Using a Sensory Integrative Approach to Treat Self-Injurious Behavior in an Adult With Profound Mental Retardation

Judith Reisman

Key Words: adaptive behavior • environmental stimulation • planning process, occupational therapy

The treatment of self-injurious behavior in adults with mental retardation is a major challenge. A critical review of the literature compares sensory-based treatment studies by behavioral psychologists with sensory integrative treatment studies by occupational therapists. In general, therapists have used direct intervention in concentrated daily sessions. This report includes a single subject study that (a) demonstrates the clinical reasoning involved in the assessment and treatment planning process, (b) documents the efficacy of multiple short treatment sessions spread throughout the day, and (c) presents an alternative model of service provision in which direct care staff provide sensory and adaptive activities under the supervision of an occupational therapist. The use of sensory integration with adults with profound handicaps is presented as a valid application of a theory and treatment that was originally developed from work with higher functioning children with learning disabilities.

Self-injurious behavior (SIB) is the most prevalent and serious maladaptive behavior in institutionalized persons with mental retardation (Barron & Sandman, 1983). Between 8% and 15% of such persons engage in behaviors serious enough to inflict tissue damage (Oliver, Murphy, & Corbett, 1987). Persons with profound handicaps are more likely to show SIB than are higher functioning clients and are also more likely to have higher rates of SIB (Oliver et al., 1987). In the United States alone, 34,000 persons with severe or profound retardation display severe SIB (Schroeder, Bickel, & Richmond, 1986). The cost to manage this health problem is estimated at two billion dollars annually (Schroeder et al., 1986).

Literature Review

The literature on this topic reflects many divergent theories regarding how SIB can be viewed and how the selected view alters the intervention strategy. In fact, many authors have suggested that SIB can be motivated by several different functions, sometimes working in combination (Durand & Carr, 1985; Lowry & Sovner, 1991). One explanation that is gaining increased attention in the psychology literature is that SIB often fills a sensory need (Durand & Carr, 1985). This explanation is consistent with suggestions by occupational therapists that SIB in some persons with developmental disabilities may be related to sensory integrative dysfunction (Clark & Shuer, 1978; King, 1987).

The work of several behavioral psychologists illustrates this newer sensory approach (Durand & Carr, 1985; Lovaas, Newsom, & Hickman, 1987; Rincover, 1986). For example, Durand and Carr (1985) proposed that SIB is driven by at least four motives. Three are thought to be behavioral: desire for social attention; tangible consequence, such as a preferred object; and escape from aversive situations, such as task demands. In contrast, the fourth motive is thought to be a desire for sensory consequences. These behaviors occur whether the client is alone or with others and regardless of staff attention. The Motivation Assessment Scale (Durand & Crimmins, 1988) contains questions to help caregivers rate how behaviors can be weighted toward each motive.

Rincover (1986) also advocated a functional analysis of SIB and cited as an important benefit being able to detect what might be sensory reinforcing properties of self-injury. His recommendations for management of this challenging behavior, however, focused on either punishment or masking of the reinforcing sensory properties. Punishment has been reported to have limited success in managing SIB, because it is difficult to achieve generalization or maintenance of the result (Berkman & Meyer, 1988; Rincover, 1986). There is also a growing sentiment against the application of aversive programming (Berk-
man & Meyer, 1988). Masking the reinforcing sensory properties of SIB resulted in extinction of the behavior in young children, presumably because they could no longer achieve desired sensory input through SIB (Rincover & Devany, 1982). Smith (1986) suggested that providing more acceptable activities that have sensory consequences similar to those of the SIB may be a treatment alternative worthy of consideration.

In a comprehensive review of the functionally related (Iwaki & Holm, 1989) phenomenon of self-stimulation, Lovas et al. discussed the sensory consequences of this behavior in terms of the specific sensory systems stimulated. They claimed that the strength of the behaviors under observation was “not based on prior conditioning but ultimately on an organic function of stimulation in the central nervous system” (1987, p. 48). The stimulation is complex or multisensory and patterned through repetition, two elements of perceptual stimuli. The authors, therefore, preferred the term perceptual reinforcement to sensory reinforcement. Whether sensory or perceptual is the chosen term, it is encouraging that some behavioral psychologists are discussing the role of the central nervous system and its sensory systems in self-stimulation and self-injury.

