The Effect of Barkley's Behavior Management Principles on a child with ADHD in a Lebanese inclusive classroom: A case study

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Abstract: Barkley's behavior management principles for students with ADHD developed and implemented in a second grade inclusive classroom through a system of behavior modification techniques are studied in this project. The principles involve the application of some behavior modification techniques in class aiming at teaching the ADHD child self-control, response inhibition and social skills training. The system emphasizes the cooperation of general education teacher, special education teacher and the student. Two behaviors are focused on: calling –out and out of seat. Pre-observations as well as observations during the program's implementation are done to examine the effectiveness of the behavior modification principles. The results have shown that the system is effective when consistency and collaboration between regular and special education teachers are present.

1. INTRODUCTION

Children with ADHD are inattentive and overactive, and their impulsive behaviors significantly hinder their social and educational success. They often need behavioral, educational, medical, and social interventions in the general education classroom (Salend, 2001). Despite increasing awareness about ADHD in Lebanon, especially among private school teachers, most educators are ill-equipped to effectively manage the behavior of these children.

While the intervention literature has largely failed to support a single treatment for ADHD, there are many arguments in favor of a combined intervention, specifically the pairing of pharmacological and behavioral therapies (Pelham, 1989).

With the recent trend toward viewing ADHD as a potential problem in inhibition, a most compelling rationale now exists for using behavioral interventions with ADHD in the classroom based on a functional analysis of the student's behavior ((Pfeiffer & O'Leary; 1996, Barkley, Manual). Teachers are urged to deal with ADHD from a disability perspective (Barkley, 1994, Manual). These interventions have traditionally included token economies, contingency contracts, response cost, peer-mediated interventions, school-home report cards, and time-out (Garrick Duhaney, 2003).

Minor misbehaviors such as off-task behavior and class disruptions can be best prevented through as eye contact, a touch, moving closer to the student or calling on the student, or by resorting to more direct interventions such as setting clear expectations, supplying models for appropriate behavior, and establishing routines that enhance self-control in the classroom (Charney , 1998; (Winebrunner; 1996).

2. LITERATURE REVIEW

Charney recommended a systematic strategy to overcome the " blurts-outs" in the classroom: (a) giving children a clear explanation of the expected tone to be used in the classroom, (b) listing, defining and reinforcing expected student behaviors, (c) developing a set of strategies and acting them out, (d) setting up routines that show that self-control is important, such as wait time,(e) setting predictable consequences for blurting out so that student can't ignore the rules(f) having students start over when there is a communication break-down (f) encouraging the class to be disruption- free , especially when the class is very excitable.

A number of complementary techniques, such as different seating arrangement, provision of break time during seat work, use of attention self-monitoring to increase on-task behavior (Reis, 2002), and explicit teaching of classroom routes (Reynolds, 1992) can enhance behavior modification interventions.

A body of research has shown that teachers' attitudes and expectations toward students with ADHD affect students' performance (Barton, 1992; Hepperlen, Clay, Henly, & Barke', 2002). In a study on the achievement of ADHD students in inclusive classrooms, it was found that ADHD students who received more process questions, more praise, and less criticism from teachers, gained better scores and displayed more appropriate behavior (Cummins, 1998). Teachers who are caring, understanding and supportive to ADHD kids had less chaos in their classrooms (Cook, Tankersley, Cook, & Landrum, 2000; Hepperlen, Clay, Henly, & Barkley, 2002). Along the same lines, short class rules coupled with positive reinforcement for following the rules and mild punishment for rule disobedience (Reid, 2001; Rief, 1993; Parker, 1994), use of strategic positive attention whereby teachers "catch [students] being good" by applying differential reinforcement of alternative behaviors (Garrick Duhaney, 2003) tend to bring about desirable behavior change.

Russell Barkley, an authority on ADHD, drew on Bronowski's principles that ADHD children may be developmentally delayed in regulating their behaviors when consequences are weak, delayed or unavailable, and hence the best interventions are those that that directly alter the pattern, timing, salience of such consequences in the classroom. Barkley has combined a number of social, emotional and behavior modification and advocated ten core principles for the behavior management of ADHD students in school settings using a variety of techniques namely using consistency, cooperation and prompt behavior changes through a system of praises, rewards, and mild punishment, combined with social skills training (Barkley, 1994). Their success with ADHD is highly dependent on how and when they are administered by teachers (DuPaul & Stoner, 2003).

