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Abstract

Objective: The social functioning of adolescents with ADHD is characteristically impaired, yet almost no interventions effectively address the peer relationships of these youth. This study evaluates the preliminary effects of a video-feedback intervention on the social behavior of a 16-year-old male with ADHD—combined type in the context of a summer treatment program for youth with ADHD. **Method:** The intervention was administered in a teen-run business meeting designed to mimic the context of group-based activities such as student government, service clubs, and group projects. During each video-feedback session, the adolescent viewed a 5-min clip of his behavior in the previous business meeting, rated the appropriateness of his own social behavior in each 30-s interval, and discussed behavior with a summer program counselor. **Results:** Results indicated that while the video-feedback intervention was in place, the adolescent displayed improvements in social behavior from baseline. Results also indicated that the adolescent exhibited relatively accurate self-perceptions during the intervention period. The authors present preliminary evidence for cross-contextual and cross-temporal generalization. **Conclusion:** The results of this study and future directions for intervention development are discussed in the context of the broader conversation about how to treat social impairment in adolescents with ADHD. (*J. of Att. Dis.* 2012; 16(7) 579-588)

Keywords

ADHD, Adolescent Treatment, and Social Functioning

As in childhood, peer relationships are one of the most impaired domains of functioning for adolescents with ADHD (Bagwell, Molina, Pelham, & Hoza, 2001; Pelham & Bender, 1982). Compared with their peers, these adolescents lack social competence, experience more peer rejection, and are rated as less likeable after only a brief interaction (Bagwell et al., 2001; Barkley, Anastopoulos, Guevremont, & Fletcher, 1991; Lee, Lahey, Owens, & Hinshaw, 2008; Sibley, Evans, & Serpell, 2010). They also possess fewer friends, participate in fewer social engagements than their peers, and tend to associate with deviant peers (Bagwell et al., 2001; Barkley et al., 1991). Poor peer relationships in adolescence have been linked to victimization, emotional distress, and internalizing problems (Pellegrini, Bartini, & Brooks, 1999; Prinstein & La Greca, 2002; Rubin, Chen, McDougall, Bowker, & McKinnon, 1995). Furthermore, association with deviant peers has been linked to substance use, antisocial behavior, and school problems (Marshal, Molina, & Pelham, 2003; Moffitt & Caspi, 2001). As a result, the social impairment of adolescents with ADHD may be instrumental in their established risk for a barrage of negative outcomes

in adolescence and adulthood (Barkley, Murphy, & Fischer, 2007; Lee et al., 2008).

Studies of peer problems in elementary school-aged children with ADHD suggest that in most cases, social impairment stems from performance problems, rather than social knowledge deficits (Hoza, 2007; Piffner, Calzada, & McBurnett, 2000; Wheeler & Carlson, 1994). Children with ADHD show the ability to accurately interpret the social behavior of others (Whalen, Henker, & Granger, 1990; Zentall, Javorsky, & Cassady, 2001) but display difficulties evaluating and controlling their own social behavior (Hoza, Waschbusch, Pelham, Molina, & Milich, 2000). This

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phenomenon may be partially due to a pervasive self-perception bias; across the literature, children with ADHD appear to view themselves more positively and as less impaired than adult informant and objective data would suggest (Loeber, Green, Lahey, & Stouthamer-Loeber, 1991; Owens, Goldfine, Evangelista, Hoza, & Kaiser, 2007). In addition, children with ADHD often display high levels of disruptive behaviors that other children may find aversive (Pfiffner et al., 2000). Thus, many children with ADHD understand how one should act in a social situation. However, their inability to attend to social cues, inhibit impulses, and accurately self-evaluate seem to combine to create a characteristic performance deficit.

Most of the literature on ADHD-related social impairment consists of studies conducted in elementary school-aged samples (Pfiffner et al., 2000). However, research with older individuals suggests that adolescents with ADHD also produce inaccurate self-evaluations (Fischer, Barkley, Fletcher, & Smallish, 1993; Sibley et al., in press) and struggle to comprehend the nuances of social exchanges (Sibley et al., 2010). Given the vast differences between the elementary and secondary school social environments, there may be unique situational factors that compound the social impairment of adolescents with ADHD. As a result, interventions for this population must be ecologically valid to be maximally effective.