Positive but informal results from clinical observations and practice have led many to attempt investigations of sensory-based treatment with persons who perform SIB. Most have focused on children (e.g., McClure & Holtz-Yotz, 1991; Norton, 1975); this review will focus on studies in which the subjects were adults with developmental disabilities (Bright, Bittick, & Fleeman, 1981; Brocklehurst-Woods, 1990; Dura, Mulick, & Hammer, 1988; Favell, McGimsey, & Jones, 1978; Favell, McGimsey, & Schell, 1982; Hirama, 1989; Lemke, 1974; Mason & Iwata, 1990; Mulick, Hoyt, Rojahn, & Schroeder, 1978; Wells & Smith, 1983). Overall, a consistent weakness in the studies was lack of adequate controls. Often neither baseline measures for the single subject studies nor adequate control groups for the group studies were incorporated into the experimental design. In addition, some of the studies being reviewed illustrate the difficulty that arises when one attempts to operationalize the treatment yet maintain integrity with treatment principles. Many authors described the challenge of performing a clinical study while providing treatment and protection for a subject with serious self-injury. Nevertheless, considering the group of studies as a whole can be instructive for those contemplating whether and how to study the efficacy of a sensory-based or sensory integrative treatment approach for adults with developmental disabilities. Such studies are in short supply, and, as Merrill reminded us, “Techniques that clinical judgment suggests are effective in improving the quality of life for our patients should not be overlooked as we strive to demonstrate professional effectiveness in statistically significant ways” (1988, p. 4).

The first group of studies to be reviewed are those conducted by psychologists who attempted to provide sensory-based treatment through purposeful interaction with objects and people. Three studies illustrate this approach. Favell et al. (1982) designed a program for clients whose SIB was assessed as being motivated by sensory consequences rather than attention or escape. They offered the clients toys and other objects with sensory properties matched to the sensory nature of each client’s SIB. Hand mouthing, eye poking, and pica all decreased with this approach. Although one client then used the toys in a self-stimulatory manner, the authors suggested that was not problematic for a client whose “repertoire is so impoverished” (p. 101) that she almost no other skills with which to occupy her leisure time. The authors claimed that the provision of objects with sensory reinforcing properties should be viewed as appropriate management for adults with developmental disabilities and not treatment per se, just as the provision of adequate nutrition would be.

Another successful study (Mulick et al., 1978) was reported in which skin and nail picking decreased in an adult with profound retardation who was trained to exchange one preferred toy for another at will. Although the authors did not focus on the sensory aspects of the toys, they observed that SIB decreased when opportunities for purposeful interactions with self-selected objects were present. It would have been interesting to know which toys were preferred and how closely related their sensory properties were to the subject’s SIB.

Although the study by Favell et al. (1978) was not designed to be a test of the efficacy of sensory-based treatment, its results contain implications related to the theory. The authors reported that three clients were given physical restraint as a contingent reward for lack of SIB. These clients had been observed to enjoy the restraint, ceasing SIB attempts when the restraint was offered. From a sensory integrative perspective, it would seem that the clients were given exactly what each needed. The person who bit her arm had her arms swaddled by a restraint device. In addition, the responsive staff provided activity and access to quiet space in the outdoors, increasing the client’s chance to engage in activities that she found pleasurable in an environment that was less stressful than her living unit. The other two clients not only were given the restraint they enjoyed, but were distracted by staff attention and activity when they were not restrained. One of these clients even had her arms stroked and gently squeezed when not in restraints. The calming influence of pressure against the skin has been discussed by several (Ayres, 1972; Fisher & Dunn, 1983; Krauss, 1987; Reisman & Gross, 1992).

Although the obvious confounds of receipt of desired sensory input as well as staff attention weaken the validity of the study, the results are suggestive regarding the value of reinforcing sensory input and purposeful activity to gradually release clients from restraints. The
conclusions of the study might have been strengthened if
the authors had examined the sensory aspects of the SIB
and the environmental stress (boredom, overstimula-
tion) that probably contributed to the SIB.

In the above studies, treatment efficacy seemed estab-
lished when clients were (a) involved in purposeful
activity, (b) removed from stress-producing situations, or
(c) engaged in activities that provided the specific senso-
ry input sought by each client, or a combination of the
above. This last element required not only a functional
analysis to determine the motivation for each SIB ob-
served but also an analysis of the sensory systems stimu-
lated by that SIB. These principles have also been applied
in studies conducted by occupational therapists. Some
therapists have designed treatment that was more closely
aligned with strictly sensory-based or sensory stimulation
activities, whereas others have developed programs
based on sensory integration treatment principles. The
four studies below reflect this progression.