Barkley's adaptation of Bronowski's theory (1977) of delayed responding to ADHD seems to provide a more elegant explanation of existing research findings, a deeper appreciation for the pervasive impact of this disorder on daily life, and exciting suggestions for numerous future research explorations. Improve the capacity for delay, and these functions should act more proficiently, feeding forward information that guides adaptive behavior (Barkley; 2006).

There exists only one published study on the effectiveness of Barkley's principles. It involves six hyperactive boys aged 7 to 10 indicated that the self-control package derived from the principles was effective in improving misbehavior and attention to tasks during seat work but not during group instruction. The children were not able to follow up with the teacher when using the sign system or the color chart system because they were distracted by other peers. (Barkley;1980). Barkley demonstrated his principles in a popular commercial video "ADHD in the Classroom" (1994) using several self-contained classrooms of students with ADHD in Worcester, Massachusetts, some as young as kindergartners, all on psycho-stimulant medication.

The purpose of this study was to investigate the effectiveness of Barkley's ten core principles of behavior management with an ADHD child from a different cultural context, namely an inclusive setting in Lebanon where very few teachers use a systematic, research-based approach to deal with hyperactivity, impulsivity and inattention. It was hypothesized that Fouad would improve his disruptive in-class behaviors and would develop sustained self-control skills after the implementation of the system.

3. METHODLOGY

3.1 SUBJECT

Fouad, a 10-year-old child, is the youngest of 5 children. He comes from a low socio-economic class. His mother is a housekeeper and his father a truck driver. He is of average intelligence as indicated by the WISC-R Test (IQ composite=91). He was diagnosed with ADHD - combined type at the age of 8 and had been on Ritalin (10 mg/ two pills a day) since May 2005. The assessment process included the administration of ADHD Rating Scale- IV (DuPaul et al, 1998): School and Home Situations. Teachers' observations, parents' interviews as well as observations done by the social assistant in the rehabilitation center were also used during the assessment process. The neurological examination, including the MRI scan, showed no neurological damage.

Fouad was in a public school until he reached second grade. He was not able to follow classroom rules or even sit in his chair for more than ten minutes. His behavior was affecting his academic performance. Teachers tried to provide in-class support through teachers' help as and peer-tutoring. However, Fouad's misconduct was highly detrimental to his academic performance. Fouad failed second grade twice; he was

then moved to a rehabilitation center to receive the needed medical attention, psychotherapy and necessary academic support that would prepare him to cope in a regular class.

Fouad was placed in a self-contained special class for a year (during the 2005-2006 academic year) with five other children who had emotional and behavior problems. Fouad had counseling sessions twice per week and received one-on one instruction (one session per day) to remediate his academic weaknesses, especially reading.

Target Behaviors

In the regular classroom, Fouad reportedly displayed the following behaviors during the first week: frequent interruptions, leaving classroom and seat without teacher's permission, active defiance of teacher's directions or class rules, deliberate annoyances and blaming of others for his mistakes, argumentativeness, resentfulness, and temper tantrums. When asked about the priority behaviors that need immediate modifications, both the special educator and the general classroom teacher agreed that they are mostly concerned about Fouad's out-of-seat and calling-out behaviors.

Out-of –seat: to leave one's place without the teacher's permission

Calling –out: to talk or blurt out answers without the teacher's permission.

3.2 Setting

The setting of the study is a rehabilitation center founded in 1996 and located in South Lebanon. It provides specialized services for persons with disabilities of all ages. The center consists of the following departments: medical clinics, physical therapy, eye and ear, special education, speech therapy, psychomotor therapy, psychotherapy, psychiatry, and training departments.

Fouad's class consisted of 25 regular students; only Fouad had ADHD. The class has a regular teacher and a special education teacher who clarified concepts and helped him stay focused and control his impulsivity.

