

Behind the Wheel: Specialized Driving Instructors' Experiences and Strategies for Teaching Autistic Adolescents to Drive

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Importance: In the transition to adulthood, driving supports independence. For autistic adolescents, training provided by specialized driving instructors, including occupational therapists, may establish fitness to drive and continued independence.

Objective: To examine specialized driving instructors' experiences providing behind-the-wheel instruction to autistic adolescents.

Design: We recruited participants through purposive and snowball sampling of members of ADED, the Association for Driver Rehabilitation Specialists. Interviews investigated experiences providing instruction, autistic students' strengths and challenges, strategies used, and recommendations to improve the learning-to-drive process. We coded transcripts using a directed content analysis approach.

Setting: Telephone interviews.

Participants: Specialized driving instructors ($N = 17$) trained as occupational therapists, driver rehabilitation specialists, or licensed driving instructors with recent experience providing behind-the-wheel training for autistic adolescents participated.

Results: Behind-the-wheel challenges included mental inflexibility, distractibility, and difficulties with social cues and motor coordination. Instructors acknowledged students' strengths, including adherence to rules of the road, limited risk taking, and careful observations. Instructors scaffolded learning to help students develop skills. Although licensure and driving outcomes were sometimes unknown to instructors, students who became licensed frequently drove with supervision or restrictions.

Conclusions and Relevance: Licensure is possible for autistic adolescents, although developing fitness to drive requires individualization and rigorous specialized instruction, which may culminate in delayed or restricted driving.

What This Article Adds: This article highlights challenges and strengths encountered by specialized driving instructors teaching autistic adolescents. Despite requiring prolonged training, autistic adolescents can achieve licensure when supported by specialized instruction that is individualized to their needs and strengths.

Learning to drive is an important developmental milestone for many adolescents and young adults. Efforts such as Graduated Driver Licensing (GDL) policies and enhanced support for parents supervising the learning-to-drive process may be foundational to reducing adolescents' and young adults' crash risk (Williams, 2017). However, the supplemental efforts that may be necessary to support adolescents and young adults with developmental, physical, or neurological disabilities, including autism spectrum disorder (ASD), to develop fitness to drive remains unclear. These conditions may require expert training, such as that provided by driving rehabilitation specialists (DRSs), occupational therapists, and licensed driving instructors (hereinafter referred to collectively as *specialized driving instructors*). These professionals are an important resource to support learning to drive, given their expertise in providing training and structured support in the development of daily living activities, such as independent mobility. Moreover, the structured approach to assessment and training or rehabilitation makes specialized driving instructors particularly well suited to address the skill challenges associated with disabilities, providing behind-the-wheel (e.g., on-road) evaluation and instruction to prepare autistic individuals for licensure and independent driving.

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Approximately 1 in 3 autistic adolescents and young adults without intellectual disability acquires a driver's license by age 21 yr (Curry et al., 2018; Daly et al., 2014). Driving may help autistic adolescents overcome education and employment barriers as well as adverse psychosocial outcomes associated with the transition to adulthood, including social isolation (Gotham et al., 2015; Huang et al., 2012; Interagency Autism Coordinating Committee, 2013). Although parents often assume responsibility for preparing and teaching their children to drive, specialized instruction may be necessary to supplement this practice. Autistic adolescents may have greater difficulties with motor coordination and executive functioning (e.g., social hazard recognition and attention), which may increase their risk for unsafe driving as a result of challenges with physical vehicle operation (e.g., steering) as well as integration of visual cues (Bishop et al., 2017; Cox et al., 2016; Lindsay, 2017). In our previous work, specialized driving instructors reported that approaches to teaching autistic adolescents must be tailored to meet individual needs, something that parents may be unable to provide (Myers et al., 2019).