Although there have been successful efforts to treat social impairment in children with ADHD (Chronis et al., 2004; Hoza et al., 2005; Pelham et al., 2005), there are only a handful of attempts to target social functioning in adolescents with this disorder (Evans, Axelrod, & Langberg, 2004; Smith, Pelham, Gnagy, Molina, & Evans, 2000). Stimulant medication is the most common treatment for ADHD in childhood and shows evidence of acutely improving the social behavior of adolescents with ADHD (Smith et al., 1998). However, stimulant medications show questionable ability to remedy peer relationships (Hoza et al., 2005), and adolescents are increasingly likely to refuse and desist use of stimulant medication (Molina et al., 2009). Traditional social skills training interventions show little evidence of improving the functioning of elementary school-aged children with ADHD (Antshel & Remer, 2003; Pfiffner & McBurnett, 1997), with no published studies of this approach in adolescence. Behavior therapy shows mixed results of improving the social functioning of younger children with ADHD, with informant and observational ratings suggesting gains (Chronis et al., 2004; Pelham et al., 2005) but peer sociometric ratings showing little generalizability to the natural social environment (Hoza et al., 2005). Attempts to use behavior therapy to improve the social functioning of adolescents in an after-school program setting resulted in small effects in parent-rated social skills (Evans et al., 2004; Evans, Langberg, Raggi, Allen, & Buvinger, 2005), but these studies did not evaluate whether these gains generalized to

the peer setting. In sum, social functioning has been a very intervention-resistant domain for adolescents with ADHD.

One intervention that targets self-perception and shows evidence of improving social behavior in children and adolescents is a video-feedback intervention (Embregts, 2000; Kern-Dunlap et al., 1992; O'Reilly et al., 2005). During this treatment, youth view video of and rate their social behavior while clinicians provide feedback to the youth (Falk, Dunlap, & Kern, 1996). It is hoped that by attending to and processing the consequences of their social behaviors, youth will develop more accurate self-perceptions and improve their peer interactions. Case studies of video-feedback interventions suggest that this treatment can reduce rates of disruptive and inappropriate behaviors in youth who possess emotional disturbance, problems with aggression, and low intelligence (Embregts, 2000; Kern-Dunlap et al., 1992; Kern et al., 1995; O'Reilly et al., 2005). In most cases, these interventions were delivered to elementary school children (Kern-Dunlap et al., 1992; Kern et al., 1995; O'Reilly et al., 2005; Walther & Beare, 1991). However, three small *N* studies demonstrated that video feedback improved the social behavior of secondary school students in analogue or treatment settings (Embregts, 2000; Falk et al., 1996; Kern et al., 1995). Although some of the children and adolescents in these studies were diagnosed with ADHD, most had more severe primary diagnoses (i.e., mental retardation, conduct disorder, and emotional disturbance).

Because video feedback can increase self-awareness, the application of this treatment to adolescents with ADHD seems intuitive. However, the peer problems of these youth are notoriously resistant to interventions that are successful with other socially impaired populations (Pfiffner et al., 2000). Thus, it is unclear whether video feedback would serve to ameliorate the self-perception bias held by many adolescents with ADHD and consequently improve their social behavior. Furthermore, it is unclear whether a video-feedback intervention can improve adolescent behavior in naturalistic peer settings. In a preliminary investigation of these questions, we delivered a video-feedback intervention to a 16-year-old male with ADHD-combined type (ADHD-C) and oppositional defiant disorder (ODD) in the context of a summer school-like environment (see the section titled "Method"). Over the course of the program, the adolescent was videotaped during a teen-run, small-group business meeting, which ran much like the teen-led student government meetings that are typical in high schools. Using an A-B-A, treatment withdrawal design, we hypothesized the following: (a) while the intervention was in place, behavior would improve during the taped business meeting segments; (b) the adolescent would accurately self-evaluate as measured by the rate of adolescent-counselor agreement during the intervention; (c) during the intervention period, behavioral improvement would occur on negative Summer

Treatment Program for Adolescents (STP-A) tracking system behaviors during the untaped remainder of business meetings and the recreation period that followed; and (d) improvements in social behavior would persist after the withdrawal of the intervention.