3.3 INTERVENTION

A system derived from Barkley's principles was created after thoroughly screening the video demonstration of the program (Barkley, 1994). Data was collected before and during the intervention. Two observable behaviors were targeted: calling out and out of seat. The regular and special education teachers collected baseline data related to Fouad's behavior during Arabic instruction on five consecutive days for the duration of a whole school week using event recording, the technique of choice to note the number of times a behavior occurs (Lewis & Doorlag, 2005). The intervention was implemented for one month. Observations were done during the implementation of the program for two weeks and then another week after the intervention had been terminated (Reversal Period). The Appendix illustrates the observation sheet used in data collection.

3.4 Description of the Application of Barkley's Behavior Management Principles

The following is a description of the ten core principles for behavior management of ADHD students and the way they were applied with Fouad:

1.   *Rules and instructions must be clear, brief, and delivered through visible modes of presentation:* Rules were agreed on with Fouad and posted clearly on an easel facing Fouad's desk. The rules were: (1). Follow directions given by your teacher; (2) Stay in class; (3) Do your best.

2.   *Immediacy of the consequences:* Fouad was given immediate feedback about his acceptable behavior. Feedback was clear and specific, and occurred as soon as the target behavior took place. This principle was demonstrated in class through using the "color chart system". Fouad was encouraged to follow the rules and "stay red". The yellow square was placed on the color chart every time Fouad would break a rule. Fouad was rewarded after three consecutive "reds" and was not rewarded after three consecutive "yellows".

3. *Frequency of the Consequence:* Using the color chart system, Fouad was given feedback on his behavior every ten minutes because Fouad cannot sustain attention for a longer period and gets bored fast.

4. *Saliency of the Consequence:* As an ADHD child, Fouad was assumed to need more important or salient rewards. In addition to praise, teachers often provided physical affection, privileges, tokens, and collectible items to motivate Fouad to persist in following rules. As a group, teachers also used the "Big Deal System". On a large pizza cardboard, and every thirty minutes, Fouad put either a red pin or a yellow pin on the

pizza. A red pin means in seat and not calling out. A yellow pin means the opposite. At the end of the week, the pins were counted and Fouad would go out for lunch with his favorite teacher when he earned 20 red pins.

During the third week, teachers used a "token economy system". A plastic cup was placed on Fouad's desk. Every ten minutes, the teacher would place a token in Fouad's cup if Fouad was following the rules. Fouad would exchange the tokens for inexpensive gifts at the end of the day.

5. *Teachers would "act not yack"* when dealing with Fouad in the regular classroom. Teachers would always act with consequences; for every good behavior, there was a reward and for every inappropriate behavior there was a negative consequence- loss of a certain privilege.

6. *Positives before Negatives:* Teachers would explain the undesirable or negative behavior to Fouad by rephrasing the inappropriate behavior problem in positive terms. At the end of every period, the special education teacher would work on a "follow up" period during which she would discuss with Fouad his behavior and evaluate his efforts during the period. The special education teacher would also suggest other ways by which Fouad's behavior could improve. After the new behavior had been reinforced consistently for at least one week, teachers would begin punishing the undesirable behavior. Teachers would use mild punishment: Fouad would sit beside the teacher and would complete assigned worksheet.

7. *Consistency:* Fouad's teachers were consistent, i.e, responded exactly in the same way across setting – in the classroom as well as the playground during recess. They used the "sign system" with Fouad to make sure he knew what to do. A red sign means "raise your hand before talking". A yellow sign means "soft voices" and a green sign is "free play". Fouad was encouraged to watch the signs and behave accordingly. The sign system was used during recess time. Teachers made sure to be consistent in reinforcing rules and in giving feedback.

8. *Anticipating problems:* Teachers tried to anticipate problem situations. They considered ahead of time the best ways to deal with them, developed a plan, share it with Fouad and classmates, and then implement them. This was implemented through social skills training sessions provided twice a week for the whole class of 25 students. The teachers would describe social situations like fighting with a friend during recess and would encourage the whole class to suggest nonviolent ways by which these problems can be solved.

9. *Keeping Perspective:* Teachers were asked to keep perspective on the behavior problems that arose. They stayed calm, kept a sense of humor about the problem, and tried to follow Barkley's principles in responding to the child.

10. *Practicing Forgiveness:* Teachers will forgive the anger, disappointment, or other destructive feelings that might arise that day due to Fouad's misconduct or disruptions.

