

## Descriptive Analysis of the Instructional Control of Teachers in a Classroom of Students with Behavioral Disorders

Eitan Eldar Ph.D, BCBA-D,  
Kibbutzim College, Israel

Shiri Ayvazo Ph.D, BCBA-D,  
David Yellin College, Israel

Michal Hirschmann, Ph.D,  
Kibbutzim College, Israel

### ABSTRACT

Classroom management still remains a topic of major apprehension for teachers, and especially for those teaching students who display challenging behaviors. This paper presents an empirical examination that supplemented an exceptional project of the ministry of education in a small Middle-East country to support students with severe problem behaviors in a unique self-contained classroom. The paper conceptualizes classroom management as instructional stimulus control manifested by superior identification of the discriminative stimulus, repertoire of responses, timing, and latency. The purpose of this study was to assess teachers' instructional control by identifying and measuring co-variations between their behaviors and students' behaviors. The teachers interchangeably taught a class of 12 boys, age 8-10 with severe problem behaviors. The variables measured were teaching behaviors (e.g., type of interaction with the students, reaction time, and proximity) and students' inappropriate behaviors. Data are presented and analyzed graphically. The discussion illuminates levels of inappropriate behavior in correspondence to the type of teaching behaviors displayed, and the differences between the teachers' instructional control. Possible implications for teacher training programs are provided.

Key Words: Teacher Stimulus Control; Middle-East Country; Behavior Analysis Education; Classroom Management; Instructional Control;

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In an educational era emphasizing quality of instruction, achieving and monitoring students' progress and learning, and differentiating instruction to increase inclusion of students with special needs, teacher's management skills become a critical component (Stronge, Ward, & Grant, 2011). Yet, classroom management still remains a topic of major apprehension for teachers (Barmby, 2006; Evertson & Weinstein, 2006; O'Neill & Stephenson, 2013), and even more so for those who educate students with

behavioral disorders (Mooney, Ryan, Uhing, Reid, & Epstein, 2005).

Primary source of concern is the inadequate training and preparation for effective classroom management (Freeman, Simonsen, Briere, & MacSuga-Gage, 2013). Findings suggest only 26% of special education training programs include classroom management courses, with content mostly leaning on reactive rather than proactive

management strategies (Oliver & Reschly, 2010). Similarly, low percentages of general teacher training programs include classroom management course allocations, resulting in weak managerial skills that impede effective teaching (O'Neill & Stephenson, 2013). This trend is true worldwide and internationally alike. Australian preservice teachers reported feeling less than somewhat prepared to deal with disruptions, non-compliance, disorganization, anti-social, aggressive or destructive behaviors (O'Neill & Stephenson, 2013). Beginning teachers in Israel were found to perceive classroom management as an especially alarming topic, and a primary professional development need (Eldar, Nabel, Schechter, Talmor, & Mazin, 2003).

Repeated recommendations in the literature call to rely more heavily on evidence-based behavioral strategies to manage the classroom in a more effective and preventative manner (Briesch & Chafouleas, 2009; Mooney et al., 2005; Simonsen, Fairbanks, Briesch, Myers, & Sugai, 2008; Simonsen, Myers, & DeLuca, 2010). A science-based pedagogy underlined by behavioral analytic technology may advance effective classroom management.

### **Conceptualization of Effective Classroom Management as Development of Teacher's Stimulus Control**

Effective management in the classroom, from a behavioral analytic viewpoint, involves the development of teacher's stimulus control (Martens & Kelly, 1993; Siedentop & Eldar, 1989). Teacher's levels of stimulus control result in superior or inferior management of students and classroom contextual events. Thus, stimulus control level could predict effectiveness in teaching and may discern between effective and less effective managers.