Evidence suggests that autistic adolescents require extensively more instructional time to become fit to drive. However, efforts to understand the specific challenges encountered and the strategies used by driving instructors working with autistic adolescents are limited (Almberg et al., 2017). As part of a research program to comprehensively understand the transition to driving among autistic adolescents, we conducted a qualitative study to elicit the perspectives of specialized driving instructors who provide behind-the-wheel support for autistic adolescent drivers. The objectives of this article are to (1) describe observed behind-the-wheel challenges and strengths of the instructors' autistic students and (2) identify specific strategies used to facilitate behind-the-wheel instruction provided to autistic adolescents.

Method

We conducted qualitative interviews with specialized driving instructors trained as occupational therapists, DRSs, or licensed driving instructors (LDIs) who had completed additional training related to autistic drivers. To be eligible, participants had to have self-reported experience providing behind-the-wheel training to autistic adolescents. We recruited interview participants unaffiliated with the study team via email through purposive and snowball sampling of members of ADED, the Association for Driver Rehabilitation Specialists, a network of health care professionals who provide driver rehabilitation services. This study was determined to be exempt from institutional review board review.

We used a modified grounded theory approach because we designed the study with several theoretical constructs in mind but were open to additional ideas arising from the data during thematic analysis. We developed the interview guide through an iterative process, including a literature review and feedback from an occupational therapist who was a certified DRS and LDI and was not part of the study team, to ensure that key domains related to learning to drive were discussed. The guide investigated topics that included (1) experience providing driving instruction to autistic students, (2) observations of these students' strengths and challenges, (3) specific strategies used, and (4) recommendations to improve the learning-to-drive process. We pilot tested the guide through mock interviews with two qualitative researchers unaffiliated with the research team to ensure clarity.

A single member of the research team (Janice M. Bonsu), a public health graduate student, was trained by a senior member of the research team (Cynthia J. Mollen), a physician with advanced training and experience in qualitative methods, and conducted all study interviews. She conducted a single, audio-recorded interview with each participant by telephone. Interviews lasted approximately 55 min, and recordings were transcribed verbatim and deidentified before analysis. We conducted interviews until data reached thematic saturation. After every third interview, the interviewer (Bonsu) reviewed each transcript and identified emergent themes. After the sixth interview, a senior member of the research team (Mollen) reviewed two randomly selected transcripts to identify themes. On the basis of differences between these reviews, we continued interviewing. The interviewer reviewed subsequent transcripts and

presented emergent themes to the research team until consensus was reached that no new themes were emerging, and recruitment ceased.

Transcripts were imported into NVivo (Version 11; QSR International, Doncaster, Victoria, Australia), a software program that aids in the organization and analysis of qualitative data. We developed a coding scheme using a directed content analysis approach. Codes were based on an initial literature review (e.g., [Almberg et al., 2017](#); [Cox et al., 2012](#)) as well as a close reading of interview transcripts ([Hsieh & Shannon, 2005](#)). We developed a fully explicated coding guide ([Table 1](#)), which provided a description and example of each code to ensure consistent application of codes. Four randomly selected interviews were double coded by the interviewer (Bonsu) and coordinator (Carey), both of whom received training and oversight from the study's senior qualitative investigator (Mollen), to assess intercoder agreement using Cohen's κ . We observed strong agreement for all codes (mean $\kappa = 0.95$, range = 0.91–1.0). The remaining transcripts were coded independently by a single coder (Bonsu). Four members of the research team (Rachel K. Myers, Benjamin E. Yerys, Bonsu, and Mollen) independently reviewed the coded text to prepare thematic summaries, which were discussed with the entire team to ensure agreement in interpretation. Review of these summaries resulted in identification of two distinct sets of themes. The first set of themes (previously published; [Myers et al., 2019](#)) pertained to the experience of instructing autistic adolescents, including the role of parents and need for refinement of best practices and strategies to use during specialized instruction. The second set of themes, presented here, relates to on-road experiences of specialized driving instructors, including challenges and strengths the study participants perceived among autistic students, the strategies used to address these challenges during instruction, and student outcomes.

Results

[Table 2](#) provides a summary of participants' demographic and instructional experiences. The sections that follow describe the themes identified in our interviews.

