Research on Self-Management Techniques Used by Students with Disabilities in General Education Settings: A Promise Fulfilled?

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Abstract

This comprehensive review synthesizes findings from 43 studies in which students with disabilities utilized behavioral self-management (BSM) techniques in general education settings. Findings suggest that the long-standing promise of BSM as an inclusive technique has been partially fulfilled. The review identifies strengths and limitations of BSM studies and BSM techniques, provides recommendations for future research and practice, and identifies BSM training materials.

Recent Research on Self-Management Techniques Used by Students with Disabilities in General Education Settings: A Promise Fulfilled?

Researchers and practitioners have long noted the promise of behavioral self-management (BSM) to improve academic and social outcomes, especially for students with disabilities and their teachers, and to promote inclusion of such students in general education (GE) settings (McDougall, 1998). Extensive support for BSM efficacy is evident in early reviews (McLaughlin, 1976; O'Leary & Duby, 1979), later reviews (Hughes, Ruhl, & Misra, 1989; Martin & Mithaug, 1986; Nelson, Smith, Young, & Dodd, 1991; Skiba & Casey, 1985; Stage & Quiroz, 1997; Wolery & Schuster, 1997), and recent reviews (Barry & Haraway, 2005; Hitchcock, Dowrick & Prater, 2003; Lancioni & O'Reilly, 2001; Mooney, Ryan, Uhing, Reid, & Epstein, 2005; Post & Story, 2002). However, very few of the hundreds of BSM studies published since 1970 have targeted students with disabilities in GE settings. In this review, we examine BSM efficacy for students with disabilities in GE settings. We also evaluate how BSM has fulfilled its promise as an inclusive technique and provide corresponding recommendations.

The Promise and Benefits of BSM for Students, Teachers, and Inclusive Education

For students, BSM: (a) "has offered the promise of a set of procedures to modify undesirable behavior without relying on external agents (such as parents, teachers, peers) to administer reinforcement and punishment contingencies" (Christie, Hiss, & Lozanoff, 1984, p. 392); (b) "encourages the child to become a more responsible agent in the education process [and] engenders initiative and independence" (Rooney, Hallahan, & Lloyd, 1984, p. 360); (c) reduces dependence on external agents and teachers for reinforcement, control, and guidance (Nelson, Smith, Young, & Dodd, 1991; Workman & Hector, 1978); (d) helps students "learn and behave in the absence of adult oversight" (Prater, Hogan & Miller, 1992, p. 44); (e) helps students meet teacher expectations for routine performance in GE settings, including completing tasks accurately, arriving punctually at class, having materials ready, and completing homework (Clees, 1994-5); (f) promotes self-regulation, responsibility, and skills that students use

throughout their lifetime (Hogan & Prater, 1993); (g) reduces excessive or coercive adult control (Dunlap, Dunlap, Koegel, & Koegel, 1991; Falk, Dunlap & Kern, 1996); and (h) promotes active involvement and counters inactive learning styles, strategy deficiencies, inattentiveness, and passivity (Hallahan, Marshall, & Lloyd, 1981; Prater, Joy, Chilman, Temple, & Miller, 1991; Rooney, Hallahan, & Lloyd, 1984).

For teachers, BSM 'frees up' time to plan lessons, design learning environments, and instruct lessons rather than manage problem behaviors (Rosenbaum & Drabman, 1979; Trammel, Schloss & Alper, 1994). BSM requires less supervision compared to teacher-directed strategies (Dunlap, Dunlap, Koegel, & Koegel, 1991) and it increases efficiency by saving teachers' time and money (Clees, 1994-5; Gardner, Clees, & Cole, 1983).

After passage of the Education of All Handicapped Children Act of 1975 and its corresponding mandate to provide services in the least restrictive environment, the literature noted the promise of BSM as an inclusive technique (McDougall, 1998). Rooney, Hallahan, and Lloyd (1984) reported that BSM "holds promise of use in mainstream settings" (p. 363) and "seems particularly well-suited for use in regular classrooms" (p. 360). In addition, Edwards, Salent, Howard, Brougher, and McLaughlin (1995) noted that BSM "holds promise for use in mainstream settings for students with very compelling educational needs" (p. 12) and that BSM "techniques are a powerful tool which might allow otherwise segregated children to be included in the regular classroom" (p. 16). The literature consistently cites a few reasons why BSM has the potential to promote inclusion. First, BSM techniques are portable across settings (Thoreson & Mahoney, 1974). Second, BSM techniques can promote maintenance and generalization of performance from training and special education settings to GE settings (Falk, Dunlap & Kern, 1996; Osborne, Kiburz & Miller, 1986; Rhode, Morgan, & Young, 1983). Third, BSM techniques are adaptable, unobtrusive, easy to implement, and accommodate individual students needs without overburdening teachers (Dunlap, Dunlap, Koegel, & Koegel, 1991). Thus, GE teachers, whose classes now include more students with disabilities than in the past, might be more willing to implement BSM than more intrusive procedures (Hogan & Prater, 1993; Prater Hogan, & Miller, 1992; Rooney, Hallahan, & Lloyd, 1984).

BSM Efficacy and the Need for Research and Application of BSM in General Education

In a comprehensive review of BSM studies published from 1970 to 1997, McDougall (1998) concluded that BSM produced relatively consistent moderate-to-strong outcomes for students with disabilities in inclusive GE settings. However, like Hughes, Ruhl, and Misra (1989) one decade earlier, McDougall (1998) lamented the unfulfilled promise of BSM, as evidenced by the paucity of Category III studies (n = 13), in which students with disabilities applied BSM techniques in GE settings, compared to more than 240: (a) Category I studies, in which students with disabilities applied BSM techniques in non-integrated settings, such as resource rooms; and (b) Category II studies, in which students without disabilities applied BSM techniques in GE settings. McDougall also identified issues for researchers and teachers to address when having students with disabilities use BSM in GE settings. See Table 3, left column. First, train students directly in the GE settings where they will use BSM techniques, rather than training them in special education settings and expecting generalization to GE settings. Second, ensure via periodic monitoring that students actually use the BSM techniques in the manner expected (i.e., punctually and accurately). Third, apply BSM techniques (self-evaluation, self-graphing, self-reinforcement, self-modeling, and self-instruction) and target dependent variables (social interaction, homework completion, and aggressive behaviors toward self and others) that are rare

in Category III students, but which have empirical support via Category I and II studies. Likewise, expand use of BSM beyond: (a) academic classes, to the playground, cafeteria, hallways, gym, music, and art; and (b) students with learning disabilities, emotional-behavioral disorders, and AD/HD, to students with mental retardation, autism, and other disabilities.

BSM Models and Techniques

BSM techniques reviewed here are based on cognitive-behavioral models that attribute self-directed learning and behavioral self-control (BSC) to the reactive effects of cognitive factors, such as awareness and self-talk, and behavioral factors, such as antecedents, observable actions, and consequences (Kanfer & Karoly, 1972a, 1972b; Meichenbaum, 1977; Rachlin, 1974; Skinner, 1953). In 1973, Glynn, Thomas, and Shee proposed a four-component model of BSC: (a) self-assessment (e.g., covert questions about performance, such as "Am I on-task?"); (b) self-recording (e.g., overt responses to self-assessment questions, such as checking yes or no on a self-recording form); (c) self-determination of reinforcement (i.e., specifying types, amounts, and schedules of reinforcement); and (d) self-administration of reinforcement (i.e., delivering reinforcement contingent on performance). The first two components in this BSC model comprise self-monitoring, which can be cued covertly (i.e., student reminds self) or overtly (e.g., via tape-recorded audio cues). Meichenbaum (1977) described another traditional BSC component, self-verbalization or self-instruction, in which students talk themselves through a task (e.g., studying, "Look at the first word, say and spell it. Car, c-a-r.").

In the 1980s, the term BSM replaced the term BSC. Researchers and practitioners reported that BSM skills were necessary for self-determination, whereby individuals with disabilities have "the capacity to choose and to have those choices be the determinants of one's actions" (Deci & Ryan, 1985, p.38). Researchers have developed additional BSM components, such as: (a) self-graphing, whereby students obtain on-going feedback by charting results soon after they perform a task (DiGangi, Maag, & Rutherford, 1991; McDougall & Brady, 1998); (b) self-evaluation, whereby students judge the quality of their own performance (Grossi & Heward, 1998); and (c) video self-modeling (VSM), whereby students view videotaped images of themselves performing tasks and, thereby, serve as their own model (Dowrick, 1999; Hitchcock, Dowrick & Prater, 2003; Lonnecker, Brady, McPherson, & Hawkins, 1994).

Purposes of this Literature Review

Our purposes were to analyze critically Category III BSM studies published since McDougall's (1998) review and to provide corresponding recommendations for researchers and practitioners. We expanded upon McDougall's three major questions.

1. "To what extent have researchers investigated the use of BSM techniques by students with disabilities in general education settings?" (p. 312). Have researchers expanded investigations of BSM techniques in integrated or inclusive settings?
2. "How have these BSM techniques been implemented (e.g., specific procedures used, participants and types of disabilities selected, and outcome variables targeted)?" (p. 312). Have investigators diversified BSM techniques and applied novel BSM techniques in integrated or inclusive settings?
3. "How effective have BSM techniques been in improving academic and social outcomes for students with disabilities in general education settings?" (p. 312). To what extent have BSM techniques fulfilled their oft-cited potential as inclusive techniques?