Lemke (1974) described a sensory-based treatment
for a 19-year-old woman with profound retardation who
had been almost completely restrained for several years
to prevent self-injury. Lemke supplied tactile stimulation
followed by social and motor tasks in 30-min sessions
three to four times a week. The case study highlighted the
gains in adaptive behaviors and the decrease in SIB over a
5-month treatment period.

The same author (under a different name) reported
positive results in a more controlled study that employed
a multiple baseline design (Hirama, 1989). All eight sub-
jects had significant reductions in rates of SIB during a
structured treatment program of firm tactile stimulation
applied for 30 min daily. The author acknowledged the
need to examine long-term effects and generalization be-
yond the treatment setting in future studies.

A program based on sensory integrative treatment
principles was designed by Bright et al. (1981) for a man
with profound retardation and high rates of self-hitting.
Many unsuccessful behavior programs had led the staff to
suspect the SIB might be motivated by a desire to obtain
sensation rather than attention. The client received 30
min per day of a combination of tactile and vestibular
activities that had been determined in prior assessment
ments to be effective in reducing this client’s SIB. Self-injury
during treatment decreased from 13 hits per min to one
hit per min in a 5-month period. More important, time
out of restraint on the living unit increased from 36% to
61% of each day over a 7-month period. The authors
noted that there was a latency period or delay before
generalization of treatment effects to the living unit was
seen. The lack of baseline data and the confound of social
attention were addressed by the authors. Because the
program was begun as an emergency intervention before
resorting to the use of aversives, it was not possible to
collect baseline data in this study. Additionally, the au-
thors concluded that because social attention had been
part of the unsuccessful behavioral programs the client
had received, it was probably not the primary explanation
for the results obtained.

Wells and Smith (1985) designed a study that began
with the collection of baseline data on four adults with
profound retardation with SIB and self-stimulatory behav-
ior. The subjects in this study received 30 min of daily
tactile and vestibular stimulation activities, in accordance
with the sensory integrative treatment principles of Ayres
(1972). Like the Bright et al. (1981) study, the focus was
on generalizability of treatment effects. Living unit staff
collected data on rates of SIB throughout the day. In all
cases, there was a significant decrease in those rates. The
authors recognized that lack of established interrater reli-
ability among staff raters and the possibility of rater bias
were flaws in the study.

These last two reports may be viewed as studies of
sensory integration, not sensory stimulation, because the
emphasis of treatment was on normalizing responses to
input so that functional gains could result. After individual
evaluation, preferred activities based on sensory integrative
variables were offered. The distinction between sensory
stimulation and sensory integration will be elaborated in
the discussion section.

A few studies by non-occupational therapists pur-
tured to investigate the efficacy of sensory integration,
but failed to do so because one or several principles of
sensory integration theory and practice were violated. An
example is the single-subject study by Dura et al. (1988).
A teenager with profound retardation was involved in a
program that consisted of 20 min of swinging in several
directions. Although there was a partial positive result,
this study of passive vestibular stimulation cannot be
viewed as a test of the efficacy of sensory integration. The
treatment was chosen without evaluation of the nature of
the subject’s SIB, which was in the form of attacks against
his skin through lip biting, rubbing body parts against the
wheelchair, digging, and hair pulling. Reisman and Hans-
chu (1992) and Resman (1981) have identified these as
behaviors that indicate the need for a sensory integration
treatment program that incorporates tactile input.

One strength of the study by Dura et al. (1988) was
that it attempted to provide a control for attention by
engaging the subject in games such as catch and motor
imitation. Given the profound nature of the subject’s
handicap, 20 min of these social and motor activities,
although seemingly pleasurable, may have been oversti-
mulating for the subject. Many persons with developmen-
tal disabilities are in an overaroused state, and this has
been linked to problem behaviors such as SIB (Lowry &

The results of the study support the legitimacy of
these concerns. Mean rates of SIB decreased to 0.06 per
min during vestibular stimulation and increased to 2.27
per min in the 15 min immediately after treatment,
whereas mean rates of SIB in the control condition were
SIB rates during the control condition and lower rates in 5.0'5 per min during treatment, decreasing to 3.47 per min in the 15 min after the control activities. The higher SIB rates during the control condition and lower rates in the period after these activities support the conclusion that the control activities were too stimulating for the subject. The authors noted that although there was a significant treatment effect in the 3-week study, there was no carryover. It seems unrealistic to expect a person with profound handicaps to display a significant carryover given the short study period and the latency effect noted by Bright et al. (1981). The initial positive response to vestibular stimulation may be seen as support for the pervasive influence of this type of sensory input (Ayres, 1972).