Emerging from behavioral classroom management literature is that teachers' stimulus control in the classroom is evident by the existence of at least four constituents (Ayvazo & Ward, 2011; Berliner, 1988; Gettinger, 1988; Siedentop & Eldar, 1989). First is superior identification of discriminative stimuli in the classroom. Teachers who are effective managers identify critical changes in environmental events relating them to predictable students' behavior (Siedentop & Eldar, 1989). Second is repertoire of responses – effective managers have a wider repertoire of responses that have been developed due to their discriminatory capability (Ayvazo & Ward, 2011; Berliner, 1988; Siedentop & Eldar, 1989). They have advanced ability to respond differently to even the most trifling changes in the educational context. Third is the timing of effective managers who promptly discriminate precursors in the classroom that may escalate to problem behavior and impede learning. As such, they mostly demonstrate proactive, preventative classroom management rather than reactive management of misbehavior (Gettinger, 1988). Lastly, effective managers demonstrate only brief latency in

response to a classroom event (Siedentop & Eldar, 1989). A prompt response is critical for the value of the contingent consequence delivered by the teacher and for maintenance of an appropriate learning environment (Cooper, Heron, & Heward, 2007).

Teachers with fine stimulus control over students' behavior become a primary discriminative stimulus in the classroom (Marholin & Steinman, 1977). In the presence of the teacher, students will emit certain behaviors (e.g., attention to learning stimuli displayed on the white board), that may not be emitted in the absence of the teacher. This explains, for example, students' differentiated behavior in different instructional conditions (e.g., with two different teachers). More disruptive behaviors occur in settings where appropriate classroom contingencies are weak or less systematic (Marholin & Steinman, 1977), when the teacher neglects to discriminate antecedents, lacks to respond, responds with significant delay, and/or responds using ineffective methods.

Conceptualization of effectiveness in classroom management as a function of the teacher's stimulus control is fairly preliminary. The current project involved a special initiative of the ministry of education in a Middle-East country to host an eclectic special education classroom for students with behavioral disorders within a teacher education college. Special education services were provided on-campus by qualified and specifically-trained teachers with the purpose of successfully mainstreaming students back into designated public-school settings. This initiative was also accompanied by descriptive empirical investigations in order to assess teachers' stimulus control by identifying and measuring co-variations between their behaviors and students' behaviors. This preliminary study expands the literature by (a) exploring a descriptive research methodology to identify teaching stimulus control in the classroom and (b) describing a special educational initiative in a Middle-East country, and (c) examining stimulus control variables that may contribute to the training of teachers of students with challenging behaviors.

## **METHOD**

### **Participants and Setting**

Participants were 12 boys aged 8-10 who were removed from various regular education schools. All students were diagnosed by the schools' psychologists as having severe behavior problems preventing them from attending a regular school. They displayed chronic high-risk aggressive behavior, violence, bullying, and dangerous disruptions to students and teachers in the classroom. Students were referred to a self-contained classroom and were therefore placed in an external behaviorally-oriented alternative education program. The program was housed in a teacher education college in the central district of a small Middle-East country. Students commuted daily to the self-

contained classroom located on-campus, for 4-5-hour school-day for the entire year. An Applied Behavior Analysis (ABA) training program ran this special education classroom on-campus, in collaboration with special education superintendents from the Ministry of Education. The curriculum was similar to the school's regular curriculum with emphasis on development of self-control and cooperation skills that will promote students' return to regular education within two years.

The students were taught by four teacher participants. Two of the teachers were special educators with 20 years of experience. They were referred to work in the program by the region superintendents, based on their experience and expertise in special education. These teachers had no substantial knowledge in behavioral procedures and had never received structured training in classroom management skills. They have completed a 30-hour ABA workshop prior to the project. The other two teachers graduated from the teaching college with a minor in ABA (450 hours) and were in their first year of teaching. Their preservice training included a series of courses practicing and demonstrating behaviorally-oriented classroom management skills.

### Materials

Four lessons were measured. The content taught in the first three lessons was reading and storytelling. The topics were related to an upcoming holiday and nature events. Each segment included a brief reading task, in which students were asked to review the reading materials, ask questions, and then participate in classroom discussion. The lesson also included teacher's storytelling with guided questions and guided discussion. The fourth lesson was in math, specifically about properties of numbers, odd and even and ordering. The teachers planned all four lessons together to control for content effect. All lessons, by all teachers, were taught in the same teacher-led manner.