Method

Participant and Setting

Mark participated in the STP-A (Pelham, Sibley, et al., 2010; Sibley et al., in press), an 8-week summer program for secondary school students with ADHD. Mark was a 16-year-old White male with an estimated IQ of 103 (Wechsler Intelligence Scale for Children, Fourth Edition; Wechsler, 2003) who was first diagnosed with ADHD-C and ODD in elementary school. Current diagnoses were confirmed by parent/teacher rating scales (Fabiano et al., 2006; Pelham, Evans, Gnagy, & Greenslade, 1992). These measures indicated that Mark currently displayed seven symptoms of inattention, six symptoms of hyperactivity/impulsivity, and four symptoms of ODD (present only in the home setting). Achievement testing did not indicate the presence of a learning disability, although Mark's math achievement score was in the low-average range (reading = 95, math = 81, and spelling = 90; Wechsler, 2002). During the previous school year, Mark attended ninth-grade regular education classes at a public school. Mark was referred to treatment by his mother, who noted that he was forgetful and noncompliant at home, possessed few friends, and experienced homework problems. Mark's teachers noted that he was disruptive in class and frequently tried to gain peer attention by acting atypically. Mark had no history of medication use, and the only treatments he had ever received for ADHD were attending the STP-A during the previous summer and a brief social skills group during the previous school year.

As part of the STP-A, adolescents participated in nine treatment modules each day (for more information, see Sibley et al., in press). The STP-A was adapted from the nationally recognized children's STP, which is the most well-studied child-focused intervention for ADHD (Pelham & Fabiano, 2008; Pelham, Gnagy, et al., 2010; Pelham & Hoza, 1996). The STP-A uses comprehensive reward and response-cost programs in a naturalistic setting to target social functioning, classroom performance, vocational skills, and disruptive behavior in adolescents (Sibley et al., in press).

Each day, Mark participated in a 30-min business meeting. The purpose of this module was to develop skills in planning, cooperation, and organization. The business meeting was run by adolescents and modeled after typical extracurricular activities such as student government, service clubs, and Future Business Leaders of America (Geddes, 1986).

Mark participated in a business group with six other 14- to 16-year-olds (two girls and four other boys). All members of this group were diagnosed with ADHD, possessed average to above average IQs, and were placed in regular education classes during the school year. Mark's group typically planned food sales and coordinated a service project during business meetings. Immediately following the business meeting, Mark participated in an 1-hr recreation period with a group of 10 same-aged peers and three counselors (Pelham, Greiner, & Gnagy, 1997; Pelham, Sibley, et al., 2010). The purpose of this module was to practice appropriate peer interactions in an athletic setting while staff modeled and provided feedback. During the business meeting and the recreation periods, counselors implemented an extensive behavior modification system (Pelham et al., 1997; Pelham, Sibley, et al., 2010). Adolescents received verbal feedback when they exhibited any of the 15 negative behaviors (e.g., teasing a peer, aggression, noncompliance) or 5 positive behaviors (e.g., sharing with a peer, helping a peer, compliance with adult requests) throughout the program day. Staff members tallied these behaviors, and frequency counts were used to determine each adolescent's home and program privileges.

During Week 4 of the STP-A, Mark was chosen to participate in the video-feedback intervention because he showed marked social impairment and rejection from peers. Typical aversive behaviors displayed by Mark included the following: laughing without an appropriate stimulus, making exaggerated and contextually inappropriate movements, self-stimulating behaviors (i.e., nose picking, playing with his skin in a way that offended peers), and making off-topic and bizarre comments during discussions. Despite the presence of the STP-A behavior modification system, these behaviors were exhibited at impairing rates throughout the program day. Furthermore, many of Mark's aversive social behaviors were subtle and were unaddressed by the behavior modification system, which primarily addresses overt disruptive behaviors such as complaining, interruption, teasing, and talking back to adults.

Experimental Design

A total of 9 days of baseline data were collected for Mark, prior to the introduction of the intervention. Mark participated in seven sessions of the video-feedback intervention. During the intervention period, Mark participated in the intervention instead of the business meeting every other day. At each video-feedback session, Mark watched a video clip from the previous day's business meeting. The intervention was removed for the final week of the STP-A and four additional days of data were collected to obtain a preliminary measure posttreatment generalization. In addition, data from the recreation period were collected to measure cross-situational generalization.

Recording Video Clips

Each day, during the baseline, intervention, and postintervention phases, a research assistant videotaped 5 min from the middle of the business meeting. Furniture was arranged in such a way that all adolescent faces were visible on tape. The research assistant did not acknowledge the adolescents during taping and only communicated with adolescents prior to taping if an adolescent needed to be moved into the camera frame.