Another study that attempted to examine the efficacy of sensory integrative treatment but failed to do so was conducted by Mason and Iwata (1990). Although two of the three subjects in this study were children, a brief review is given for illustrative purposes. The authors selected the subjects after a functional analysis of the SIB so that they could assess results of treatment for subjects whose SIB was motivated by desire for attention, sensory input, or escape from task demands. The treatment consisted of “a flashing blue or amber light suspended from the ceiling, a rocking chair with a vibrating pillow attached at neck level and a cassette tape recorder that played rock or jazz music” (p. 364). All this equipment was activated for each 15-min session with no therapist interaction except to monitor safety.

Several design flaws make it impossible to draw any conclusions about the efficacy of sensory integration treatment on the basis of this study. First, activities were provided without prior assessment of the specific sensory needs of the client. Furthermore, the activation of the light and sound equipment leads one to imagine a disco-like atmosphere instead of a calming, focused treatment session. Being subjected to an overwhelming multisensory experience is not sensory integrative therapy.

It is no wonder that the subject whose functional analysis revealed SIB motivated by desire for sensory input actually had increased SIB rates in this environment. And, considering the work by Mulick et al. (1978) and Favell et al. (1982), it is also not surprising that giving this client access to manipulable toys and reinforcement for alternative behaviors produced positive results. By attempting to introduce more rigorous experimental procedures into the design of a treatment program that had little relationship to the principles or practices of sensory integration, the authors were rendered unable to draw conclusions about the merits of sensory integrative treatment for this population.

In most of the occupational therapy studies reviewed, daily treatment of 30 min of tactile or vestibular stimulation or both was provided. To determine whether a more economical schedule would be effective, Brocklehurst-Woods (1990) employed twice weekly treatment sessions of 50 min for a period of 7 months. Two subjects were treated together and observed weekly. One subject engaged in self-stimulatory behavior while the other displayed a combination of self-stimulatory and self-injurious behaviors. The study data did not support the efficacy of a reduced number of longer treatment sessions.

The following report is of a study examining the effect of a more frequent treatment schedule but with markedly shorter sessions. This study documents treatment effects when direct care staff, rather than occupational therapists, are trained to provide most of the direct intervention.

Study Report

Subject

The subject was a 41-year-old woman with profound retardation, impaired vision, and cerebral palsy manifested as weakness and mild spasticity in the lower extremities. She had been continuously institutionalized since the age of 14 years. Her high rates of SIB were of two types: hitting her face with her hands and digging her fingernails into body tissue. The latter often resulted in skin infections requiring medical attention. The form and severity of her SIB were unchanged from the time of admission at age 14 to the time of her involvement in this study. While uniformly high, her SIB rates spiked even higher during menses.

The subject also displayed behaviors indicative of stress. These included holding her arms closed against her body, keeping her eyes closed, maintaining a tense facial expression, and reacting to transitions of any sort with increased rates of SIB. Her self-injury was so severe that she wore protective sheepskin mitten restraints when she was awake. Because she continued to pick at her hands with her thumbs while wearing the mitts, a second interior component had to be added to the mitts.

Past attempts to control the subject’s SIB had been primarily behavioral, with structured interventions involving redirection, contingent misting of the face with water or air puffs, contingent food rewards, and restraint in a jacket and mitts. For a while she was involved in a standing program, ostensibly to facilitate standing, but actually so she could not dig at her genital area. None of these methods was successful, although the mitts did decrease some of the medical complications of the skin picking by enabling the tissues to periodically heal. The subject received no psychotropic medication during the study period.

Dependent Variables

Two measures of change were selected, number of min per day spent in restraints and mean number of SIB per min. Both measures were based on a continuous 24-hour count. These measures were chosen because (a) the use of restraints was presumed to be an indication of how often the subject attempted to engage in SIB, (b) near-
continuous restraint meant the subject was unable to use her hands to participate in other programming, (c) there were several months of baseline data available, (d) the staff were trained and mandated to record this information as part of their duties, and (e) it was thought that a measure taken throughout the day was more useful than small samplings of behavior either during or immediately after a particular treatment.