Method

Search Process

The first author searched for Category III BSM studies using: (a) EBSCOhost, Academic Search Premier, ERIC, Professional Development Collection, PsycINFO, and Psychology and Behavioral Sciences Collection; (b) published reviews on BSM; (c) manual inspection and computer-index scanning of recent journal issues; and (d) reference lists of articles from the aforementioned sources. Initial web-based searches utilized the terms self and management and disabilities in the default field. Subsequent searches combined BSM terms (see Criteria for Selecting BSM Studies, item 4) with other terms (general education, special education, video, learning disabilities, emotional, behavioral, disorders, disturbance, impairment, autism, speech, hearing, visual, mental retardation, developmental disabilities, attention deficit, and hyperactivity). The first author read and eliminated all search-generated abstracts for articles that clearly failed to qualify for this review. Then he obtained, read, and screened full-text articles for all remaining abstracts via on-line services, interlibrary loans, and visits to libraries at major universities in five states in the US. We also contacted authors of difficult-to-access articles.

Criteria for Selecting BSM Studies

We used the following inclusion and exclusion criteria, which we adapted from McDougall (1998), to identify studies that qualified as Category III BSM interventions.

1. Study participants included at least one student with an identified disability according to guidelines from: (a) the 1997 Amendments of the Individuals with Disabilities Act or the Individuals with Disabilities Education Act of 1990; (b) Section 504 of the Rehabilitation Act of 1973; (c) state and local education agencies; and (d) national or provincial sources. We excluded studies that did not document disability status and those that only identified participants as being at risk or having learning or behavior problems.
2. Study settings included at least one GE classroom or school-related environment that included the concurrent presence of students with and without disabilities. Settings could not be only non-integrated locations, such as self-contained classrooms, resource rooms, or special programs, where only students with disabilities, or students with disabilities and 'at-risk' students, were present (e.g., Category I studies). Settings also could not be locations where only students without disabilities were present (e.g., Category II studies).
3. Dependent variables included quantitative measures of: academic engagement, performance, or outcomes; related academic variables; or social behaviors. We excluded descriptive studies without quantitative measures of targeted outcomes and studies that reported only qualitative measures, verbal reports, or anecdotal information.
4. Interventions included one or more BSM components: self-monitoring and its two constituent components, self-assessment and self-recording; self-evaluation; self-instruction; self-reinforcement; self-graphing; and self-modeling.
5. Studies were published in professional journals from January 1997 to June 2005.

Finally, because extensive documentation exists already (cf: Algozinne, Browder, Karvonen, Test, & Wood 2001; Graham, Harris, & Troia, 2000; Palmer & Wehmeyer, 2003), we excluded studies of self-regulated strategy development and self-determination unless the studies used BSM as the primary intervention.

Framework for Reporting Data and Coding Information from Category III BSM Studies

We adapted McDougall's (1998) framework to report descriptive data in Table 1 and findings about procedural and outcome variables in Table 2. To bolster the credibility of information reported in Tables 1 and 2, we operationally defined variables of interest, used coding directions, and trained independent coders. The first author was the primary coder and the remaining authors and research assistants were secondary coders. We calculated appropriate indices of agreement that included: (a) percentage of inter-coder agreement (I-CA = equals number of agreements divided by number of agreements plus disagreements, multiplied by 100%); (b) Kappa (k) to adjust I-CA for chance agreements on dichotomously coded variables (Cohen, 1960); and (c) correlation coefficients (r).

Agreement for variables reported in Table 1 was as follows: total number of participants, number of female participants, and number of male participants in each study (r = 1.00); number of participants by disability (r = 1.00); settings (I-CA = 100%); dependent variables and dependent variables measurement (IC-A = 96%); independent variables (I-CA = 100%); research designs (I-CA = 100%). Agreement for variables reported in Table 2 was as follows: magnitude of intervention efficacy (IC-A = 86%); presence of information on intervention integrity (I-CA = 100% and k = 1.00 for both initial training and ongoing adherence to intervention procedures); magnitude of reliability of dependent variable measurement (I-CA = 100%); use of Kappa (I-CA = 100%, k = 1.00); formal use of maintenance probes or follow-up (I-CA = 100%, k = 1.00); formal use of generalization probes (I-CA = 100%, k = 1.00); social validity [(I-CA = 100% and k = 1.00 for both the social comparison and subjective evaluation methods (Kazdin, 1982)].

Findings for Descriptive Variables

Table 1 and the following paragraphs summarize descriptive data from the 43 Category III studies that qualified for this review.

Authors and Year of Publication. The most prolific authors were Wehmeyer, Hughes, and Agran, who teamed and co-authored 9 studies. Buggey, Copeland, Fowler, and Rock authored 3 studies each. Blanchard, Church-Pupke, DuPaul, Horner, and Todd authored 2 studies each. Four to five studies were published each year from 1997 through mid-2005, except for 2003 (n = 3) and 2005 (n = 7).

Participants

Number. The 43 studies included a total of 385 participants (range = 1 to 123 participants). The median and mode number of participants was 3 (n = 11 studies). Nine studies had one participant and eight studies had two participants. Two quasi-experimental group studies had 172 (i.e., 123 and 49) of the 385 total participants. One applied behavior analysis or 'small-n' study with a multiple baseline design across three classrooms used 97 participants.

Gender and age. Sixty-seven percent of the participants were male and 33% were female. Authors of one study did not identify participants' gender. Participants ranged in age from 4 to 19 years old. The number of studies that included primarily participants of the following age ranges were: 15 to 19 years (n = 6); 12 to 15 years (n = 9); 8 to 12 years (n = 17); 5 to 8 years (n = 10); and pre-k or 4 years (n =1).

Disability status. Twenty-two of the 43 studies included participants with a single disability; 21 studies included participants with more than one disability. In order of magnitude, these disabilities, with the corresponding number of studies that included participants with that

disability in parentheses, were mental retardation (11), learning disabilities (10), autism (9), serious emotional disturbance or behavior disorders (7), speech-language impairments (7), AD/HD (4), Asperger (4), hearing impairments (3), developmental disabilities (3), and visual impairments (2). The following disabilities were represented in one study each – other health impairments, orthopedic impairments, physical disabilities, multiple disabilities, mild educational handicap, oppositional defiant disorder, and pervasive developmental delay.

Settings

Thirty-five of 43 studies utilized multiple settings and eight studies used a single setting. Some authors broadly identified settings as a GE classroom (n = 9 studies) or a special education classroom (n = 5 studies). However, most authors specifically identified classes. These classes, with the corresponding number of studies that utilized such settings in parentheses, were math (7), reading (5), physical education/gym (5), science (4), social studies (4), English (3), history (3), language arts (3), and art (2). In addition, each of the following classes served once as a setting in a study – agricultural biology, agricultural mechanics, auto mechanics, cosmetology, Gaelic, life skills, occupational health, religion, and Spanish. Other settings were school hallways (4), playground and recess (3), free time (2), free play (2), work-time (2), seatwork (1), circle time (1), center time (1), lunch (1), study hall (1), homeroom (1), library media center (1), and a classroom leisure setting (1). One study used multiple settings outside the school, including a pubic library, a fast food restaurant, and a neighborhood street.

Dependent Variables

Thirty-four of 43 studies targeted multiple dependent variables. Dependent variables targeted most frequently, with the corresponding number of studies in parentheses, included: variations of on-task, engaged, and disruptive behaviors (25); social skills and communication (14); variations of academic performance (10); 'classroom survival' or 'essential' skills, such as having materials ready (9); and teacher praise (2). Homework completion was the primary dependent variable in one study, although additional studies incorporated homework completion as part of multi-faceted outcome measures. A few studies also measured teachers' perceptions of participants' performance or behavior. Teachers and researchers prescribed target behaviors in 37 studies. Participants selected or helped to select their target behaviors in the 6 remaining studies.

Measurement of Dependent Variables

Of the 39 studies that used observational recording systems to measure dependent variables, 24 reported data as the percentage of intervals in which the target behavior occurred. Nineteen studies reported simple frequency counts and 15 studies reported data on the percentage of responses, skills, or steps completed or completed correctly. Eleven studies collected permanent products, such as students' written work. Eight studies used informal ratings, such as Likert-type scales, and six studies used formal instruments (e.g., published scales). Three studies reported rate, two studies reported duration, and one study reported latency.

Independent Variables

Self-monitoring (n = 26) and self-evaluation (n = 19) were the most frequently applied BSM components, followed by self-reinforcement (n = 8), self-instruction (n = 6), VSM (n = 4), self-selection of goals (n = 3), and self-graphing (n = 2). Independent variables in 11 studies included antecedent cue regulation with visual or audio prompts, which included communication books, photo activity schedules, cards with pictures or written phrases, and self-operated auditory prompts. Independent variables in 17 studies included multiple BSM components. Finally, 29 of

43 studies combined BSM with 'external' intervention features, such as externally delivered reinforcement or prompts, corrective or performance feedback from teachers, and sessions when teachers and students compared their respective observations or data.

Research Designs

Thirty-eight of 43 studies utilized small-n research designs. Three other studies utilized quasi-experimental group designs and the two remaining studies did not utilize systematic research designs (i.e., an uncontrolled case study and a descriptive demonstration). Of the 38 small-n designs, 3 used primarily reversal designs and 34 used variations of the multiple baseline, including 2 multiple probe designs. Two small-n studies used a changing conditions design rather than the designs that authors reported. A few investigators embedded additional small-n design elements (i.e., reversal phases, alternating treatments, and multiple probes) to supplement the primary research design of their respective studies. Finally, investigators often incorporated phases to fade intervention components.

Findings on Efficacy, Integrity, and Outcomes of BSM Interventions

Table 2 and the following paragraphs summarize findings for intervention efficacy, as well as procedural integrity and outcome variables.

