Behavioral Treatment of Self-Injury, 1964 to 2000

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Abstract

A quantitative analysis of behavioral research on the treatment of self-injurious behavior (SIB) over the past 35 years is provided. A literature search covering the period from 1964 to 2000 yielded 396 articles (706 participants) on the treatment of SIB. Most research participants have been male and diagnosed with severe/profound mental retardation. The use of reinforcement-based interventions has increased during the past decade, whereas the use of punishment-based interventions has decreased slightly; both of these trends coincide with the increase in the use of functional assessments. Most treatments have been highly effective in reducing SIB; nevertheless, the disorder persists in spite of an abundance of research, suggesting that a greater emphasis should be placed on prevention.

Self-injurious behavior (SIB) has been defined as a response that produces physical injury to the individual's own body (Tate & Baroff, 1966). Estimates of the prevalence of SIB among individuals diagnosed with developmental disabilities have ranged from 7% to 23% (Maisto, Baumeister, & Maisto, 1978; Maurice & Trudel, 1982; Schroeder, Schroeder, Smith, & Dalldorf, 1978; Soule & O'Brien, 1974), with most falling at or near 15%. For example, Griffin, Williams, Stark, Altmeyer, and Mason (1986) conducted a state-wide survey of 13 residential facilities in Texas serving approximately 10,000 individuals. Their findings indicate that 13.6% of the population engaged in some form of SIB. The majority of the individuals who engaged in SIB were male, diagnosed with severe or profound mental retardation, and engaged in multiple forms of SIB.

These data suggest that SIB is a relatively common behavior disorder, which poses significant health risks. Hyman, Fisher, Mercugliano, and Cataldo (1990) reviewed the medical records of 97 individuals admitted to an inpatient unit specializing in the assessment and treatment of SIB. Physical injury was documented in 76.3% of the cases, and those noted most frequently were soft tissue lacerations and contusions (49.5%), followed by permanent scars and callus formation (42.3%). The most severe injuries consisted of permanent damage to the eye (cataract formation, perforation, or retinal detachment), which occurred in 4.7% of their patients. Other reports have described cases in which SIB may have been a contributing cause of death (Nissen & Haveman, 1997).

Self-injurious behavior may also have detrimental effects of an indirect nature. For example, the behavior may limit the individual's participation in therapeutic activities, such as academic, self-care, or vocational instruction, which may result in continued placement in restrictive living situations. Furthermore, physical and chemical restraints often used for protection may also prevent the individual from engaging in alternative activities and may themselves result in physical damage, such as shortened tendons due to prolonged immobility and adverse side effects of medication (Favell et al., 1982).

Given the high prevalence of and risks associated with SIB, a great deal of research over the

past 30 years has been focused on treatment of the behavior. In one of the earliest reviews of this literature, Johnson and Baumeister (1978) examined 62 articles published from 1965 to 1976. Their analysis revealed that the most common treatment was electric shock, used either alone or in combination with other interventions. This was followed closely by differential reinforcement (differential reinforcement of alternative behavior [DRA] and differential reinforcement of other behavior [DRO]). The authors also noted that although the frequency of SIB was reduced to near-zero levels in 75% of the cases, this result may have been somewhat tenuous because of a positive-outcome bias. That is, researchers may be reluctant to submit negative findings, and journal editors may be even more reluctant to publish them.

Gorman-Smith and Matson (1985) reviewed 39 studies on the treatment of SIB and stereotypic behaviors from 1976 to 1983. Their results indicated that the most prevalent topographies of SIB studied were head hitting and banging and that the majority of the participants tended to be diagnosed with profound mental retardation. As noted by Johnson and Baumeister (1978), Gorman-Smith and Matson also found that punishment was the most commonly reported treatment for SIB. However, overcorrection replaced shock as the most frequently used method of punishment. Gorman-Smith and Matson suggested that the trend away from the use of electric shock reflected a general change in treatment philosophy toward "less restrictive" interventions. The interventions shown to have the greatest effects on SIB were DRO, lemon juice therapy, time-out, air splints (a type of arm restraint), and DRO plus overcorrection.

