA*, limiting their search to experimental studies occurring in schools involving children under the age of 19 years. The studies that were subject to review were published between 1980 and 1990. Again, they found a low level of treatment integrity. Only 14.9% of the 181 studies that were reviewed measured and reported treatment integrity. In addition, 18 more studies claimed to have monitored integrity but failed to report data. Both reviews of experimental studies demonstrate the need for more attention to be paid to operational definitions of independent variables and systematic measurement and reporting of treatment integrity.

Without measuring treatment integrity, researchers can not establish a functional relationship between the independent and dependent variables. Even if the manipulation of the independent variable results in a change in the dependent variable, researchers can not state with certainty whether the change was due to the manipulation or some other factor. Therefore, without treatment integrity, internal validity is questioned (Gresham, Gansle, & Noell, 1993). Despite the importance of treatment integrity in research, few studies clearly define or measure independent variables or integrity.

#### *Treatment Integrity in Practice*

In addition to the lack of treatment integrity assessment in research, there is evidence that integrity is not measured in practice. Recent literature has questioned the way professionals collect data and use the information to make decisions regarding intervention strategies. Bahr (1994) surveyed special education directors in Michigan to assess the prereferral process. He found that 75% of the interventions were “somewhat”

successful, but schools were not accurately able to define success because only 13% of the respondents reported establishing criteria for intervention success. Moreover, only 10% reported that the degree to which interventions were implemented was assessed. These results suggest that we need better ways of tracking intervention implementation and success.

### *Factors Affecting Treatment Integrity*

Gresham (1989) was one of the first researchers to stress the need to monitor treatment integrity. He identified several factors that are related to integrity such as the complexity of the treatment, time and materials required for implementation, motivation and number of treatment agents, and the perceived and actual effectiveness of the treatment. Specifically, complex intervention strategies are less likely to be carried out with adequate integrity. Gresham also hypothesized that treatments will be executed with more integrity if the consultee believes the intervention will be effective. However, integrity is likely to be low if the consultee's motivation for referral is to have the student removed from the classroom.

Besides examining factors that influence treatment integrity in practice we can review the literature to determine which factors have not been found to affect treatment integrity. For instance, some have hypothesized that treatment acceptability and problem severity affect treatment integrity. Acceptability has been defined as the consultee's opinion regarding whether the treatment is fair and appropriate. However, Watson, Sterling, and McDade (1997) reviewed the literature and found that there has been no formal link between treatment acceptability and integrity. It is important for the consultee

to know how the teacher feels about the intervention to determine whether or not the teacher is capable and feels comfortable and is capable of executing the treatment.

Wickstrom, Jones, LaFleur, and Witt (1998) researched the possible relationship between problem severity, treatment acceptability, verbal interaction style during consultation, and treatment integrity in a regular education setting. It was concluded that none of the researched variables were significantly related to treatment integrity.

Therefore, researchers have concluded that treatment complexity (number of treatment agents, time, and materials), motivation, and perceived effectiveness are the main factors that can affect treatment integrity.

#### *Suggestions for Assessing Treatment Integrity*

Until recently, treatment integrity had largely been ignored in practice as well as in research. Some have suggested methods to assess treatment integrity (Gresham, Gansle, & Noell, 1993; Gresham, Gansle, Noell, Cohen, & Rosenblum, 1993). First, independent variables need to be defined according to verbal, physical, spatial, and temporal dimensions, similar to the way dependent variables are defined. Second, treatment integrity should be calculated in two ways. Each element of the treatment plan should have its integrity assessed across days. This allows the consultant to examine which treatment steps that may be more difficult for the consultee to execute. Difficulty may be due to lack of skills, time or another factor. Daily integrity should also be assessed by summarizing the integrity of all components over a few days. Trends can then be examined for patterns of “good days” or “bad days.” Taken together, consultants would get an accurate assessment of treatment integrity. Lastly, direct observation

methods should be used to assess treatment integrity. However, frequency of observation sessions and possible reactions to observation need to be considered. Observations should be conducted across treatment agents, settings, and time. Self-reports and behavior rating scales are useful tools to supplement direct observation data.

Gresham, Gansle, and Noell (1993) also made suggestions on how to increase accuracy of observations in spite of possible biases that may occur. First, they suggested “spot checking” the consultee to ensure the treatment is being carried out as prescribed. Second, observers can attempt to be unobtrusive. The observer may decide to be positioned in the classroom before class begins or to avoid eye contact with the consultee and quietly position himself or herself in the room. When possible, video recorders would be a helpful option. The observer could place the camera at the back of the room and leave it there over a few days and turn it on just one day without announcing the change. Finally, the observer may decide not to tell the consultee the purpose of the observation or may provide inaccurate information to the consultee regarding the purpose. An element of deception would be present but would help to reduce bias in the observation session.

Few studies have addressed the precise strategies to improve treatment integrity in practice despite the many strategies listed above and the established importance of attending to treatment integrity. Two common methods that have been examined to increase treatment integrity include the use of performance feedback and the use of scripts. The next step is to determine if the use of performance feedback or scripts are

practical in schools as well as whether they produce satisfactory results in student performance.

*Use of Performance Feedback to Improve Treatment Integrity*

One proposed method to increase treatment integrity involves the use of performance feedback. The consultant would periodically review treatment integrity, either by directly observing the consultant execute the intervention or by reviewing permanent products, and discuss his or her performance with the consultee. Studies have also examined the frequency in which these performance evaluations would need to occur in order to maintain an acceptable level of treatment integrity.

Noell, Witt, Gilbertson, Ranier, and Freeland (1997) conducted one of the earliest investigations of the relationship between the use of performance feedback and treatment integrity. The study involved three elementary school teachers who had referred students for assistance because of performance deficits in academics. They found that teachers were able to maintain an acceptable level of treatment integrity for two to four days during the non-feedback phase. However, daily performance feedback sessions led to significant improvements in treatment integrity. In addition, increased levels of treatment integrity were also related to improvements in student performance.