Coding Procedure

Raters coded each 30-s interval on the 5-min videotape as inappropriate or appropriate based on an operationalized definition of inappropriate behavior. An interval was coded as inappropriate if one instance of inappropriate behavior occurred within it. Inappropriate behavior was defined as any verbal or nonverbal social interaction that would typically annoy others in the group or decrease the popularity of the adolescent. Raters were trained to watch peer reactions and consider social norms to determine the appropriateness of a behavior (i.e., is the behavior socially acceptable to most teens). All coders demonstrated mastery of the coding scheme through the following: (a) memorization of the definition and footnotes for inappropriate behavior and (b) correct classification of example behaviors, including typical, rare, and ambiguous situations. Examples of inappropriate behavior included overt disruptive behaviors as well as more subtle behaviors such as strange noises, age-inappropriate or odd jokes, weird gestures, poor manners, off-topic comments, disruptive fidgeting, and exaggerated facial expressions. Once raters could reliably implement this system at a level of 80% or higher accuracy on example scenarios, they were allowed to begin coding. Coding was conducted in pairs to maximize the reliability and contextual validity of the coding scheme, as we expected that the less overt social maladies of adolescents with ADHD would be especially difficult to code.

For the baseline phase, intervals were coded by a pair of STP-A research assistants, who did not work directly with the adolescent during the business meeting. Within the pair, if the raters disagreed on the categorization of an interval, they reviewed the interval and reconciled the discrepancy by referring to the definition and discussing the behavior to reach consensus. Once Mark was chosen to receive the intervention (Week 5 of the STP-A), one half of the coding pair was the counselor who was chosen to deliver the intervention. This shift occurred so that the "counselor rating" reviewed with the adolescent was both reliable and truly from the counselor who delivered the intervention. During the intervention phase, tapes were coded daily, and the pair's rating was the gold standard to which Mark compared his self-rating.

After the STP-A ended, a second pair of research assistants who were blind to the purpose of the coding project independently coded one third of Mark's video clips to obtain an index of intercoding pair reliability. Percentage agreement ranged from 60% to 80% ($M = 68.8%$) per day, which, as we expected, was somewhat lower than rates presented using similar methodology (Embregts, 2000; Falk et al., 1996; Kern et al., 1995). We suspect this difference was attributable to two factors: (a) the complex nature of appropriate socialization in the mainstream adolescent environment and (b) the fact that the inappropriate social behaviors displayed by many adolescents with ADHD are typically less overt than the behaviors displayed by participants in previous studies (i.e., aggressive, emotionally disturbed, or low-IQ youth).

Intervention Procedures

At the start of each video-feedback session, Mark received a self-rating form that facilitated coaching and was asked to recite the definition of inappropriate behavior. For reference, the self-rating form also contained this definition. For each 30-s interval, the self-rating form asked three questions: "What was good?" "What would you change?" and "Alternative behaviors?" During the session, the counselor stopped the business meeting clip every 30 s to instruct Mark to complete the self-monitoring form for the interval. The counselor also instructed Mark to record whether his self-rating matched the counselor's gold standard rating. The counselor then reviewed the self-rating with Mark and discussed the match and his performance during the interval. This procedure repeated after each interval, and at the end of the session, Mark received a raffle ticket for each interval that he agreed with the gold standard. Raffle tickets were given frequently during the STP-A for good behavior (e.g., staying on task during study hall, accurately completing one's daily report card) and were drawn for low-value prizes at the end of the week (e.g., US\$10 gift card or candy). The purpose of these rewards was to maintain active participation in the intervention. Previous work demonstrates that the use of rewards enhances the efficacy of video-feedback interventions but that rewards alone are less efficacious than video-feedback alone (Kern et al., 1995).

Measures of Outcome

Intervals of inappropriate behavior. The number of 30-s intervals on the video clip that were coded as inappropriate was used as the primary measure of improvement. There were 10 intervals for each clip.

Adolescent-counselor agreement. To measure the accuracy of the adolescent's self-perception, percentage agreement was measured for each of the seven intervention sessions.