Intervention Efficacy

For studies that used small-n research designs, we evaluated functional control of interventions. That is, we visually inspected graphed data for changes in means, changes in trends, changes in level, stability-variability, latency, and overlap (Kazdin, 1982). For studies that used quasi-experimental group designs, we examined results of inferential statistical procedures used to test research hypotheses. We also searched for author-reported effect sizes in all studies. In the 38 studies that used small-n designs, BSM interventions demonstrated: (a) strong functional control over target behaviors in 12 studies; (b) moderate-strong functional control in 8 studies; (c) moderate-mixed functional control in 9 studies; and (d) weak, limited, or no functional control in 9 studies. Three quasi-experimental group studies demonstrated mixed-moderate efficacy. Two studies failed to use systematic research designs, which precluded evaluation of intervention efficacy. Only 2 of the 43 studies reported effect sizes.

Intervention Integrity

We identified whether authors reported numerical indices to verify the quality of: (a) initial training procedures (e.g., training participants or teachers to a specific mastery criterion on BSM); and (b) treatment fidelity or adherence to ongoing intervention procedures (Mertens, 1998). Twenty-seven studies did not report an index for quality of initial training procedures and 29 studies did not report an index for adherence to ongoing intervention procedures. Only seven studies reported numerical indices for both of these elements of intervention integrity. These indices, when reported, almost always reflected high levels of intervention integrity.

Interobserver Agreement or Reliability Indices for Dependent Variable Measures

Thirty-five of 43 studies included indices of interobserver (IO) agreement or reliability for dependent variable measures. Of these 35 studies, IO agreement or reliability was high for 25 studies, moderate to high for 4 studies, and moderate in 5 studies. We could not evaluate reliability for one of these 35 studies because the IO calculation formula (A/A+D x 100%) reported appeared to be inconsistent with the dimension of measurement for the dependent

variable (i.e., duration measures require the formula, shorter duration/longer duration x 100%). Although 38 of 43 studies used observational recording systems amenable to Kappa, only three studies used Kappa and only 2 of these 3 studies included clear data for Kappa.

Maintenance Probes or Follow-up

Investigators in 5 of the 43 studies formally assessed maintenance of changes in participants' target behaviors. Formal assessment of maintenance required non-contiguous data collection - that is, an intervening period between the last session of the final intervention phase of contiguous data collection and the first maintenance probe or follow-up session. Maintenance was strong in each of these 5 studies and these investigators collected maintenance data 2 weeks to 6 months after the final intervention phase ended. Investigators in 23 of the 43 studies informally assessed maintenance when they collected contiguous data during: (a) post-training phases that immediately followed a training phase; or (b) phases when they faded, reduced, or removed intervention components. Maintenance was strong in most of these 23 studies. Finally, investigators in 15 studies failed to address maintenance.

Generalization

Investigators in most studies indirectly or directly addressed generalization of treatment impact. For example, investigators in 34 studies measured treatment impact on more than one dependent variable; 35 studies reported outcomes in more than one setting. Participants in eight studies were trained initially or first used BSM in special education settings, then applied BSM techniques in GE settings with additional or continual training, or with elements of initial training. Investigators in 35 studies trained participants or measured initial outcomes directly in GE settings and, thereby eliminated the need to determine whether intervention effects generalized from special education to GE settings. Three studies failed to address generalization in any manner, either directly (e.g., via generalization probes) or indirectly (e.g., via multiple dependent variables or multiple baseline designs).

Social Validity of Changes in Target Behaviors

Investigators in 23 of 43 studies assessed the social validity of improvements in participants' target behaviors - 15 used subjective evaluation, 5 used social comparison, and 3 used both subjective evaluation and social comparison methods (Kazdin, 1982). Nearly all data supported the contention that changes in participants' target behaviors were socially valid.

BSM in Inclusive Settings – A Promise Partially Fulfilled

Based on findings from this review, BSM has partially fulfilled its oft-cited promise as an inclusive technique. However, only about half of the 43 studies reviewed here demonstrated moderate to strong efficacy, a few BSM techniques remained underutilized, and limitations plagued many studies.

Proliferation of Category III BSM Studies

Journal publications of Category III BSM studies have proliferated greatly since 1997. McDougall (1998) identified 13 studies published in 8 journals from 1970 to 1997 – a publication rate of about one study every two years. We identified 43 studies published in 26 journals from 1997 to mid-2005 – a publication rate of about five studies per year. Consumers of these journals tend to be professionals in special education and disabilities. No studies of this

type have been published in journals with GE titles. However, researchers have disseminated findings beyond special education to related services disciplines – a pattern not evident in McDougall's previous review. Thus, we recommend further use of BSM in inclusive settings to help students monitor performance of skills acquired via speech, physical therapy, and counseling services. We also recommend that researchers publish studies in journals read primarily by general educators to promote awareness and use of BSM in GE settings.

Malleability of BSM Applications

Our second research question addressed how investigators have applied and diversified BSM techniques in inclusive settings. Since 1997, investigators have (a) applied traditional and novel BSM techniques, and (b) expanded the range of participants (disability and age), settings, and dependent variables. See Table 3. Self-monitoring in various forms continues to be the most frequently used and most versatile BSM technique. Emerging BSM techniques include self-recruitment of reinforcement and variations of self-instruction. Researchers also used BSM in conjunction with functional behavioral assessment, positive behavioral supports, and goal setting, and, thereby, established a trend toward having participants become more active agents in these interventions (e.g., by having students select target behaviors).

We recommend that teachers expand students' use of self-monitoring in inclusive settings because it has the broadest empirical support of all BSM techniques. Moreover, self-monitoring is very versatile. Students can cue themselves to self-monitor via auditory, visual, and covert cues. Self-monitoring also can be combined with other techniques, takes relatively little time and expense to train, and can be faded quite easily. We also recommend that researchers investigate BSM techniques rarely used in Category III studies– tactilely-cued self-monitoring, VSM, and self-graphing.

Tactilely-cued self-monitoring. Tactile cues, such as those produced by vibrating pagers, might be useful for individuals who experience difficulty responding to visual and auditory cues, GE settings in which audio or visual cues might distract other students, and individuals who wish to maintain privacy. Instructional assistants also could use such cues to manage their proximity and prevent problems that arise when they 'hover' excessively near students with disabilities in GE settings. These problems include interfering with general educators' ownership and responsibility of duties toward students with disabilities, promoting students' overreliance upon instructional assistants, and limiting students' opportunities for interaction with peers who do not have disabilities (Giangreco, Edelman, Luiselli, & MacFarland, 1997).

VSM. The paucity of Category III VSM studies is surprising for at least three reasons. First, for more than three decades, findings from studies and literature reviews provide support for the efficacy of self-modeling in various settings, for a wide range of individuals, across many behaviors, (Creer & Miklich, 1970; Dowrick, 1999; Hitchcock, Dowrick, & Prater, 2003; Hosford, 1980; Mehrag & Woltensdorf, 1990; Wert & Nesworth, 2003). Second, guidance is available on using VSM techniques, including positive self-review and video feedforward (Dowrick, 1997; Dowrick & Hood, 1978; Dowrick, Power, Manz, Ginsberg-Block, Leff, & Kim-Rupnow, 2001). Third, video technology has become more accessible and more affordable in recent years. However, VSM requires considerable time and technological effort compared to other BSM techniques. This might limit teachers' willingness to use VSM. Studies illustrate potential use of VSM for students with disabilities in inclusive settings to improve: (a) attention span of preschoolers (Dowrick & Raeburn, 1977); (b) on-task behaviors of students with

behavior disorders (Clare, Jenson, Kehle, & Bray 1986); and (c) talking among students with selective mutism (Blum, et al., 1998; Dowrick & Hood, 1978).

Self-graphing. Graphing is a simple and effective way to provide ongoing visual feedback on performance. For guidance, see two recent studies that combined self-graphing with goal setting and self-monitoring, and: (a) improved daily exercise, body weight, and cardiovascular fitness (McDougall, 2005); and (b) increased writing productivity (McDougall, in press). To maximize the reactive effects of self-graphing, students should: (a) receive systematic training in self-graphing; (b) graph their results consistently, frequently, and immediately after they complete a task; and (c) graph their performance of one or two specific, proactive tasks. Teachers can instruct students about two orientations for interpreting and acting on self-graphed data. In the personal improvement orientation, students aim to improve their performance over time and compare their current performance to their recent performance. In the normative orientation, students aim to improve their performance relative to their peers. Finally, students can post their graphs publicly or privately.

Age and time considerations. We recommend that practitioners show students how to use BSM techniques 'sooner than later.' Study findings suggest that students can apply many BSM techniques effectively during the early years of elementary school through young adulthood. Preschoolers might also benefit but additional studies are needed to verify this matter. We also recommend that teachers initiate BSM at the beginning of each school year as part of their classroom routine rather than waiting until problems arise. Claims about ease of use notwithstanding, BSM requires systematic training. Thus, we recommend that practitioners invest time efficiently during initial training. Moreover, practitioners should monitor students periodically, especially during initial use of BSM, to ensure that students use BSM techniques accurately and punctually. Finally, findings suggest that many GE teachers will require support in order to further the promise of BSM as an inclusive technique. Special education teachers can provide such support via direct collaboration with their GE colleagues in inclusive classrooms.