There have been a few other studies that examined the possible benefits of daily performance feedback on treatment integrity (Jones, Wickstrom, & Friman, 1997; Witt, Noell, LaFleur, & Mortenson, 1997). All of the reviewed studies suggested moderate improvements in treatment integrity when performance feedback was given daily but benefits of improved integrity had inconsistent results on student performance. The

resulting student outcomes are dependent, however, on the intervention the teacher and consultant agreed upon. An ineffective intervention that is perfectly implemented will have little effect on student performance. However, all of the studies demonstrated that treatment integrity could be improved by providing feedback from a consultant who did not have administrative authority over the teacher. Also, it would not present a tremendous strain on the consultant because the feedback sessions were short in duration. Yet, the daily meetings may be problematic for consultants who are required to divide his or her time between multiple schools. Therefore, daily feedback meetings with a referring teacher may be impractical for many school psychologists.

Mortenson and Witt (1998) replicated previous performance feedback studies using weekly meetings instead of daily consultations. Their results were similar to previous results in which treatment integrity was moderately improved but student performance improvements were inconsistent. Therefore, regardless of the frequency of performance feedback sessions, it appears that some type of monitoring is needed to maintain treatment integrity.

Because feedback studies have not been able to consistently and reliably produce robust treatment integrity improvements some researchers have attempted to use methods which teachers help develop and monitor their own levels of treatment integrity. Consultants would have more time to help other teachers and students if teachers are able to take part in the monitoring of their own treatment integrity. Also, teachers would feel more empowered to implement interventions in their classroom the next time they refer



one of their students. One such method that has been proposed to get teachers more involved is the use of scripts to improve treatment integrity.

### *Use of Scripts to Improve Treatment Integrity*

Scripts are detailed step-by-step outlines of treatment components. Scripts are used to guide teachers through the intervention so that each element is executed. Hiralall and Martens (1998) conducted a counterbalanced multiple baseline designed study to assess the effects of scripts on treatment integrity. In this study, the researchers created the scripts and presented them to the teacher who was then expected to use them in the classroom. Hiralall and Martens studied four preschool teachers and their implementation of Direct Instruction techniques with 14 preschoolers during art activities. Results demonstrate that treatment integrity was dramatically increased between baseline and either the training-only phase or training-plus-scripts phase. Despite the significant improvement in treatment integrity evident in all teachers, regardless of phase sequence, it is difficult to determine if changes were due to scripts or to the training. One can assume that training had a significant effect on integrity because of the improvements observed in the training only phase over baseline. The addition of scripts slightly improved integrity but we cannot be sure scripts alone would have been sufficient to improve integrity without isolating scripts from training in an additional phase. The lasting effects as demonstrated during follow up is encouraging but we do not know whether the improvements can be attributed to the use of scripts because of the confounding training sessions. However, just as we cannot be sure the effects were due to

training alone, we should not discount the possibility that effects were due to scripts. More research would need to be done before this conclusion can be made.

Teachers rated scripts highly acceptable throughout the study (Hiralall & Martens, 1998). They stated that scripts were easy to use and to follow. However, scripts were developed by the consultant and were fairly wordy. Teachers had no input in the wording or format of the scripts. Possible script effects on treatment integrity should be pursued further to understand factors related to teacher acceptance and their effect on treatment integrity as well as student performance. Certain methodological limitations, specifically the lack of a no-script phase, in this study prevent a clear determination of the actual script effects on treatment integrity. Additional research that allow for direct comparison of script effects must be conducted to see if scripts in fact have a positive influence on integrity and subsequent student performance.

A study conducted by Ehrhardt et al. (1996) also attempted to use scripts to increase treatment integrity. They studied treatment integrity of four teachers in a Head Start program who worked with four preschool students between ages 4- and 6-years. Interventions were collaboratively developed by the teacher and consultant that were specifically designed to address each child's problem behavior and a script was developed to help guide the intervention.

Ehrhardt et al. (1996) concurrently tracked treatment integrity, child behavior, and script acceptability. Treatment integrity was calculated by dividing the number of completed treatment components by the number of steps involved in the intervention.

Observations of child behavior and questionnaires to assess script acceptability were periodically administered.

The study was a multiple baseline design across teachers with a follow up approximately one month later. Results indicate that treatment integrity increased for all four teachers. Target behavior also improved over baseline levels in all four cases. In addition, script acceptability was high for all teachers. In some cases, teachers initially ranked acceptability as low but improved as they continued to use the scripts.

The Ehrhardt et al. (1996) study, like the Hiralall and Martens (1998) study, did not have a phase in which the treatment was implemented without the aid of scripts. Therefore, we can not isolate the effects of scripts on treatment integrity or on child behaviors. Results also highlight the need for consultants to closely monitor the use of scripts at the beginning of their use because of possible lower levels of acceptability.

The two previously reviewed studies represent the only research completed thus far addressing the effects of scripts on treatment integrity. Each study had limitations that prevent us from drawing strong conclusions about the benefits of scripts on treatment integrity. However, results suggest the possibility that improvements in treatment integrity can be attributed to the use of scripts. Although we cannot currently determine the relationship with confidence, the possibility cannot be discounted due to the lack of research available. In addition, both studies were conducted in early childhood environments (Preschool art classes and Head Start programs). It is possible that scripts may have a different effect within schools (e.g., public vs. private) for various reasons.

More research is needed to pursue the possible benefits of scripts on treatment integrity before their use can be deemed ineffective at improving treatment integrity.

### *Present Study*

The present study was an extension of Ehrhardt et al.'s (1996) study with the following systematic variations. The current study used a multiple baseline design across participants to allow comparisons in treatment integrity between scripts and no-script conditions so that possible benefits of scripts can be more confidently discovered. The purpose of this study was to examine the effects of scripts on treatment integrity in an elementary school setting. It combined aspects of previous research and added to the very limited literature regarding treatment integrity. The study allowed for direct comparison of script effects due to the use of a multiple baseline design across participants. Lastly, the current study differed from previous research in the way scripts were created. In past studies, the consultant, created the script and gave it to the teacher to use during implementation. However, in the current study, the consultant and the teacher collaboratively created the script. The consultant ensured that all of the necessary treatment components were addressed and the teacher made sure that it was easy to follow and use in the classroom.