Although in a number of subsequent reviews (e.g., Lennox, Miltenberger, Spengler, & Erfanian, 1988; Lundervold & Bourland, 1988; Scotti, Evans, Meyer, & Walker, 1991), investigators have focused on the treatment of other problem behaviors (e.g., aggression and property destruction) among individuals with developmental disabilities, very few have examined the treatment of SIB specifically, and those that have are somewhat dated (e.g., Johnson & Baumeister, 1978) or did not examine trends across time (e.g., Sternberg, Taylor, & Babkie, 1994). Thus, the purpose of this paper is to provide a quantitative analysis of behavioral research on the treatment of SIB over the past 35 years.

Method

Literature Search

A database of articles on the assessment and treatment of SIB was generated through searches of *Current Contents* as a part of a broader review on SIB (Kahng, Iwata, & Lewin, 2002). Additional searches of the *PsychInfo* and *ERIC* databases were conducted using the key words *self-injurious behavior* and *SIB*. Articles were included or excluded based on the following inclusion criteria: (a) The researcher(s) presented data on the use of a behavioral intervention as treatment for SIB, either alone or in conjunction with other problem behaviors (e.g., aggression, property destruction). (b) Participants were diagnosed with developmental disabilities (e.g., mental retardation or autism). (c) If the article included multiple participants, only those individuals who engaged in SIB (alone or in conjunction with other problem behaviors) were included in the analysis. (d) Only articles incorporating single-subject experimental designs (Kazdin, 1982) were included; this was to ensure that behavioral data for each participant were readily available. The exclusion criteria were: (a) The study involved the assessment of SIB, but treatment was not implemented. (b) The investigator(s) did not report individual data. (c) The study involved the use of pharmacological interventions either alone or in conjunction with behavioral interventions.

Demographic Characteristics

Participants. Data were collected on participants' gender, age, degree of mental retardation, and other diagnoses (e.g., sensory impairment, autism, Down syndrome). Participants were divided into four age categories: (a) 1 to 10 years, (b) 11 to 18 years, (c) 19 and over, and (d) no data. Degree of retardation was also divided into four categories: (a) severe/profound, (b) moderate, (c) mild, and (d) no data.

Topographies of SIB. A list of SIB topographies was developed based on those responses reported in the literature. It consisted of 11 topographies (e.g., aerophagia and biting) and the option to describe other, less common forms of SIB.

Treatment setting. Information about the settings in which treatment was conducted was also recorded. It consisted of seven settings (e.g., outpatient clinic, group home, and institution) as well as the option to describe other areas in which treatment may have occurred.

Procedure

Interobserver agreement. Interobserver agreement, which refers to the extent to which independent observers agree on the occurrence or nonoccurrence of a behavior, is often necessary to ensure measurement consistency, minimize observer bias, and ensure the integrity of behavioral definitions (Kazdin, 1982). Therefore, data were collected on whether or not interobserver agreement statistics were reported.

Experimental design. The use of single-subject experimental designs is one of the hallmarks of applied behavior analysis (Baer, Wolf, & Risley, 1968), and information was collected on the number of studies that incorporated a single-subject experimental design *with replication.* We defined a *single-subject experimental design with replication* as any experimental design in which conditions were repeated on a within-subject basis, such as reversal (i.e., ABAB) or multi-element designs. We also included all forms of multiple baseline designs, including multiple baseline across subjects. Studies without baselines or systematic replications (e.g., AB designs) were scored as not having a single-subject experimental design with replication.

Treatment

Type of treatment. Treatment was divided into seven main categories (antecedent manipulation, extinction, reinforcement, punishment, restraint, response blocking, and other) and several subcategories (such as type of reinforcement [e.g., DRO and DRA] and type of punishment [e.g., timeout and overcorrection]). Response blocking was not included in any of the other categories because data suggest that it could function as punishment (Lerman & Iwata, 1996) or extinction (Smith, Russo, & Le, 1999). Each component of the treatment package was counted separately in the event of the simultaneous application of multiple interventions.

Effectiveness. We determined the value of the last five data points from the baseline and treatment phases to estimate treatment effectiveness. If either phase consisted of fewer than five data points, values were determined for the maximum, yet equal, number of data points. For example, if a baseline phase only consisted of three data points, those three baseline points were compared to the last three data points of the treatment phase. If the study consisted of multiple replications of baseline and/or treatment conditions (e.g., reversal designs), data were taken from the final phase of each baseline and treatment condition.

