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# Parenting Behaviors During Risky Driving by Teens with Attention-Deficit/Hyperactivity Disorder

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## Abstract

Parenting practices for teen drivers with ADHD were observed via a video monitor installed in vehicles. All teens had recently completed a driver education course and were in the driving permit stage of a graduated driver-licensing program. Parent behaviors were coded during drives when teens were driving safely and during drives when teens engaged in risky driving. The overall frequency of positive parenting strategies was low regardless of whether teens drove safely or engaged in risky driving. Although the rate of negative feedback was also low, parents engaged in significantly more criticism and were rated by an observer to appear angrier when teens were driving in a risky manner. No other differences in parent behaviors associated with the quality of teen driving were observed. The inconsistencies between observed parenting behaviors and those parenting practices recommended as effective with teens with ADHD are discussed. The need for further research addressing effective strategies for teaching teens with ADHD to drive is highlighted.

### Keywords

ADHD; Adolescents; Parenting; Driving

Accidental injury is the leading cause of death for teens in the United States, and 73% of accidental injuries resulting in a teen's death from 1999 to 2006 were attributable to automobile crashes (Minino, 2010). Compared to the general population, teen drivers are involved in a disproportionately high number of fatal motor vehicle crashes. Based on 2006 data, only 6.4% of all licensed drivers were teenagers, but they were involved in 12.9% of all fatal automobile crashes (Compton & Ellison-Potter, 2008). Furthermore, young drivers are involved in significantly more automobile crashes involving a fatality than are drivers from any other age group (Compton & Ellison-Potter, 2008). Not only are teen drivers more likely to be involved in serious automobile crashes, they also are more often the cause of such events. In an investigation of data from 795 serious motor vehicle crashes involving

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teen drivers, the cause of the crash was deemed to be driver error on the part of the teen in more than 75% of cases (Curry, Hafetz, Kallan, Winston, & Durbin, 2011).

Risk of negative driving outcomes is even greater among adolescents with Attention-Deficit/Hyperactivity Disorder (ADHD). Young drivers with ADHD are involved in more motor vehicle crashes than typically-developing teen drivers, and are more likely to be found at fault for crashes (Barkley, Guevremont, Anastopoulos, DuPaul, & Shelton, 1993; Barkley, Murphy, & Kwasnik, 1996). Young drivers with ADHD receive more traffic citations than drivers without ADHD, are more likely to have their licenses suspended, drive illegally, and demonstrate poorer performance during simulated driving (Barkley et al., 1993; Barkley et al., 1996; Biederman et al., 2007; Fischer, Barkley, Smallish, & Fletcher, 2007; Thompson, Molina, Pelham, & Gnagy, 2007).

Although there is considerable evidence that teens with ADHD experience more negative driving outcomes relative to typically-developing teens, little is known about specific steps families of novice teen drivers with ADHD may take to improve safety. There have been few studies addressing effective strategies for parents teaching teens with ADHD to drive. There is some evidence regarding strategies for reducing driving risk among typically-developing teens in the general population. For example, teens who delay obtaining a drivers license have better outcomes, as do teens whose parents set stricter limits related to when, where, and with whom teens are allowed to drive (Hartos, Eitel, & Simons-Morton, 2001). Greater parent-teen agreement regarding driving restrictions also appears to contribute to fewer negative driving outcomes (Beck, Hartos, & Simons-Morton, 2006). Although these parenting strategies appear to be associated with improved driving outcomes for typically-developing teens, teen drivers with ADHD have reliably worse outcomes relative to typically-developing teen drivers, and a different or more intense approach may be necessary when teaching teens with ADHD to drive. Furthermore, the strategies described above are implemented following licensure; for families of teenagers with ADHD, who are known to have worse outcomes, interventions may need to occur during the permitted driving stage and continue until safe driving practices have been achieved.