Specifically, in the present study, it was investigated whether scripts increased treatment integrity for general education teachers and if increases in treatment integrity affected student performance. Treatment integrity was measured by teacher self-report and consultant direct observation. In addition, student performance was concurrently measured. Based on previous research, it was hypothesized that the introduction of scripts

would significantly increase the level of treatment integrity. Further, if the selected intervention was appropriate for the referral, an increase in treatment integrity would lead to moderate improvements in student performance.

### *Design*

*Single case design.* The current study used a single case design to measure treatment outcomes. Single case designs are advantageous when conducting studies in practice because they eliminate the need for a control group (Gresham & Kendell, 1987). With the single case design, the participant serves as his or her own control. Generalizability of results can be demonstrated through replication. In the present study, two teachers participated in separate baseline and script conditions. The baseline phase represented the control condition. The experimental condition began when scripts were introduced. In addition, results of the study can be generalized through replication of procedures across the two teachers, settings, and interventions.

Shapiro (1987) promoted single subject designs because the design allows researchers to clearly demonstrate changes due to an intervention within the natural environment. Functional relationships can be seen between the intervention and behavior change. Often, the relationship is presented graphically and differences in behavior can be evident.

*Multiple baseline design.* Given the nature of the present study, reversal designs are not feasible. Usually, reversal designs are used to strengthen the relationship between the independent and dependent variables. In situations in which reversals are unethical or not possible, a nonconcurrent multiple baseline across participants design is an acceptable

alternative (Gresham & Kendell, 1987). Gresham and Kendell recommended the use of multiple baseline designs because they provide an internally valid and practical approach to school research.

Therefore, a multiple baseline design across participants was used in the present study. Each teacher participated in both phases. For clarity, AB will be used to distinguish student outcome data and A'B' will be used to notate treatment integrity data. The multiple baselines are nonconcurrent because although both participants experienced the treatment in the same order, one teacher began using scripts before the other. That is, there was a period when one teacher was using a script to aid implementation while the other teacher was without a script. The nonconcurrent baseline design helps to isolate possible script effects on treatment integrity.

## Experiment 1

### *Method*

*Participants.* The consultant's field supervisor referred the case to the consultant as part of a class requirement. The referring teacher was in her first year as a full-time teacher. She had been a substitute teacher at the school the previous year. She had no teaching employment prior to the year she performed as a substitute. She was in her early-thirties and was Caucasian. She taught in a fifth-grade general education classroom. The classroom was primarily composed of Caucasian students.

The consultant for the two cases was a second year graduate student. He collected data as part of a practicum experience. He spent approximately five hours per week in each school. A practicing school psychologist who worked in the two schools served as

the consultant's supervisor. Therefore, both teachers were familiar with the supervisor but had limited contact with the consultant.

*Setting.* This experiment took place in a public school for students from kindergarten to fifth grade. It had 455 students enrolled in the spring of 2003. It is in a low-to-middle class neighborhood in western Iowa and predominately serves Caucasian students. Roughly 10 percent of the population was minority students. Approximately 25 students were in an average classroom.

*Procedure.* The graduate student was assigned to work with the referring teacher to develop an intervention strategy. Collaborative problem solving (Allen & Graden, 2001) was used in both referrals. Collaborative problem solving is a systematic approach to define a problem, identify needs, analyze contributive factors, design and evaluate interventions to meet those needs. The process involves problem identification, problem analysis, intervention implementation and intervention evaluation steps.

The goal of the problem identification phase is for the teacher and consultant to work together to move from general definitions to more specific, observable details of the problem. The problem should be defined within the educational environment and should focus on alterable variables. The teacher sought assistance in managing one student's off-task behavior and inappropriate vocalizations especially during transitions. To obtain a more accurate definition of the problem, the consultant interviewed the teacher and observed in the classroom. It was noted that students frequently left their desks unnecessarily, conversed with peers, played with objects and engaged in other behaviors that were not related to completing the transition. The teacher did little to keep students

on-task during these unstructured transitions. The length of time between when the teacher finished giving verbal instructions to the class and when all of the students had completed the transition was recorded. A lot of instructional time was lost during the transitions between activities and it was noted that the referred student made little noise compared to the majority of the class. Therefore, the teacher and consultant agreed to target inefficient transitions in the intervention.

Another key to the problem identification phase is the collection of baseline data. Baseline data was collected over a one-week period. Mean transition times were recorded for two days. Total time spent transitioning between activities was divided by the number of observed transitions. The length of transitions was defined as the amount of time that elapsed between the completion of the teacher's directions and the compliance of the entire class.

The problem analysis phase includes forming hypotheses as to why the problem is occurring. Baseline data was analyzed by the consultant to develop a functional relationship between classroom behavior and environmental circumstances. It was hypothesized that transitions were inefficient due to the teacher's repetition of directions for the next activity because there was noise and other distractions in the classroom. There was little organization and no penalty for long transitions. Instead, the students were unintentionally rewarded for their inefficient transitions by missing instructional time. The teacher and consultant decided to create a more salient reward system for efficient transitions.



Data-based interventions were explored and selected during the intervention implementation phase. The consultant researched empirically-supported interventions that targeted transitions in the classroom. After discussing options, the teacher and consultant agreed that a “Beat the Buzzer” game (Rathvon, 1999) was feasible in the classroom.

The “Beat the Buzzer” game was an intervention that would allow the teacher to reward students for efficient transitions. The teacher would be responsible for rewarding tickets to students who completed transitions appropriately and without creating distractions. Tickets could be saved and used to purchase other items. The teacher created a grab-box of small rewards (i.e. pencils, erasers) and posted signs around the room that listed prizes and their “cost”. The consultant was responsible for monitoring the class’s progress. Transition times were monitored throughout the week and results were shared with the teacher weekly. The teacher and consultant were able to discuss treatment and address questions at their meetings.

Before implementing the intervention, the teacher and consultant discussed each step of the treatment and made a chronological list of treatment steps. They agreed the list was comprehensive and in the correct order of operation (Table 1). Although the script was collaboratively created, the consultant told the teacher that the list was needed as part of his practicum class and would not be left with her. The teacher was unaware that she would eventually be asked to use the script to aid treatment implementation in her classroom.

