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USE OF A HIGH-PROBABILITY INSTRUCTIONAL SEQUENCE TO INCREASE COMPLIANCE TO FEEDING DEMANDS IN THE ABSENCE OF ESCAPE EXTINCTION

Meeta Patel[1], Gregory K. Reed[2*], Cathleen C. Piazza[3], Michael Mueller[3], Melanie H. Bachmeyer[4] and Stacy A. Layer[4]

[1]Clinic 4 kidz, 102 Chapel Hill Rd, Novato, CA 94949, USA
[2]School of Education, Howard University, 2441 4th St. N.W., Washington, DC, USA
[3]Marcus Institute and Kennedy Krieger Institutes and Johns Hopkins University School of Medicine, 1902 Briarcliff Road, Atlanta, GA 30329, USA
[4]Marcus Institute, 1902 Briarcliff Road, Atlanta, GA 30329, USA

We evaluated the effects of a high-probability (high-p) instructional sequence on the feeding-related compliance (food acceptance) of a young boy diagnosed with a feeding disorder. The high-p sequence consisted of three presentations of an empty spoon; the low-probability (low-p) instruction was the presentation of a spoon with food. Results showed that acceptance of food increased in the presence and not the absence of the high-p sequence. Data are discussed in terms of the role of high-p instructional sequences in the treatment of feeding problems. Copyright © 2007 John Wiley & Sons, Ltd.

Despite largely positive findings from research on the effects of high-probability (high-p) instructional sequences with other forms of noncompliant behavior (e.g., task completion; Mace, Hock, Lalli, West, Belfiore, & Brown, 1988), few studies have evaluated the effectiveness of high-p sequences with children with feeding problems. Moreover, existing research in this area has suggested that high-p sequences are ineffective for increasing food acceptance when an ongoing escape-contingency exists for food refusal (e.g., Dawson, Piazza, Sevin, Gulotta, Lerman, & Kelley, 2003). The purpose of the current study was to further evaluate the effects of a high-p instructional sequence (without escape extinction) on the feeding-related compliance (food acceptance) of a young boy.

*Correspondence to: Gregory K. Reed, Ph.D., Howard University, School of Education, 2441 4th St. N.W., Washington, DC 20059, USA. E-mail: gregkreed@yahoo.com

METHOD

Participant and Setting

Elliot, a 4-year-old male diagnosed with pervasive developmental disorder, participated in the study. Upon admission to an 8-week day treatment facility for children with Pediatric Feeding Disorders, Elliot inconsistently consumed a limited number of jarred baby foods (sweet potatoes, apricots, peaches) and peanut butter sandwiches. He received a majority of his calories via supplemental liquids (e.g., 360 mL of whole milk three times a day at approximately 12:30 pm, 2:30 pm, and 4:30 pm), which he consistently consumed throughout the treatment evaluation. Elliot spoke in two- to three-word sentences and followed complex instructions. All feeding observations were conducted in a specialized treatment room equipped with one-way observation and sound monitors, furniture (tables, chairs), and toys. No programmed changes in supplemental feedings were made during the treatment evaluation described below.

Dependent Variables and Data Collection

The major dependent variable was compliance to low-probability (low-p) requests. Low-p requests were for Elliot to 'take a bite' in the presence of a spoon with food. Compliance to a low-p request was scored if Elliot opened his mouth to accept the entire spoon (with food on it) in his mouth. Percentage of trials with compliance (low-p) was calculated by dividing the occurrence of accepted low-p bites, by the number low-p bite presentations (bites placed in front of Elliot), multiplied by 100. Data on compliance to high-p requests also were collected during both the pre-treatment compliance assessment (described below) and throughout the treatment evaluation. Compliance to a high-p request was scored and calculated as described above for low-p requests; however, high-p requests were defined as an instruction for Elliot to 'take a bite' in the presence of an empty spoon (no food). All data were collected on laptop computers using an event recording procedure. Interobserver agreement (IOA) was calculated on a trial-by-trial basis as the total number of agreements divided by the sum of agreements plus disagreements, multiplied by 100. A second observer independently scored 74% of the sessions during the compliance assessment, and 52% of the sessions during the treatment evaluation; IOA was 100% for compliance to high-p requests during both the compliance assessment and treatment evaluation, and averaged 98% (range, 88–100%) for compliance to low-p requests during the treatment evaluation.