Challenges Experienced by Autistic Adolescents

Specialized driving instructors described the challenges encountered as varying from student to student, sharing “If you've seen one kid with autism, you've seen one kid with autism. They're all so different” (Participant 1). They explained that many of the symptoms of autism, such as poor motor control, sensory processing challenges, and visual–motor integration deficits, present challenges in learning to drive. One participant described that students “have difficulty with bilateral integration, doing activities that involve coordinating their left hand and their right hand or integrating their upper body with their lower body” (Participant 2), and another noted that “there is difficulty with coordinating steering patterns, for example. They might do the pretzel arms where their two hands are glued on the wheel” (Participant 9). Many students had limited experience with other forms of transportation or vehicle use, such as bicycling or lawn tractors, which contributed to challenges in controlling speed, maintaining lane position, and managing oncoming traffic.

Beyond the physical challenges, specialized driving instructors extensively described social challenges that could impair driving ability, including strict rule following and mental inflexibility, challenges in observing social cues, and distractibility or inattention. One participant detailed how this influenced their teaching approach:

He's looking at my sheet. It says left-hand turn for the diagram. And I go, “So what do you need to do to prepare to make your left-hand turn? Let's talk through the steps.” And he's looking at the sheet, and he looks at me, and he's like, “I put my left hand out. Because it said left-hand turn.” So I learned really quickly that a lot of my ASD learners are super concrete and rule followers. And so I have to be careful of the language that I use that they're understanding and also that my handouts are written well. I changed all my handouts so they just say “left turn.” (Participant 14).

Instructors reported that students took a longer time applying skills in novel situations in part because of mental inflexibility. There was a degree of unpredictability such that “you have to totally be on your toes the entire time you're in the vehicle [with them] until it's in park” (Participant 4).

Table 1. Codebook: Learning to Drive With Autism

Code	When to Use	When Not to Use	Example
1. Students	Use when respondents describe student recruitment methods, enrollment procedures, and any demographic characteristics of students.		“Driver’s ed is like one of the classes they take . . . when they leave, the hope is they’ll go and they’ll be employed and they’ll be able to drive to and from their job.”
2. Autistic parents	Use when respondents discuss the parental concerns for, involvement in, or endorsement of the learning-to-drive process for autistic teens.	Do not use when respondents describe the parental engagement for nonautistic teens.	“I don’t have a whole lot of parents [of teens with autism spectrum disorder] that come and ride. Maybe two a month that come and ride with us.”
3. Neurotypical parents	Use when respondents discuss the parental concerns for, involvement in, or endorsement of the learning-to-drive process for nonautistic teens.	Do not use when respondents describe the parental engagement for autistic teens.	“We always send a letter to the family saying, even though they’re licensed, they’re still a very new driver . . . you might wanna ride with them to make sure they’re competent in your area.”
4. Day to day	Use when respondents discuss their typical day at work and the activities involved in driving instruction.	Do not use when respondents discuss their experiences conducting driving evaluations.	“I do driving evaluations, and I also do some behind-the-wheel training.”
5. Respondent emotions	Use when respondents talk about their own emotions when working with autistic students.	Do not use when respondents talk about emotions of anyone other than themselves.	“In fact, I think my standards of what makes a good driver [have] kind of lowered because I wouldn’t want to pass [many] of our students.”
6. Autistic lessons	Use when respondents describe how they prepared for or modified driving lessons for autistic students.	Do not use when respondents discuss lessons with nonautistic students.	“We kind of do—we kind of play it by ear. Because what they say in health care, if you’ve seen one kid with autism, you’ve seen one kid with autism.”
7. Autistic challenges	Use when respondents describe what autistic students struggled with or found challenging.	Do not use when respondents talk about nonautistic students.	“They want to yield to everybody and let everybody else go. So they’re slow to assess intersections. Even if you have a stop sign with no traffic. . . .”
8. Autistic strengths	Use when respondents describe what autistic students performed well.	Do not use when respondents talk about nonautistic students.	“Some students who have good physical skills have good physical skills.”
9. Autistic strategies	Use when respondents talk about strategies that they use to teach autistic students.	Do not use when respondents talk about nonautistic students.	“Repetition helps the most. So we might take them on the same route. And we’ll tell them ahead of time.”
10. Outcomes	Use when respondents discuss what happens if they recommend an autistic teen get or not get licensed and what happens after the student leaves the driving facility.	Do not use when respondents talk about nonautistic teens.	“We recommend so many more months to a year of practice—regular practice.”
11. Neurotypical driving challenges	Use when respondents describe struggles of nonautistic students.	Do not use when respondents talk about autistic students or other developmental disabilities.	“In general with the other students if I had to clump them, one of the other students can’t remember the rules of the road. They can’t remember what to do in a situation.”
12. Neurotypical driving strengths	Use when respondents describe what nonautistic students performed well.	Do not use when respondents talk about autistic students or other developmental disabilities.	“They seem to be at a higher level . . . maintaining their speed, interacting with other traffic a little bit better, being able to drive more defensively.”
13. Other disabilities driving challenges	Use when respondents describe struggles of students with other disabilities (excluding autism).	Do not use when respondents talk about autistic students or neurotypical students.	
14. Other disabilities driving strengths	Use when respondents describe what students with other disabilities (excluding autism) performed well.	Do not use when respondents talk about nonautistic students or neurotypical students.	
15. Alternate design	Use when respondents describe how they would design a driver education program tailored to autistic students.		“I’d probably start each person on the simulator. And I could see—I could isolate the motor skills from the processing and sensory skills maybe.”
16. Good quote	Use when there is a good quote.		“I’d say maybe 20% of our parents are such a strong advocate for their child; they just don’t see the errors.”

