Commentary: Enhancing the Effectiveness of Sleep Treatments: Developing a Functional Approach

Kimberly A. Brown, PhD, and Cathleen C. Piazza, PhD
The Kennedy Krieger Institute and Johns Hopkins University School of Medicine

One approach to the treatment of pediatric sleep problems is to base treatment on the structural characteristics of the problem. A structural approach to treatment assumes that the topographical characteristics of the problem (i.e., what the behavior looks like) provide sufficient information about the problem to develop an effective treatment. Implicit in that assumption is that sleep problems are sufficiently homogeneous in their etiology and in the factors that maintain the problem. Based on this assumption, structural approaches will be effective with the majority of individuals who fit into a certain category or diagnosis. For example, ignoring, a procedure also referred to as extinction, has been described as a treatment for bedtime tantrums. But how likely is it that all children will throw a tantrum at bedtime for the same reason?

An alternative approach to treatment development is to examine the functional characteristics of the problem. A functional approach to treatment involves identifying why the behavior occurs (i.e., what is the motivation behind the behavior?). A functional relationship implies that the behavior is related to events that occur before and after the behavior. A functional approach to treatment would involve determining the situations in which behaviors occur and the outcomes those behaviors produce and including those factors during treatment development.

In 1982, Iwata, Dorsey, Slifer, Bauman, and Richman (1994) developed a functional analysis method for empirically examining the antecedent and consequent events that were associated with self-injurious behavior (SIB). During the functional analysis, a series of conditions were recreated in order to determine the situations in which aberrant behavior was more or less likely to occur. In the “attention” condition, occurrences of SIB resulted in attention in the form of statements of disapproval or concern (e.g., “Stop that,” “Don’t do that,” “You’ll hurt yourself”) and/or physical contact (e.g., pats on the back). This condition was designed to test if behavior was maintained by positive reinforcement in the form of adult attention. In the “demand” condition, instructional activities were presented, and occurrences of SIB resulted in a break from instructions. This condition was designed to test if behavior was maintained by negative reinforcement in the form of removal of instructions or demands. In the “alone” condition, the participant was observed alone in a room. The purpose of this condition was to determine if SIB occurred when preferred stimuli and attention were provided and no demands were present.

In their initial investigation, Iwata et al. (1994) noted that higher levels of SIB were associated with one test condition for two-thirds of the participants studied. These data indicated that different reinforcement contingencies maintained each participant’s SIB. This method demonstrated the possibility of experimentally identifying and controlling the relationships between certain behaviors and consequent events. Furthermore, the functional analysis procedure has been demonstrated to...
be a useful method for identifying the variables that maintain other forms of problem behavior including aggression (Thompson, Fisher, Piazza, & Kuhn, 1998), destructive behavior (Fisher, Adelinis, Thompson, Worsdell, & Zarcone, 1998), tantrums (Vollmer, Northup, Ringdahl, LeBlanc, & Chauvin, 1996), elopement (Piazza et al., 1997), and vocalizations (Mace & Lalli, 1991). In addition, functional analyses have become a standard procedure for prescribing treatments for problem behavior (Mace, 1994). As opposed to treatments based on response topography or structural approaches, functional analyses result in identification of the variable(s) that maintain aberrant behavior. Therefore, treatments can be based on the manipulation of the antecedent or consequent events that are associated with the behavior (Day, Rea, Schussler, Larsen, & Johnson, 1988; Steege et al., 1990). The results of a number of studies have shown that treatments based on functional analysis are more effective than non-function-based treatments (e.g., Iwata, Pace, Cowdery, & Miltenberger, 1994; Kuhn, DeLeon, Fisher, & Wilke, 1999).

As stated previously, a functional analysis results in the systematic identification of variables that precede and follow the occurrence of behavior problems. This is important in the treatment of sleep problems because, even though many sleep problems appear topographically similar, the etiology of sleep problems is probably heterogeneous. A variety of factors may affect sleep including medication, illness, behavioral mismanagement, and circadian rhythm disturbances, to name a few. These variables may act in isolation or in different combinations to affect sleep. In addition, the factor that causes the sleep problem may not be the same factor that maintains it. Therefore, it is important to examine all of the variables related to the onset and maintenance of the sleep problem. For example, some children may throw a tantrum at bedtime in order to gain parental attention. Others may do it as a function of a medical illness (e.g., otitis). Some children may have difficulty falling asleep as a result of biological factors (e.g., circadian) that interfere with rapid sleep onset. A functional approach to sleep problems would assist in the identification of the specific variables that maintain the sleep problem and would allow for the development of a differentially effective treatment. Thus, if the results of the functional analysis indicated that the child did throw a tantrum at bedtime to gain parental attention, planned ignoring would be one indicated treatment. By contrast, if the child engaged in a tantrum at bedtime as a function of a circadian rhythm disturbance, a different treatment would be indicated (e.g., faded bedtime with response cost, Piazza & Fisher, 1991).

A number of data-based treatment outcome studies have been published on procedures for improving the sleep and sleep-related behaviors (e.g., bedtime tantrums) of children (e.g., Milan, Mitchell, Berger, & Pierson, 1981; Piazza, Fisher, & Kahng, 1996). Nevertheless, the literature on effective treatments for ameliorating bedtime problems among children remains small. A functional approach to pediatric sleep problems should result in a greater variety and increased effectiveness of treatments because treatment would be based on why the behavior occurs, rather than on what the behavior looks like. It is time that the field moved forward, in a systematic and aggressive manner, to better match treatment recommendations to the variables that motivate behavior and to document the efficacy (or lack thereof) of the numerous recommendations that professionals provide to parents to help their children fall asleep.

Received April 8, 1999; accepted April 10, 1999

References