3.5 Team Planning

The regular education teacher and the special education teacher agreed to collaborate to improve Fouad's behavior. Both teachers conducted a functional behavioral assessment to identify the antecedents that caused the two targeted behaviors to occur: calling out and out of seat behavior. Both teachers observed Fouad in class twice per day: for one session in the morning and another session in the evening. They collected data for two weeks. The teachers met after this period and both agreed that the antecedents for the behaviors were:

Antecedent- calling out
- During oral discussion and while the teacher is asking questions to the group, when Fouad does not know the answer and others are engaged, fouad keeps on calling out to distract his peers and distract the teacher.
- Whenever the teacher says bravo to somebody for answering in a correct way, fouad calls out as a sign of jealousy.

Antecedent- out of seat:
- Whenever the students are solving a math problem or doing individual tasks (paper and pencil) Fouad leaves place indicating that he gets bored and hates this type of instruction.
- Whenever the teacher is helping one of Fouad's peers on one-to-one basis, Fouad leaves place.
- They both concluded that Fouad exhibit the behaviors as a way to attract the teacher's attention – distract her attention when engaged with peers. He leaves place whenever he finds the task boring. Fouad does not leave his place when doing a project or a group activity.

The special education teacher prepared a list of reinforcers Fouad had arranged in a hierarchy from the most to the least favorite. They were: (1) paint horses (2); spend some time with his favorite teacher; (3) play basketball with a friend; and (4) surf the internet.

3.6 The Implementation of Barkley's Behavior Management program

Barkley's behavior management techniques that are clearly described in the videotape emphasize the use of the following techniques: color charts, signs, point system (Big Deal System), mild punishment, time out, social skills training, and turtle control. These techniques were used on a consistent basis by the team working with the ADHD child and specifically the teachers.

First, the team placed a visible reminder- the color chart -in class. The chart had all the students' names with six spaces next to each name- every space corresponded to a ten-minute interval. Every ten minutes, the teacher placed a square describing the behavior of the child: a red-for good behavior, yellow for –a can be better behavior and a blue square-for not following the rule. They explained the rules to the class as a whole and to Fouad in particular. If he broke a rule, he would get a blue square. If he did not, he stayed red. When Fouad collected three reds on the chart, he would get a reinforcer. If he had three yellows, he could have a less favorite reinforcer. The rule was, "stay red". It was not the color that motivated Fouad; it was what the color was associated with. The rules were: (1) Follow teacher's directions; (2) Stay in seat; and (3) Do your best. The color chart system was used for two weeks.

The team also used a timer during seat-work to keep Fouad focused, and provided frequent verbal reminders such as, "you have ten minutes to finish this activity."

They made sure to consistently give feedback after every class for two weeks. Fouad was asked to evaluate his behavior at the end of every period, "What did you have today? Why did you take three yellows? What should you do next time to stay red?" Teachers also provided feedback in class through verbal praise, a tap on the back, or a smile.

Second, teachers used signs to help Fouad stay focused. When the red sign was up, Fouad had to raise his hand before talking. Yellow required him to use his soft voice and green was associated with free work. This was used for two weeks.

Third, the "Big Deal System" was used with the class as a whole for a week as a way to motivate students to work in a group. Students placed a red pin on a large "pizza" cardboard every time they were following class rules. They placed a yellow pin on the pizza every time they broke the rules. When fifty red pins were attained, a really big reward was given (a pizza party, a pop-corn party, or a field trip).

*D*uring the third week of the implementation of the program, the team felt the need to add a new strategy to optimize the benefits of the program, the token economy system. Teachers gave plastic chips to Fouad every time he displayed appropriate behavior. Fouad accumulated these during the day and at the end of the day, and traded them for inexpensive gifts, stickers of horses- Fouad's favorite animal.

Fourth, when Fouad misbehaved, teachers used with him "mild punishment"- the task system. Fouad was given a piece of paper and was reminded about the rule he broke. He had to write down on a piece of paper what he was supposed to do instead.

Fifth, they used "time-out" for unacceptable behavior. Teachers removed Fouad from the situation and seated him alone for ten minutes. The purpose was to allow his emotions to subside and to provide him with an opportunity to reflect on his mistakes.