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Table 2. Participant Characteristics

Characteristics	n (%)
Female	13 (76.5)
Years of teaching experience	
≤15	9 (52.9)
>15	8 (47.1)
Certification	
OT/DRS	15 (88.2)
LDI with supplemental experience	2 (11.8)
Practice facility setting	
Hospital based	8 (47.1)
State facility	2 (11.8)
Private practice	7 (41.2)

Note. N = 17. LDI = licensed driving instructor; OT/DRS = occupational therapist/driver rehabilitation specialist.

Beyond the symptoms of and challenges related to autism, specialized instructors noted that co-occurring conditions, such as anxiety, and medication use affected driving:

So if you have autism, a lot of times you have [attention deficit hyperactivity disorder] or you have anxiety also, which, really, the anxiety can really make the driving paralyzing for the student. Here they're nervous, and here we are in traffic and it makes them more nervous, and then I'm giving instruction which makes it more nervous, the anxiety. . . . An anxiety component is real, real critical. (Participant 1)

Some students displayed extreme overconfidence that, when coupled with a lack of insight regarding skills, made instruction difficult and led students to interpret coaching as criticism:

If I say go ahead and move to the left a little bit or start pressing your brake they'll say, "I am. I know. I am. I was." . . . They think that they're doing it, but they're not doing it. They lack insight, which makes it really hard to correct. And it comes across like they're arguing. So our driving instructors get very impatient with that. Even though we know it's part of their disability, it makes it hard to work with a student who's saying "I know. I am. I was." And you're like, "Uh, no, you weren't." (Participant 1)

Several study participants noted that because of these challenges, students often experienced mental exhaustion during lessons, which required shortening individual training sessions and conducting lessons over a longer period of time.