Supervised driving practice may be a situation in which it is especially important for parents to engage in effective parenting practices. During supervised driving practice, parents are arguably the most active in monitoring and providing instruction related to driving, and this may be a period of time when parents have significant influence on teen driving outcomes. Unfortunately, very little is known about how parents approach driving practice with their teens with ADHD. Robin (2006) suggested that effective parenting of teens with ADHD involves more positive feedback than negative; however, parents of adolescents with ADHD engage in more negative parenting practices than do parents of children without ADHD (Barkley, Anastopoulos, Guevremont, & Fletcher, 1992). To the extent that these negative parent-teen interactions also occur during supervised driving, there may be a negative effect on the quality of teen driving.

The primary aim of the current study was to provide an initial look at parents' use of effective parenting strategies during supervised driving practice with teens with ADHD. Through in vivo observations of parent-supervised teen driving practice, particular attention

was focused on the extent to which parents engaged in positive parenting strategies (e.g., praise, effective commands, and coaching) as opposed to negative parenting strategies (e.g., criticism and negative comments). To investigate whether parents responded differently depending on the quality of teen driving, parent behaviors during drives in which teens engaged in risky driving were compared to parent behaviors during drives in which teens drove more safely. It was hypothesized that parents would engage in significantly more negative behaviors, and fewer positive behaviors, following a risky driving behavior than they would following non-risky driving. Parent behaviors prior to risky driving were not expected to differ from parent behaviors prior to non-risky driving.

## Method

### Participants

Participants in this study represented a subset of participants from a larger, ongoing, randomized control trial. Driving behaviors of participants in the larger study are tracked longitudinally following participation in a driver education program. Participants were recruited through radio advertisements and flyers distributed to high schools and community providers in western New York. Study procedures were approved by the Child and Youth Institutional Review Board. As incentive to participate, teens were enrolled in a 10-week driver education course free of charge. Participants were also provided with $75 stipends for completing follow-up assessments.

To be eligible to participate, teens were required to have obtained a learner's driving permit. Additionally, the teen and at least one parent needed to be willing to participate in the project. All teens met current DSM-IV-TR diagnostic criteria for ADHD – Combined Type according to current evidence-based assessment guidelines (Pelham, Fabiano, & Massetti, 2005). ADHD diagnoses as well as diagnoses of comorbid conditions were determined according to DSM-IV-TR criteria.

This study included teens who had been randomly assigned to participate in the control group of the larger study and who had completed the four-week assessment period (described below) following completion of the driver education course. The sample for this study included 24 teens with ADHD (16 male). An additional 31 teens who had been assigned to the control group were excluded from this subsample. Of those 31 teens, four were excluded because they did not drive during the assessment period. One teen was excluded because all drives were supervised by an adult other than the teen's parent. The remaining 27 teens were excluded because they committed no risky driving events (described below) while driving during the assessment period and, therefore, had no event-triggered video data to code. There are multiple reasons for a lack of triggered events, including infrequent driving, driving short distances, noncompliance with the camera protocol, and appropriate driving. This sample appears to be reasonable for the study question as the sample includes teens who engaged in risky driving and who are likely to have a greater need for effective parenting during supervised driving. *T*-test and $\chi^2$ analyses indicated no significant differences between the 31 excluded teens and those included in this study with regard to the following: severity of ADHD, severity of impairment, teen age, teen gender, parent income, parent marital status, race, and ethnicity. Demographic information

for those teens included in the sample is displayed in Table 1. Mean age was 16.35 years (*SD* = .55). The sample was primarily Caucasian (*n* = 20). The majority of teens (*n* = 15) were taking medication for ADHD, and all teens were enrolled in school, grades 9 through 12. Medication was not manipulated as part of this study; however, participants were asked to inform the researchers of changes in medications and dosages. Baseline assessment information for this subset of participants is included in Table 2.

