

*A MULTIPLE-SCHEDULE EVALUATION OF IMMEDIATE AND
SUBSEQUENT EFFECTS OF FIXED-TIME FOOD PRESENTATION ON
AUTOMATICALLY MAINTAINED MOUTHING*

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The purpose of this study was to evaluate the immediate and subsequent effects of fixed-time (FT) food presentations on mouthing. The effects of FT food presentations were analyzed within a three-component multiple schedule in which baseline conditions were implemented during the first and third components and treatment conditions were implemented during the second component. Results indicated that FT food reduced mouthing and that levels of mouthing during post-FT components were reliably lower than pre-FT components. Behavioral mechanisms responsible for treatment effects are discussed.

DESCRIPTORS: hand mouthing, automatic reinforcement, fixed-time food presentation, noncontingent reinforcement

Behavior disorders maintained by automatic reinforcement may present serious challenges for the development of treatment because the maintaining reinforcer is often difficult or impossible to identify and eliminate (Vollmer, 1994). Therefore, intrusive interventions such as response blocking, punishment, or extremely dense schedules of reinforcement may be necessary to effectively reduce automatically maintained problem behavior. In such cases, procedures to evaluate both immediate and subsequent effects of behavioral interventions may have both clinical and conceptual benefits. For example, knowing that the effects of a specific form of treatment endure during periods following their termination would permit caregivers to withdraw treatment temporarily during times when procedures are difficult

or impossible to conduct (e.g., when attending to other duties) without occasioning increases in the treated behavior. In addition, patterns of responding observed following treatment intervals might provide information about the behavioral principles that underlie treatment effects. For example, if responding recovered at or above baseline levels immediately after response blocking, then one might suspect that blocking involved extinction, punishment, or both, resulting in deprivation of a maintaining reinforcer and a subsequent increase in responding when the reinforcement contingency is reinstated.

Multiple schedules have been used often by basic researchers to evaluate changes in responding when signaled changes in reinforcement schedules occur in sequence (Lattal, 1991). The current study used a three-component multiple-schedule arrangement to evaluate the immediate and subsequent effects of fixed-time (FT) schedules of food presentation on automatically maintained mouthing.

METHOD

Participant and Setting

Alicia was a 48-year-old woman whose SIB consisted of hand and thread mouthing.

This research was part of a thesis submitted by the first author in partial fulfillment of the requirements for a master's degree at the University of North Texas. We thank the Denton State School and members of the Behavior Analysis Resource Center for their support and assistance in conducting this study.

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Hand mouthing produced tissue damage to the hands, and thread mouthing had resulted in intestinal blocking when threads were ingested. A pretreatment functional analysis (Iwata, Dorsey, Slifer, Bauman, & Richman, 1982/1994) indicated that hand and thread mouthing persisted in the absence of social contingencies (detailed procedures and data are available upon request). Thus, it appeared that her targeted behaviors were maintained by automatic reinforcement.

Sessions were conducted in an experimental room (3 m by 3 m) containing chairs, a table, supplies as needed, and data collectors. Data collectors were present during all sessions and did not interact with Alicia in any way.

Dependent Variables and Interobserver Agreement

Hand mouthing was defined as insertion of any part of either hand past the plane of the lips for at least 1 s. *Thread mouthing* was defined as insertion of any thread past the plane of the lips. Observers used laptop computers to score hand and thread mouthing, and the results were summarized using a 10-s partial-interval method. Results are presented separately for each component of the multiple schedule.

A second observer simultaneously but independently recorded data during 26% of FT analysis sessions. Mean agreement for mouthing was 97% (range, 83% to 100%).

FT Food Analysis

Effects of the 10-s FT schedule were initially evaluated using a combination reversal and multiple-schedule design. All sessions lasted 30 min and consisted of three 10-min components. During baseline there were no social or tangible consequences, no food or materials were presented, and the therapist was not present. For data analysis, baseline sessions were divided into three components, corresponding to the multiple-schedule

components presented during FT analysis sessions. Subsequently, effects of escalating FT values were investigated using a multiple-schedule design. The components of the FT analysis are described below.

Component 1: Alone. This component was identical to baseline conditions. No social or tangible consequences were delivered for mouthing, no food or materials were presented, and the therapist was not present.

Component 2: FT food. Component 2 was conducted immediately following Component 1. The therapist entered the room and sat next to Alicia on a bench, approximately 0.6 m away, with a small piece of cloth between them (the presence of the experimenter was a discriminable difference between Component 2 and Components 1 and 3; thus, the arrangement is properly described as a multiple, rather than mixed, schedule). The therapist placed small, measured amounts of food (e.g., one piece of caramel popcorn) on the cloth according to the FT schedule, with the first food delivery at the beginning of the component. The therapist did not interact with Alicia in any other way, and mouthing produced no social consequences. Alicia always consumed the food items within 10 s of their presentation. The therapist left the room at the end of Component 2. FT values were gradually increased from 10 s to 600 s. FT values were increased after two consecutive sessions in which mouthing was scored in fewer than 5.5% of intervals, representing a reduction of at least 90% relative to the second baseline condition. If Alicia did not meet the criterion for advancing the FT schedule after 10 consecutive sessions at a given FT value, the previous FT schedule was reimplemented.