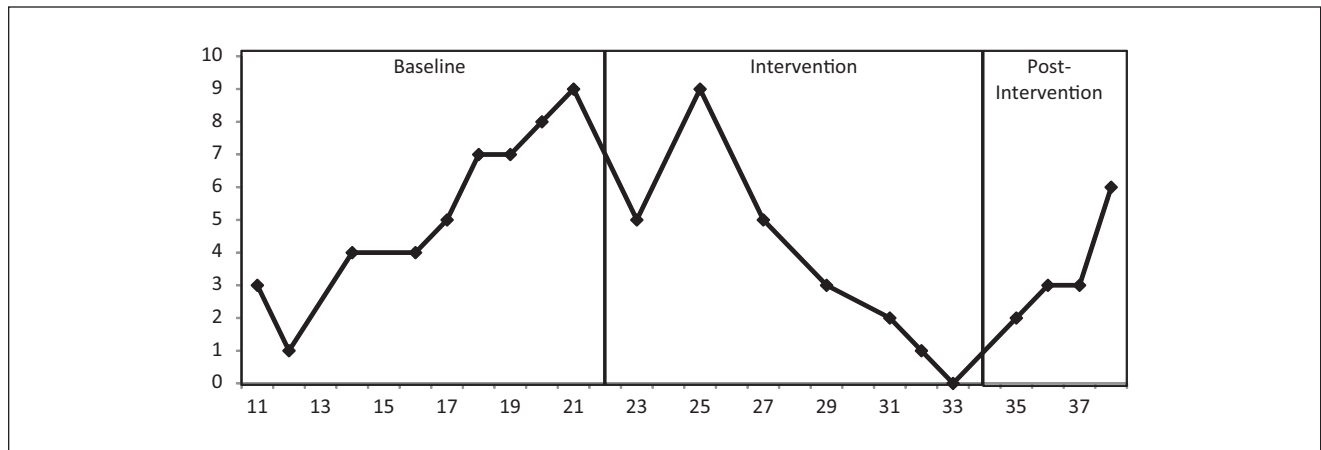


Figure 1. Intervals of inappropriate behavior during business meeting

Note. X-axis represents the STP-A program day. Y-axis represents the number of intervals of inappropriate behavior during the five minute video clip of the business meeting.

Negative tracking system behaviors. To measure therapeutic gains outside of the 5-min business meeting video clip, negative behavior frequency counts from the STP-A behavior tracking system were counted for each business meeting and afternoon recreation period (Monday-Thursday; no afternoon recreation occurred on Fridays) during baseline, intervention period, and postintervention. Group means (excluding Mark) for negative tracking system behaviors are also presented to provide a comparative reference. Many of the impairing behaviors displayed by Mark were low-intensity behaviors not included in the tracking system; however, his rates of inappropriate behavior were often associated with negative tracking system behaviors such as interrupting the group, teasing a peer, or poor sportsmanship. Therefore, although negative tracking system behaviors were expected to occur at lower rates than the coded socially inappropriate behaviors, the frequency of these behaviors gave an indication of the overall appropriateness of Mark's behavior.

The behavior management system included 15 operationally defined negative behaviors (e.g., teasing a peer, verbal abuse to staff, interruption, intentional aggression, complaining; see Pelham, Sibley, et al., 2010, for definitions). Counselors, who systematically recorded these behaviors, memorized all definitions and notes prior to the beginning of the STP-A. Counselors participated in a 1-week training program during which they practiced classifying behaviors and implementing the behavior management system. Counselors also completed weekly treatment fidelity quizzes to promote retention of the definitions. In addition, supervisors completed treatment integrity and fidelity observations each week. Counselors were given regular feedback and were required to participate in additional training if observations indicated they were not reliably implementing the system.

Results

Intervals of Coded Behavior

Coded intervals of inappropriate behavior are displayed in Figure 1. During the baseline period, Mark's inappropriate behavior steadily increased over time. Once the intervention was implemented (with the exception of 1 day), Mark's inappropriate behavior demonstrated a steady decrease to a final rate of zero. On removal of the intervention, Mark's inappropriate behavior increased slightly; however, further postintervention data are needed to fully interpret the extent to which maintenance occurred.

Adolescent-Counselor Agreement

Table 1 displays the rate of agreement between Mark and his counselor when judging whether an interval should be coded as inappropriate. Mark's rate of agreement ranged from 60% to 100% over the course of the intervention ($M = 81.42$, $SD = 13.45$), with the fourth session being an unusually low data point.