All teens had at least one parent or caregiver who agreed to participate in the program (five teens had two parents/caregivers supervise driving). Demographic information for parents who supervised driving is presented in Table 1. Consistent with Institutional Review Board approved procedures, a sign was posted inside all vehicles informing all other passengers that a video camera was installed in the vehicle and that it was recording during the drive.

## Procedure

Informed consent was obtained from all parents and teens aged 18 or older. Parental permission and informed assent was obtained for all teens under the age of 18. Parents of teens in the study completed the Disruptive Behavior Disorders interview (DBD; Hartung, McCarthy, Milich, & Martin, 2005), a semi-structured interview used to determine severity and impairment of symptoms of ADHD according to the Diagnostic and Statistical Manual, Fourth Edition, Text Revision (DSM-IV-TR; APA, 2000). The DBD was administered by advanced graduate students and post-doctoral fellows who were supervised by a Ph.D.-level psychologist. Parents and teachers were also asked to complete the DBD rating scale of ADHD symptoms (Evans et al., 2012; Pelham, Gnagy, Greenslade, & Milich, 1992), the Child Behavior Checklist (Achenbach & Rescorla, 2001), and the Impairment Rating Scale (Evans et al., 2012; Fabiano et al., 2006). Additionally, clinicians conducted a review of records (e.g., elementary and high school report cards, psychoeducational reports) when available. Teens with conditions (e.g., seizures, psychotic disorder, pervasive developmental disorder, IQ < 70) that would impair driving or otherwise cause them to be inappropriate participants for this intervention were not enrolled in the study. Information from the Impairment Rating Scale, CBCL, and the DBD interview was reviewed to determine ADHD status and eligibility to participate, but it was not included in analyses.

Following assessment to establish eligibility, teens were enrolled in a 10-week driver education program that included weekly classroom instruction and one-on-one driving practice with an instructor. Data regarding parent and teen behavior during teen driving was obtained over the course of a four-week period following the completion of the driver education program through the use of an on-board video monitor, the T-Eye ADR3000 Mobile Event Data Recorder (kcicommunications.com/mobile/teye.html), installed in all teens' vehicles. Teens were instructed to turn the T-Eye device on each time they drove. The T-Eye device allowed for video observations of the driver's view of the road, and video and audio recording of the vehicle's interior cabin. The T-Eye device was activated by sudden changes in the vehicle's trajectory (e.g., abrupt stops, fast starts, swerves, and collisions), which will be referred to as driving events. The device was also sensitive to relatively small bumps in the road and would be triggered even though the driver had not engaged in risky driving. These false positives will be referred to as non-events. Bumps in the road were only

coded as non-events in situations when the driver did not appear to be at fault for triggering the camera. Instances in which teens did not appropriately anticipate and slow down for large bumps in the road were coded as events due to imprudent speed. Each video was coded for teen behavior, parent behavior, and other aspects of the driving situation (e.g., cause of driving event, speed, etc.).

## Measures

**Objective Measure of Parent and Teen Driving Behavior—**The T-Eye ADR3000 Mobile Event Data Recorder included two cameras that recorded a forward view of the road as well as a view of the driver and the vehicle cabin. In addition to capturing video, the monitor system recorded vehicle speed. The monitor included a three-axis accelerometer that, when triggered, saved video related to risky driving events (e.g., hard brakes, fast starts, swerves, collisions, or other events that result in an abrupt change in the velocity of the vehicle) and non-events (e.g., driving over a small bump in the road). When triggered, the monitor system saved the video for approximately 30 seconds prior to the risky driving event or non-event and approximately 10 seconds following the event or non-event.

## Video Coding Procedures

For each participant included in this sub-sample, all videos associated with risky driving events during parent-supervised driving were included in the data set. Non-event videos were randomly selected from all available non-event videos for each participant in the data set. An equal number of event and non-event videos per participant were coded.