### Dependent Measures and Data Collection

Data were collected on students' most prevalent inappropriate behaviors and on the teachers' behaviors. An inappropriate behavior (IB) was recorded when one of the following behaviors was demonstrated: (a) moving (i.e., head or body shift or twist to directions other than the location of the learning stimuli for more than 5 seconds), (b) talking (i.e., speaking to self or to others while the teacher talks or while performing a learning assignment that does not require talking), (c) shouting (i.e., raising voice beyond an average volume practiced in the class), (d) leaving (i.e., being away from one's desk, while no body part touches the chair, for more than 5 seconds), and (e) hitting (i.e., forcefully touching, pushing, or kicking other students). These inappropriate behaviors were selected as they were the most frequently observed during six preliminary pilot observations. The IBs of all 12 students

were coded from the videotapes using event recording procedures (Cooper et al., 2007) and converted to rate per 10 minutes by dividing the frequency by the exact number of minutes per lesson and multiplying by 10.

Teachers' behaviors were selected as follows. Two expert pedagogues observed all four teachers' videos and indicated the most prominent teachers' behaviors that appeared to co-vary with students' IBs as suggested in the behavioral and pedagogical literature (Evertson, Emmer, & Worsham, 2006). Five behaviors were selected for analysis:

- a) Increasing (i.e., encouraging) interactions – Any positive verbal or nonverbal teacher's feedback following a student's behavior and intended on strengthening its future occurrence. Judgment was based on the teacher's behavior topography only, without a clear confirmation that student's future behavior had increased.
- b) Decreasing (i.e., reprimanding) interactions – Any negative verbal or nonverbal teacher's feedback following student's behavior and intended on weakening its future occurrence. Similar to increasing interactions variable, decrease in interactions was presumed only.
- c) Overall interactions – The total rate per 10 minutes of teachers' increasing and decreasing interactions.
- d) Reaction time – Time elapsed between a student's inappropriate behavior and the teacher's initial response to it. Time was counted only when the teacher's response explicitly referred to an inappropriate behavior displayed.
- e) Proximity during interactions - Proximity was classified according to three measures: (a) step toward the student – the teacher made at least one step in the direction of the student she referred to; b) closeness – the teacher stood one meter or less from the student while talking to him; c) contact – the teacher touched the student during interaction.

All teachers' behaviors were coded from the videotapes using event recording procedures (Cooper et al., 2007), and converted to rate per 10 minutes with the exception of reaction time which was collected using latency recording procedures.

### Research Procedures

A descriptive investigation was conducted to reveal presumable co-occurrences between teachers' behaviors and students' behaviors that may enhance or hinder the development of the teacher's stimulus control. Bijou, Peterson and Ault (1968) accentuated the importance of descriptive research to the revelation of co-variations between behaviors that can later inform experimental investigations. Previous descriptive studies examined how the behavior of caregivers, staff members, or teachers correlates with students' problem behaviors mostly involving direct observation on events using frequency measures

Table 1  
Interobserver Agreement Percentages for Students' and Teachers' Behavior

Behavior	Percentage of data on which interobserver agreement was collected	Mean IOA	Range
Students' inappropriate behavior	40	86	78-95
Increasing interactions	50	91	88-95
Decreasing interactions	50	88	84-94
Reaction time	40	100	
Proximity	40	94	83-100

of behavior (e.g., Lalli, Browder, Mace, & Brown, 1993). Similarly, this descriptive investigation attempted to identify presumed relations between teachers' behaviors and students' behaviors that may indicate teachers' stimulus control.

One daily lesson (i.e., first period) was videotaped for four consecutive days. Each teacher taught a 10-minute segment of a lesson. Teaching order was randomly altered so that each teacher was assigned to teach a different segment of the lesson at any given day. At the end of each 10-minute segment, the following teacher entered the room and continued the same content taught while the present teacher left the room. The transition included a 30-seconds overlap during which two teachers were present in the classroom and no more than 5-seconds pause in instruction when the following teacher resumed teaching. The transition routine was practiced by all teachers prior to the beginning of the data collection until these criteria were met. As all teachers prepared the four lessons together, they were all familiar and comfortable with the content to be taught.

Three video cameras operated by a technology expert were placed in the classroom corners. Two cameras captured all students in the classroom, and one captured the teacher. To control for participant reactivity, videotaping was conducted in the classroom by the same person for at least once per week from the beginning of the school year and every day for six consecutive days prior to beginning of the study. At this point students were already accustomed to the presence of the cameras and the technology expert and did not interact with him nor were affected by his presence.