Baseline Condition

In the months preceding the introduction of sensory integrative treatment, the staff were instructed to remove the subject's mitts each hour and offer water play and object manipulation experiences. Absence of SIB was contingently reinforced with a rub on the back or a food treat. If SIB occurred while the mitts were off, the staff were instructed to hold the subject's arms for 30 sec. This program was designed by the case manager and carried out by the unit staff. The program was initially evaluated as successful because time in restraint dropped from more than 36,000 min per month to just over 9,000 min per month. Unfortunately, the treatment effect did not hold and it was necessary to increase restraint time once again. During the 6-month baseline phase of this study, time in restraints had returned to unacceptably high levels (17,000–21,000 min per month). A reliability study of staff reporting of SIB was not performed; the data were collected from the subject's chart.

Assessment

An initial assessment was performed to determine the subject's response to different types of sensory input and to develop a treatment plan best suited to her needs. The clinical reasoning involved in the assessment and design of treatment is documented as an aid to readers. In general, the investigator expected that the subject would not be different from other clients with profound developmental disabilities who are easily overstimulated and in need of calming sensory activities. The assessment, therefore, focused on providing activities that had slow linear movements and deep touch-pressure as these are expected to be calming (Ayres, 1979). Because her face relaxed into a smile, the activity seemed successful as a beginning to treatment. The subject's active involvement in this activity was also seen through her continued arm cocontraction. If the activity had not been pleasurable or had become overwhelming to her, it was expected that she would have indicated this through her facial expression and by withdrawing her arms and assuming her habitual closed posture.

For the purposes of assessment, the subject was then lifted into a hammock swing so that increased vestibular input could be provided. Although the transition from wheelchair to hammock produced a momentary attempt at SIB, as the hammock was swung, she quickly returned to a relaxed facial expression and smile. To begin the assessment of response to tactile input, a pillow was placed over her stomach and gentle pressure was applied as she was swung. Pressure on the abdomen has been observed to be calming to infants (Brazelton, 1973), and the pillow was chosen because, in the author's experience, objects seemed to be less threatening than touch from another person. A decrease of rigid tone throughout the body was observed.

At this point in the assessment, a plastic bristled surgeon's scrub brush was slowly stroked down the subject's arms. This produced a wider smile and eye opening. Continued stroking resulted in eye contact with the investigator and vocalizations of pleasure. The investigator then switched to a soft toothbrush to stroke on and between the subject's fingers. Lack of withdrawal of the hands and continued eye contact and vocalizations of pleasure were interpreted as positive responses to this more intense stimulation to the hands. When she was placed back in her wheelchair after this 20-min assessment, she did not respond negatively to the transition. She remained alert, relaxed, and smiling as the staff met to develop the treatment program.

Treatment Schedule

The occupational therapist who provided the assessment was fortunate to have the subject's behavior analyst/case manager present at the session. Together, they determined that the subject's treatment program would be amended to include the sensory input she obviously found enjoyable. Rather than limit treatment to once a day for up to 5 days per week as in previous studies, it was decided that treatment would be incorporated into the existing hourly program by the unit staff. This preserved the same schedule of mitt removal and staff interaction as in the baseline phase.
Treatment Activities

The treatment was structured so that caregivers who were unfamiliar with the practice of sensory integration could safely carry out the procedures. Following sensory integration treatment theory (Koomar & Bundy, 1991), initial activities were designed that aided the subject in responding with more acceptance to sensory input, in this case, social and object interactions appropriate to her developmental abilities.

Each hour a staff member removed the mitts, held the subject's hands, and rhythmically rocked her wheelchair by using her spontaneously cocontracted arms as handles. This was done for 10 complete excursions of 4 to 5 feet and gradually slowed to a standstill. Staff were instructed that the movement should be smooth, rhythmic and calming. After this, the staff member provided slow, firm, downward strokes to the arms, legs and back using a surgical brush. This passively applied vestibular, proprioceptive, and tactile input was provided for approximately 5 min each hour and was followed by attempts to engage the subject in social interaction and object manipulation. These adaptive activities were offered immediately, much as a traditional sensory integration treatment session begins with a few minutes of general inhibiting or facilitating input followed by activities that require more active and adaptive responses (Ayres, 1972). Because both day program and residential staff were used, the subject was assured of receiving this programming each waking hour. The program was monitored by the behavior analyst/case manager and an occupational therapist employed by the institution.