Frequency counts were obtained for the following parent behaviors: labeled praise, unlabeled praise, appropriate commands, inappropriate commands, negative talk, and coaching. Definitions for all parent behaviors except coaching were adapted from the behavioral definitions in the Manual for the Dyadic Parent-Child Interaction Coding System, Third Edition (DPICS; Eyberg, Nelson, Duke, & Boggs, 2005). Labeled praise was defined as any time a parent gave the teen positive feedback about a specific behavior. To qualify as labeled praise, the parents' statement had to identify a specific teen behavior and describe the behavior in a positive manner (e.g., "Good job slowing down before that turn."). Unlabeled praise included instances of positive statements by the parent about the teen that did not identify a specific teen behavior (e.g., "Good job."). Instances of parents giving short, specific, easily understood instructions were coded as appropriate commands (e.g., "Begin slowing down for the stop sign now."). Commands issued in the form of a question, vague commands, and other commands issued in a manner that would not be expected to facilitate teen compliance were labeled as inappropriate commands (e.g., "Don't you think you should slow down now?"). Negative talk was defined as any instance of a parent making critical or disapproving comments about the teen driver (e.g., "That was terrible!"). Coaching was defined as any statement by the parent designed to teach or explain driving that would not otherwise be coded as an instance of praise, as a command, or as negative talk (e.g., "If it were snowing, you would need to drive slower than you are now.").

In addition to frequency count variables, overall levels of parent and teen anger throughout the course of each video were rated on a Likert scale ranging from 1 ("Not at all angry") to 5

("Extremely angry"). Parent and teen anxiety levels were rated on a similar scale ranging from 1 ("Not at all anxious") to 5 ("Extremely anxious").

Videos were coded by undergraduate research assistants as well as post-doctoral and master's-level staff. Twenty percent of videos were recoded by a second coder to establish reliability. Because it was likely clear to coders whether videos did or did not contain risky driving events, it was not possible for coders to be blinded to video type by event or non-event. Additionally, coders were not blind to the purpose of the study.

Following the guidelines of Shrout and Fleiss (1979), intra-class correlations (ICCs) were calculated using a one-way random effects model. Using criteria recommended by Cicchetti (1994), ICCs for the majority of codes indicate inter-rater reliability ranging from good (Appropriate Commands ICC = .721, Negative Talk ICC = .723, Parent Anxiety ICC = .616, and Teen Anxiety ICC = .707) to excellent (Coaching ICC = .821, Parent Anger ICC = .814, and Teen Anger ICC = .823). The ICC for unlabeled praise fell in the fair range (Unlabeled Praise ICC = .489). An ICC for labeled praise could not be calculated because no instances of labeled praise were observed in the subset of videos coded for reliability (only one instance of labeled praise was observed across all videos in the dataset). Furthermore, a series of one-sample T-tests of variables representing the difference between raters for each behavior code yielded all non-significant results and indicated that the averages of the differences between raters for each individual code across all videos are not statistically different from zero. After consideration of these data, inter-rater reliability for all variables was deemed acceptable for the planned analyses.

Two types of summary scores were created using the frequency count data. First, the frequency counts for all observed positive and negative parenting behaviors (i.e., labeled praise, unlabeled praise, appropriate commands, negative talk, and coaching) across all videos within each participant were summed to yield the total number of observed parenting behaviors across all videos for each individual teen. Ratio scores for positive parenting (i.e., labeled praise, unlabeled praise, appropriate commands, and coaching) and negative talk were then calculated. For each participant the combined total of all positive parenting behaviors across all videos was divided by the sum of all parenting behaviors to create a score for each participant reflecting the proportion of observed parenting behaviors that were coded as positive. A similar score was calculated reflecting the proportion of parenting behaviors coded as negative talk. These positive parenting and negative talk ratio scores were calculated separately for event and non-event videos.

