

*USING PAIRED-CHOICE ASSESSMENT TO  
IDENTIFY VARIABLES MAINTAINING SLEEP PROBLEMS IN  
A CHILD WITH SEVERE DISABILITIES*

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In this study, we used a paired-choice assessment protocol to identify the relative reinforcing value of stimuli and activities for a child with severe disabilities when she failed to settle to sleep at night. The results of this assessment indicated that the child preferred the mother's attention relative to other activities presented. Assessment results were incorporated into an intervention, that produced a reduction in sleep disturbance that was maintained at a 12-month follow up.

DESCRIPTORS: choice making, developmental disabilities, sleep disturbance

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Many children with severe disabilities experience sleep difficulties (Lancioni, O'Reilly, & Basili, 1999). Behavioral strategies such as sleep scheduling, extinction, and bedtime fading have been used to treat sleep problems (Lancioni et al.). In this study, we attempted a novel use of a paired-choice assessment protocol to identify stimuli or activities that maintained sleep problems for a child with severe disabilities. The results of the assessment were then incorporated into a successful intervention.

## METHOD

### *Participant and Setting*

Shona was a 5-year-old girl with severe intellectual disabilities. According to parent

reports, she had difficulty settling to sleep when put to bed at night, would repeatedly exit her room, and typically slept between 6 and 7 hr per night. There was no formal bedtime or activity routine prior to bedtime but her parents reported that she was typically placed in bed anytime between 7:00 and 9:00 p.m. and that supertime could be anytime between 4:00 and 8:00 p.m. Shona did not take naps during the day. The mother and first author conducted all assessments and interventions in the child's home.

### *Target Behaviors*

The amount of time that Shona allocated to three activities was measured during the choice assessment. The two target behaviors measured during the intervention phase were physically leaving the bedroom and actually falling asleep. The former was measured using a simple nightly frequency count, and the latter was measured with timed observation—at 30-min intervals after Shona en-

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tered her room, the mother checked on her and recorded the time of the interval when sleep onset had occurred.

#### *Choice Assessment*

Three favorite activities (playing with favorite toys, watching videos, cuddling with her mother) were selected based on prior parent interviews and observations. During this assessment, Shona could engage in two of the activities once she left her bedroom. Each activity was presented in a different room throughout the assessment (mother in the kitchen, toys in the playroom, videos in the TV room). For example, Shona's mother would sit in the kitchen while a favorite video played in the TV room. The activities were mutually exclusive (e.g., Shona could either cuddle with her mother or play with her toys, play with her toys or watch the video, etc.). Each of the activities were paired an equal number of times. Choice sessions (i.e., the presentation of one pair of items) were 10 min long, and a maximum of two sessions were conducted on any given night. A total of 30 choice sessions were conducted.

#### *Intervention and Experimental Design*

Due to the somewhat chaotic nature of Shona's sleep routine prior to the study, we initially implemented a sleep schedule to provide a controlled baseline from which to conduct a subsequent intervention. Once a sleep schedule was in place, we examined the influence of an intervention, derived from the results of the choice assessment, using a BCBC reversal design.

*Sleep scheduling.* Shona was placed in her bed at 8:00 p.m. each evening without any toys or books. A routine was established prior to bedtime and included a snack, changing into pajamas, and then watching a favorite video. The mother immediately returned Shona to her bed if she exited her room.

*Fixed-time delivery of attention.* The scheduling intervention remained in place during this phase, and a fixed-time schedule of attention was added. The mother returned to Shona's bedroom every 5 min and interacted with her for approximately 20 s if Shona was awake. The mother then left the bedroom. During these interactions, the mother reassured Shona in a quiet tone of voice, kissed her, adjusted her blankets, and so forth. This intervention continued each night until Shona was asleep.

#### *Interobserver Agreement*

Interobserver agreement was conducted on 20% of the choice and 18.9% of the intervention sessions. Overall agreement on time allocated to each activity during choice sessions was 83%, with 100% agreement for frequency of exits from the bedroom and time of sleep onset.

#### *Follow-Up*

Follow-up observations were conducted at 1, 6, and 12 months. The intervention protocol remained the same, with the exception that attention was now delivered every 15 min.

## RESULTS AND DISCUSSION

During the choice assessment, Shona had the opportunity to engage in each individual activity for a total of 200 min. She spent a total of 173 min with her mother, 89 min watching videos, and 38 min playing with her toys. The data suggest that when Shona left her bedroom, she preferred to be with her mother.

The effects of the sleep scheduling and scheduling plus attention interventions on the number of times Shona left her bedroom are presented in the upper panel Figure 1. Shona left her bedroom frequently each night under the initial sleep scheduling phase ( $M = 6.5$ ; range, 4 to 9). The bottom