Room for Improvement – Methodological and Procedural Considerations

"Contemporary ABA [applied behavior analysis] standards require investigators to collect and report data that address not only outcomes for dependent variables but also maintenance and generalization of these targeted outcomes, along with social validity and IO agreement" (McDougall, 1998, p. 138). In this review, 38 of 43 studies used ABA or small-N research designs. Most of these studies failed to meet one or more of the aforementioned standards. Nearly one-half of the studies failed to assess social validity and many of studies used only the subjective evaluation method. We concur with Pierce, Reid, and Epstein (2004) that the social comparison method appears to be underutilized. Thus, we recommend that researchers use, when applicable, both the social comparison method and the subjective evaluation method. In addition, many investigators failed to formally assess maintenance and generalization. Five studies failed to report any reliability data and only three investigators used Kappa to adjust IO agreement indices for the probability of chance agreements. Thus, we recommend that investigators meet contemporary standards by reporting data for maintenance, generalization, social validity, and IO agreement. See Cohen (1960) and Kazdin (1982) for guidance on these matters.

A few studies emphasized collaborative research efforts between author-investigators and teacher-practitioners. King-Sears (1999) was notable because of extensive "co-design" (p. 134) efforts between the teacher and researcher. A few other authors presented information about

accommodating teacher preferences or responding to the immediate needs or daily classroom routines of teachers and students. These studies illustrate benefits and challenges of executing collaborative research. In some studies, the give-and-take required was justified. In other studies, methodological rigor was compromised not only by accommodating teachers' preferences, but also by factors investigators could have anticipated. For example, about one-third of the authors reported they could not train all participants, complete intervention phases, or collect maintenance data because the school year ended. Thus, we recommend that investigators schedule their studies accordingly.

Methodological and procedural weaknesses, as well as authors' failures to report such weaknesses, raise concerns. We found that for each author-reported weakness (see superscript plus signs in Table 2), authors failed to report five other weaknesses (see superscript minus signs in Table 2). Thus, we recommend that researchers be vigilant and identify explicitly, in a limitations section, the methodological and procedural weaknesses of their studies. In addition, only one-third of the studies included systematic measures on intervention integrity. Investigators should provide this data because judgments about intervention efficacy are severely limited without clear evidence of intervention integrity.

Most small-N studies adhered to conventions for reporting data. However, graphs in a few studies included basic errors (i.e., data points connected across phase lines and across non-consecutive sessions; graph captions misplaced; graphs without phase lines; no graphs). A few studies omitted indices of central tendency and many studies omitted measures of dispersion for baseline and intervention phases. Some authors did not identify their observational recording systems. Investigators and reviewers should attend carefully to such 'devil-in-the-detail' matters.

Favorable Trends

Most investigators avoided three less-than-desirable trends from earlier Category III BSM studies. First, rather than targeting one dysfunctional behavior for reduction, investigators also aimed concurrently to increase at least one functional behavior. Second, rather than targeting only 'on-task' behavior and assuming that students accrued related benefits, investigators concurrently targeted and evaluated changes in specific academic and social behaviors. Third, most participants were trained initially in GE classrooms. We believe that students will be more successful in GE settings when teachers train students in those settings. This direct approach eliminates many challenges inherent in attempting to generalize behavior from special education or separate training settings to GE classrooms where students are expected to self-manage.

Additional Recommendations for Practitioners and Researchers

We recommend that practitioners and researchers consult findings from Category I and II BSM studies, and studies of self-determination and self-regulated strategy development, where BSM components are incorporated frequently as part of multi-component interventions. See, for example, how to combine goal setting with self-instruction (Johnson, Graham, & Harris, 1997) or self-managed contracts (Martin, Mithaug, Cox, Peterson, Van Dycke, & Cash, 2003). BSM also might be used in conjunction with field-tested self-determination curricula and materials and to bolster goal attainment when using the Choice Maker Self-Determination curriculum (Martin & Huber Marshall, 1998), or corresponding instructional modules, such as Take Action: Making Goals Happen (Huber Marshall, et al, 1999). German, Martin, Huber Marshall, and Sale (2003) directed, "Research also needs to be undertaken to determine if the Take Action process can be successfully taught in an inclusive academic environment to students with and without

disabilities" (p. 35). For guidance on effective use of BSM components with self-regulated strategy development, see Hughes, Ruhl, Schumaker and Deschler's (2002) study on teaching students with learning disabilities, in GE classes, to improve homework via an assignment completion strategy.

Our findings also suggest that self-instruction is quite effective. This conclusion is consistent with findings from Krosenbergen and Van Luit's (2004) meta-analysis of mathematics interventions, which deemed self-instruction effective for children with special needs. We also recommend that researchers and practitioners attempt to replicate, in inclusive settings, the positive outcomes that students in non-integrated settings achieved when they used self-correction (Morton, Heward, & Alber, 1998; Okyere, Heron, & Goddard, 1997). We also encourage BSM use in inclusive settings beyond school classrooms. See, for example, Brookman, Boettcher, Klein, Openden, Koegel, and Koegel (2003), who applied BSM as part of a larger strategy that promoted social interactions between children with and without autism in an inclusive day camp. Finally, we recommend that future Category III studies target two classes of behavior that have not yet been targeted effectively in inclusive settings – anger management-violence and health-exercise habits.

Findings from this review reinforce – with qualifications - other authors' contentions that BSM is a best practice that helps to bridge the research-to-practice gap. Frey and George-Nichols (2003) identified BSM as 1 of 10 best practices interventions and Hughes et al. (1997) validated BSM as one of eight, practitioner-validated, transition support strategies. Gable and Hendrickson (2000) identified BSM as one of seven strategies "that hold promise for improving intervention results for students with a wide range of behavior problems" (p. 288). The authors cautioned that six conditions might limit the utility of BSM in promoting maintenance of behavioral changes and explained how to address these conditions.

> Teacher-directed instruction is essential. Effective teachers must provide instruction in the step-by-step process, model each of the steps for the student, and train across multiple stimuli. Such teachers create realistic role-play experiences, give the student feedback on both the quantitative and qualitative aspects of his or her performance, and engineer the social environment so that the student has multiple problem-solving opportunities, for which there is timely and sufficient reinforcement. (p. 289)

We conclude that BSM is a best practice in inclusive settings when students are trained systematically, GE teachers are supported, and procedural integrity is high. Support is critical because teachers throughout the US reported that they lack skills or training to teach BSM (Wehmeyer, Agran, & Hughes, 2000). Moreover, Agran and Alper (2000) indicated that only 28% of GE teachers surveyed reported that they taught BSM to students. Thus, we recommend that teacher preparation programs and professional development include BSM training for GE and special education teachers.

Limitations of Our Review

Findings from this review of Category III BSM interventions are limited in at least two ways. First, we restricted the pool of qualifying studies to articles published in professional journals. Second, we did not calculate meta-analytic indices that would illuminate relations between BSM efficacy and procedural, demographic, and outcome variables. Authors of 41 of 43 studies did not report effect sizes (ES) and most studies had insufficient data to calculate ES. Therefore, we

recommend that investigators report ES or supply sufficient data to calculate such indices. The literature documents advantages and limitations of meta-analysis for small-N research (Kromrey & Foster-Johnson, 1996; Scruggs & Mastropieri, 1998; White, Rusch, Kazdin, & Hartmann, 1989). Moreover, "it is almost always necessary to include some index of effect size or strength of relationship in your Results section" (American Psychological Association, 2001, p. 25).

BSM Resources for Practitioners

Fortunately, many BSM resources are available for practitioners. Individuals can learn how to teach BSM techniques by reading "how to" articles (Alberto & Sharpton, 1987; Daly & Ranalli, 2003; Dunlap, Dunlap, Koegel, & Koegel, 1991; Frith & Armstrong, 1986; Hughes, Ruhl, & Peterson, 1988; Johnson & Johnson, 1999; Lazarus, 1998; Liberty & Paeth, 1990; McConnell, 1999; Schloss, 1987; Swaggart, 1998; Young, West, Li, & Peterson 1997). Dowrick (1991) and Gunter, Miller, Venn, Thomas, and House (2002) describe two BSM techniques – VSM and computer-assisted self-graphing – that have the potential to improve student performance in inclusive GE settings. Additional BSM training materials are available in: books (Agran, 1997; King-Sears, Wehmeyer, & Copeland, 2003); booklets (King-Sears, & Carpenter, 1997); practical guides (Dowrick, 1991); manuals (Koegel, Koegel, & Parks, 1992; Young, West, Smith, & Morgan, 1995); and instructional videos (Dowrick, 1997; McDougall, 2003).