The second type of summary score represents the frequency of positive parenting and negative parenting, while controlling for video length and number of videos per participant. Video clips were divided at the time of the event or non-event and separate frequency counts were obtained for parenting behaviors observed prior to the event or non-event and for parenting behaviors observed during and after the event or non-event. In most cases, video clips included 30 seconds prior to the event or non-event and 10-seconds following the event or non-event; however, there were several clips of shorter duration due to the occurrence of an event or non-event in close time proximity to either the beginning or the end of a drive. As with the positive ratio score described above, the frequency counts for all positive

parenting behaviors were summed into a single composite. Because of variability in video length, frequency counts of positive parenting behaviors and negative talk for each video were divided by the video length (in seconds) to create variables reflecting the rate of the behaviors per second of video. Due to variability in the number of video clips per participant, average scores were created to reflect the average per second rates of positive parenting behaviors and negative talk both before and after events or non-events across all videos for individual participants. Average positive parenting and negative talk frequency scores were calculated separately for event and non-event videos.

## Results

Across all participants, data were available for a total of 91 risky driving events and 91 non-events. The majority of risky driving events were due to hard brakes ($n$ = 31) and sharp turns ($n$ = 25). Other risky driving events were attributed to hard acceleration, swerves, striking curbs, and imprudent speed. The number of risky driving events per teen ranged from 1 to 14 ($M$ = 3.792, $SD$ = 3.036). The majority of teens (75%) had 5 or fewer events and one teen had 14 total risky driving events. The accompanying parent tended to be female during driving events (80%) and during non-events (84%). Due to the small sample size and relatively low frequency of male parents supervising driving, data for male and female parents were combined in analyses.

The frequency of driving-related parenting behaviors (i.e., labeled praise, unlabeled praise, appropriate commands, negative talk, and coaching) was relatively low across all videos. Only one instance of labeled praise was observed across all event and non-event videos. To measure the rate at which parents engaged in at least one positive or instructive behavior (e.g., labeled praise, unlabeled praise, appropriate commands, and coaching) across videos for each participant, the number of videos in which a parent engaged in at least one of these behaviors was divided by the total number of videos. For videos with an event, the average proportion of videos with at least one observed positive parenting behavior across participants was .499 ($SD$ = .364). For videos with no risky driving events, the average proportion was .402 ($SD$ = .412). In other words, parents did not engage in any observed positive or instructive behaviors during 50% of the videos with a risky driving event and 60% of videos without a driving event. To measure the rate at which parents made critical comments towards their teens, the number of event and non-event videos in which a parent engaged in Negative Talk was divided by the total number of event and non-event videos, respectively. For the average teen, the average proportion of videos with at least one instance of negative talk was .189 ($SD$ = .343) for non-event videos and .519 ($SD$ = .370) for event videos

### Comparison of the Relative Frequency of Positive Parenting and Negative Talk Between Events and Non-Events

Paired-sample $t$-tests comparing the average positive parenting ratio scores to the average negative talk ratio scores for event and non-event videos were conducted to compare the relative frequency of positive parenting and negative talk. For non-event videos, the average proportion of parenting behaviors coded as positive parenting behaviors ($M$ = .532, $SD$ = .

443) was significantly greater than the average proportion of behaviors coded as negative talk ($M$ = .219, $SD$ = .338, $t$ = 2.351, $p$ = .028). For event videos, there was no significant difference between the average proportion of parenting behaviors coded as positive parenting ($M$ = .447, $SD$ = .373) and the average proportion of videos coded as negative talk ($M$ = .512, $SD$ = .376, $t$ = −.443, $p$ = .662). In other words, despite the overall low rate of positive parenting behaviors, parents engaged in relatively more positive parenting behaviors during non-event videos than negative parenting behaviors. During event videos, there was no significant difference in the relative frequency of positive and negative parenting behaviors.