Results

During the 6-month baseline phase, the subject spent a total of almost 19,000 min per month in mitten restraint. This time accounted for most of her waking hours. In addition, she engaged in almost one SIB per min (0.85 per min) throughout the baseline months. Visual analysis (Ottenbacher, 1986) of the data shows that after the initiation of treatment, there was a steady decrease in restraint time (see Figure 1).

After a delay of 3 months the mean number of SIB per min also showed a steady decline (see Figure 2). The small rise in both measures in the last month of the study coincided with the occurrence of a bladder infection in the subject.

Anecdotally, the staff reported the same positive response to treatment that had been observed in the occupational therapy assessment. The subject smiled, laughed aloud, maintained eye contact, and imitated sounds and motions with the staff. She readily engaged in hand and vocal activities. These were all newly observed behaviors that contrasted with the subject's former head-down, eyes-closed posture, fearful facial expression, and difficulty participating in programming.

The subject began the treatment phase of the study with an institutional goal of community placement within 4 years. Because of her rapid response to treatment, she was able to be placed in a foster care setting 7 months after treatment began. She made a successful adjustment to the situation, quickly bonding with both parents and displaying adaptive behaviors not seen in the institution. For example, she rapidly learned the route from her bedroom to her foster parents' bedroom and reversed it to gain personal contact. She also learned not to damage the houseplants that were situated within her reach so she could move freely about the home. In addition, the subject was able to successfully engage in a day program outside her residence. Monitoring by the institution throughout the 6-month provisional discharge period indicated that the subject continued to do well aside from slight recurrence of SIB with menses. Foster parents and day program staff were continuing the sensory and adaptive activities begun in the institution.

Figure 1. Amount of mitten restraint placed on subject in terms of min per month.

Figure 2. Number of events of self-injurious behavior in terms of mean per min per month.
time in restraint and amount of SIB decreased during the treatment phase. The steady decrease in restraint time and SIB seems to indicate that this schedule and combination of sensory and adaptive activities were effective. Replication with other subjects is in progress and supports this finding (B. Hanschu, personal communication, August 12, 1992). The latency effect discussed by Bright et al. (1981) was also seen. Although treatment was initiated in the seventh month of this study, there was no significant decrease in mean SIB until the tenth month. Because there was an immediate decrease in the time the subject spent unrestrained, this latency or delayed effect may have been more a function of the subject’s hands becoming available to engage in SIB. It is likely that the subject’s positive response to treatment made the staff feel comfortable releasing her from restraints and that, despite the initial rise in SIB, some other variable, such as a change in the subject’s affect or responsiveness, reinforced the staff’s decision to leave the subject unrestrained. Because data on the subject’s state were not collected, this question cannot be answered.

The subject was in the treatment phase of the study for 7 months, until the time of her discharge. During that time she experienced a treatment schedule of frequent, short sessions. This seemed more effective in decreasing rates of SIB than other schedules of treatment, which usually delivered sensory integrative activities in a single, daily concentrated session (e.g., Bright et al., 1981). Several (King, 1987; S. Livingston, personal communication, May 4, 1992; Wilbarger & Wilbarger, 1991) have noted that clients with severe disability respond more positively when treatment is spread throughout the day instead of being restricted to a daily concentrated session. Small sessions of planned sensory input remind one of the “sensory diet” advocated by Wilbarger and Wilbarger (1991). Just as food may be given in several small meals throughout the day, so, too, may sustenance for the nervous system be given in this manner. The tendency of persons with severe brain damage to become overstimulated makes this schedule appealing. In addition, the opportunity to adaptively engage in activities many times a day just as one’s state reaches a more optimum level of arousal seems to be an advantage of this type of scheduling.

On the surface, the sensory activities in this study do not seem to fit the traditional definition of sensory integrative treatment. Clark and Pierce (1988) and Ottenbacher (1991) would define the input given to the subject as sensory stimulation, rather than sensory integration, because the sensory activities are preset and unchanged over many sessions. This would seemingly prevent self-direction, an essential component of sensory integrative therapy. Consistent with the principles defined by Ayres (1972), however, it seems appropriate to view the combination of sensory and adaptive activities provided in this study as fitting within the domain of sensory integration.