Sixth, social skills training was used on a daily basis. Fouad was encouraged to talk about his feelings alone and within the group everyday for five to ten minutes. In addition, teachers used "acting out" scenarios or "brave talk" to explain to the students what they should do in certain problem situations: "What would you do if somebody pushed you? Do you push back? Do you talk to the person?"

Seventh, during recess, teachers encouraged Fouad to use the "Turtle Control" Technique which consists of four steps. It encourages the child to stop, focus, think and find a solution to his problem, and hence, control his or her impulsivity.

The teachers were thorough, consistent and systematic. They used all the above techniques except the color chart system which they replaced with the token economy system two weeks into the implementation phase when they noticed that Fouad had reached satiation and stopped responding positively to the tokens.

4. RESULTS

Inter –observer agreement for each observation averaged 98.8%for calling out behavior and 100% for out-of-seat behavior.

Figure 1 and figure 2 in the appendix display the results of the implementing Barkley's behavior management principles on Fouad.

During the baseline period, the out-of-seat behavior ranged between 18 and 19 times per observation session. The calling-out behavior ranged between 24 and 22 times per session. Observations during the implementation of the program showed that calling- out behavior decreased gradually from 19 to 4 times per session. Further, the out-of-seat behavior decreased gradually from 15 to 3 times per session. When the color chart was implemented, Fouad earned "yellows" during the first week. During the second week, Fouad was able to "stay red" and earned reinforcers.

Reversal data collected during a week after the program had been terminated show that both out-of-seat and the calling-out behaviors ranged between 5 and 4 per session with some mild fluctuation between the two.

Comparisons between the results during the baseline and reversal periods reveal that calling- out behavior decreased from 25 to 5 times per session, whereas the out-of-seat behavior decreased from 19 to 3 times per session.

Based on teachers' informal observations, Fouad demonstrated better social skills in interacting with peers during recess. His critical thinking abilities also improved through the continuous drill of the "turtle control" technique. Fouad was now able to handle his impulsivity and stopped getting himself in trouble as indicated by his peers.

During the reversal period, after the behavior modification strategies had stopped, Fouad was still able to practice self-control skills. He was able to control his impulsivity in class and during recess. He was able to maintain a good relationship with his friends. Teachers noted absence of fights with friends during this period.

During recess, Fouad always repeated the steps of the "turtle control" technique to himself to control his impulsivity.

Finally, teachers noted an average increase of 10 points in his grades across all subjects, a possible by-product of the intervention.

After the implementation of the program and observations were conducted, Fouad had a 2 months summer vacation. He was back to school in October. During the first two weeks, Fouad's teachers re-drilled and reinforced barkley's techniques to make sure Fouad will practice self-control. Teachers indicated that Fouad could re-apply easily the techniques learned previously. He was proud to have the tools that will help him improve.

Observations were done on Fouad after two weeks drill by both teachers for a period of two weeks (one session in the morning and one session in the afternoon). Inte-rater observation results indicated that the calling out behavior ranged between (1-2) in the morning and between (2-3) times during the afternoon session. On the other hand, the out of seat behavior rated once in the morning and between (2-3) times in the afternoon.

It is important to mention some teacher's observational comments about Fouad's behavior during recess: fouad was using the "turtle-control" technique during recess. He had more friends to play with and he always asked the teacher to evaluate his performance: "am I behaving well?"He joined the basketball team club of the school and consequently, his energy was effectively used. His peers love him and acted as "indicators "when Fouad started losing control. The secret word that they agreed on: "Fouad, watch out". Fouad had more confidence and better self-esteem.

This year, Fouad was re-included in the regular school. The social assistant of the center visits the school every month and she has visited Fouad twice so far. She said that Fouad is disciplined, and loved by his peers. He is teaching the techniques he learned to his peers and he is pretty enjoying being a leader sometimes. He is being pulled out twice per week to remediate his academic language problems.

5. DISCUSSION

It is clear that Barkley's behavior management techniques implemented by Fouad's teachers have markedly improved Fouad's calling-out and out-of-seat behaviors.

Teachers found the "color chart" system effective because: (1) consequences were immediate, (2) rewards were salient, and (3) rules clearly stated and enforced.