### Comparison of Parenting Behaviors Before and After Events and Non-Events

Frequency scores for positive parenting and negative talk observed following the occurrence of driving events were compared with frequency scores for positive parenting and negative talk following non-events. Standard $t$-tests to compare mean frequency of parenting behaviors during events and non-events could not be performed due to violations of the assumption of normality, given the low rate of the parenting behaviors. Therefore, Wilcoxon signed-rank tests were performed (see Table 3 for results). Following suggested procedures in Jaccard and Guilamo-Ramos (2002) for grouping individual analyses into families of related analyses, we grouped the parenting behavior analyses into one family and the parent and teen emotions analyses into a second family. Experiment-wise error was then addressed within families of analyses using the sequentially rejective test described by Holm (1979) and recommended by Jaccard and Guilamo-Ramos (2002). There were no significant differences in parenting behaviors during events and during non-events with respect to positive parenting behaviors. There were, however, differences with regard to negative talk. Parents engaged in significantly more negative talk following events than they did following non-events ($Z$ = −2.799, $p$ =.005).

Anger and anxiety ratings for parents and teens during event and non-event videos were also compared. Again, due to violations of the assumption of normality, Wilcoxon signed-rank tests were performed (see Table 3 for results). Parents were rated as significantly angrier ($Z$ = −2.702, $p$ =.007) during event videos than during non-event videos. Teens were also rated as angrier ($Z$ = −3.297, $p$ =.001) during event videos than during non-event videos. Ratings of parent and teen anxiety, however, did not significantly differ between event and non-event videos.

## Discussion

The results presented in this paper serve as an initial step toward addressing the significant gap in existing research regarding the learning experiences of teen drivers with ADHD. These results also provide a first look at the parenting strategies employed by parents of teens with ADHD during an important functional activity and developmental transition – supervised driving. Findings were, in part, consistent with hypotheses. The only observed differences in parent behavior between videos in which teens were driving poorly (event videos) and videos in which teens were driving safely (non-event videos) were with regard to parents' anger and their use of negative and critical comments. Although ratings of

overall levels of anger and anxiety were relatively low across event and non-event videos, parents were rated as significantly angrier during videos with a driving event. Parents responded to risky driving events with more negative talk than parents used in response to non-events. No differences between events and non-events were observed with regard to positive parenting behaviors (e.g., praise, commands, coaching). Parents rarely praised teens for a job well done (only one instance of labeled praise occurred in all the videos analyzed) and provided teens with instructions related to driving at a low rate. Although rates of positive parenting were low during both events and non-events, parents engaged in relatively more positive parenting than negative talk during non-events. There was no significant difference, however, between rates of positive parenting and negative talk observed during events due to the higher frequency of negative parenting observed during events than was observed during non-event videos.

The patterns of parenting behaviors observed in this study may be problematic because they run counter to behavior management principles that have been recommended as efficacious for teens with ADHD. More specifically, behavioral interventions for adolescents with ADHD recommend that parents provide teens with frequent feedback regarding their performance (Robin, 2006). Furthermore, parents are advised to provide relatively more positive feedback regarding appropriate teen behaviors than negative feedback regarding behaviors needing improvement (Robin, 2006). The parenting behaviors observed during this study were not consistent with these recommendations and parents gave little feedback to teens regarding driving performance. This may be considered a missed opportunity for parents to provide constructive feedback and prevent similar teen driving errors in the future. Without appropriate feedback from parents about what they are doing well and about what actions they need to take to improve, young drivers with ADHD may struggle to develop appropriate driving skills through supervised practice. Additionally, parents may have been able to prevent some instances of risky teen driving through the effective use of coaching and instruction during the time leading up to the risky driving event.

Parents and teens were also rated as appearing angrier during drives with a risky driving event. It will be important for future research to investigate the extent to which negative parent-teen communication during driving practice might contribute to risk for teen driving errors, as it is possible that parent and teen anger served as an antecedent for subsequent risky teen driving behaviors. Additionally, it will be important for future researchers to address gender differences in parenting during driving practice, something that was not possible with the current data. Given that mothers and fathers appear to behave differently from each other during interactions with their ADHD teens (Edwards, Barkley, Laneri, Fletcher, & Metevia, 2001), there may be differences in parenting strategies during supervised driving for mothers and fathers.