### Interobserver Agreement

Four observers, trained in direct observation methods, practiced response definitions and measurement using

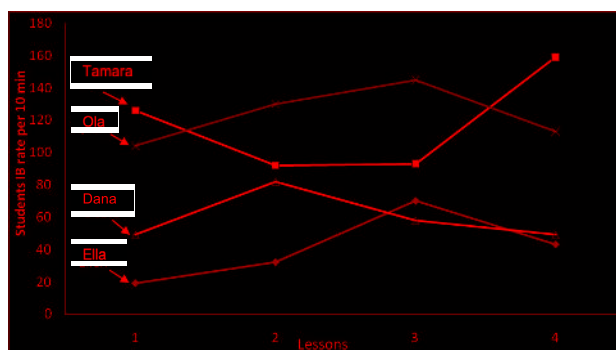


Figure 1: Students' Inappropriate Behaviors (IB) rate per 10 minutes in the presences of the four teachers

prerecorded videotaped lessons until reaching 100% agreement in three consecutive sessions. Interobserver agreement (IOA) was calculated by dividing the smallest total of occurrences by the largest total multiplying by 100. Overall IOA averaged 94%. Specific IOA for each of the behaviors measured is presented in Table 1. Overall, IOA for students' behaviors was conducted on 40% of the data. Mean agreement was 86% (range 78-95%). IOA for teacher's behaviors was conducted on average of 44% of the data, resulting in 93% (range 83-100%) agreement on average.

### RESULTS

Figure 1 illustrates frequencies of IBs observed in the presence of each of the participating teachers during the four 40-minute lessons. The data show the novice teachers (Ella and Dana), trained in classroom management, encountered less frequencies of IBs than the veteran teachers (Tamara and Ola). Notably, there were no overlapping data points between the novice and the experienced teachers.

Two teachers (Tamara and Ella) were selected for further analysis of their teaching interactions. Ella encountered an average rate of 41 IBs per 10 minutes (range, 20-43), while Tamara encountered 117 (range, 41-159), almost three times more. Most frequent types of IBs displayed for Ella and Tamara were moving (23 and 59 per 10 min, respectively) and talking (17 and 34, respectively). Leaving one's desk and shouting, which are arguably more severe behaviors, occurred more frequently in Tamara's presences of (19 and 6 per 10 minutes, respectively), versus almost never in Ella's presence (1 and 0, respectively).

A further analysis of the types of IBs displayed in the presence of Ella and Tamara is illustrated in Figure 2. Most frequent IBs displayed were moving (average of 23 and 59 per 10 min, respectively) and talking (17 and 34, respectively). Leaving one's learning position and shouting, which are arguably more severe behaviors, occurred more frequently in the presences of Tamara (19 and 6 per 10

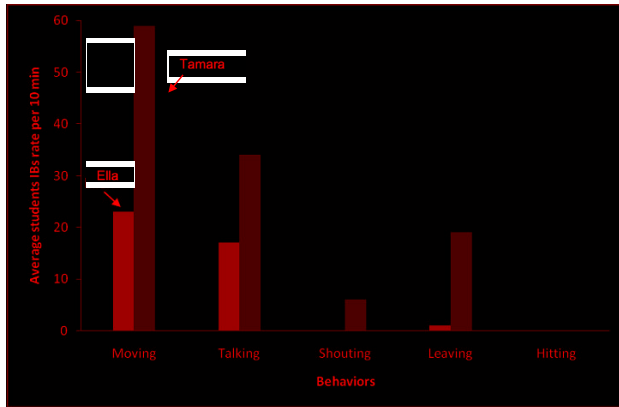


Figure 2: Average distribution of students' Inappropriate Behaviors (IB) per 10 minutes for Ella and Tamara

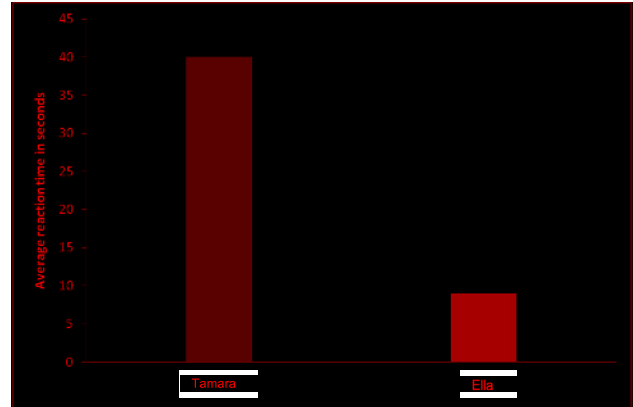


Figure 4: Average latencies of the teachers' reaction to inappropriate behaviors

minutes, respectively), versus almost never in the presence of Ella (1 and 0, respectively).