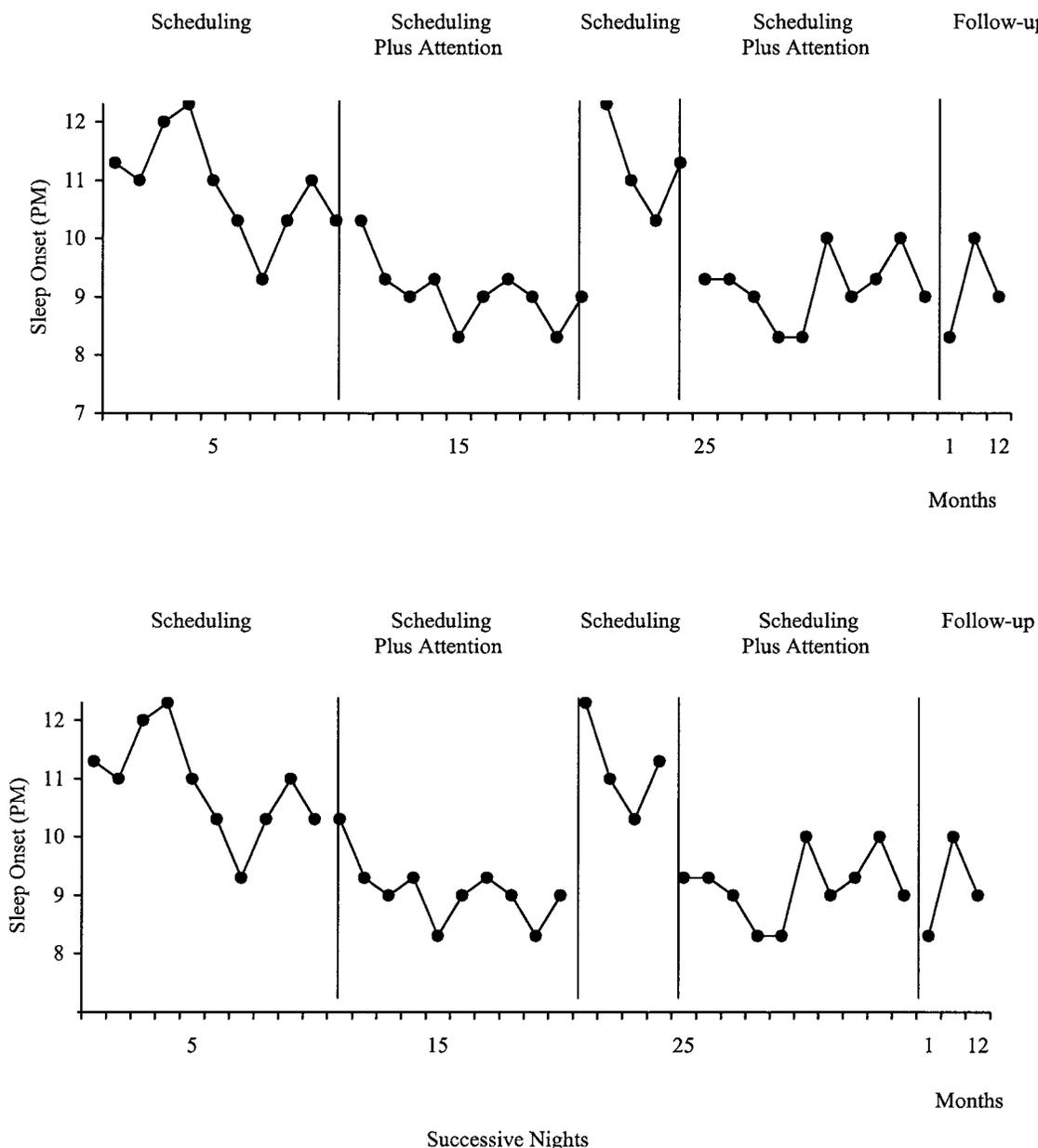


Figure 1. The number of times Shona exited her bedroom (upper panel) and time she was observed to be asleep (lower panel) each night across the sleep scheduling, sleep scheduling plus attention, and follow-up conditions.

panel shows the time at which she was observed to be asleep each night. It typically took from 2 to 4 hr before she was observed to be asleep in her bed during the sleep scheduling condition. The earliest time that she was observed to be asleep during sleep

scheduling was 9:30 p.m., and the latest time was 12:30 a.m.

With the introduction of the scheduling plus attention condition, there was a reduction in the number of times Shona exited her bedroom each night ( $M = 1.3$ ; range, 0

to 4). She also fell asleep earlier in this condition. It typically took from 1 to 2 hr before she was observed to be asleep. The earliest time she was observed to be asleep was 8:30 p.m., whereas the latest time was 10:30 p.m.

Attention was withdrawn for 4 nights while the scheduling intervention remained in effect. Shona began to exit her bedroom frequently each night as she did during the initial scheduling condition ( $M = 5.6$ ; range, 4 to 7), and she was again taking longer to get to sleep. When the attention component was reintroduced, there was a reduction in the number of times Shona exited her bedroom, and her sleep onset was also earlier. Follow-up observations indicated that the positive effects of the intervention were maintained for up to 12 months.

In this study, we identified a potential source of reinforcement for failure-to-settle sleep disturbance using a paired-choice assessment protocol. The present results are similar to earlier investigations (e.g., Lindauer, Zarcone, Richman, & Schroeder, 2002) in which choice arrangements were used to identify the variables that maintain problem behavior. Based on the results of the choice assessment, we developed a suc-

cessful intervention. The intervention was labor intensive initially (attention every 5 min), but this schedule was eventually thinned to attention every 15 min. Not all parents may find such intensive interventions acceptable, which underscores the need to examine the social validity of such protocols in future research. Because the fixed-time schedule of attention was superimposed on a preexisting intervention (i.e., scheduling), it remains unknown whether attention delivery alone would have been an effective intervention. Future investigations should examine the independent effects of fixed-time delivery of attention on sleep disturbance.

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