These findings must be considered within the context of the limitations of this study. All teens who participated in this study had completed a driver education course, and parenting strategies may be different among parents of teens who have not completed driver education. Coders were not blind to the purpose of the study or to the classification (event versus non-event) of videos. To limit confounds related to coder bias, the behavior codes were adapted from a well-established behavior coding system and were designed to

maximize coder objectivity. As an additional limitation, these findings are based on data from a relatively small number of teens with ADHD. Due to the small sample size, there was insufficient power to compare driving performance of teens who take medication for ADHD and those who do not. To the extent that stimulant medications for ADHD are associated with improved teen behavior and driving performance, the use of prescribed medications may indirectly contribute to parents' behaviors during supervised driving. Also related to sample size, there were a number of teens participating in the larger study who are not represented in this smaller data set because they did not have video from risky driving events. It was outside the scope of this study to identify why some teens had risky driving events and others did not and it will be important for future studies to identify factors that contribute to safer driving among teens with ADHD. It may be that effective parenting contributed to safer driving among teens without risky driving events. On the other hand, some teens may have driven less than others and had fewer opportunities for a risky driving event to occur. Alternatively, previously observed group differences in risky driving between teens with ADHD and control group teens may be the result of very poor driving among a subset of teens with ADHD rather than poor driving across all teens with ADHD (see a comparable pattern of outcomes in McGehee, Raby, Carney, Lee, & Reyes, 2007). These are all issues that need to be addressed in future studies.

This study is also limited by the lack of a comparison group of teen drivers without ADHD. Because of this, it is not possible to ascertain if the parenting practices observed during driving videos are specific to parents of teens with ADHD or if all parents would behave similarly. Regardless of whether the parenting practices observed in this study are unique to parents of teens with ADHD, the data presented here suggest that parents frequently engage in parenting practices during supervised driving practice that existing research and theory would suggest are unlikely to promote compliance and cooperation (Dishion, Nelson, & Bullock, 2004). Thus, there appears to be a mismatch between parenting practices and the needs of teen drivers with ADHD. More specifically, due to well-established risk for negative driving outcomes among teens with ADHD (Barkley et al., 1993; Barkley et al., 1996; Jerome, Segal, & Habinski, 2006), this group of novice drivers may be in greater need of effective instruction and parenting related to safe driving than are teens without ADHD.

It is also important to note that the patterns of positive and negative parenting behaviors observed during this study may not be unique to parent-teen interactions during driving. Instead, the observed parenting behaviors may be an extension of the typical manner in which the parents interact with their teens in day-to-day life. After years of increased conflict with their child with ADHD (Barkley, Anastopoulos, Guevremont, & Fletcher, 1992), parents may attempt to avoid conflict by setting fewer limits and providing less monitoring, similar to the pattern identified by Dishion, Nelson, and Bullock (2004). This pattern may apply to parenting behavior during driving as well as in other situations. Given the potentially severe consequences to teens' safety as well as the safety of passengers and other motorists, supervised driving practice is a time when teens may be especially in need of effective parental monitoring and management.

Additional research is necessary to determine how parents may effectively instruct teens with ADHD during driving practice. Such research could lead to interventions that

significantly reduce the risk of accidents and injury among teen drivers with ADHD. This initial study suggests that negative parenting practices observed in other studies of parent-teen interactions also appear to occur during supervised driving practice. Additionally, this study begins to identify potential target behaviors for interventions that may contribute to safer driving practices among teens with ADHD by improving the effectiveness of parenting during supervised driving.