Negative Tracking System Behaviors

Figure 2 illustrates that Mark's negative tracking system behaviors during the 30-min business meeting ranged from 0 to 3 during baseline. During the intervention phase, Mark emitted zero negative tracking system behaviors during the business meetings. In the postintervention phase, Mark's behavioral improvement during the business meeting appeared to maintain. Figure 3 illustrates that Mark's rate of negative tracking system behaviors during baseline ranged from 0 to 5. This variability continued into the first 5 days of the intervention period, after which Mark's negative behaviors ceased for the remainder of the intervention

Table 1. Adolescent-Counselor Agreement

Session no./day	Total percentage of intervals coded inappropriate (%)		Percentage of agreed-on intervals (%)
	Adolescent	Counselor	
1/22	70.0	90.0	80.0
2/24	70.0	50.0	80.0
3/26	80.0	90.0	90.0
4/28	50.0	50.0	60.0
5/30	0.0	30.0	70.0
6/32	30.0	20.0	90.0
7/34	0.0	0.0	100.0

period, with one exception. During postintervention, it appears that Mark's negative behavior may have been increasing; however, further postintervention data points are needed to fully interpret the extent to which posttreatment generalization occurred. Throughout the summer, Mark's rate of negative tracking system behaviors in both the business meeting and recreation tended to fall below the group mean; however, this difference steadily increased across the intervention sessions and postintervention period, largely due to increasing disruptive behavior by peers, whereas Mark's negative behaviors remained close to zero.

Discussion

The results of this case study provide preliminary support for a video-feedback intervention to treat the social impairment of adolescents with ADHD. Our initial data suggest that (a) a video-feedback intervention may decrease inappropriate social behavior while it is in place, (b) Mark was capable of providing accurate self-evaluations during the intervention, and (c) there seems to be preliminary evidence of generalization outside of the 5 min that were recorded each day (i.e., portions of the business meeting that were not taped and recreation time). However, we were limited in assessing treatment maintenance due to the STP-A's length.

Prior to the intervention, Mark displayed gradually increasing inappropriate behavior during the videotaped business meeting sessions. This behavior gradually improved over the course of the intervention to a level of zero. Our findings appear to be consistent with previous studies suggesting that video feedback can decrease aversive behaviors in emotionally disturbed, aggressive, and low-IQ children and adolescents (Embregts, 2000; Kern-Dunlap et al., 1992; O'Reilly et al., 2005). Our study extends these findings to a mainstreamed adolescent whose primary diagnosis is ADHD, suggesting that perhaps a video feedback can reduce the less overt yet still impairing behaviors typically exhibited by these youth (Bagwell et al., 2001).

Mark appeared to make accurate self-evaluations during the intervention sessions. A limitation of this study is that we did not collect baseline or postintervention self-ratings, as the rating process itself likely would have led to therapeutic effects. However, Mark's rate of agreement was generally high and even reached 100% on the final day of the intervention. It may have been easier for Mark to correctly identify whether social behavior was appropriate rather than inappropriate. Thus, we cannot assert that the intervention improved Mark's self-perception, as appropriate behavior occurred with greater frequency in the final video clips. Consistent with our finding, previous video-feedback studies also report high adolescent-counselor agreement (Falk et al., 1996; Kern et al., 1995). We found Mark's generally accurate self-evaluations to be especially affirming given the challenges of interpreting mainstream adolescent social behavior. Adolescents with ADHD struggle to accurately self-evaluate (Fischer et al., 1993) and to detect cause-effect relationships in social situations (Sibley et al., 2010). Therefore, a promising benefit of this intervention is its potential to reduce self-perception biases in adolescents with ADHD.

Data collected from the STP-A behavior tracking system suggested that therapeutic gains may have been present outside of the intervals recorded on videotape (i.e., portions of the business meetings that were not recorded and the afternoon recreation period). The near absence of negative tracking system behaviors during the intervention period is promising but represented only minimal improvement over baseline trends. Perhaps more compelling was the possible prevention of a normative increase in disruptive behavior that was displayed by the other ADHD teens in Mark's group (see Figures 2 and 3). Although absolute levels of Mark's negative tracking system behaviors changed only slightly, the difference between Mark's behavior and the group mean increased over time. Unfortunately, we were unable to fully interpret maintenance effects because the STP-A ended after 8 weeks. It appeared that Mark showed a slight increase in inappropriate behavior posttreatment; however, with only four data points, it is unclear whether these increases were simply driven by a couple of bad days.