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Note: (superscripts indicate studies that qualified for this review)

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Table 1
Descriptive Data for Category III Behavioral Self-Management Studies

Authors, Year	Participants	Setting	Dependent Variable	DV Measurement	Independent Variable	Research Design
Agran, Blanchard, Wehmeyer & Hughes, 2002	3F, 1M Grades 7 to 8 1 autism, 2 intelectual disabilities, 1 multiple disabilities	GE Science GE Life Skills GE English	• appropriate touching • follow directions • contribute to class (respond to peers'/teachers' questions	% of correct responses observed during teacher-created opportunities	problems strategy (self-determined learning model of instruction) incl: goal setting & take action plan w/self-selected goals, S-M, S-I, S-E	multiple baseline across participants using ABC
Agran, Blanchard, Wehmeyer & Hughes, 2001	6M Grades 10 to 11 1 LD, 2 intellectual disabilities, 1 visual impairments, 1 visual+hearing+orthepedic disability, & 1 other health impairment	GE English GE Agricultural Mechanics GE History GE Agricultural Biology	• organizational skills (e.g., carry planner to class, record and turn in assignments) • social skills/ initiating conversations	% of correct responses observed	problem-solving strategy (self-determined learning model of instruction) incl: goal setting & take action plan w/ self-selected goals, S-M, adjust goal/ plan, S-E, S-R, S-I	multiple baseline across groups of participants using ABCD
Alberto, Taber & Fredrick, 1999	1F, 1M Age 19 Moderate MR	public library, fast food restaurant; HS hallway, neighborhood street	inappropriate (aberrant) vocalizations	% of 20-second intervals	self-operated auditory prompting system (S-I)	multiple-probe across settings w/ one reversal phase, plus fading
Apple, Billingsley & Schwartz, 2005 (Study 2)	2M, 1F Age 4 to 5 2 Asperger 1 Autism	free play at integrated preschool & kindergarten	Complements: • initiations • responses	# occurrences per 15-minute observation period	• view video of peer models • teacher & visually cued self-recording • verbal & tangible reinforcement	multiple baseline across participants

Brooks, Todd, Tofflemeyer & Horner, 2003	1F Age 10 Mild MR & Down syndrome	seatwork: • GE grade 4 • SPED resource Group instruction: SPED resource	• academic engagement (on-task) • work completion	• % of 10-sec. whole intervals • finish assign-ment by period end, yes/no	S-M & self-recruited reinforcement, token reinforcement & general case instruction	multiple baseline w/ABCAC & two AC
Bryan & Sullivan-Burstein, 1998 (Study 3)	123, M/F not spec Grades 1 to 6 4 grps incl LD vs Ave. Achieving x w/ vs w/o hmwk com- pletion problems	inclusive GE classrooms	homework completion in: • math • spelling	# completed homework assignments divided by total # homework assign-ments = proportion	self-graphing of homework completion (following prior homework interventions)	3-factor MANOVA group (LD v average achvng), homework problems (yes, no), graphing (yes, no)
Buggey, 2005 (Study 1)	2M Age 9 and 11 1 autism 1 mild autism/ Asperger	lunch, recess & free time at an integrated private school	social (appropriate verbal) initiations to peers and staff	# occurrences	video self-modeling	multiple baseline across participants using ABC
Buggey, 2005 (Study 2)	2M Age 6 and 8 1 Asperger 1 autism	academic instruction in classroom at an integrated private school	tantrums	• duration • "rate" but only reported limited occurrence data	video self-modeling	multiple baseline across participants using ABC & follow up
Buggey, 2005 (Study 3)	1M Age 5 Pervasive develop-mental delay	circle, center & free time at an integrated private school	• pushing classmates • expressive language	• occurrences • occurrences	video self-modeling	multiple baseline across behaviors using ABC
Copeland, Hughes, Agran, Wehmeyer & Fowler, 2002	3 F, 1 M Ages 14, 15, 17 (2) 2 MR w/speech/ language 2 MR	GE cosmetology classes	worksheet completion tasks (& S-M steps & goal-evaluation steps)	% of tasks per-formed (& % S-M steps performed & # goal evaluation steps performed)	S-M, goal setting instruction, self-selected goals, S-E, assignment comple-tion instruction & modified worksheets	Multiple baseline across participants with ABCDE
Craft, Alber & Heward, 1998	3M, 1F Ages 10 to 11 Developmental disabilities	• SPED classroom • GE homeroom/ spelling	• Student recruiting of teacher attention • Teacher praise • Spelling work-sheet compl'n • Spelling work-	• # occurrences • # occurrences • % of items $\geq$ 50% complete • % of answers correct (# cor-rect answers/	Recruitment training incl: instruction & role playing, morn-ing prompts (w/ & w/o teacher assist-ance & visually cued S-M), & end-	Multiple baseline across participants using ABCDE

			sheet accuracy	total # items completed x 100%)	of-day check and reward (w & w/o external reinf)	
Crum, 20004	1 M Age 8 Behavior disorders	GE handwriting and phonics seatwork	on-task	# (and %) of 10-second partial intervals	visually and teacher-cued S-M w/ & w/o goal setting & rein-forcement	ABC
Dalton, Martella & Marchand-Martella 1999	2M Ages 14 to 15 1 LD in written language 1 LD in math	• GE science • GE lang. arts • GE social stds • "learning opportunity center" = SPED/at-risk study hall	• Off-task behavior (e.g., out-of-seat, interrupting others) • Teacher ratings of classroom behavior	• % of 30-sec. partial intervals • 1 – 5 rating scale	S-M & self-evaluation w/ teacher matching, token reinforce-ment & adult feedback	Multiple baseline across settings using ABC
Davies & Witte, 2003	2M+2 F w/disab + 4 teacher-selected "matched controls" w/o disabilities Ages 8 to 10 ADHD	GE 3rd grade class during lesson/work time	inappropriate verbalizations	Frequency, event recording	Individual & group S-M within a group contingency	ABAB with "teacher-selected matched controls"
DuPaul, McGoey & Yugar, 1997	2M Age 11 SED (also 2 GE peer "buddy" evaluators)	• self-contained class for stu-dents w/ SED • GE science • GE math	• pos/neg class behaviors • multiple secondary DVs (e.g., social skills, socio-metric status, self-esteem)	• % of 6-second partial intervals • multiple teach-er & student ratings, e.g., SSRS subscale scores; standar-dized liking scores	token reinf: • teacher-mediated S-E & token reinf. • peer-mediated S-E & token reinf.	Multiple baseline across participants w/ ABCD; also AB case study for GE peer buddies
Gansele & McMahon, 1997	31 M, 18 F Grades 3 to 6 w/ mean age 10.4 22 "mildly educa-tionally disabled	GE 3rd through 6th grade classrooms	"three teacher measures and two student measures" of students' social skills, positive and negative classroom behaviors	Pre-Post teacher ratings of students on: 1. Conners Abbreviated Symptom Ques-tionnaire; 2. Social Skills Rating System; 3. two teacher-selected	3 levels of integrity of S-M program: • S-M only • S-M with feed-back & reward • S-M with feed-back & reward, plus graphing	3 (treatment level) x 2 (time=pre-post) factorial with repeated measures MANOVA

				behaviors from Common Classroom Behavior Rating Scale Pre-Post Student: 1. self-ratings on Social Skills Rating System; 2. frequency counts of teacher-selected target behaviors		
Gerdtz, 2000	1M Age 16 Autism	"general education and special education classrooms" (lacks description)	• Level of problem behavior during school day • Mild/severely disruptive, off-task, & appropriate behavior	• daily, end-of-day data sheet w/ 1-4 self-rating by student w/ tchr verification • % of observed behs. using Student Tchr Interaction Profile alternate 15-sec code student then teacher behs.	environmental manipulations, "self-monitoring" (actually S-E) w/ adult review, relaxation training, staff training	"uncontrolled case study" (p. 100)
Gilberts, Agran, Hughes & Wehmeyer 2001	3F, 2M Ages 12 to 15 Severe intellectual disability	GE Spanish GE History GE Art GE Reading	• 11 classroom survival skills • S-M acccuracy	• % occurrence • % agreement	S-M: peer taught & peer tutors	Multiple baseline across participants w/ABC
Gregory, Kehle & McLoughlin, 1997	2M, 1F Ages 13 to 14 "behaviorally disorder"	GE classrooms, hallway, gym; plus SPED classrooms	• off-task • self-perceived competence	• % of 15-sec. partial intervals • Piers-Harris Self-Concept Scale, pre-post • "self-concept" self-rated 1/wk	self-evaluation (matching ratings of students & teacher) + token reinforcement	"ABAB" (p.685) but graphs not presented; text identifies additional phases; has features of a changing conditions design
Gumpel & David, 2000	3M Age 9 to 10.5 severe behavioral	playground during morning and afternoon recess at elem.	• positive interactions • negative	% of observations using 10-second fixed interval time	audio-cued S-M with and w/o performance	multiple baseline across participants w/ ABC

	disorders	school in Tel Aviv, Israel	interactions (e.g., speak/play w/ peers w/ or w/o aggressive acts)	sampling	feedback	
Hoff & DuPaul, 1998	2M, 1F Age 9 ODD &/or ADHD	• GE Math • GE Social Studies • GE Reading • Recess	• disruptive behavior • teachers' perceptions of disruptive & aggressive behavior • adverse side-effects of intervention	• % of 15-sec partial intervals • aggression subscale of Iowa Conners Teacher Rating Scale • side-effects rating scale	sequential interven-tion: teacher ratings w/token reinf & feedback; S-E w/teacher matching, token reinf. & feedback; S-E w/ fade feedback & fade matching	Multiple probe across settings using ABCD
Hughes, Copeland, Agran, Wehmeyer, Rodi & Pressley, 2002	1F, 3M Ages 19(2)&16(2) MR w/ hearing impairment, MR w/ autism, & MR (2)	GE Occupational Health; SPED class & GE auto mecha-; nics; hallway; SPED class & GE physical education	• head up during peer interact'ns • social response ("Thank you.") • write answers • initiate/obtain peer interact'ns	• % of intervals • % of oppor-tunities • % correct • % of intervals	various individu-alized visually-cued S-M (e.g., w/ picture prompt card)	Multiple baseline across participants w/ABC
Hughes, Fowler, Copeland, Agran, Wehmeyer & Church-Pupke, 2004 (Study 1 = Period 1)	1F, 1M Age 14 & 15 1 MR w/ speech & articulation impair-ments; 1 MR w/ lan-guage impairments	GE physical education class in gymnasium, 1st period of day	• engagement in recreational activities w/peers • quality of interactions • self-prompting steps performed • recreational activity steps performed	• % of 5-second partial intervals • Likert scale rating • % via observation checklist • % via observation checklist	Multi-component training: asses goals; self-prompt using a picture book (visually cued S-I); program common stimuli; adult-cued self-evaluation of daily goals and daily performance	Multiple baseline across participants w/ ABC
Hughes, Fowler, Copeland, Agran, Wehmeyer & Church-Pupke, 2004 (Study 2 = Period 2)	3F Age 14, 18 & 18 3 MR including 1 w/ language impairments	GE physical education class in gymnasium, 2nd period of day	• engagement in recreational activities w/peers • quality of interactions • self-prompting	• % of 5-second partial intervals • Likert scale rating • % via observation checklist	Multi-component training: assess goals; self-prompt using a picture book (visually cued S-I); program common stimuli; adult-cued self-evaluation of	Multiple baseline across participants w/ ABC