The consultant concurrently assessed the teacher's level of treatment integrity and the class's transition times by observing in the classroom. The consultant used a copy of the script as a guideline for calculating baseline levels of treatment integrity. Treatment integrity was calculated by dividing the number of completed steps by the total number of possible intervention components (Gresham, Gansle, & Noell, 1993; Gresham, Gansle, Noell, Cohen, & Rosenblum, 1993).

At one of their progress evaluation meetings, the consultant suggested that the teacher take a copy of the script to guide implementation. The consultant explained that scripts may be a helpful tool to ensure the intervention was being implemented as they had agreed. Similar to the first phase, the consultant periodically observed the teacher to assess treatment integrity and evaluated classroom performance.

### *Results*

On average, the class required 3 min 5s to transition from one activity to another when the consultant and teacher first began to work together. An intervention strategy was created and a script was outlined. During the period when the intervention was in place but the teacher was without a script, the class required a mean transition time of 1 min 39s. The initial improvement, however, was short lived. Once the script was introduced and the intervention continued as prescribed, classroom transitions increased to a mean of 2 min 34s (Figure 1). However, overall mean classroom transition times decreased by 1 min 11s when comparing conditions without the intervention to when the intervention was in place regardless of the presence of a script. Therefore, the

intervention procedure was moderately successful in reducing transition times in the classroom.

We must investigate levels of treatment integrity to determine if the intervention strategy was responsible for the reduction in classroom behavior or if it was another variable. Without the aid of a script, the teacher was observed to have a mean daily treatment integrity level of 30.4%. Treatment integrity levels decreased slightly once scripts were introduced to 26.0% (Figure 2). In comparison, the first and last steps of the script would automatically be implemented in the course of teaching. Therefore, using the script to calculate treatment integrity, the teacher should always be implementing at least 25% of the intervention.

Interestingly, the teacher consistently reported her own levels of treatment integrity higher than observed levels. Compared to the 26.0% level of treatment integrity that was observed during implementation accompanied by a script, the teacher reported a mean of 47.7% treatment integrity. However, the teacher did not consistently turn in completed scripts to the consultant so there is limited self-report data available.

Despite the teacher's infrequent completion of scripts, she rated scripts highly on the Script Acceptability Questionnaire (Table 3). She strongly agreed that the scripts were easy to follow. Additionally, she agreed that scripts helped her carry out the intervention and were easy to include in her daily routine. She reported that the scripts may have been more helpful if she did not have as many "difficult" students. The teacher said that although scripts were helpful reminders of the intervention, she likes to vary routines in the classroom and therefore her implementation was inconsistent.

## Experiment 2

### *Method*

*Participants.* The consultant's field supervisor referred the case to the consultant as part of a class requirement. The referring teacher in was in her first year as a full-time teacher. She had no teaching experience before joining the district. She taught in a third-grade general education classroom. She was Caucasian in her early-thirties. There were no minority students in the classroom.

*Setting.* The school was a parochial school in western Iowa that had 478 students in kindergarten through sixth grades in the spring of 2003. There were approximately one percent minority students. Students were primarily from low-to-middle class families. Class sizes were an average of 20 students.

*Procedure.* The teacher referred a student because of his frequent off-task behavior. A secondary concern regarding the quality of his in-class assignments was also raised. Off-task behaviors mainly consisted of staring at areas or objects other than what were involved in the current task and being out of his seat at inappropriate times. He rarely spoke to other students or spoke out in class inappropriately so these behaviors were not included in our target definition. After consulting with the teacher, it was decided to focus on the student's off-task behavior in hopes that improving attention would subsequently have a positive effect on the quality of submitted assignments. The decision was based on the teacher's observation that the student often had to hurry to complete assignments because he has spent much of the time off-task. For example, the student typically received low scores on assignments because he filled in answers without

reading the questions in a rush to turn in the assignments on time. Recent testing suggested no developmental or intellectual delays. Teachers had reported sporadic attention problems in the past. Historically, the student had done well when working on a one-on-one basis. Therefore, it was decided that the concern was with the student's performance, not a lack of ability. The consultant collected baseline data for two weeks by observing the student's behavior (A). The percent of time the student remained on-task was recorded (Figure 4).

The consultant and teacher hypothesized that the student was not motivated to remain on task. The teacher noted that the student enjoyed candy and playing on the computer. It was believed that the student's on-task behavior would improve if given the opportunity to earn rewards. The student's improved performance when given individualized attention and his good rapport with the teacher was also discussed. It was agreed to break the class down into smaller segments and provide regular intervals of verbal and token reinforcement for on-task behavior as a way of providing more individualized attention and making instructional time more manageable for the student.

The teacher and consultant discussed different empirically-supported interventions that had been used to target on-task behavior. It was agreed that a token reinforcement system would be used along with verbal praise from the teacher.

A timer was set to sound at 10 minute intervals to make class time more manageable for the student. At that point, the teacher would either praise the student for being on-task or redirect the student if he was off-task. If the teacher acknowledged that the student was on-task she provided verbal reinforcement and allowed the student to

draw a star on his behavior card. At the end of the day, the teacher and student would review his performance. If a criterion was reached, the student was allowed to select a reward. If the criterion was not met, the student and teacher discussed why the goal was not achieved and ways behavior could be improved for the next day. Each of the intervention steps were discussed and agreed upon by the teacher and consultant and recorded in chronological order (Table 2). The consultant retained the scripts and gave the same reasoning as in Experiment 1.

The consultant concurrently assessed the teacher's level of treatment integrity and the student's on-task behavior by directly observing in the classroom, reviewing the student's behavior card, and by consulting with the teacher. After the treatment had been in place for a few weeks, the consultant suggested that she use the script to aid in treatment implementation. The teacher agreed and treatment implementation continued. The consultant assessed treatment integrity by directly observing in the classroom and reviewing completed scripts (B').

### *Results*

The goal of the intervention was to increase the amount of time the student attended to the teacher and learning task by dividing the total class time into more manageable intervals and offering rewards. However, the student's percent of time on-task remained at a similar level as was recorded at baseline. The mean percent on-task during baseline was 68.9%. The student's attention improved slightly to a mean of 78.4% during the intervention without script phase (Figure 4). There was a slight decrease in the student's on-task behavior once scripts were introduced. The student was on-task a mean

of 71.2% of the time during the final phase of the study. Although the intervention was not effective at significantly improving the student's attention, his behavior was maintained at the baseline level and did not decline.