A divider (Alvin®), which is a device similar to a compass but with needlepoint tips on both ends, was used to estimate the value of each data point. The distance between a data point and the x-axis of the graph was determined by using the divider, which was then measured against the y-axis of the same graph to obtain an approximate value. Condition means were calculated for baseline and treatment using these approximate values.

Treatment effectiveness was calculated by subtracting the mean treatment value from the mean baseline value, dividing by the mean baseline value, and multiplying by 100% to obtain a percentage reduction or increase in SIB. A 100% reduction reflected total elimination of the response, whereas a 0% reduction reflected no change from baseline. A negative percentage reflected an increase in responding during treatment. Percentage effectiveness was not calculated for those data sets in which the data were presented as averages or based on rating scales or if the data set failed to include a baseline.

Follow-up and generalization. Finally, we determined how often and for how long data were collected after the termination of the study (i.e., follow-up data). We also recorded whether experimenters assessed generalization (transfer) of treatment effects across settings or therapists.

Interobserver Agreement

A second rater independently reviewed 13.3% of the articles (13.6% of the data sets). With the exception of the treatment efficacy category, we calculated agreement percentages based on a comparison of the selections within each category (e.g., topography, age, setting, and intervention). An *agreement* was defined as both observers selecting the exact same categories (i.e., exact agreement). Reliability was calculated for each category by dividing the number of agreements by the number of agreements plus disagreements and multiplying by 100%. Agreement for the treatment efficacy category was calculated by dividing the smaller number by the larger number and multiplying by 100%.

Mean interobserver agreement scores for all categories combined (except treatment efficacy) was 96.0% (range = 91.5% [methodology] to

Table 1. Distribution of Journals Publishing Articles on the Treatment of SIB

Journal	No. of articles	No. of data sets
Journal of Applied Behavior Analysis	121	263
Journal of Behavior Therapy and Experimental Psychiatry	34	41
Research in Developmental Disabilities[a]	24	50
Behavioral Interventions[b]	22	36
American Journal on Mental Retardation[c]	16	35
Journal of Intellectual Disability Research[d]	16	20
Behavior Modification	14	23
Behavior Therapy	14	18
Journal of Developmental and Physical Disabilities[e]	11	17
Mental Retardation	10	12
Behaviour Research and Therapy	9	23
Journal of Autism and Developmental Disorders[f]	8	11
Psychological Reports	7	7
Journal of the Association for Persons with Severe Handicaps[g]	6	10
Behavioural and Cognitive Psychotherapy[h]	5	11
Journal of Visual Impairment and Blindness	5	10
Other (less than 5 articles)	74	119
Total (*N* = 63 journals)	396	706

[a]*Applied Research in Mental Retardation* merged with *Analysis and Intervention in Developmental Disabilities* to become *Research in Developmental Disabilities.* [b]Formerly *Behavioral Residential Treatment.* [c]Formerly *American Journal of Mental Deficiency.* [d]Formerly *Journal of Mental Deficiency Research.* [e]Formerly *Journal of the Multihandicapped Person.* [f]Formerly *Journal of Autism and Childhood Schizophrenia.* [g]Formerly *Journal of the Association for Education of Persons with Severe and Profound Handicaps.* [h]Formerly *Behavioural Psychotherapy.*

98.9% [gender]). Agreement for treatment efficacy was 97.6% (range = 61.1% to 100%).

Results

We identified 396 articles published in 63 journals covering the period 1964 to 2000 through the literature search. (A complete list of articles is available from the first author.) These articles yielded 706 data sets (i.e., participants) that met the criteria for inclusion in this review (Table 1). The *Journal of Applied Behavior Analysis* accounted for nearly a third of the articles and data sets, which might be expected given its emphasis on the use of behavioral interventions and single-subject designs. Although a steady stream of research has been published on the treatment of SIB since the early 1970s, there has been an increase since the early 1990s (Figure 1).

Demographic Characteristics

Participants. Most of the participants in research on the treatment of SIB were male (56.9%),

diagnosed with severe or profound mental retardation (71.2%), and age 19 or older (40.5%). The most common secondary diagnosis was visual impairment (13.9%), although nearly two thirds of the studies did not include this information (Table 2).