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**Table 1**

Teen and Parent Demographic Information

| **Teen** | ***M* (*SD*)**<br>***n* (%)** |
|---|---|
| Male | 16 (67%) |
| Age (in years) | 16.35 (.55) |
| Ethnicity | |
| Non-Hispanic | 24 (100%) |
| Race | |
| Black of African American | 4 (17%) |
| White | 20 (83%) |
| Taking Medication for ADHD | 15 (63%) |
| Parent | |
| Male | 7 (24%) |
| Age (in years) | 48.07 (6.35) |
| Ethnicity | |
| Hispanic | 1 (3%) |
| Non-Hispanic | 28 (97%) |
| Race | |
| Black or African American | 2 (7%) |
| White | 27 (93%) |
| Education | |
| High School | 6 (21%) |
| Associate's Degree | 10 (34%) |
| Bachelor's | 6 (21%) |
| Masters | 6 (21%) |
| Doctorate | 1 (3%) |
| Income[a] | |
| Under $25,000 | 9 (31%) |
| $25,000 to $49,999 | 7 (24%) |
| $50,000 to $75,000 | 8 (28%) |
| $75,000 to $100,000 | 2 (7%) |
| > $100,000 | 1 (3%) |
| Marital Status | |
| Single | 2 (7%) |
| Living with a Partner | 2 (7%) |
| Married | 20 (69%) |
| Separated | 1 (3%) |
| Divorced | 4 (14%) |

Note. $n$ = 24 teens. $n$ = 29 parents.

[a] 2 parents chose not to report income.

**Table 2**

Parent and Teacher Rating Scale Data

| Measure | Parent *M (SD)* | Teacher *M (SD)* |
|---|---|---|
| DBD Total IA Symptoms | 6.167 (2.239) | 3.174 (3.339) |
| DBD Total HI Symptoms | 4.042 (2.404) | 1.739 (2.397) |
| IRS Overall Impairment | 2.811 (1.490) | 1.975 (1.437) |
| CBCL/TRF Attention Problems | 67.708 (9.425) | 59.600 (9.316) |

Note. *n* = 24 teens. DBD = Disruptive Behavior Disorders Rating Scale. IRS = Impairment Rating Scale. CBCL = Achenbach Child Behavior Checklist. TRF = Achenbach Teacher Report Form.

**Table 3**

Wilcoxon Signed-Rank Tests and Effect Sizes Comparing Average Parent and Teen Emotions and Per-Second Frequency of Parent Behaviors During Events and Non-Events

| | Events Mean (*SD*) | Non-Events Mean (*SD*) | *Z* | *p* | Cohen's *d* |
|---|---|---|---|---|---|
| Parent Behaviors | | | | | |
| Positive Parenting Before | .002 (.004) | .009 (.038) | −0.672 | 0.501 | −0.259 |
| Negative Talk Before | .019 (.028) | .011 (.027) | −2.273 | 0.023 | 0.291 |
| Positive Parenting After | .003 (.004) | .003 (.007) | −0.104 | 0.918 | 0.000 |
| Negative Talk After | .074 (.088) | .022 (.038) | −2.799*** | 0.005 | 0.767 |
| Emotions During Entire Clip | | | | | |
| Parent Anger | 2.033 (1.041) | 1.339 (.589) | −2.702** | 0.007 | 0.821 |
| Teen Anger | 1.734 (.862) | 1.112 (.415) | −3.297*** | 0.001 | 0.919 |
| Parent Anxiety | 1.990 (.927) | 1.423 (.691) | −2.137 | 0.033 | 0.694 |
| Teen Anxiety | 1.679 (.767) | 1.416 (.689) | −1.426 | 0.154 | 0.361 |

Note. $N$ =24. Alpha levels determined according to a modified Bonferroni procedure within families of analyses (parent behaviors and parent/teen emotions) according to procedures outlined by Holm (1979) and recommended by Jaccard and Guilamo-Ramos (2002). Positive Parenting includes Labeled Praise, Unlabeled Praise, Appropriate Commands, and Coaching.

* $p < .025$.

** $p < .017$.

*** $p < .013$.