The teacher executed the intervention with 100% daily integrity during the no script and script phases (Figure 5). The flawless implementation was observed by the consultant and reported by the teacher. Therefore, self-report was accurate in this case. In addition, the teacher submitted completed scripts to the consultant for each school day.

Although the scripts were not necessarily needed in this case, the teacher rated them highly on the Script Acceptability Questionnaire. She strongly agreed that they were easy to follow and helped execute the intervention consistently. She also reported that scripts were easy to include in her daily routine. Even though the scripts did not improve treatment implementation, the teacher did not have problems integrating them into her classroom.

## Discussion

It was hypothesized that the introduction of scripts would significantly increase the level of treatment integrity and that the improved treatment integrity would lead to student improvements if an intervention was appropriately selected. Scripts did not have the expected outcome in Experiment 1. Treatment integrity declined slightly when scripts were introduced in Experiment 1. Scripts were not needed in Experiment 2. However, student performance improved or remained consistent in both cases. A more detailed examination of treatment outcomes, treatment integrity, scripts, limitations and suggestions for future research follows.

*Treatment outcomes and treatment integrity*

The success of an intervention strategy depends on many different variables. First, the consultant must have good rapport with the consultee and they must work together to define the problem and select an appropriate intervention strategy. The intervention must then be carried out with a high level of treatment integrity and monitored for effectiveness. Unfortunately, treatment outcomes were inconsistent in the two cases from the present study. In Experiment 1, the greatest improvements in classroom transition times were observed when treatment integrity was at its highest levels. The correlation suggests that the intervention may have been successful if the teacher implemented it according to plan. Therefore, the intervention may have been an appropriate strategy for the target behavior but not for this teacher.

In Experiment 2, the student's on-task behavior remained steady despite perfect levels of treatment integrity. The trend suggests that the intervention was not appropriate for the situation. Unfortunately, there were also extraneous variables that no one would have been able to foresee when the intervention was selected. Most notably, the family's decision to move out of the district at the conclusion of the school year likely had an adverse effect on the situation. The student began to act uncharacteristically the week he was told of their move. The student had been making steady progress before informed of the change. Also, the end of the spring semester brought numerous vacation days and so it was difficult to get into a routine with either Experiment 1 or Experiment 2. Lastly, it is possible that the problem in Experiment 2 was skill-based, not performance-based.



### *Scripts*

It was hypothesized that scripts would improve levels of treatment integrity. However, the hypothesis was not supported in the present study. Scripts were not able to improve treatment integrity in Experiment 1. Scripts did not need to be introduced in Experiment 2 because the teacher was already implementing the intervention with 100% treatment integrity. The current study fails to support the use of scripts in elementary school settings.

Scripts had the opposite effect than expected in Experiment 1. Already low levels of treatment integrity dipped even further once scripts were introduced. The ineffectiveness of scripts in Experiment 1 may be due to a number of different reasons. First, the teacher was reported to have a history of not following through with intervention suggestions. She oftentimes failed to submit completed scripts and overestimated her own performance. Her class was chaotic and included a number of students who were receiving special education services for a variety of reasons. It is possible that scripts would be beneficial for a certain type of teacher or classroom. Interventions targeting certain behaviors may also benefit more from scripts than others.

Although scripts did not improve treatment integrity in Experiment 1, they are a useful tool in deciding whether an intervention was responsible for a behavior change or not. Classroom transition time was reduced but we can not conclude that the change was due to the intervention because of the low level of treatment integrity. When examined more closely, it is evident that the intervention used in Experiment 1 was more beneficial when levels of treatment integrity were high. The information could be presented to the

teacher to illustrate the usefulness of the intervention and try to promote adherence. The information provided by scripts can be very helpful even if they do not lead to higher levels of treatment integrity.

Based on data gathered from scripts and observations, it was found that the teacher in Experiment 1 consistently rated herself higher in respect to treatment integrity than the consultant observed. The steps were reviewed and in fact created by the teacher and consultant so there should have been no confusion as to what each step entailed. Additionally, scripts weren't often turned in to the consultant so a large amount of data was unavailable. Inaccurate and inconsistent self-reports are problems with scripts that need to be addressed in the future.

Despite the difficulties one teacher had with submitting completed scripts or even carrying out the intervention as designed, both teachers rated scripts as acceptable and useful tools. The teachers reported that scripts were easy to integrate into the classroom. However, this was not reflected in the data. The teacher in Experiment 1, who supported scripts, did not submit completed scripts and had inaccurate reports when they were handed in. We should examine reasons scripts failed to improve treatment integrity in the current study and investigate possible modifications because scripts in the general education classroom are a new area of study and teachers were enthusiastic about their use.

### *Limitations*

There were several limitations to the current study. First, the present study was conducted by a practicum student in a setting in which he had a limited relationship with

the consultee. The consultant was in each school approximately five hours per week for one semester. Although he may have spent more time in the building than other school psychologists it is possible that the consultant's status as a student or his relative inexperience was detrimental to the consultation process.

Second, perhaps scripts are most effective in a narrow range of conditions. For instance, it is possible that certain teacher characteristics and certain target behaviors or intervention strategies are more conducive to scripts than others. Although both teachers in the present study rated scripts as acceptable and easy to use in their classroom, their use of scripts was very different. Relatedly, the teacher in Experiment 1 failed to submit completed scripts to the consultant so there was a lack of self-report data. Furthermore, both teachers were in their first year of full-time teaching. Scripts may have different utility with more experienced teachers.

Third, it is possible that the results may have been due to an ineffective intervention strategy or focusing on the wrong target behavior. The intervention may not have adequately addressed the student's needs. Another limitation to the present study is that modifications to the script or intervention were not explored. The consultant and teacher did not revisit the problem identification phase or analysis phase of the consultation process.

Lastly, the present study differed from past research in that intervention components were not directly taught to the teachers before implementation. Although both teachers were encouraged to ask questions at any time, none of the intervention components were directly modeled. Specifically, this limitation may have impacted the

results of Experiment 1 because the consultant never directly observed the teacher execute all of the intervention steps.

