

SIB: Suggested Functions and Interventions

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Individuals with mental retardation frequently exhibit problem behaviors, including self-injurious behavior (SIB). While the estimated incidence of SIB by individuals with mental retardation varies, the occurrence appears to be associated with the degree of retardation. For example, it is estimated that 10-15% of all individuals with severe mental retardation exhibit SIB, and the percentage is higher among individuals with disabilities who reside in institutions (Mental Retardation and Developmental Disabilities Report [MRDD], 1997). Indeed, SIB can contribute to treatments and placements that are more restrictive and lead to further isolation from the community (Dunlap, Ferro, & Depercel, 1994).

Self-injurious behavior refers to any act of self-inflicted physical harm that is forceful enough or of sufficient duration to cause tissue damage or marks that last for several hours or more. The most common manifestations in individuals with mental retardation include head banging, hair-pulling, hand mouthing or biting, scratching, or hitting parts of the body in a way that causes bruising. According to Iwata et al. (1994) and Symons, Sutton, and Bodfish (2001), other forms of SIB include body banging, face slapping, self-choking, hitting, kicking, pinching, and poking.

A number of hypotheses have been proposed in an effort to explain the causes of SIB. One theory suggests that individuals engage in SIB to escape or avoid a task, to obtain attention from others, and as a form of self-stimulation (Iwata et al., 1994). SIB also may be part of a medical condition, such as Lesch-Nyhan disease (Sandman, Hetrick, Taylor, & Aleksandra, 1997; Symons, et al., 2001). Some researchers have argued that SIB serves a communicative function, allowing

individuals with mental retardation to demonstrate displeasure or discomfort (Horner, Sprague, & Flannery, 1993). Finally, there is a growing awareness that the occurrence of problem behaviors in students with mental retardation may be related to the curriculum, the activities, or the materials used as part of the classroom routine (Ferro, Foster-Johnson, & Dunlap, 1996).

SIB is among the most challenging behavior problems exhibited by individuals with mental retardation, autism, and related developmental disorders (MRDD, 1997). Perhaps the first step in decreasing or eliminating SIB lies in changing one's attitudes towards individuals with cognitive impairments. Many educators and service providers maintain lowered expectations of individuals with mental retardation and tend to excuse inappropriate behavior such as SIB. Such attitudes may actually contribute to the disability by allowing behaviors that are distasteful, distracting, or dangerous to continue. Instead, teaching positive behaviors ensures a greater level of independence in the future (Hastings & Brown, 2000).

Persons who exhibit SIB are less likely to be socially approached or accepted by their peers (Dunlap et al., 1994). With less opportunity for social interaction, persons with mental retardation may become even more isolated and less likely to initiate interactions with others. Teachers who are



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proactive in changing SIBs increase the probability that students will learn and be able to establish appropriate relationships with their typical peers. Engaging in SIB often precludes participation in more productive activities, such as academic tasks and appropriate communication. In particular self-stimulatory SIB may become so absorbing that the student prefers to engage in SIB to the exclusion of all other activities. In this manner, SIB further contributes to the disability by reducing or eliminating opportunities to learn new skills and knowledge. Further, if the SIB is noisy or intrusive, it may prevent other students in the classroom from learning as well.

Most significantly, SIB may lead to permanent scarring or ongoing medical problems. For example, students who continually mouth or bite their hands and fingers run the risk of causing ulcerated or infected sores that do not heal because of repeated self-injury. With prolonged infection, it may even become necessary to amputate a finger or a portion of the infected limb. Similarly, repeated eye

gouging may cause visual impairments or even lead to blindness. While SIB is rarely life threatening, it contributes to the disability of the student with mental retardation, making timely and effective intervention all the more critical.