Component 3: Alone. Component 3 was conducted immediately following Component 2. Procedures were identical to Component 1.

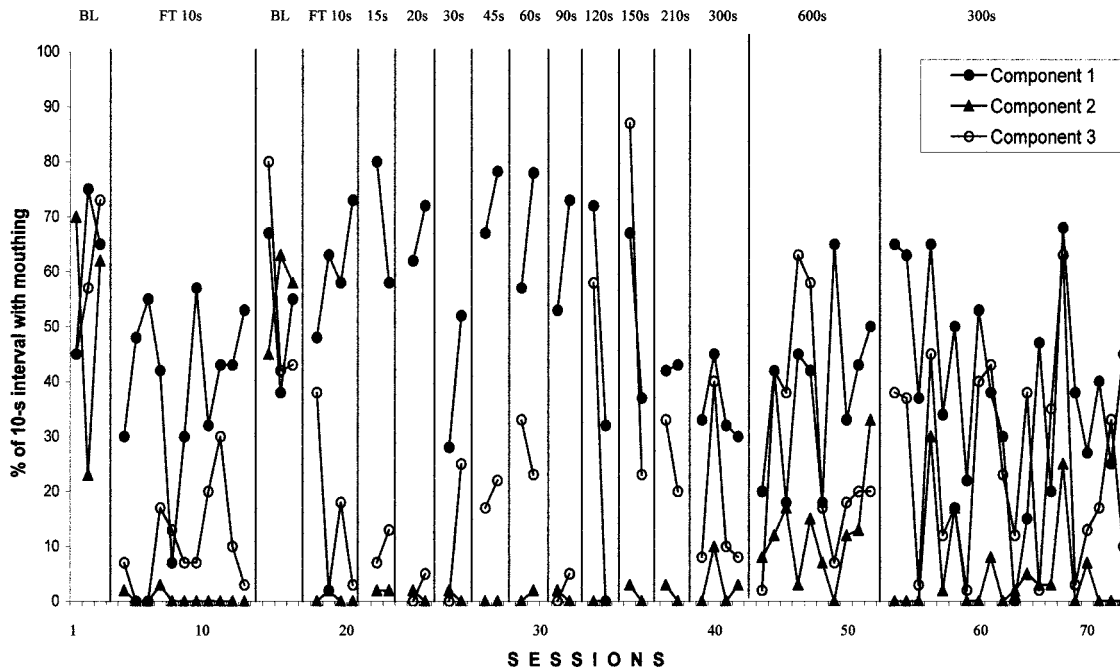


Figure 1. Results of the FT analysis. Data are presented as percentages of intervals containing mouthing. Data from Component 1 are represented by solid circles, data from Component 2 are represented by solid triangles, and data from Component 3 are represented by open circles.

RESULTS AND DISCUSSION

Results of the FT food analysis indicate that mouthing persisted in both baseline conditions and was significantly reduced by the FT intervention. In addition, whereas measures of mouthing during Component 1 of the multiple schedules were consistent with those during both baseline conditions, measures of mouthing during Component 3 were consistently lower than either baseline or Component 1. Exclusive of the results of baseline and the FT 600-s analysis, levels of mouthing during the Component 3 exceeded those observed during Component 1 in only 6 of 57 sessions. Thus, the treatment effects shown during the FT food component of the multiple-schedule analysis persisted after food delivery was terminated. At the longest FT values, food delivery was less effective in reducing mouthing in Components 2 and 3.

It appears that stimulation to the mouth was involved in the maintenance of Alicia's

mouthing and that providing an alternative form of oral stimulation attenuated the effectiveness of the stimulation produced by mouthing (i.e., FT schedules served as an establishing operation). Results indicating that responding decreased immediately when food was delivered and was maintained at low levels following FT food, and that response measures increased in both Components 2 and 3 when the FT schedule was thinned, all suggest that FT food provided stimulation that was functionally related to that maintaining mouthing in that it decreased the "motivation" for mouthing both during and after its application. A limitation of the current study is that no analysis of the effects of experimenter presence only was conducted. However, it is unlikely that the effects observed were due to stimulus control by the presence of the experimenter because (a) the experimenter was absent in Components 1 and 3 but reductions in responding were observed only in Com-

ponent 3, and (b) treatment effects waned at long FT values.

One contribution of the present study is the demonstration of a method for evaluating the immediate and enduring effects of behavioral interventions. The use of multiple schedules, previously used rarely outside basic research, to evaluate the enduring effects of treatment could have substantial applied implications. For example, in many applied contexts it can be difficult or impossible to conduct treatment procedures continuously or with perfect fidelity. Thus, if two or more interventions were shown to produce equivalent treatment effects, it would be prudent to select that intervention whose effects endure when treatment procedures cannot be implemented. In addition, observation of response patterns across components of FT schedules may provide information about maintaining variables for problem behaviors and basic principles that are operative during treatment. For example, in the current study, response patterns during and immediately

following treatment suggested that FT food served to abolish the effectiveness of the oral stimulation that maintained Alicia's mouthing. Subsequent investigations might use similar procedures to evaluate the effects of other interventions for problem behaviors maintained by a range of reinforcement contingencies.

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Received January 22, 2003

Final acceptance September 7, 2003

Action Editor, Rachel Thompson