			• steps performed • recreational activity steps performed	• % via observation checklist	daily goals and daily performance	
Hughes, Rung, Wehmeyer, Agran, Copeland & Hwang 2000	4M, 1F Age 16 to 18 MR, and MR w/various speech-language/hearing impairment & autistic-like behavior	"various locations in participants' classrooms and the school lunchroom" & school gym	• Initiate appropriate conversation • Self-prompting • Initiate in/appropriate conversation (participant), or response (partner) • Conversation topics	• rate= #/minute • % of 10-sec partial intervals • % of 10-sec partial intervals • mean # per session	self-prompted use of communication book, trained by GE peers	Multiple baseline across participants w/ ABC plus follow-up and multiple probe component
Hutchinson, Murdock, Williamson & Cronin, 2000	1 M Age 6 "emotionally disturbed/behavior disordered … hyperactivity"	GE grade 1 advanced reading class	• on-task beh's • latency starting work • "nondisruptive behaviors"	• # of behaviors • time (min/sec) • # of behaviors	S-M & "points, [token reinforcement] praise, and encouragement"	ABAB
Jindal-Snape, 2004	2F Age 9 & 10 visual impairment	Integrated school in India, student triads "chat or free play" (p. 474)	• direction of gaze • conversation	total duration in seconds	self-evaluation w/ & w/o feedback on accuracy of self-evaluation	MB across behaviors w/ multiple intervention phases
King-Sears, 1999	1 F Age 7 Down Syndrome, mod-severe MR w/ hearing impairment	hallway travel • school entry to 1st class of day • hallway and cafeteria	• on-task beha-vior (socially appropriate) • trip time • adult prompts	• % momentary time sampling observations • duration • frequency	BSM training incl: SPIN, visually cued S-M, self-evaluation* & self-reinforcement	ABC (2) although multiple baseline across participants intended
Koegel, Harrower, & Koegel, 1999	2 M Age 5 & 6 1 severe language & cognitive disability; 1 severe cognitive & LD	GE "full inclusion kindergarten class-rooms, each at a different public elementary school"	• Appropriate performance on schoolwork • disruptive behavior (e.g., tantrums, leaving seat) • "quality of classroom	% of observations using 15-second partial intervals	self-management package faded, with & without: • support person prompts & reinforcement • self-administer reinforcement • audio-cued	multiple baseline across participants using ABCD

			experience" (i.e., time spent in "time out")		(chronograph) S-M	
Massey & Wheeler, 2000	1M Age 4 Autism	Integrated pre-school classroom including work & leisure settings; cafeteria	• Task engage-ment • Challenging behaviors	% of observations using 15-second momentary time sampling	Activity schedule (visually cued via photos, pictures/ symbols) training, w/ most-to-least (physical, gestural & verbal) teacher prompting	Multiple baseline across activities w/ ABCD
McDougall & Brady, 1998	3F, 2M Ages 9 to 10 1 LD, 1 ADD, & 3 w/o disabilities	GE math in two adjoining semi-open classrooms	• Math fluency: independent practice on +,-/,x problems • on-task	• correct rate • incorrect rate • % correct • % observations (momentary time sampling)	BSM package incl: S-M, self-administration/ self-determination of reinforcement & self-graphing	Multiple baseline across participants w/ alternating treatments and fading phases
Mitchem, Young, West & Benyo, 2001 (also reported in Mitchem & Young, 2001)	All students (64M, 33F) in 3 classes, including 10 at-risk: 7 M, 3 F Ages 12 & 13 2 LD, 1 LD+BD, + 7 w/no identified disability	3 GE language arts classes in 7th-grade w/31, 33, & 33 students, respectively	Whole class: • on-task At-risk students: • on-task • follow teacher instructions • get teacher attention appropriately • social cmptnc +antisocial beh	• % of time • % of time – whole interval • % followed • frequency • School Social Behavior Scale teacher ratings	Classwide Peer-Assisted Self-Management System incl: audio-cued self-evaluation, peer ratings w/ matching, dyad and team points	multiple baseline across classes with multiple phases including fading
Monda-Amaya, Dieker, & Reed, 1998	3F, 2M Ages 13 to 14 LD	GE social studies; also training in SPED classroom	Goal attainment of essential classroom behaviors	Teacher-reported # goals established, # goals attained, & # goals made progress toward	training program to support transition from SPED to inclusive GE incl: goal setting, S-M & teacher matching	none – descriptive demonstration
O'Reilly, Tiernan, Lancioni, Lacey, Hillery, & Gardiner 2002	1 F Age 13 "moderate level of developmental disability"	3 classes inclu-ding GE Gaelic, Religion & English	on-task	% of 10-second partial intervals	audio-cued S-M w/ feedback/reinf for S-M accuracy & on-task behavior	multiple baseline across settings w/ one reversal
Possell, Kehle,	3 M	GE class & self-	1. Disruptive	• 15-sec partial	video self-modeling	multiple baseline

McLoughlin, & Bray, 1999	Age 5 to 8 SED	contained special education class	behavior 2. Teacher judge-ment and percep-tion of student behavior using: • token economy classroom/beh. management system • Conners' Tchr Rating Scale	in-terval time sample; • mean % of periods rated inappropriate vs. appropriate • T-scores		across participants w/ ABC
Rock, 2005 (Study 1)	3M Age 9, 11 & 13 1 Asperger 1 no disability (gifted) 1 Floating Harbor syndrome w/ speech & language impairments	GE Math in 4th-5th grade multiage classroom at independent practice	• Academic disengagement (time off task) • math productivity • math accuracy	• rate • total # completed math problems • % correct on completed math problems	ACT-REACT: goal-setting; S-M of attention & S-M of productivity; self-talk & self-evaluation	Multiple baseline across participants w/ ABAB
Rock, 2005 (Study 2)	3M Age 10, 11 & 13 1 LD & ADHD 1 LD 1 DD w/ speech & language impairments	GE Math in 4th-5th grade multiage classroom at independent practice	• Academic engagement (time on task) • math productivity • math accuracy	• rate • total # completed math problems • % correct on completed math problems	ACT-REACT: goal-setting; S-M of attention & S-M of productivity; self-talk & self-evaluation	Multiple baseline across participants w/ ABAB
Rock, 2005 (Study 3)	2F, 1M Age 7, 8 & 9 2 w/o disabilities 1 ADHD	GE Math and Reading in 2nd-3rd grade multiage classroom at independent practice	• Academic engagement (time on task) • math productivity • math accuracy	• rate • total # completed math problems • % correct on completed math problems	ACT-REACT: goal-setting; S-M of attention & S-M of productivity; self-talk & self-evaluation	Multiple baseline across participants w/ ABAB
Snyder & Bambara, 1997	3 M Ages 14 LD	• SPED Learn-ing Support Room in Read-ing & Math • GE Social	Classroom survival skills: e.g., arrives on time; has pen, book, paper; home-work complete	% of skills demonstrated (observational checklist)	BSM package incl: S-M, problem identification, goal setting, self-evaluation & self-	Multiple baseline across participants w/ multiple phases

		Studies			reinforcement	
Thiemann & Goldstein, 2001	5 M Ages 6 to 12 4 autism, 1 language impairment	• library media room, each participant at table in triad w/ 2 GE peers • GE classroom (generalization probes)	Primary DVs: appropriate social-language communication: secure attention, initiate comments, initiate requests, contingent responses. Other DVs: Inappropriate social-language communication & topic maintenance	• # occurrences during 10-minute sessions • # occurrences during 10-minute sessions • mean # verbal utterances per episode	Direct social skills instruction using social stories, pictoral+written cues; interventionist visual/verbal prompts; videotape feedback with self-evaluation & token reinforcement	Multiple baseline across behaviors with ABC/D
Todd, Horner, & Sugai, 2002	1 M Age 9 LD & physical disability = Legg-Calve-Perthes disease of right hip [+8 non-targeted peers w/o disab for comparison]	blended 3rd-4th grade GE class: • Reading-writing period • Group project period	• problem behs • on-task behs • teacher praise • work completion • teacher perception of student's behavior for class period	• % of 10-sec partial intervals • % of 10-sec partial intervals • frequency • dichotomous: perm product + criterion-based • 1-10 rating scale	BSM package incl: audio-cued S-M, self-evaluation, self-recruitment of teacher praise, self-recruitment of token reinforcers; based on FBA + behavior support plan	Multiple baseline across settings w/ $AB_1AB_2B_{13}$
Uberti, Mastropieri & Scruggs, 2004	4M, 2F Age 8 to 9 4 LD (5 ESL) 1 student dropped	GE math	addition w/ regrouping	mean % correct	S-I	quasi-experimental, pre-post with one small group & non-equivalent comparison group
Wehmeyer, Yeager Bolding, Agran & Hughes, 2003	3M Ages 13 to 14 2 MR w/ speech impairment 1 autism w/ speech & language impairment	GE history GE Art GE Science	• inappropriate touching • inappropriate verbalization • on-task • disruptive • listening/att'n • listening	• frequency • frequency • % of 10-second partial intervals • " " " • " " " " " "	Multi-component self-regulation incorporating goal setting, antecedent cue regulation via picture prompts, visually cued S-M, S-E, S-R	Multiple baseline across participants and behaviors w/ ABC

Note: ADD = attention-deficit disorder, ave. = average, behs. = behaviors, disab. = disabilities, eval. = evaluation, F = female, GE = general education, hmwk. = homework, lang. = language, LD = learning disability, M = male, MR = mental retardation, reinf. = reinforcement, S-E = self-evaluation, S-I = self-instruction,

S-M = self-monitoring, S-R = self-reinforcement, SPED = special education, SSRS = Social Skill Rating System, stds. = studies; Tchr. = teacher, w/ = with, w/o = without.