Figure 3 illustrates a clear difference between types of teacher–student interactions, as demonstrated by reducing, increasing and overall responses of the teacher. On average, Ella's interactions with students in 10 minutes were more than 2.5 times than those displayed by Tamara (39 versus 15, respectively). Among those interactions, Ella demonstrated a higher rate of increasing responses compared to Tamara (30 versus 10, respectively), while rate of decreasing responses was almost equal (9 versus 5, respectively) between the two teachers.

Figure 4 compares latencies between the onset of students' IBs and teachers' reaction. Mean reaction time for Ella was 9 seconds (range 2-13), while Tamara needed an average of 40 seconds (range 6-74) to react to inappropriate behavior.

A further analysis of the teachers' proximity during interaction with students is displayed in Figure 5 and provides additional information regarding their classroom

management distinctiveness. Data are presented as total number accumulated across four lessons due to the small frequencies of some behaviors. Data show Ella interacted with students twice as much as Tamara (120 versus 67, respectively). A more detailed analysis of the mode of interactions with students indicates that frequency of stepping toward students was almost equal between Ella and Tamara (47 and 42, respectively). Frequency of being close to students was slightly more than twice for Ella than for Tamara (40 versus 18, respectively) and creating direct contact with students was almost five times more (33 for Ella versus 7 for Tamara).

## DISCUSSION

The purpose of the study was to identify co-occurrences between teachers' and students' behaviors that may indicate teachers' stimulus control. Findings emerging from this descriptive study methodology do not presume functional relation between the investigated variables, but may inform further experimentation of this topic (Bijou et al., 1968).

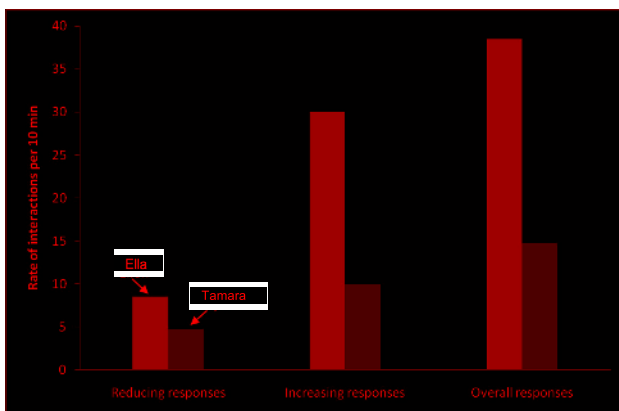


Figure 3: Rate of reducing, increasing and overall interactions per 10 minutes for Ella and Tamara