The token economy system worked well with Fouad because it was consistent, frequent and positive.

Regular teachers expressed their willingness to include Fouad in their classes and provide extra sessions to fill his academic gaps. Consequently, Barkley's behavior management principles facilitated inclusion.

DuPaul and Stoner (2003) noted that rewards should be tangible for children up to nine years. During the second week, teachers used the token economy system, namely stickers, which worked well with Fouad.

The "time-out" technique that was used as a mild punishment procedure with Fouad involved the removal of the child with ADHD from a reinforcing situation swiftly, and for a specified period of time, usually a minute for every 2 years of age (DuPaul & Stoner, 2003), was the most salient variable in the success of the time-out strategy; Fouad calmed down after the time-out period.

Barkley's behavior management principles implemented through different behavioral strategies proved to be effective when the teacher applied the principles consistently. Structure was also very important to Fouad and had improved his behavior. Pfiffner and O'Leary (1996) recommended putting the structure and incentives in place, then letting the child be responsible for his behavior.

As for social skills training, the use of school-based cognitive–behavioral approaches of helped reduce the aggressive behavior of ADHD students as well as maintenance of effects over time (Robinson, Smith, Miller, and Brownell, 1999). Fouad's problems with emotional and social competence, leading him to anti-social behaviors had been greatly reduced when teachers modeled social skills and provided him with ample opportunities to practice it. Fouad's teachers used the "brave-talk" strategy that helped Fouad consider other options to solve a problem rather than react impulsively. Communicating with Fouad about his behavior and giving him immediate feedback were contributing elements of the success of this approach.

Barkley asserted that classroom behavior treatment improves the "adaptive, aggressive, self-control and social skills" of ADHD students, but had his doubts on improvement of academic skills (Barkley, 2000).The behavioral plan implemented contradicted Barkley to some extent. Based on teachers' observations, Fouad spent a longer time doing worksheets and applying concepts and his academic grades improved from the 50s to the 60s after the behavior plan had been implemented.

Barkley (2006) indicated that "teachers' understanding of ADHD and the consistent application of the principles of educational management had a significant impact on the success of these children in their academic career." (p.219) Further, the degree to which general education teachers have emotions of attachment, care, indifference, and rejection toward their students directly affects the ADHD student's educational experience (Cook, Tankersley, Cook, & Landrum, 2000). Fouad's teachers believed that their collaboration made Fouad's behavior plan a real success, were caring, supportive and believed in his ability to improve both behaviorally and academically.

It is true there are no guaranteed "quick fixes" or "sure-fire" treatments for students with ADHD. However, when effective methods are used in a consistent, systematic fashion, there are more chances for successful pushes (Barkley; 2006, p.69)

Limitations

Consistent with the nature of case studies, the findings at hand are inherently limited and generalization of Barkley's intervention program to other students and other types of behavior problems in Lebanon most likely need additional research.

6. Recommendations for Future Studies

Related to Lebanese students with ADHD, It is recommended that future research focus on the effect of behavior modification techniques on achievement, social skills and self-esteem. Also, long-term gains need to be investigated to ensure that inappropriate behaviors are reasonably extinguished over an extended period of time, and effective in-class behaviors and self-regulatory skills are sufficiently sustained. Kohn (1993) argues that rewards and punishment are not opposites at all; they are two sides of the same coin.

And it is a coin that does not buy very much. Controlling students with incentives may prove successful short-term but ineffective over time.

Fitzsimmons (1998) believes that there is a good point in adopting behavior management on a school-wide basis because in this case students are not overwhelmed by a range of conflicting requirements and expectations. This approach to discipline needs professional development and long-term commitment by all members of the school community. Schools can benefit "from having in place a clearly defined, consistently enforced behavioral –management system designed to support students in controlling their own behaviors" (Fitzsimmons, 1998, p.191).