Over the past few decades, controversy has surfaced over the use of aversive conditioning procedures versus positive behavioral programs in the remediation of severe behavior problems (e.g., SIB) in individuals with disabilities (see Alberto & Troutman, 2002; Didden, Duker, & Korzilius, 1997). While aversives may be more effective in initially stopping a behavior, these effects are often short-lived or are replaced by other undesirable behaviors. In comparing aversive procedures to more positive interventions, a number of researchers (e.g., Beckman & Meyer, 1988; Bihm, Sigelman, & Westbrook, 1997; Iwata, Vollmer, Zarcone, & Rodgers, 1993) have found positively oriented behavioral intervention programs to be more effective. Thus, most professionals who work with individuals with mental retardation contend that behavioral problems can be successfully addressed in the context of positive behavioral support (Crane, 2002; see also Bihm et al., 1997; Weigle, 1997). Indeed, TASH (formerly The Association for Persons with Severe Handicaps) now condemns the use of any treatment that includes a punishing stimulus component on humanistic and ethical grounds (2002).

Creating positive behavioral supports often requires conducting a functional analysis of what occurs immediately before and after a particular behavior. According to Hagopian et al. (1997), the functional analysis method is one of the most significant advancements in applied behavior analysis. The 1997 Reauthorization of the Individuals with Disabilities Act mandates the use of a functional behavior assessment in treatment planning for students who exhibit challenging behaviors and specifically refers to the use of positive behavioral interventions, supports, and strategies (Bradley, 2001). When used properly, functional analysis can determine the function for a behavior and an appropriate intervention can then be designed (Freeman, Anderson, Azer, Girolami, & Scotti, 1998). Functional analyses have been

successfully used as a first step in decreasing SIB in individuals with mental retardation and have greatly contributed to our general understanding of the circumstances under which SIB occurs (Iwata et al., 1994; Knoster, 2000).

The following discussion focuses on the functions of SIB as a first and crucial step in designing effective and ethical interventions.

The Functions of SIB

Individuals may engage in SIB for reasons that are environmental or external or to derive some form of internal pleasure or arousal (Fischer, Iwata, & Worsdell, 1997; Iwata et al., 1994). Most challenging behaviors are socially linked and maintained by external or environmental reinforcement (Hastings & Brown, 2000). In these instances, the presence or absence of other people may function as an antecedent for the challenging behavior and increase the likelihood of the behavior occurring (Hastings & Brown, 2000). Sandman et al. (1997) suggest that SIB also may be a form of release for anxiety or act as a discharge to help lower the individual's level of arousal. Others argue that individuals exhibit SIB to escape or avoid a task or to express displeasure (Iwata et al., 1994).

Iwata and his colleagues have investigated SIB in individuals with mental retardation through a series of studies that have spanned the last 20 years. In the most comprehensive of these studies (Iwata et al., 1994), researchers analyzed 152 cases of individuals with SIB. In 95% of these cases SIB could be attributed to one of five behavioral functions: social-negative, social-positive, automatic/self-stimulatory, multiple functions, or no apparent functions. In 38% of the cases, individuals with mental retardation exhibited SIB in order to avoid or escape a situation, person, or task. Approximately 25% of the behaviors were motivated by social-positive drives, such as attention seeking. Another 25% of the behaviors were automatic or self-stimulatory. An even smaller percentage of cases were found to have multiple controlling functions. Only in a few cases did the behavior serve no apparent function. These behavioral functions of SIB in individuals with mental retardation are

useful in understanding how to intervene when SIB occurs in the classroom setting.

Social-negative functions

In a study of 60 individuals with severe mental retardation, 38% of the occurrences of SIB were attributed to attempts to avoid a task (Wieseler, Hanson, Chamberlain, & Thompson, 1985). Similarly, Iwata et al. found that usually an antecedent or activator triggers SIB, which then serves as a way to avoid or escape a situation (Iwata et al., 1994; Wieseler et al., 1985).

In the classroom, the most common function for SIB appears to be to obtain negative reinforcement. In these instances, there is usually an antecedent condition, such as an activity or a demand, that the student views as aversive. For example, a student may engage in self-injury in an effort to avoid an existing activity. When in response to the SIB, the activity is terminated, the SIB is negatively reinforced. Under these conditions, the student is even more likely to exhibit SIB when the activity is presented again.