### *Suggestions for Future Research*

Despite the limitations of the present study, scripts may have a use in schools. As the field of school psychology prepares to possibly shift to a “response to intervention” paradigm, the monitoring to treatment integrity will become even more important. Even if additional research suggests that scripts fail to improve treatment integrity, they can be used to monitor and document intervention implementation.

The present study only focused on behavior interventions but it would be useful to examine whether scripts are beneficial in academic interventions. Future studies should also experiment with different teacher and classroom characteristics to isolate when scripts would be an optimal option for assessing treatment integrity. Specifically, teacher organization, classroom management style, class size and student characteristics should be studied. The teacher in Experiment 1 cited that she would have benefited more from scripts if her class was different. She also reported that her teaching style was not supportive of the use of scripts. Valuable information was obtained from the Script Acceptability Questionnaire and should be investigated further by monitoring acceptability and effectiveness in varying circumstances. Lastly, future research should use an experienced practitioner in his or her school in which credibility and rapport has already been established.

*Summary*

In all, the present study examined just one portion of the general education environment and challenges the field to narrow the exact conditions in which scripts may be an optimal method of improving treatment integrity. Treatment integrity is an area of practice that has been largely ignored. However it is a vital part of the intervention process and should be planned for in every consultation and intervention team meeting. A quick, easy, and reliable method of collecting treatment integrity data is needed. Scripts, or outlines of the intervention, are one possible way of collecting the data. Past studies have demonstrated the usefulness of scripts in preschool settings (Ehrhardt et al. 1996, Hiralall and Martens, 1998). The present study attempted to extend the research into the general education elementary school environment. The data from the present study yielded inconclusive results regarding the use of scripts in the general education setting. This study identified challenges to the field to continue to focus its attention on scripts as a possible method of improving treatment integrity in general education.

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TABLE 1. Example of Intervention Script in Experiment 1

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TIMER & TICKET SCRIPT

- \_\_\_\_\_ 1. Give directions
- \_\_\_\_\_ 2. State time limit.
- \_\_\_\_\_ 3. Set timer.
- \_\_\_\_\_ 4. Start timer
- \_\_\_\_\_ 5. Give warnings at 30s intervals.
- \_\_\_\_\_ 6. Stop timer.
- \_\_\_\_\_ 7. Give tickets to students who were following directions and made the transition within the stated time limit.
- \_\_\_\_\_ 8. Proceed with next activity.

TABLE 2. Example of Intervention Script in Experiment 2

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- \_\_\_\_\_ 1. Set timer for 10 minute intervals
  - \_\_\_\_\_ 2. When timer beeps, observe if student's on-task
  - \_\_\_\_\_ 3. If on-task, put a star in the next interval on his chart.
  - \_\_\_\_\_ 4. At approximately 2:45 pm, tally # of stars student has on his chart.
  - \_\_\_\_\_ 5. Review performance at the end of the day.
  - \_\_\_\_\_ 6. If he has more than 10 stars for the day, allow student to select a reward.
-

TABLE 3. Script Acceptability Questionnaire

Name: \_\_\_\_\_

Date: \_\_\_\_\_

1. *The script is easy to follow.*

Strongly Disagree	Disagree	Agree	Strongly Agree
1    2	3    4	5    6	7    8

2. *The script is easy to include in my daily routine.*

Strongly Disagree	Disagree	Agree	Strongly Agree
1    2	3    4	5    6	7    8

3. *The script helps me to carry out the intervention consistently.*

Strongly Disagree	Disagree	Agree	Strongly Agree
1    2	3    4	5    6	7    8

Comments:

### Figure Captions

*Figure 1.* Experiment 1: Classroom transition times Transition times were recorded as the length of time between when the teacher completed giving instructions to when the last student completed all of the instructions.

*Figure 2.* Experiment 1: Daily treatment integrity The teacher reported treatment integrity only when a script was introduced. Self-reported data was collected from completed and submitted scripts.

*Figure 3.* Experiment 1: Treatment integrity per treatment component.

*Figure 4.* Experiment 2: Percent of time on-task.

*Figure 5:* Experiment 2: Daily treatment integrity.