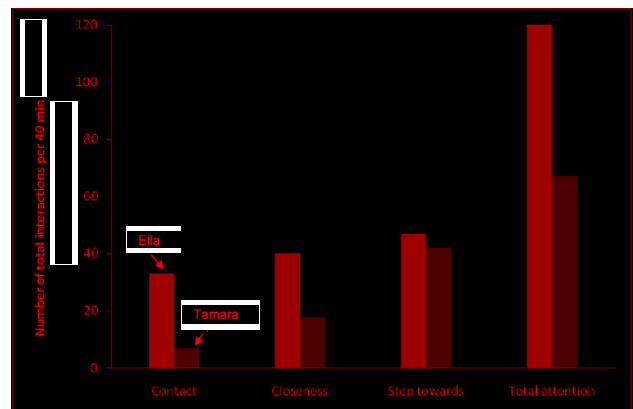


Figure 5: Total number of the three levels of teacher's proximity interactions



Overall, differences were detected in frequencies of IBs and in topography, arguably quality, of teachers' behaviors between Ella (novice, trained in classroom management) and Tamara (veteran, no formal training in classroom management). Ella encountered lower frequencies of disruptions during her teaching, exhibited more immediate, frequent and positive interactions with students, created proximity, and promptly responded to their behavior. On the other hand, Tamara encountered higher frequencies of IBs in her lessons that coincided with lower frequencies of interactions with the students, increased use of decreasing interactions, delayed contingent responding to students, and avoidance from proximity. Alacrity of responses to various environmental events, as presented more proficiently by Ella, is an indicator for enhanced stimulus control, often noticed among expert teachers (Siedentop & Eldar, 1989).

The interrelations between the teaching patterns are all together suggestive of Ella's improved degree of stimulus control, producing solid classroom management. This was evident in the fewer IBs she encountered, and their lessened severity, more positive interactions, and higher frequency of contact with the students. Tamara experienced more IBs, defaulted mostly to negative interactions, and maintained minimal and remote contact with the students. In other words, Ella made more use of instructional antecedents such as interactive teaching, eye contact, and appropriate proximity. These qualities were recommended as fundamental strategies for prevention of problem behaviors and increased compliance in the educational setting (Everett, Olmi, Edwards, & Tingstrom, 2005; Martens & Kelly, 1993; Palardy & Palardy, 2001).

As previously noted, teaching behavior data collected in this study are constituents of stimulus control. The differences found between the participating teachers are surprising, as they stand in opposite to their teaching experience. Ella, the novice teacher, exhibited better stimulus control than Tamara, the veteran. The differences could be attributed to various variables subject to further controlled experimentation. Presumably, one of the variables is the teachers' training in behavioral approaches to classroom management. Ella, a novice teacher, was trained in classroom management. Tamara, the experienced teacher, did not have an extended behavioral training. This certainly is not a single account, but one that illuminates the need to empirically identify the knowledge and skills that assist teachers in establishing better stimulus control and classroom management. It is possible that preservice training in behavioral evidence-based classroom management skills (versus experience) may equip teachers in coping with students' most challenging behaviors in the classroom (Martens & Kelly, 1993).

The data in this study echo previous findings suggesting that when good management skills (e.g.,

feedback, cues) govern the educational setting, teachers spend less time dealing with problem behaviors (Simonsen et al., 2010) and more time in teaching and advancing students' learning (Emmer & Stough, 2001). If learning opportunities are maximized with better teaching stimulus control, it is imperative to expand teacher's stimulus control research to validate casual relations between it and students' behavior and learning.

Professionally, this study illuminated an educational initiative of supporting students with severe behavior problems by specifically trained special education teachers on a teacher-education college campus. The teacher-education college establishing and supervising an on-campus school generated a well-controlled educational setting accompanied with empirical data collection. We believe this example is of unique importance to international countries who may be limited in research resources. Other international countries may consider offering special education superintendents and administrators to establish an on-campus learning classrooms specifically designed for students with behavior problems. Recommended features of such classrooms should be (a) adherence to the regular curriculum provided in school, (b) focus on social skills and self-control instruction, and (c) operation on a short to intermediate term prior referring students back to their previous school.

Findings of this study should be interpreted with caution due to its limitations. The small number of teachers participating in this study limits properties of external validity. Additionally, research control was assumed by randomizing the order of teachers during the 40-minute lesson. A counterbalancing method of the teaching segments could have aided in precluding potentially confounding effects of time in the lesson on students' behavior.

Finally, the study has several implications for the training of teachers for students with behavioral disorders:

- a) Teacher training programs should aspire to adopt evidence-based classroom management strategies that can aid in maintaining classroom order and discipline (Emmer & Stough, 2001; Palardy & Palardy, 2001; Simonsen et al., 2008).
- b) Programs should train preservice teachers to develop their teaching stimulus control by selecting and practicing few critical classroom management skills that can result in the most meaningful classroom changes (Simonsen et al., 2010).
- c) Teacher training programs could use the current research strategy for teaching and learning practice. Preservice teachers in their field experiences could be assigned to teach a classroom and compare their stimulus control over the class with the one achieved by other colleagues teaching this classroom. This

practice could enhance their learning experience in becoming a more skillful classroom manager.

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