“The central principle of sensory integrative therapy is providing planned and controlled sensory input with usually—but not invariably—the eliciting of a related adaptive response” (Ayres, 1972, p. 114). Many children need to begin treatment sessions with a few minutes of inhibiting or facilitating tactile or vestibular activities (Ayres, 1972); so, too, do many adults with developmental disabilities. The careful planning that goes into each sensory integrative activity does not change the fact that each is still a form of sensory stimulation.

The treatment activities in this study were created as other sensory integration treatment activities to “a) logically reflect sensory integration theory, b) address the client’s underlying dysfunction, and c) facilitate the attainment of... (her) goals” (Koomar & Bundy, 1991, p. 251). As such, they do not violate the principles or practice of sensory integration but do take into account the realistic differences between the higher functioning children from whom the theory was derived and these lower functioning adults to whom the theory is now applied.

What determines a sensory integrative treatment session is the complex interplay of therapeutic interaction and guidance to or provision of sensory integrative opportunities tailored to the needs of the client. Therapists who work with adults with severe and profound retardation display their commitment to sensory integration by employing this careful planning of activities while adhering to sensory integration theory. Although the elements of self-direction and playful interaction may be a long time in developing, the assurance of consistent pleasurable experiences that repetition provides is the first step in the development of trust for adults who do not have the cognitive capacity to understand continuous change as a pleasant experience. The requirement of self-direction is satisfied when the SIB and responses to sensory opportunities provided in assessment are viewed as communication. Clients direct each treatment session to the best of their ability through their responses to the activities that are offered. Because of the limitations of adults with profound handicaps, self-direction must be redefined to include simple communication of preference (Sharpton & West, 1992).

Ayers cautioned against the strict requirement of an adaptive response in every sensory integrative treatment. “Tactile and general vestibular stimulation... are therapeutic because of their sensory input. No adaptive response is expected or required for their utilization” (1972, p. 126). In this study, adaptive responses were elicited in social, motor, and vocalization activities immediately after the initial 5 min of sensory calming activities. These are understood to be part of the treatment session. Gains in overall adaptive functioning are always the most important result for this population. Adaptive responses emitted during developmentally appropriate, functional
activities are rewarding for both the staff and clients. Occupational therapists who work in this challenging specialty will find their greatest credibility with other staff when clients become amenable to training in functional performance areas or spontaneously show mastery of previously unlearned skills.

One other area of concern relates to staffing. Traditionally, special training is advocated for those therapists wishing to become competent in sensory integrative treatment (Koomar & Bundy, 1991). Some may worry that direct care staff are unable to provide the kinds of therapeutic experiences that sensory integrative treatment demands. Although this is certainly true in providing direct therapy for children with learning disabilities, work with adults who have severe or profound retardation requires a new model. The assessment of sensory integrative dysfunction must always depend on the expertise of an occupational therapist or physical therapist. However, the design of treatment for this population demands creativity in the translation of sensory integrative theory and treatment into activities that may be safely and correctly administered by direct care staff. Regular monitoring of individual client–staff sessions and intensive inservice of direct care staff enhance the quality of treatment given by the staff while maximizing scarce therapist time.

The benefits of using this collaboration between consulting and monitoring by professional staff and application of treatment by direct care staff are many. In addition to the obvious benefit of reducing the target behaviors that threaten the health of clients, Hara called attention to the following: (a) "treatment can be incorporated into the existing daily . . . routine," (b) "staff efforts . . . shift from application of restraints . . . to interaction and educational efforts," and (c) "attitudes . . . change from fear of being responsible for the resident’s SIB to that of helping the resident learn and develop" (1989, p. 18). The implementation of nonaversive, sensory integrating activities gives paraprofessionals an opportunity for positive and effective interaction with clients (Hirama, 1989; Smith, 1986).

Researchers in the field of mental retardation are used to looking at SIB as behaviorally driven, thus it is easy to forget that the first and most primitive behaviors are sensory driven (Ayres, 1979). Seeking pleasurable stimulations, organisms invent methods to produce calm and decrease stress. In persons with severe brain damage who continue to function at these primitive levels, we must look again at the basic functions of the nervous system and not do our clients the disservice of considering their persistent attempts to achieve a calm, organized state as anything but that. Only then will we be able to understand the nature of sensory-driven behavior and design treatment programs that satisfy client needs, freeing them for further development and the experience of pleasure.

Acknowledgments
I thank Bonnie Hanschu, OR, Director of Specialized Education Services, and the staff of Cambridge Regional Human Services Center, Cambridge, Minnesota, for their assistance.

References