Figure 1: Experiment 1: Classroom transition times

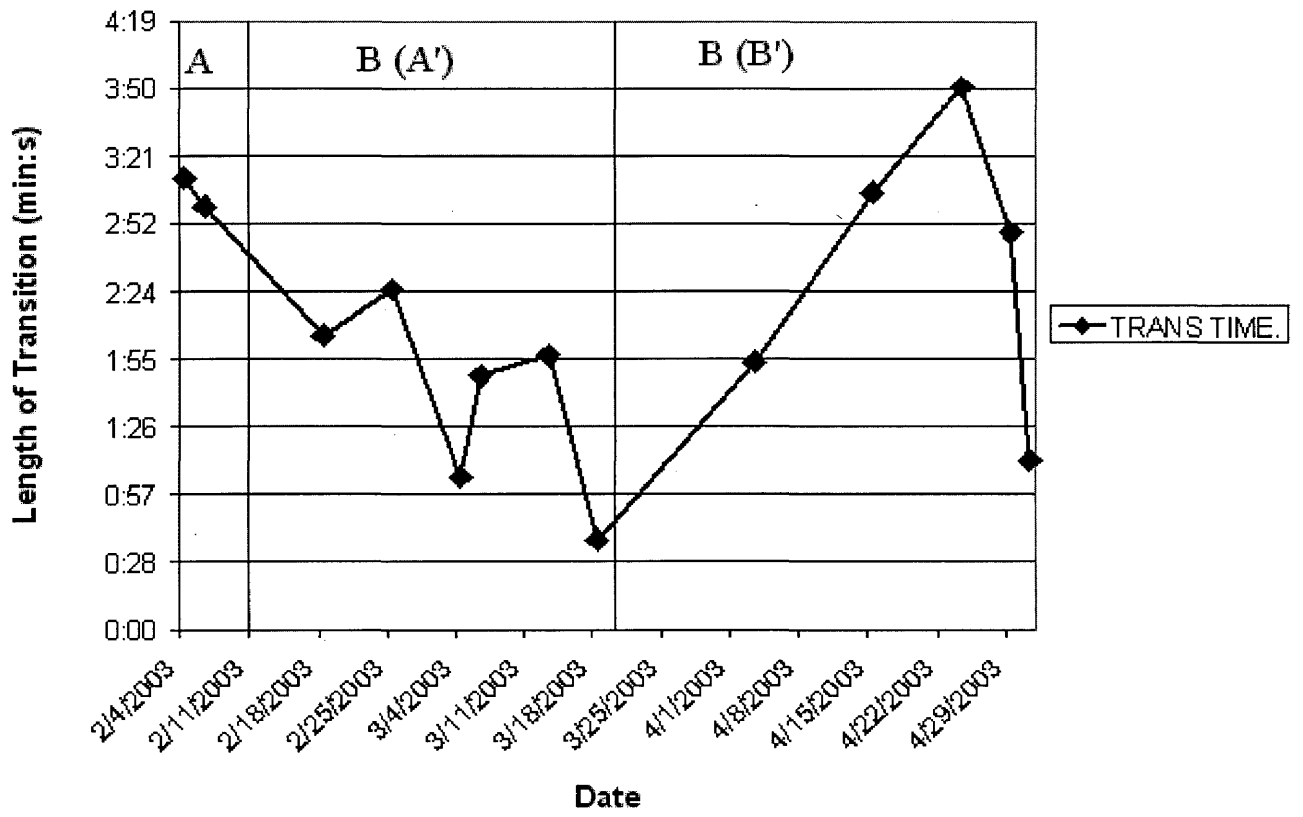


Figure 2. Experiment 1: Daily treatment integrity

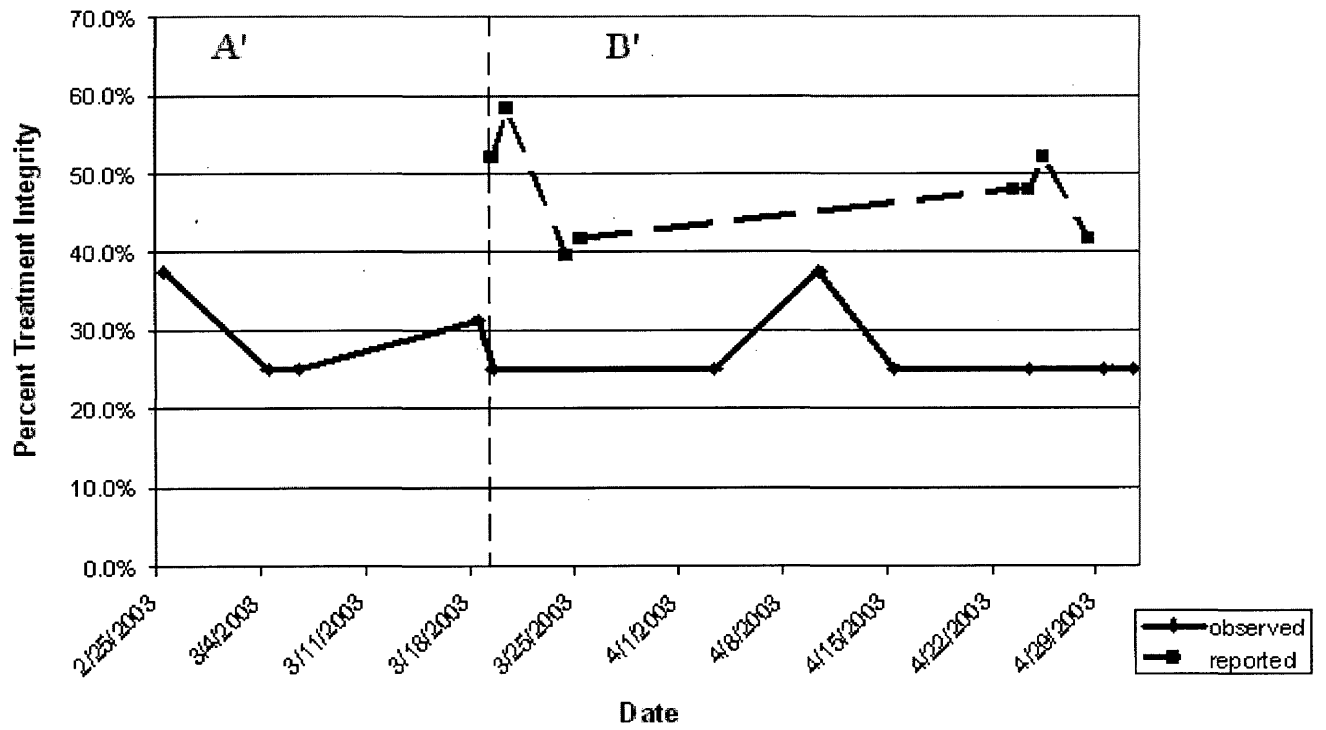