Students may use SIB to avoid tasks that are demanding or that require more effort than they are willing to put forth (Iwata et al., 1994; Weigle, 1997). In addition, SIB may occur when students negatively perceive age-inappropriate materials, such as toy manipulatives in a secondary classroom, and refuse to participate in the activity. According to Alberto and Troutman (2002), embarrassment, humiliation, or ridicule can also cause students to engage in SIB.

Social-positive functions

Iwata and colleagues found that SIB can function as a way of receiving or obtaining food, attention, leisure materials, or some other type of social-positive reinforcement. In these instances, individuals engage in SIB as a controlling or manipulative behavior to gain tangible reinforcement (Iwata et al., 1994; Peck, Sasso, & Stambaugh, 1998). These challenging behaviors may be reinforced by repeated access to preferred materials or activities (Mace, Lalli, Lalli, & Shea, 1993). Similarly, students in the classroom may

Table 1
Suggested Interventions for Functions of SIB

Function and Definition	Interventions to address SIB
<p>1. Social-negative: SIB is an attempt to avoid an activity or interaction</p>	<ul style="list-style-type: none"> a) Avoid terminating activities in response to the initiation of SIB b) Shorten the duration of the activity but increase the opportunities to initiate it c) Add frequent positive reinforcement to activities that tend to elicit SIB d) Change the environment or setting of the activity or interaction e) Change the features of the activity or interaction without changing its nature f) Allow students the opportunity to work with different students and staff
<p>2. Social-positive: SIB is an attempt to obtain a tangible item or other type of reinforcement</p>	<ul style="list-style-type: none"> a) Be aware of when SIB is used to call for attention in place of more appropriate methods b) Monitor what type of attention or tangible item is given after a SIB occurs c) Use attention as a reward for appropriate behavior d) Change the type and rate of reinforcement e) Allow students the opportunity to interact with different students and staff
<p>3. Under-arousal: SIB in an attempt to alleviate boredom or increase stimulation</p>	<ul style="list-style-type: none"> a) Offer students who exhibit SIB a varied and interesting curriculum b) Change activities regularly c) Provide appropriate ways in which students can engage in free play activities d) Allow students to self select activities e) Change the environment or setting of the activity as needed f) Allow students to have an area where the level of sound and visual stimulus are adjustable
<p>4. Over-arousal: SIB is a response to over stimulation or a busy environment</p>	<ul style="list-style-type: none"> a) Assess the level of noise, activity, and stimulation in the classroom b) Reduce the number, color, and kind of instructional materials to lower arousal c) Allow the student to be slowly integrated into area of high sensory stimulation d) Reduce the number, color, and kind of instructional materials to lower arousal e) Allow students to have an area where the level of sound and visual stimulus are always very low
<p>5. Multiple functions: Combinations of forces reinforce the behavior</p>	<ul style="list-style-type: none"> a) Alter the classroom in response to the function that is easiest to change b) When the behavior is part of a chain of events, start by altering the behavior that is earliest in the sequence. c) Make the simple changes first

Note. The table above represents some basic interventions and considerations for addressing SIB. However, SIB is such a complex problem that it requires a comprehensive functional analysis in order to treat the behavior effectively.

exhibit SIB when attempting to access social attention (Carr, Bailey, Ecott, Lucker, & Weil, 1998; Hastings & Brown, 2000; Knoster, 2000). For example, students may head-bang or bite themselves to get a teacher to move closer and to talk to them.

Social-positive functions of SIB can be the result of inappropriate use of positive reinforcement by teachers or staff. When a SIB is unintentionally positively reinforced, for example, when more attention is paid to a student when she exhibits SIB, it is likely to occur again, because a reinforcer was given after the SIB occurred (Hastings & Brown, 2000; Iwata et al., 1993; Mace et al., 1993; Peck et al., 1998).

Sensory stimulation/automatic reinforcement

Self-stimulation is a type of sensory stimulation that automatically produces reinforcement to the student and appears to be independent of any social environment stimulus (Iwata et al., 1994). Self-stimulatory behaviors are highly visible and often produce a social stigma (Lee & Odom, 1996). While some individuals engage in SIB in order to receive some sort of secondary reinforcement (Iwata et al., 1994), others may do so to derive a form of sensory stimulation or arousal. Some researchers have (e.g., Sandman et al., 1997) hypothesized that self-stimulatory behaviors are used to release endorphins in the brain, which provides the individual with a form of internal enjoyment.