Topography. Over a quarter (27.6%) of the participants engaged in multiple topographies of SIB. The most common forms of SIB, however, were
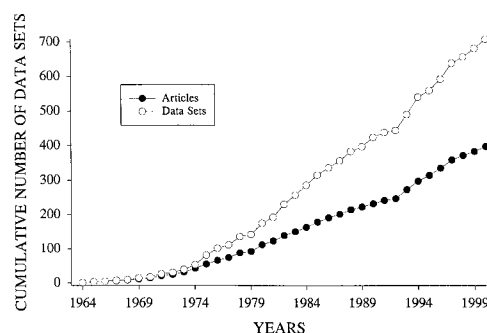
Figure 1. Cumulative number of articles and data sets on the behavioral treatment of SIB.

Table 2. Participant Characteristics

Characteristic	n	%
Gender		
Male	402	56.9
Female	304	43.1
Level of mental retardation		
Severe/profound	503	71.2
Moderate	60	8.5
Mild	15	2.1
No data	128	18.1
Age		
0 to 10	212	30.0
11 to 18	175	24.8
19 and over	286	40.5
No data	33	4.7
Secondary diagnosis[a]		
Visual impairment	98	13.9
Autism	71	10.1
Hearing impairment	43	6.1
Down syndrome	32	4.5
Cerebral palsy	14	2.0
Lesch-Nyhan syndrome	13	1.8
Rett syndrome	5	0.7
Other	12	1.7
No data	419	59.3

[a]Some data sets may include more than one secondary diagnosis.

Table 3. Topographies of SIB

Topography[a]	No. of data sets	%
Head-banging/hitting	346	49.0
Biting	155	30.0
Hand-mouthing	98	13.9
Body-hitting	79	11.2
Pica	55	7.8
Vomiting/rumination	48	6.8
Scratching	40	5.7
Hair-pulling	32	4.5
Eye-poking	30	4.2
Skin-picking	16	2.3
Pinching	11	1.6
Kicking	7	1.0
Bruxism	5	0.7
Other (less than 5 data sets)	14	2.0
No data	23	3.3

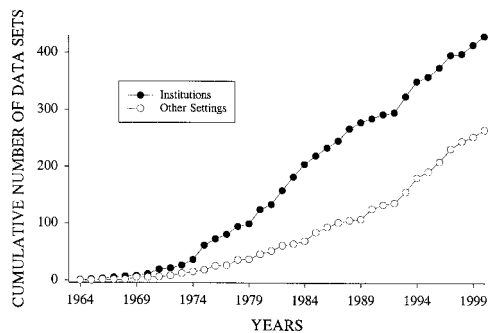[a]Some data sets may include more than one topography.

versally in recent years, as evidenced by the near-zero growth in published research in which interobserver agreement was not reported over the past 5 years (Figure 3, top panel).

Approximately two thirds (65.6%) of the data sets incorporated a single-subject experimental design with replication. Although the use of such designs has become common practice over the years, a small but noticeable proportion of published research continues to consist of uncontrolled studies (Figure 3, bottom panel).

Treatment Selection

Type of treatment. Reinforcement-based interventions have been used more frequently than punishment. Differential reinforcement of other behavior was the most common reinforcement-based intervention, and contingent manual restraint and overcorrection were the most common forms of punishment (Table 4). Of the interventions classified as neither reinforcement nor punishment, extinction, which procedurally involves the manipulation (removal) of a reinforcement contingency, was used most frequently.

Studies on reinforcement and punishment were published at about the same rate throughout the 1970s and 1980s. Since the early 1990s, however, there has been a sharp increasing trend in the number of studies on reinforcement and a

head-hitting or head-banging and biting; none of the 11 other topographies reported occurred in more than 15% of the cases (Table 3).

Treatment setting. Most research on SIB has been conducted in residential institutions (60.3%) or other specialized or group settings such as hospitals (14.3%) or schools (13.5%). By contrast, very little research has occurred in either less controlled or more community-oriented settings, such as the home (3.1%), outpatient clinic (3.1%), or group home (2.5%). When viewed longitudinally (Figure 2), however, it appears that research in institutional and noninstitutional settings has been conducted at about the same rate since the early 1990s.