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Appendix

Event recording student observation sheet

Weekly Sheet

Arabic Class

Observation time: 10:00-10-50 A.M

Target Behavior: **Calling out**   Target Behavior: **Out- of -seat**

Day\time	10:00 - 10:10	10:10 - 10:20	10:20 - 10:30	10:30 - 10:40	10:40 - 10:50	10:00- 10:10	10:10- 10:20	10:20- 10:30	10:30- 10:40	10:40- 10:50
Monday										
Tuesday										
Wednesday										
Thursday										
Saturday										

P.S: The observer fills in the corresponding space by putting a tally (/) every time the
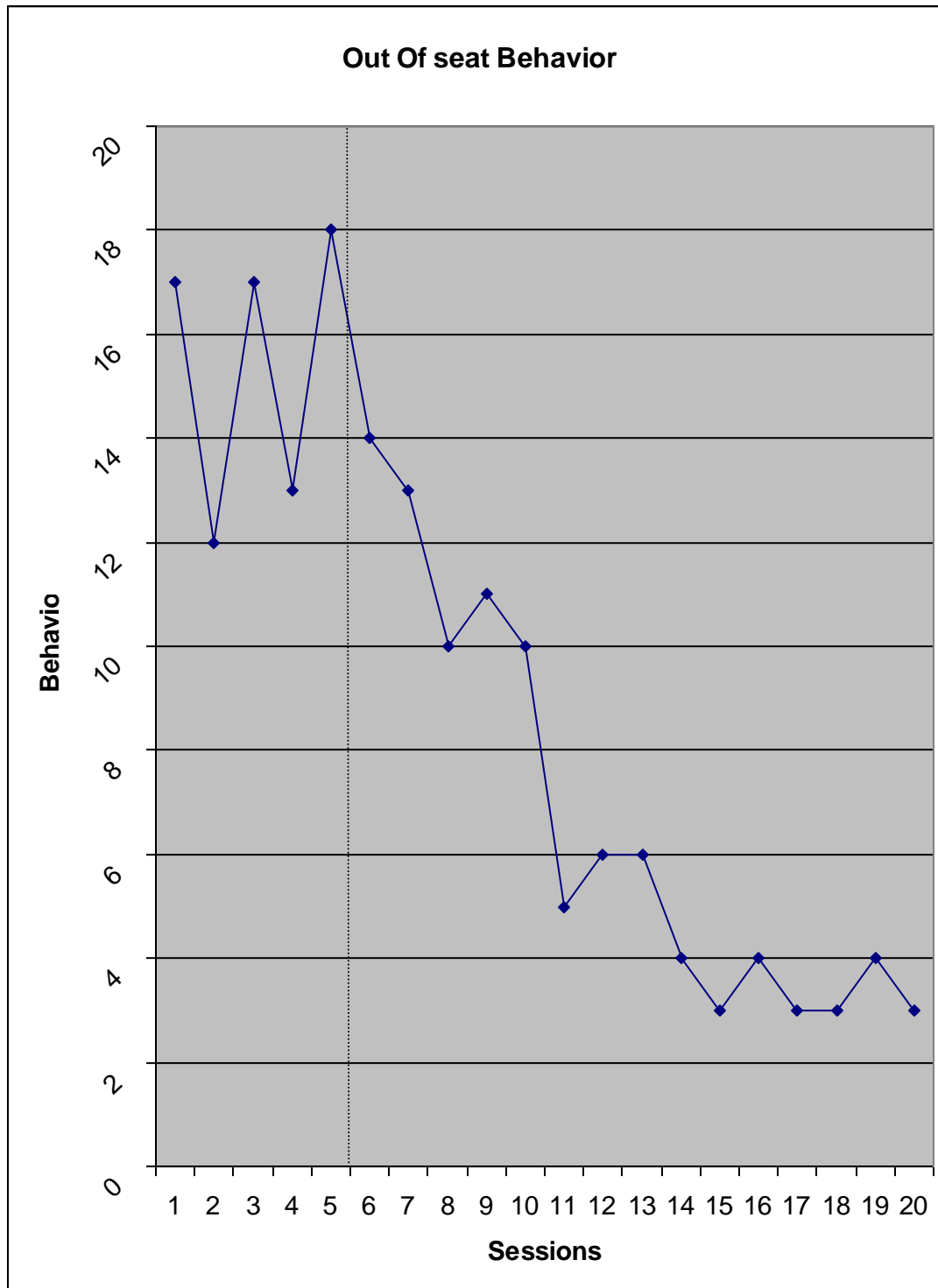
target behavior is observed.

Figure 1

Figure 2

Calling-out Behavior