When students get bored, they tend to find ways to entertain or stimulate themselves. Sensory stimulation can be in response to under- or over-arousal. Under-stimulation can also accrue during intervals of little or no instruction or activity, when the student consequently has nothing to do (Alberto & Troutman, 2002). Students may lose interest when a lesson is too slow paced and engage in SIB out of boredom.

Over-arousal or over-stimulation typically results when an individual's senses are overloaded (Alberto & Troutman, 2002). For example, over-stimulation can occur in environments where excessive noise, people, or materials overload the child's cognitive system. Many factors can contribute to over-stimulation, including the number of objects in the classroom, the

amount of color used in instruction, the intensity of lighting in the room, or the number of social interactions occurring. Decreasing the amount of stimulation the student is exposed to throughout the day or decreasing the level of stimulation during a lesson can help control over-stimulation.

Multiple functions

SIB can also occur when a combination of forces are reinforcing the behavior (Iwata et al., 1994; Szymanski & Tanguay, 1980). Iwata et al. (1994) estimated that multiple functions are responsible for approximately 5% of SIB in persons with mental retardation. To demonstrate that behavior is independent of a given antecedent requires systematic isolation of all possible sources of social reinforcement (Iwata et al., 1994). In these cases, teachers must address each contributing factor separately, which often leads to more time-consuming interventions. For example, if transition from one activity to another that triggers SIB in a student, several factors may be contributing to the behavior, such as: (a) termination of the earlier activity, (b) initiation of the next activity, and (c) movement from one location to another.

No apparent functions

When appropriate research methods are unable to determine the function of the SIB, it can be classified as having no apparent function (Hastings & Brown, 2000; Iwata et al., 1994). SIB of this type constitutes approximately 4.9% of all SIB in individuals with mental retardation (Iwata et al., 1994). Behaviors with no apparent function are sometimes labeled as "stereotypic" or "self-stimulatory" (e.g., Frea, 1997) while others view them as social-positive in nature.

In addition to the categories outlined above, communicative and biological functions of SIB have also been proposed. Further research in these areas is needed before it can be determined if SIB does indeed serve these functions.

Communication

When serving a communicative function, SIB may express that a student with mental retardation is tired, hungry, upset, or frustrated (Horner et al., 1993). Students with severe disabilities who lack the skill to communicate may be frustrated in their attempts to accomplish even the simplest of tasks. Tasks such as requesting materials, a trip to the restroom, or the need for a drink may be initially expressed as small body movements or soft vocalizations. However, if an appropriate response from others is not forthcoming, these gestures may eventually escalate into an episode of SIB (Hastings & Brown, 2000).

Biological functions

In certain disorders or syndromes where there appears to be no apparent function of the SIB the cause could be biological. For example, Lesch-Nyhan is a disorder that is associated with SIB such as mouth and lip biting (Mace et al., 1993). Individuals with Prader Willi Syndrome have a high rate of skin-picking, often resulting in bleeding (Dykens & Kasari, 1997). Research by Symons et al. (2001) suggests that dysesthesia, an impairment of sensitivity, especially to touch, may also contribute to cases of SIB. SIB does not appear to occur more frequently in one gender than the other except for Lesch-Nyhan disease, which only occurs in males.

Conclusion

A primary strategy for decreasing SIB by a student with mental retardation is to consider the function the behavior is serving. An investigation of SIB, through functional analysis, will help identify the function the behavior serves. Table 1 represents some basic interventions and considerations for addressing SIB. Additional activities, materials, or curricula are potential causes that should also be examined.

Inappropriate behaviors may be caused by a number of factors. Likewise, they signal that the needs of the student are not being met or that a classroom activity may not be effective. Effective teachers must be willing to examine the environment

surrounding the student and to determine what sets the occasion for, causes, or maintains the behavior. Understanding why a student engages in a self-injurious behavior will greatly assist the teacher in designing appropriate and ethical interventions that best address students' needs.

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