Methodology

Results obtained from assessment of interobserver agreement were reported for over three quarters of the data sets (76.8%). This methodological practice appears to have been adopted uni-

Figure 2. Cumulative number of data sets collected in institutional versus noninstitutional settings.

gradual decline in the number of studies on punishment (Figure 4). These trends may reflect, to some extent, a change in philosophical orientation favoring "less restrictive" forms of intervention. It is interesting to note, however, that the sudden acceleration in research on reinforcement-based interventions coincides with rapid growth in the use of functional-assessment procedures. In fact, there was a very high degree of correspondence between the use of functional assessment and the selection of reinforcement-based interventions.

Effectiveness. The mean outcome of all reported treatments was an 83.7% reduction in SIB from baseline to treatment, and most treatments were
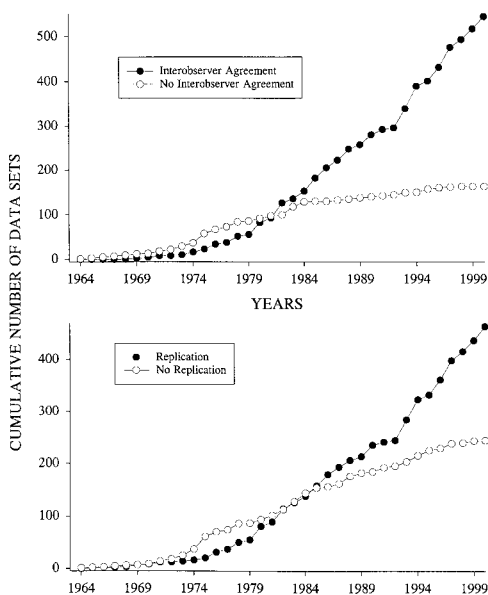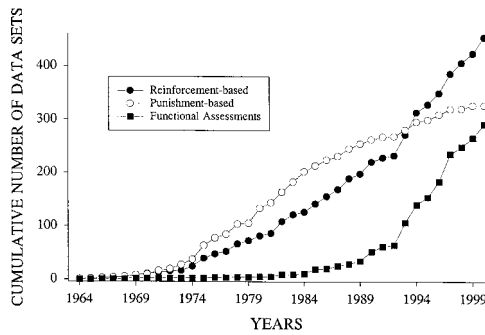

Figure 3. Cumulative number of data sets with interobserver agreement (top panel) and experimental replication (bottom panel).
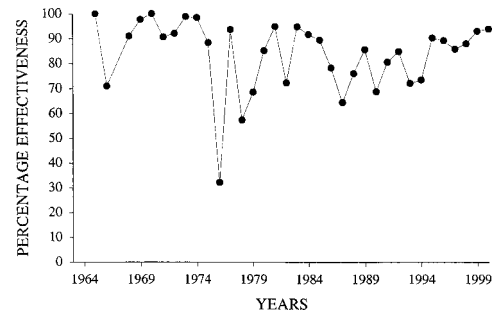
Table 4. Treatment Procedure

Treatment	No. of applications[a]	%[b]
Reinforcement[c]	437	42.2
DRO	176	17.0 (40.3)
DRA	134	12.9 (30.7)
NCR	127	12.3 (29.1)
Punishment	342	33.0
Manual restraint	67	6.5 (19.6)
Overcorrection	66	6.4 (19.3)
Shock	39	3.8 (11.4)
Timeout	34	3.3 (9.9)
Facial screen	25	2.4 (7.3)
Watermist	19	1.8 (5.6)
Protective equipment	18	1.7 (5.3)
Exercise	15	1.4 (4.4)
Smell	14	1.4 (4.1)
Taste	11	1.1 (3.2)
Response cost	7	0.7 (2.0)
Demands	5	0.5 (1.5)
Other (less than 5 data sets)	22	2.1 (6.4)
Extinction	110	10.6
Mechanical restraint	53	5.1
Antecedent manipulation	46	4.4
Response block	27	2.6
Exercise	12	1.2
Other (less than 5 data sets)	8	0.8