Table 2

Efficacy, Integrity and Various Outcome Measures for Category III Behavioral Self-Management Studies

Authors, Year	Intervention efficacy	Intervention integrity	Dependent variable (DV) reliability	Maintenance probes/follow-up	Generalization	Social validity of DV changes
Agran, Blanchard, Wehmeyer & Hughes, 2002	strong FC	IT: not measured[+] AD: not measured[+]	high; no Kappa[--]	post-training phase after training phase	not conducted;[+] BSM used directly in GE w/ MB across participants	informal/anecdotal - teachers; subjective evaluation - students
Agran, Blanchard, Wehmeyer & Hughes, 2001	mixed FC; some support for S-M but not S-R[+]; design limitations[+]	IT: not measured[+] AD: not measured[+]	high; no Kappa[--]	post-training phase after training phase	not conducted;[+] BSM used directly in GE w/MB across groups	subjective evaluation
Alberto, Taber & Fredrick, 1999	moderate FC	IT: students met 100% criterion AD: not measured[--]	high; no Kappa[--]	used fading phase	not conducted;[--] BSM used directly in GE; across settings design	not measured[--]
Apple, Billingsley & Schwartz, 2005 (Study 2)	strong FC for initiations when BSM teaching used	IT: 89% overall for students AD: 94% overall for students	high; no Kappa[--]	post-training phase faded prompts	measured compli-ment-giving respon-ses across settings	subjective evaluation via ratings by teachers & parents
Brooks, Todd, Tofflemeyer & Horner, 2003	Mixed FC; some strong but target behavior worse in one setting[+]	IT: students met 90% criterion AD: not measured[--]	high; no Kappa[--]	not conducted[--]	BSM used initially in GE, then SPED; across settings de-sign; multiple DVs	not measured[--]
Bryan & Sullivan-Burstein, 1998 (Study 3)	mixed; statistically significant effect for S-G on spelling but not math homework; effect sizes unreported[--]	IT: not measured[--] AD: not measured[--]	not measured[--]	not conducted[--]	not conducted;[--] BSM used directly in GE; multiple DVs	discussed but no systematic data reported
Buggey, 2005 (Study 1)	FC evaluation limi-ted = used only two baselines in multiple baseline design[+]	IT: not measured[--] AD: not measured[--]	high; no Kappa[--]	post-training phase after training phase	not conducted; BSM used directly in mul-tiple GE settings w/ MB across students	not measured explicitly[--] but anecdotal data from teachers
Buggey, 2005 (Study 2)	FC evaluation limi-ted = used only two baselines in multiple baseline design[+]	IT: not measured[--] AD: not measured[--]	high; no Kappa[--]	strong via probes 2 weeks after end of post-training phase but limited data[+]	not conducted; BSM used directly in GE w/MB across students	not measured explicitly[--] but anecdotal data from teachers
Buggey, 2005	FC evaluation limi-	IT: not measured[--]	high;	post-training phase	not conducted;	not measured

(Study 3)	ted = used only two baselines in multiple baseline design[+]	AD: not measured[--]	no Kappa[--]	after training phase	BSM used directly in GE w/MB across target behaviors	explicitly[--] but anecdotal data from teachers
Copeland, Hughes, Agran, Wehmeyer & Fowler, 2002	strong FC	IT: trainer performed 99% of steps AD: students' % of S-M & goal evaluation steps	high; no Kappa[--]	not conducted[--]	not conducted; BSM used directly in GE; multiple outcome measures	subjective evaluation
Craft, Alber & Heward, 1998	mixed FC	IT: not measured[--] AD: not measured[--]	high; no Kappa[--]	faded intervention elements during post-training phases	BSM trained first in SPED then used in GE; multiple DVs	GE teacher, students' subjective evaluation (interviews); no social comparison[+]
Crum, 2004	weak FC[--]	IT: not measured[--] AD: not measured[--]	not measured[—] no Kappa[--]	not measured[+]	not measured[+]	not identified[--] but compared data of 1 "neuro-typical" peer
Dalton, Martella & Marchand-Martella 1999	strong FC	IT: students met 100% criterion using S-M form AD: not measured[+]	high; no Kappa[--]	removed intervention components in phase after S-M training phase	pretrained BSM in SPED then used in GE	subjective evaluation via teachers' daily Likert-scale ratings
Davies & Witte, 2003	strong FC threats posed by non-equivalent conditions in respective phases of ABAB design[+]	IT: students met 100% criterion on 20-item quiz AD: not measured[--]	moderate; event recording = no assurance of one-to-one event correspondence[--]	not conducted[--]	not conducted[+/--] BSM used directly in GE	not stated explicitly but quasi-social comparison possible using data from "matched controls" (p. 139)
DuPaul, McGoey & Yugar, 1997	directional improvements but weak FC; no statistical analysis for pre-post measures[+]	IT: not measured[--] AD: integrity checklist used once per week with 100% results	high for primary DV w/ Kappa; generally "adequate" (p. 638) for other DV measures	not conducted as school year ended[+]	trained in SPED then modified use for GE; plus 3 measures "to examine possible collateral effects" (p. 637)	not stated explicitly; teacher questionnaire items incl. subjective evaluation items (p. 639) but those results not reported[--]
Gansele & McMahon, 1997	mixed; few statistically significant results, mostly for main effects (time, group) but not for interaction; no effect sizes reported [--]	IT: not measured[--] AD: teacher self-reports, corresponding permanent products collection & 2 reliability checks on teachers by consultants	not reported[--]	not addressed[--]	BSM used directly in GE; multiple DVs	not addressed[--]

Gerdtz, 2000	uncontrolled case study design with no baseline; cannot demonstrate FC^{+}	IT: not measured^{--} AD: not measured^{--}	4% disagreement on data sheets but limited description^{--}; not measured for direct observations^{+}; no Kappa^{--}	not addressed^{--}	not addressed^{--} (design limitations)	not stated & not addressed explicitly^{--}; anecdotal information
Gilberts, Agran, Hughes & Wheymeyer 2001	strong FC	IT: Mean 97-100% for 7 peer-delivered training steps AD: 90+% for students' S-M accuracy	high; no Kappa^{--}	after training phase, post-training phase continued use of S-M form & required 2 retraining sessions for 3 of 5 students	not addressed^{--} but 11 classroom survival skills comprise DV; BSM used directly in GE	subjective evaluation via teacher & participant Likert-scale ratings; no social comparison^{+}
Gregory, Kehle & McLoughlin, 1997	no graphed data = cannot evaluate FC^{--} but phase means suggest improvement	IT: not measured^{--} AD: not measured^{--}	"were calculated using Kappa" (p.684) but data unclear/missing^{--}	reduced intervention intensity in later phases	trained & used BSM in SPED, eventually used BSM in GE	not addressed explicitly^{--}
Gumpel & David, 2000	moderate-strong FC	IT: students met 100% criterion AD: not measured $^{--}$	high, included % for occurrence & nonoccurrence; no Kappa^{--}	strong with probes from 2 to 10 weeks post-intervention	trained BSM in SPED then applied in GE; multiple DVs	social comparison via randomly selected peers; data lacking^{--} from interviews for subjective evaluation
Hoff & DuPaul, 1998	strong FC only for initial token reinf. moderate FC for phases with S-M;$^{+}$ reported PND	IT: not measured for students^{--} AD: 98% for teachers via 11-item scale	high; also reported Kappa	reduced intervention intensity in last phase	BSM used directly in GE; across settings design; multiple DVs	social comparison via observations of teacher-identified "average" peers
Hughes, Copeland, Agran, Wehmeyer, Rodi & Pressley, 2002	strong FC	IT: not measured^{--} AD: high % for students' S-M use	high; no Kappa^{--}	one element of training phase (prompt card/book) continued during post-training phase	most students trained in SPED w/ BSM applied in GE; some students trained directly in GE; various DVs	subjective evaluation via questionnaires of peers, SE & GE teachers; also "asked only one participant" out of four^{+} (p. 269)
Hughes, Fowler, Copeland, Agran, Wehmeyer & Church-Pupke, 2004 (Study 1: 1st period)	moderate-strong FC	IT: 100% steps correct for trainer AD: high %s for self-prompting & accuracy of self-assessment & self-	high; no Kappa^{--}	post-training phase after training phase	BSM used directly in GE; measured multiple outcomes	subjective evaluation via peers 5-point Likert scale & post-intervention interview w/ participants