Figure 3. Experiment 1: Treatment integrity per treatment

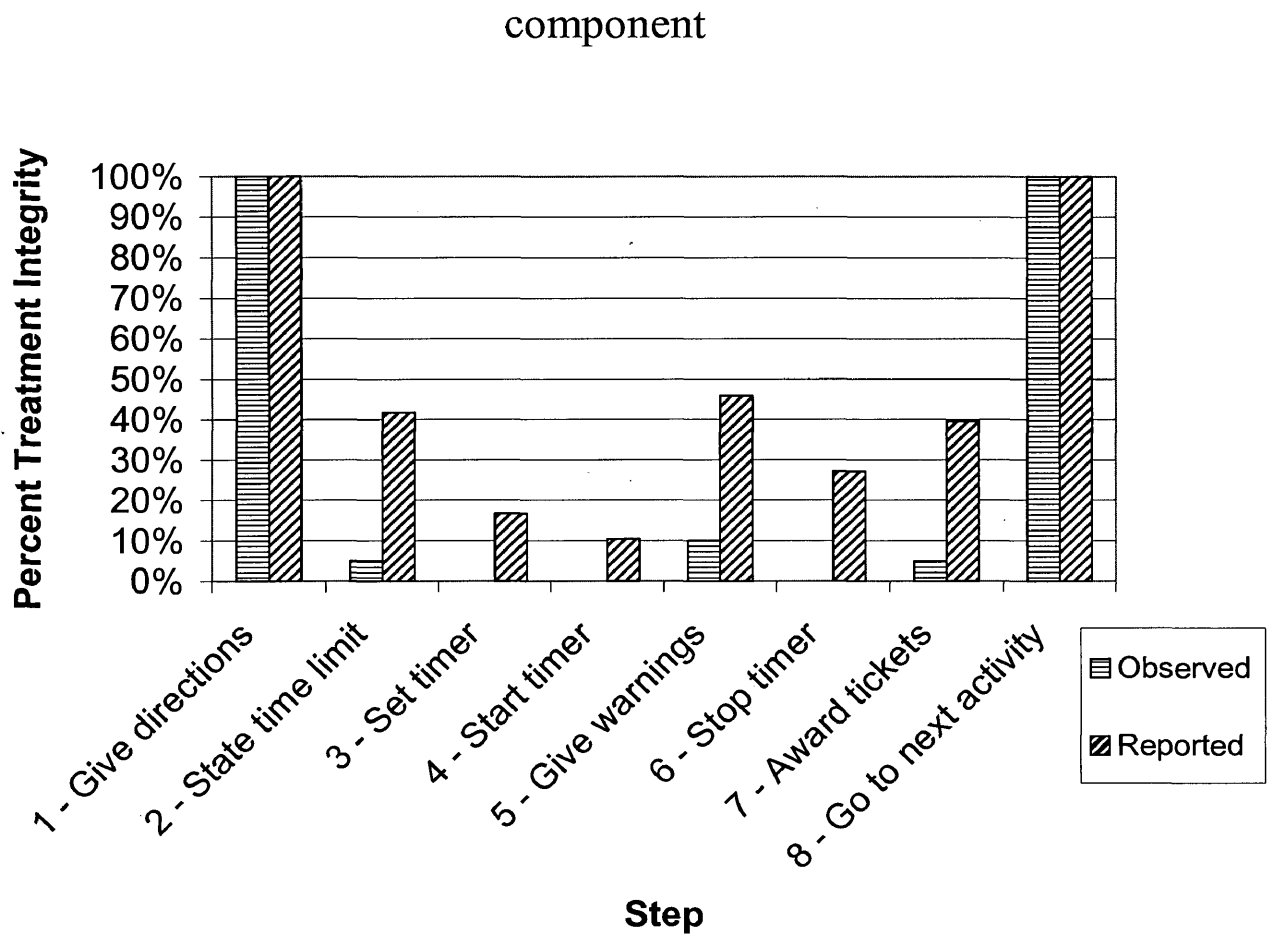


Figure 4. Experiment 2: Percent of time on-task

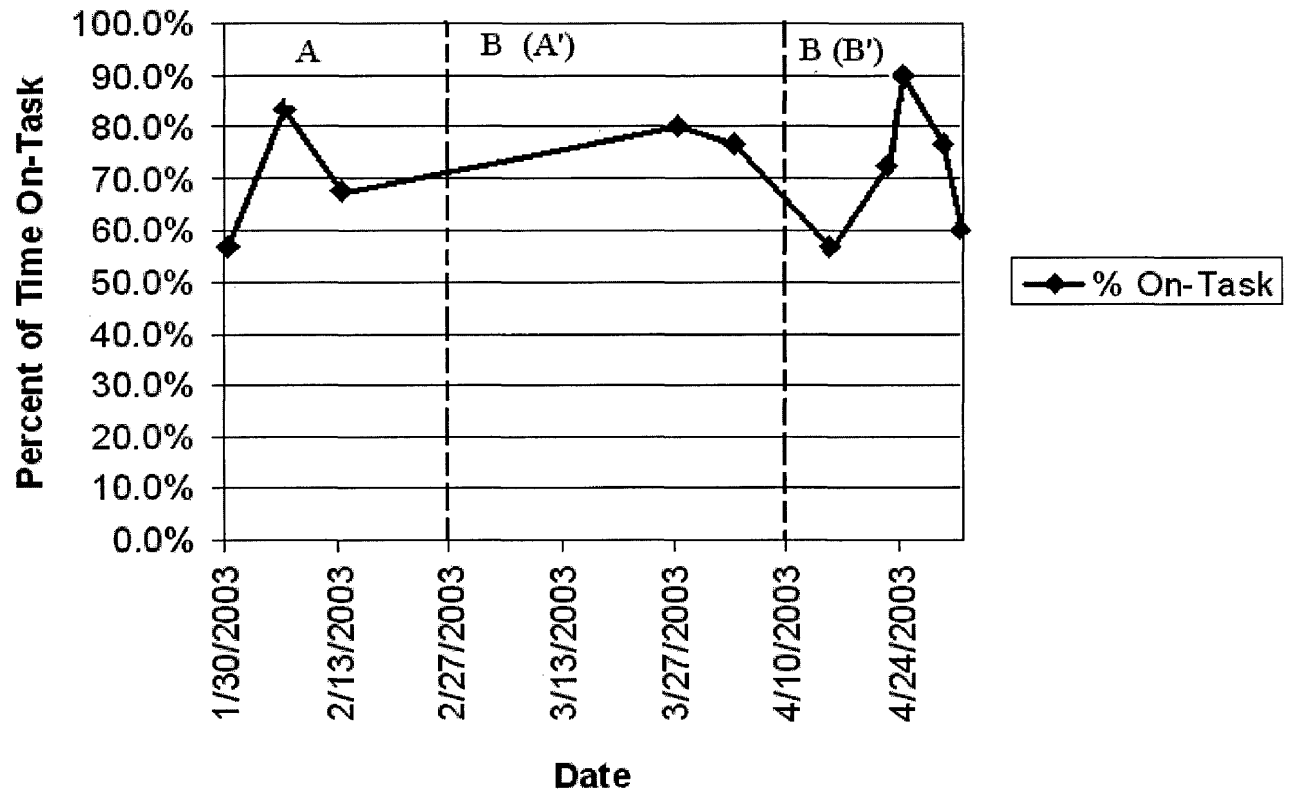




Figure 5: Experiment 2: Daily treatment integrity