[a]Data sets may have included several different treatments. [b]Numbers in parentheses represent the percentage of applications within that particular treatment category (i.e., reinforcement or punishment). [c]DRO = differential reinforcement of other behavior, DRA = differential reinforcement of alternative behavior, NCR = noncontingent reinforcement.

successful in reducing SIB by at least 80% (Table 5). Exceptions were found for the category of reinforcement-based interventions: When used alone and in conjunction with response blocking, reinforcement produced reductions in SIB of approximately 73% for both procedures. In general, intervention effectiveness has not increased across years (Figure 5). The only apparent trend over time has been a reduction in the variability in effectiveness, especially during the past 6 years. From 1964 to 1995, the range of effectiveness was 32.1% to 100% ($M = 82.4\%$), whereas from 1996 to 2000, the range was 85.6% to 93.7% ($M = 89.8\%$).

Figure 4. Cumulative number of data sets based on the application of reinforcement and punishment procedures, and number of data sets derived from functional assessments.

Follow-up and generalization. Follow-up data, ranging from 2 weeks to 7 years posttreatment (*M* = 15.7 months), were reported for only 13.7% of the data sets. Generalization of treatment was assessed in only 11.0% of the data sets, with the majority of those involving generalization across setting (5.2%) or therapist (3.5%).

Discussion

Since the late 1960s, a steady stream of research has been published on behavioral approaches to the treatment of SIB, with a noticeable increase in activity during the past decade. Approximately 10.9 articles were published per

Figure 5. Percentage effectiveness for all interventions across the years.

year during the 20-year period from 1971–1990; this number increased to 16.5 articles per year from 1991–2000. A great majority of the research continues to consist of case studies and small-*N* investigations; the number of participants has averaged only 1.8 per study. This may reflect difficulties in conducting research with larger numbers of participants with SIB (or in finding many such individuals at a single site) or merely the fact that small-*N* research is very common in behavior analysis. Nevertheless, it is clear that most of what we know about the treatment of SIB is based on generalizations from many small data sets. Although this fact makes comparisons across studies difficult due to methodological differences, the accumulation of multiple, independent replications may increase the external validity of findings.

Table 5. Effectiveness of Treatment Either Alone or in Conjunction With Another Intervention (in %)

Treatment	Antecedent	Extinction	Reinforcement	Punishment	Response block	Mechanical restraint
Antecedent	87.2 (*n* = 39)	94.3 (*n* = 15)	100.0 (*n* = 4)	—	95.8 (*n* = 6)	99.5 (*n* = 2)
Extinction		82.6 (*n* = 26)	77.4 (*n* = 36)	97.8 (*n* = 4)	97.2 (*n* = 2)	99.5 (*n* = 1)
Reinforcement			73.2 (*n* = 195)	83.7 (*n* = 92)	72.6 (*n* = 8)	87.7 (*n* = 4)
Punishment				83.2 (*n* = 194)	—	94.7 (*n* = 2)
Response block					90.6 (*n* = 4)	—
Mechanical restraint						91.4 (*n* = 33)

Note. Treatment alone = identical column and row labels; in conjunction with another intervention = different column and row labels.

An analysis of demographic characteristics reveals that most participants tended to be male, diagnosed with severe or profound mental retardation, and treated for SIB that primarily consisted of head-hitting/head-banging or biting, which, at first glance, may appear to reflect a bias in sampling. However, these characteristics are consistent with published data on the prevalence of SIB (e.g., Griffin et al., 1986; Maurice & Trudel, 1982). Thus, participant characteristics in treatment research seem to coincide with those found in the larger population of individuals diagnosed with developmental disabilities. Over the past 20 years, over two thirds of this population has moved from institutional to community residences (Lakin, Anderson, Prouty, & Polister, 1999). Nevertheless, research on SIB continues to be conducted at about the same rate in institutional settings, perhaps because a large proportion of those still living in institutions have more severe functional limitations as well as interfering behaviors that pose as barriers to community placement.