		evaluation				
Hughes, Fowler, Copeland, Agran, Wehmeyer & Church-Pupke, 2004 (Study 2: 2nd period)	same as Study 1 = see preceding cell	same as Study 1 = see preceding cell	same as Study 1 = see preceding cell	same as Study 1 = see preceding cell	same as Study 1 = see preceding cell	same as Study 1 = see preceding cell
Hughes, Rung, Wehmeyer, Agran, Copeland & Hwang 2000	mostly strong FC	IT: peers averaged 97% correct on 5-step training of students AD: students self-prompted at high %	high; no Kappa--	strong maintenance via probes 2, 4, 6 & 8 weeks after post-training phase; post-training phase after training phase	BSM used directly in GE; multiple DVs; assessed generalized performance to unfamiliar peers	Social comparison via range of expected performance of GE peer from another school; participants' subjective evaluation data
Hutchinson, Murdock, Williamson & Cronin, 2000	FC weak; directional improvements but timing of phase changes problematic--	IT: student trained to 100% criterion AD: 95% agreement on S-M between student & observer	appears moderate but description of results limited;-- no Kappa--	not conducted--	not conducted;-- BSM used & applied initially in GE; multiple DVs	not addressed--
Jindal-Snape, 2004	moderate FC for initial self-evaluation but insufficient # sessions for stagger in MB design--	IT: not measured-- AD: not measured--	cannot evaluate; IO agreement formula (A/A+D) inconsistent-- with measure (duration) reported for DV	strong maintenance via probes 6 months after intervention ended	mixed results for "nontarget behaviors"	not measured--
King-Sears, 1999	accommodating teachers preferences compromised FC;+ directional improvements; large effect sizes for tchr ratings	IT: 100% for teachers' use of 10-step script AD: not measured-- for students	high; no Kappa--	post-training phase after training phase; limited anecdotal data (p. 155); end of school year factor	suggestive data for generalization to untrained setting; multiple settings and DVs	Not addressed explicitly--
Koegel, Harrower, & Koegel, 1999	strong FC w/ only 2 students in MB design	IT: not measured-- AD: not measured--	high; no Kappa--	intervention components removed immediately after fading phase	not conducted;-- applied BSM directly in GE; multiple DVs	social comparison via observing 7 randomly selected peers
Massey & Wheeler, 2000	moderate/mixed FC	IT: not measured-- AD: not measured-- but primary DV incorporated integrity-like elements	moderate; no Kappa--	post-training phase w/ fewer prompts after training phase	BSM used directly in GE; across activities design; multiple DVs	subjective evaluation via adults' ratings of scale items
McDougall & Brady, 1998	moderate FC	IT: not measured-- AD: students' S-M	high; no Kappa--	strong maintenance via probes 1 & 2	used probes to assess	social comparison & informal-anecdotal

		accuracy 95+% w/ one exception; S-M punctuality 100%		weeks after fading phase ended	generalization (weak^{+}) to untrained behavior; multiple DVs; BSM used directly in GE	
Mitchem, Young, West & Benyo, 2001 (also reported in Mitchem & Young, 2001)	moderate-strong FC	mean 97% via 30-item checklist; unclear whether 97% applied to IT and/or AD	moderate-high; no Kappa^{--}	last phase w/ most intervention compo-nents removed followed fading phases	not conducted; BSM used directly in GE; multiple DVs	social validilty questionnaires w/ teachers & students incl. subjective evaluation but results unclear
Monda-Amaya, Dieker, & Reed, 1998	no systematic research design & data limitations$^{--/+}$= cannot assess	IT: not measured^{--} AD: not measured^{--}	not addressed^{--} no Kappa^{--}	not addressed^{--}	not conducted^{--} trained in SPED, applied in GE	not mentioned explicitly^{--} but subjective evalua-tion data in follow-up interviews
O'Reilly, Tiernan, Lancioni, Lacey, Hillery, & Gardiner 2002	strong FC	IT: students trained to 100% criterion AD: not measured^{--}	high; no Kappa^{--}	not conducted$^{--/+}$	not conducted; BSM trained initially in SPED then used in GE; across settings design	social comparison via observations of "two most well-behaved" peers (p. 97); subjective evaluation via teacher interviews
Possell, Kehle, McLoughlin, & Bray, 1999	moderate-mixed FC	IT: not measured^{--} AD: not measured^{--} "essentially 100%" = lacks precise data & researcher self-checked (not inde-pendent measure)$^{--}$	moderate; no Kappa^{--}	primary DV means unreported for intervention phase & "bifurcated" follow-up data preclude clear evaluation^{--}	not conducted;$^{--}$ training done in office with DV measured in class	not addressed^{--}
Rock, 2005 (Study 1)	moderate-strong FC	IT: not measured^{--} AD: not measured^{--}	moderate	not measured^{--} but author identified lack of fading phase	moderate-strong generalization for problem behavior	not measured^{--}
Rock, 2005 (Study 2)	moderate-strong FC	IT: not measured^{--} AD: not measured^{--}	high; no Kappa^{--}	not measured^{--} but author identified lack of fading phase	moderate-strong generalization for problem behavior	not measured^{--}
Rock, 2005 (Study 3)	moderate-strong FC	IT: not measured^{--} AD: not measured^{--}	moderate-high; no Kappa^{--}	not measured^{--} but author identified lack of fading phase	moderate-strong generalization for problem behavior	not measured^{--}
Snyder & Bambara, 1997	moderate-strong FC	IT: not measured^{--} AD: not measured^{--}	high; no Kappa^{--}	after fading phase, used phase w/	trained in SPED then weak-moderate	social comparison and subjective

				nearly all intervention components removed	initial impact in GE but strong later	evaluation
Thiemann & Goldstein, 2001	mostly moderate FC with some weak FC	mean treatment fidelity was 89%; unclear whether 89% applied to IT and/or AD	moderate-high; no Kappa^{--} strong video tape procedures	post-training phase after training phase	weak generalization to modified classroom activities; multiple DVs	subjective evaluation via teacher ratings using Likert-scale
Todd, Horner, & Sugai, 2002	strong FC	IT: not measured^{--} AD: not measured^{--}	high; no Kappa^{--}	used phase that reduced intensity of cues	not conducted;$^{--/+}$ used BSM directly in GE; across settings design; multiple DVs	no explicit mention but measured teacher perception of change
Uberti, Mastropieri & Scruggs, 2004	pre to post test improvement statistically significant but omitted multiple measures^{--} between pre-post; no effect sizes reported^{--}	IT: not measured^{--} AD: not measured^{--}	not measured^{--}	not measured^{--}	not conducted;$^{--}$ BSM used directly in GE;	not named^{--} but compared data of peers (social comparison); & teacher & participant anecdotal information
Wehmeyer, Yeager Bolding, Agran & Hughes, 2003	strong FC	IT: not measured^{--} AD: not measured^{+}	not measured^{+} no Kappa^{--}	post-training phase after training phase	not conducted;$^{--}$ BSM used directly in GE; multiple DVs	subjective evaluation via teachers' goal attainment scale (GAS) ratings

Note: AD = adherence to ongoing intervention procedures by student-participants or teachers-adults, BSM = behavioral self-management, FC = functional control, GE = general education, IT = initial training of students, MB = multiple baseline, PND = percentage of nonoverlapping data; SPED = special education; "not conducted" in generalization column indicates the absence of formal generalization probes.

Table 3
Fulfilling the Promise of Behavioral Self-Management in Inclusive General Education Settings – Then and Now

Category III BSM Studies	Then (1970 - 1996)	Now (1997 - mid-2005)
Dissemination	• ½ study published per year • limited to 8 journals: 5 special education, 3 behavioral, 0 related services • no journals with mainly general education readership	• 5 studies published per year • expanded to 26 journals: 17 special education, 5 behavioral, 4 related services (3 psychology & 1 social work) • no journals w/ mainly general education readership
Participants' Disabilities, Age Ranges, & Settings	• LD, E/BD, AD/HD • 6 to 18 years old • almost always academic classes; plus study hall and hallway locker • no out-of-school settings	• LD, E/BD, AD/HD; plus MR, autism, SLI, Asperger, HI, DD, VI, OHI, OI, physical dis., multiple dis., MEH, ODD, PDD • 4 to 19 years old • wider range of academic classes; plus playground, art cafeteria, hallways, gym, library • out-of-school settings: fast food restaurant, neighborhood street, and public library
Dependent Variables or Target Behaviors	• commonly variations of time-on-task behaviors • sometimes academic performance • rarely homework or SIB • rarely social interaction • no aggressive behavior	• commonly variations of time-on-task behaviors • infrequently academic performance • rarely homework, no SIB • numerous social interaction and classroom survival skills • one study of aggressive behavior
Types of BSM Interventions	• self-monitoring predominates but no tactically-cued self-monitoring interventions • video self-modeling, self-graphing, self-instruction, self-evaluation & self-reinforcement rarely investigated	• self-monitoring predominates but no tactically-cued self-monitoring interventions • video self-modeling, self-graphing rarely investigated • self-evaluation & self-reinforcement quite common • emergence of self-instruction variations, self-recruitment of reinforcement, and use of FBA/PBS or goal setting in conjunction with BSM
Efficacy of Interventions	• mostly moderate to strong with a few weak outcomes	• moderate-strong & strong for slightly < 50% of studies; moderate-mixed and weak-indeterminate for slightly > 50% of studies

Note. AD/HD = attention deficit-hyperactivity disorder, BSM = behavioral self-management, DD = developmental disabilities, dis. = disabilities, E/BD = emotional/behavioral disorders, FBA = functional behavioral assessment, HI = hearing impairments, LD = learning disablilities, MEH = mild educational handicap, MR = mental retardation, ODD = oppositional defiant disorder, OHI = other health impairments, OI = orthopedic impairments, PBS = positive behavioral supports, PDD = pervasive developmental delay, SED = serious emotional disturbance or disorder; SIB = self-injurious behavior, SLI = speech and language impairments, VI = visual impairments