It is possible that an increased number of video-feedback sessions may have led to greater maintenance after the intervention was terminated. Unfortunately, given the time constraints of the STP-A, we were limited in the number of days that we could deliver the intervention. Most other video-feedback intervention studies delivered at least twice as many sessions as Mark received (Embregts, 2000; Falk et al., 1996; Kern et al., 1995; O'Reilly et al., 2005). Thus, it is promising to see immediate decreases in Mark's inappropriate behavior following implementation of the video-feedback intervention; however, further work should extend the number of sessions delivered, to evaluate the incremental effects of intervention dose.

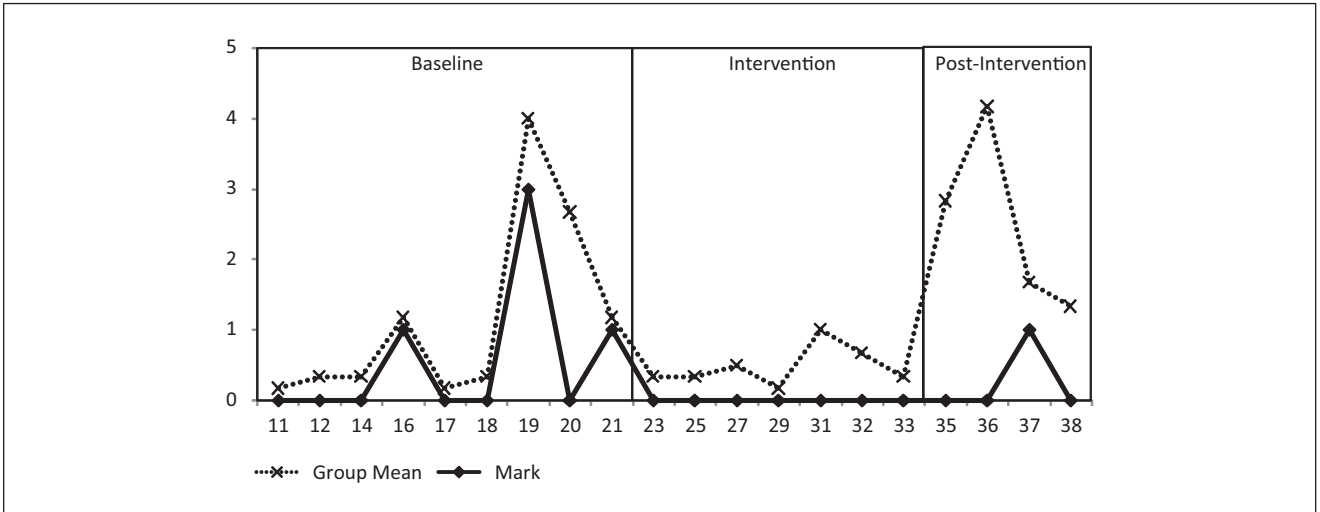


Figure 2. Negative tracking system behaviors during business meeting

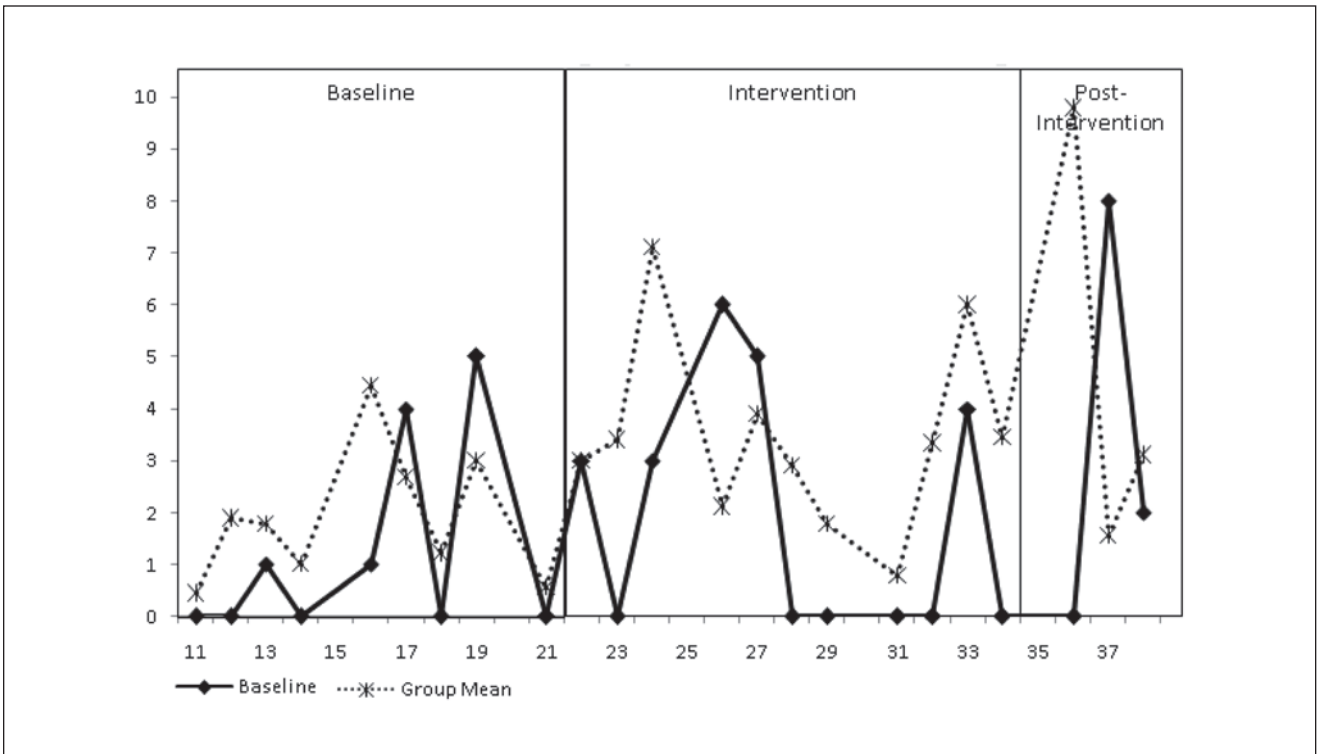


Figure 3. Negative tracking system behaviors during recreation

Despite its limitations, a strength of this investigation is that it was conducted in a naturalistic summer school-like setting, maximizing the likelihood of generalization to the mainstream peer environment. The business meeting mirrored an activity that regularly occurs in typical high schools (Geddes, 1986) and dependent measures included Mark's

typical interactions with peers in that setting. This case study is preliminary in nature and its results will need to be replicated with larger samples to demonstrate the efficacy of the intervention in this population. Given the somewhat subjective nature of appropriate mainstream social interactions in adolescence, intercoding pair reliability (68.8%) was somewhat