With respect to methodology, virtually all studies published during the past 5 years included an assessment of interobserver agreement, and a similar finding was observed for replication. Nevertheless, a small proportion of published research involves evaluation of treatment without proper experimental control (e.g., AB designs), which has led some researchers to question the outcome of studies in which intervention effects may have been confounded. For example, Berkman and Meyer (1988) treated the multiple SIBs of a 45-year-old man using a successive series of interventions consisting of DRO, mechanical restraint, antecedent manipulation, DRA, and physical restraint. In a reanalysis of their data, Linscheid and Landau (1993) noted the absence of replication for any of the interventions and, further, found that the reduction in SIB, which Berkman and Meyer attributed to the behavioral treatments, coincided with the introduction of a medication—chlorpromazine. The extent to which behavior change was a function of environmental versus pharmacological treatment may have been clarified with a more rigorous experimental design (e.g., reversal design and multiple-baseline across settings design).

Data on the selection of behavioral interventions revealed a gradual decrease in the use of punishment across years and a dramatic increase in the use of reinforcement-based interventions. The sharp and continued rise in research on reinforcement procedures beginning in the late 1980s seems to reflect more than a trend away from the use of punishment. Several authors (Kahng et al., 2002; Pelios, Morren, Tesch, & Axelrod, 1999) have noted that there has been a large increase in the use of functional assessment as the basis for treatment, particularly during the last decade, which places emphasis on interventions involving the alteration of reinforcement (rather than punishment) contingencies.

Finally, the analysis of treatment effectiveness revealed that in a large majority of studies, investigators reported reductions in SIB from a baseline of 80% or greater, although there were some differences across interventions. Caution must be taken, however, when making general conclusions about the effectiveness of intervention based on published findings. Reluctance on the part of researchers to submit data reporting treatment "failures," and on the part of editors to publish these data, tend to bias treatment effects toward positive outcomes (Johnson & Baumeister, 1978). An exception may be found in studies comparing two or more interventions. In these cases, failure data may be published as a basis for comparison with an alternative, more effective intervention. Thus, it is possible that researchers may tend to use a relatively "generic" or arbitrary reinforcement procedure as a standard for comparison, resulting in a lower percentage of effectiveness for such interventions. Another factor that may affect treatment efficacy is whether a functional assessment was conducted prior to treatment. Several researchers (Iwata et al., 1994; Kahng et al., 2002) have suggested that the design of effective extinction and differential reinforcement procedures may be heavily dependent on the results of functional assessments. By contrast, the effectiveness of punishment and other nonreinforcement procedures, such as mechanical restraint, may be unaffected by behavioral function.

A somewhat surprising finding was the fact that there has been little change in the overall effectiveness of behavioral interventions across years, with the exception of reduced variability in the data, which appeared to be the result of differences in the number of data sets across years (there were far fewer earlier studies). In addition, fewer older studies met the criterion for inclusion in the calculation of overall effectiveness because many did not include a baseline phase. Thus, in spite of the many advances in procedural refinement and methodology that characterize current

research in behavior analysis, it is discouraging to find that SIB continues to be a disorder that is very difficult to treat. Increasing evidence suggests that some proportion of SIB can be maintained by biological sources of reinforcement (Sandman & Hetrick, 1995), which may be unresponsive to interventions based solely on the arrangement of environmental contingencies. Most research on pharmacological approaches to the treatment of SIB, however, has been characterized by a number of methodological limitations (Baumeister & Sevin, 1990; Matson et al., 2000). Therefore, well-controlled research is needed on the combined use of carefully selected behavioral and biological interventions to determine whether such approaches yield better results than those to date.

Given the difficulty in treating SIB once it has become a significant problem, future research may also benefit from a change in emphasis so that greater attention is focused on the *prevention* of SIB (Schroeder, Bickel, & Richmond, 1986). The first step in preventing SIB requires identification of factors that predict the development of the disorder. For example, Salovitta (2000) found a correlation between functioning level and the occurrence of SIB: a higher prevalence of SIB among individuals with severe or profound disabilities relative to individuals with mild or moderate disabilities. Although these data do not identify any particular strategy for intervention, results of intervention research have shown that much of SIB functions as either attention-seeking or escape behavior or as behavior that is maintained by sensory stimulation. Thus, early intervention research with individuals having severe disabilities might evaluate the preventive effects of curricula that emphasize enriched social stimulation, communication training (requesting attention), errorless learning strategies, and/or the development of leisure skills (play behavior), which may reduce the likelihood that SIB will acquire reinforcing properties.

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