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Procedures and Experimental Design

All sessions were conducted by a trained therapist. Approximately three to five 30-min session blocks, each with three to four sessions, were conducted daily. All sessions were terminated after five low-p bites had been presented. However, more total bite presentations (20) were presented during the high-p treatment (5 low-p bites and 15 high-p bites).

Compliance Assessment

Prior to Elliot's treatment evaluation, a compliance assessment was conducted to demonstrate that acceptance of an empty spoon was a high-p response (i.e., above 90% compliance). The compliance assessment consisted of 24 trials of the presentation of an empty spoon in a bowl and a verbal prompt for Elliot to 'take a bite'. A new trial was initiated approximately every 30 s. Verbal praise was delivered when the empty spoon entered Elliot's mouth after a verbal prompt. If the spoon did not enter Elliot's mouth, it remained in front of him for the duration of the 30 s interval. If Elliot engaged in inappropriate behavior (which he never did), the spoon would have been removed for a 20 s escape period. The next presentation of the spoon would have occurred immediately after the escape period.

Treatment Evaluation

The goal of Elliot's treatment was to increase his consistent acceptance of new foods. Elliot was presented with table purees (i.e., table foods blended to a puree texture) across all phases of the treatment evaluation. Table purees, rather than jarred baby foods, were used as an initial step towards transitioning Elliot from the taste and texture of jarred baby foods to that of more age-appropriate table foods (textures were further increased as a goal of outpatient therapy). During treatment sessions, Elliot was presented with one fruit (tropical fruit salad), one vegetable (carrots), and one protein (lima beans).

The effects of the high-p sequence on compliance (acceptance) were evaluated using a reversal (ABAB) design. In the *A* (low-p) phase, Elliot was presented only with low-p instructions every 30 s. More specifically, one spoonful (approximately 5 mL) of food was placed on a spoon, in a bowl in front of Elliot. If Elliot did not take a bite on his own (e.g., the bite did not enter his mouth within 5 s of the presentation), he was given a verbal prompt (e.g., 'Elliot, take a bite'.). If the bite did not enter his mouth within 5 s after the first verbal prompt, another verbal prompt was delivered. The bite was removed if it did not enter Elliot's mouth within 5 s of the second verbal

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prompt. Compliance resulted in verbal praise and light physical touch (e.g., a high five, pat on the back, etc.). If Elliot engaged in inappropriate behavior, the bite was removed for 20 s. The next bite was presented immediately after the escape period. Expelled bites would have been ignored; however, Elliot never expelled any bites.

During the *B* (high-p) phase, procedures were identical to those in phase *A* except that three rapid (approximately every 1–3 s) presentations of an empty spoon (high-p request) preceded the presentation of the low-p request. That is, Elliot first was prompted on three consecutive trials to 'take a bite' of an empty spoon. Then, following successful completion of the high-p sequence, he was prompted to 'take a bite' of a spoon containing food (low-p request). During empty spoon presentations, Elliot was not required to place the spoon back into the bowl each time compliance was achieved. Brief praise was provided for each act of compliance. No other aspects of treatment (e.g., stimulus characteristics such as spoon type, bite size, food texture, etc.) were altered across treatment sessions or treatment phases.

RESULTS AND DISCUSSION

Compliance with the empty spoon was 100% (data not shown) for Elliot during the pre-treatment compliance assessment. That is, when presented with only an empty spoon, Elliot readily accepted bites within 5 s. Thus, empty spoon presentations were established as a high-p instruction.