lower than desirable. We attempted to improve reliability by using coding pairs; however, it is possible that despite this procedure, some intervals were given an invalid rating. Because our study was conducted in the context of a summer program for adolescents with ADHD, it is possible that Mark's behavioral changes may not generalize to interactions with non-ADHD peers. We also do not know whether video feedback would be effective in the absence of the behavioral treatment program. Finally, we did not conduct a component analysis to determine the relative contribution of video feedback and rewards to Mark's improvement. Kern et al. (1995) conducted such an analysis and reported that improvements in behavior following the intervention were largely due to the video-feedback component, which was enhanced by rewards. However, there were components of the current video-feedback intervention that were not investigated in the Kern et al. study such as time spent away from the group and counselor attention. In addition, it is unclear whether the self-monitoring component need to rely on video feedback. Perhaps the intervention would be equally effective if delivered in vivo, eliminating the need for videotaping.

Despite these limitations, we believe that this case example offers suggestive evidence that a video-feedback intervention can reduce socially inappropriate behaviors in a mainstreamed adolescent with ADHD. This finding is especially promising given the intractable nature of social impairment in adolescents with this disorder (Bagwell et al., 2001; Smith et al., 2000) and the complexities of social interactions during this developmental period. Further work is needed to replicate our findings with a larger sample, in other settings, and with a longer follow-up period. It will also be important to evaluate whether a higher dose of the intervention (i.e., more sessions) can increase treatment effects. If our findings can be replicated and extended, video feedback could become a valuable intervention for adolescents with ADHD.

Declaration of Conflicting Interests

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