Figure 1 depicts Elliot's compliance to low-p requests across both A and B phases of the treatment evaluation. Compliance was zero when low-p (spoon with food) instructions were presented in isolation and increased only when the high-p sequence

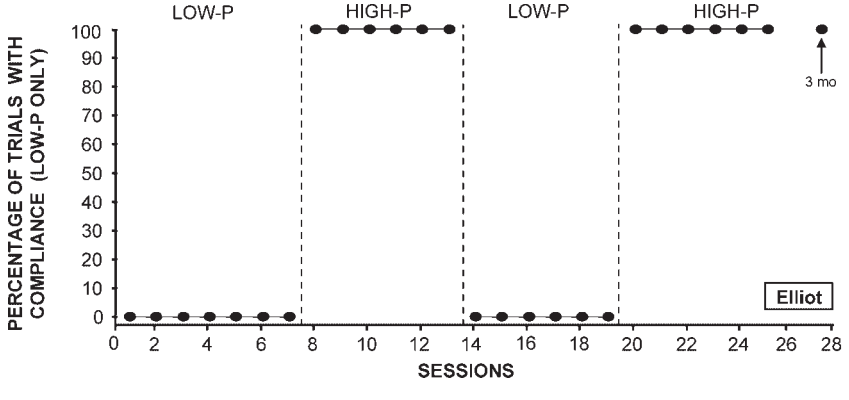

Figure 1. Shows the percentage of trials with compliance (acceptance) to low-p requests in the absence and in the presence of the high-p instructional sequence.

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(empty spoon) preceded low-p instructions. In addition, compliance remained at 100% for the high-p response throughout the treatment evaluation (high-p data not shown).

On a clinical level, the current study demonstrated that a relatively simple, antecedent-based procedure (presenting high-p instructions immediately prior to presenting low-p instructions), could be used successfully to treat food refusal. Following the evaluation of the high-p sequence, the variety of foods Elliot accepted was increased by continuing to introduce new foods during meals using the same procedures. Elliott's intake also was increased by systematically extending the length of meals and volume requirements for meal termination (i.e., meals were switched from trial- to volume-based). Elliott's mother was trained to implement the procedures during mealtimes in the clinic and subsequently at home following discharge. Upon discharge, Elliot was consuming four fruits, five vegetables, and four different proteins, all at age-appropriate portions. Also of note was that Elliot's weight, which was not a target for intervention, remained relatively stable across his admission cycle *(admission weight was* 19.1 *kg*/42.02 *lb compared to* 19.4 *kg*/ 42.68 *lb at discharge)*.

During a 3-month follow-up visit, the high-p instructional sequence had been discontinued altogether. Elliot's mother presented him with a bowl of food at a table pureed texture. If Elliot did not take a bite independently, his mom provided a verbal prompt (e.g., 'Elliot, take a bite'.). Observations showed that Elliot's acceptance remained high.

These data demonstrate that high-p sequences may produce consistent increases in food acceptance (compliance) in the absence of escape extinction. By contrast, prior research on the use of high-p sequences with feeding problems has suggested that these procedures are ineffective when an ongoing escape-contingency exists for food refusal (e.g., Dawson et al., 2003). The reasons for this apparent discrepancy are unclear. However, one notable difference between the current study and the Dawson et al. (2003) study is that the participant in the Dawson et al. (2003) study exhibited noncompliance that co-occurred with problem behavior (i.e., active food refusal), while Elliot's food refusal involved noncompliance only (i.e., he did not engage in problem behavior during meals; 0 RPM across phases). It may be the case that when food refusal co-occurs with escape maintained problem behavior, high-p sequences are less likely to produce increases in food acceptance without escape extinction. On the other hand, when food refusal involves simply 'not responding' to bite presentations, in the absence of problem behavior (i.e., passive food refusal), high-p sequences (alone) may be sufficient for producing increases in acceptance. Indeed, prior research in the area of feeding disorders has demonstrated the importance of extinguishing negatively reinforced problem behavior when evaluating the relative contribution of reinforcement-based procedures (e.g., Piazza, Patel, Gulotta, Sevin, &

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Layer, 2003). Nevertheless, future studies might directly examine the degree to which the efficacy of high-p sequence is affected by the presence or absence of escape-related problem behavior during feeding interventions. In general, more research is needed to establish the conditions under which high-p sequences are more or less likely to increase food acceptance without the use of escape extinction.

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