Strengths of Autistic Drivers

Despite the challenges encountered, specialized driving instructors noted several strengths among autistic students. Students were generally described as displaying an aptitude for memorizing the rules of the road and driving routes: "They tend to have an [absolutely incredibly] detailed memory for anything that you've shown them or you said to them" (Participant 17). Describing an experience with a student, 1 participant shared,

He drove a road one time. He had that memorized. It was like navigation was his super power. . . . He was . . . just phenomenal. He lived on the opposite side of the county and had never really been on our side of town. And we would have him driving around, and he could remember exactly the road, the names—everything from that point on. And it was helpful for training because then it was like we do it one time and he would need a lot [of] cues on what to expect. I would kind of prep him [on] what's coming up. And then the next time, he wouldn't need that prep, and he could focus on other skills and stuff. (Participant 10)

Strict rule following, noted as a challenge, was also a strength for autistic students: "They're gonna make those stops at those four-way stops every time. . . . They're gonna slow down at yellows. They're gonna stop at reds" (Participant 13). Moreover,

autistic drivers, as a rule, tend to be more—or as a group tend [to] be more—rigid rule followers. So these are people who don't speed. They don't take chances. They don't take risks. They're never gonna do anything overtly illegal. (Participant 12)

Specialized driving instructors described that their autistic students

generally [displayed] great observation skills. They just don't know how to organize, and so that I can work with as opposed to somebody who does see the detail or doesn't see the information on the roadway. So that's very helpful. The other thing is that they're visual learners generally speaking, and driving is very visual. (Participant 11)

Moreover, students commonly mastered the individual parts of vehicle control (e.g., steering, gas pedal, braking) quickly.

Instructional Strategies

Given the challenges and unique strengths of autistic students, study participants discussed a range of instructional strategies reflecting students' highly individualized needs. Many specialized driving instructors described a process of scaffolding skills:

It's one thing at a time, and it's layering the skills one on top of the other. [Students] have to master a skill and then we move on and add another skill on top. Overloading them with trying to do too many things at once, it's just completely unproductive. (Participant 12)

Repetition and continued practice of the same skills and driving routes were often used to enhance skills and overcome anxiety-related challenges. One participant described,

I drove out to his rural city, and we did take those exact routes. We talked about what do you look for in a parking space? We practiced pumping gas at the gas station he would use. I mean just everything we went through so he—help with kind of the anxiety management and to build those scripts of experiences. (Participant 9)

Several participants described using repetitious phrases or mnemonics:

I had one boy, he could not change lanes unless he—we have an acronym for changing lanes, SMOG, Signals, Mirror, Over the shoulder, Go. He would not—I mean . . . we saw [each other] for over a year. He would not change lanes unless he said it out loud, SMOG. I mean, he just was, SMOG, you know, and he would do it. And it just—I mean, when his parents were there, he was just very set. And that was fine as long as he was doing it. (Participant 4)

Additional strategies used during lessons included commentary driving, in which the student is

in the passenger side and they're telling [the driver] okay, that guy up ahead is turning, so we need to slow down, and those kinds of things. . . . I mean, just any kind of thing to get them using their visual skills while they're in motion. (Participant 4)

This was a strategy for both instructors and parents during practice driving. Some instructors took this further, describing how

sometimes I would say, "Let's get out of the car and let me walk you through it. Let me show you how you're gonna back into this parking space. . . . You get out of the car and watch me. I'm gonna do it so you can see the direction that the car's gonna go." And so there would be more demonstration, more experiential things that the student did. (Participant 8)

Specialized driving instructors did not universally agree on the use of driving simulators as a tool for assessment and teaching. Several noted that simulators and driving apps were helpful tools to assess and allow students to practice physical coordination and visual scanning. Instructors described, "In a driving simulator, we can break it down . . . like a computer game almost, where we do just steering or just gas and brake so they can master those things individually before putting them together" (Participant 1). However, many were cautious about extensive use of simulators because the experience of processing and control in a simulator does not exactly parallel that in a real vehicle. Moreover, they highlighted students' strong memorization skills:

Our simulator . . . doesn't have a really good decision-making process as far as knowing when to go, like when there's a lot of traffic. . . . It's very predictable, which [students] like. And then once they've done it once or twice, they know exactly when to go and what to do. (Participants 7)

To provide coaching and correct errors in a way that did not exacerbate students' frustration, a participant described allowing students to take risks:

If they're coming up on a stop sign, and I wanna see if they notice the stop sign, I'll take a look first and make sure that there's no cars coming, and if I see that the intersection is fit, I'll let them run it, just so that I can really show them. Like, "Look, you just ran a stop sign." And then we can talk about it. Because a lot of times, if I start braking, they'll say, "No, no, I was on that. I was just about to do that." And I—so sometimes you have to let them run through the intersection just [to] prove your point. (Participant 12)

Specialized driving instructors also explicated their role in helping students recognize social cues while behind the wheel. Instructors would call out other drivers' social cues to their students and help students make sense of and interpret these behaviors:

A young person with autism is . . . not necessarily gonna be able to identify a tailgater when they look in the rearview mirror. . . . So those are social skills that they don't necessarily know. So I've taught them—the way I teach them is that there are different behaviors [among] drivers that you can pick up before you make a lane change. . . . So I work with the kids on, that's one behavior that you see, and let's give it name. And then if they don't want to give it a name or they're not sure, I say, "Well, I call them zoomers. Now they're gonna zoom up behind me, pass me," and they're not—and they start to see these social behaviors because we've labeled them and we defined them. So they're better able to then spot them. (Participant 11)

Beyond providing instruction related to vehicle maneuvering and on-road control, specialized driving instructors trained students in other aspects of vehicle operation, including changing a tire and interacting with law enforcement:

We're starting a group for students with ASD to learn how to interact with law enforcement. Because that tends to be a very stressful situation for anybody whether or not they have ASD. . . . And a lot of the students . . . may not communicate in the way you and I do. They may not follow directions in the way you and I do, particularly under stress. So kind of giving them exposure to what to expect for the interaction with law enforcement. (Participant 9)

A consistent theme across interviews was to “not treat [autistic students] like a neurotypical teen because it won't work and not—they're not paint by numbers. You have to have a lot of creativity, flexibility and deal with what's in front of you” (Participant 12).

Licensure and Instructional Outcomes

Interview participants estimated that fewer than 30% of the autistic students they evaluated obtained their driver's license, although many acknowledged that they were not always aware of licensing outcomes. Specialized instructors often conducted an initial evaluation and recommended that the student return at a later time after having mastered the skills foundational to fitness to drive. One participant described,

Maybe they came to us when they were 15 and we talked about . . . why they weren't ready. . . . And we gave them a home program and they've been working on it and they come back to us when they're 18, 19, 20 years old. And some of them are ready at that point. They've developed those skills that are needed for driving. (Participant 9)

Specialized driving instructors occasionally evaluated autistic students for whom driving was an unlikely outcome, going so far as to note, “And then there [are] other kids, after lessons, where we advise them not to drive and ask the doctor to have the permit removed” (Participant 3).

In addition, study participants noted that an outcome for many autistic students was a recommendation for months or years of parent-supervised practice driving before returning for further specialized instruction. This included use of commentary driving, noting, “Commentary driving is a very common ending point, at least for—you can do commentary driving for a year and then start behind the wheel again” (Participant 1). Another specialized driving instructor described a highly systematic approach to helping families prepare their children for driving:

We found an . . . activities of daily living [ADL] checklist that we had used in outpatient rehab for poststroke and things of that nature with cognitive impairment, and we developed it in a way that would look at it from a hierarchy of ADL tasks. And so we now give that to the—to those that we recommend that they wait; they're not yet ready, as a guideline and tell them when they can do these tasks starting here all the way through without hearing, without prompting, they can do them independently. That's when it's the right time to refer back for driving. (Participant 17)

When students' instruction ended in licensure, it was often with restrictions: “Most students, I recommend not just driving freely anywhere that they choose. I say take one to three routes and just do those one to three routes over and over and over” (Participant 1). Some specialized driving instructors shared that parents continued to reach out after licensure for ongoing support:

At least the first year, I find that sometimes I'll get a message like “Do you think—he would like to be able to drive here? Do you think that's a good idea?” And then I'll give my feedback sort of in an email, that kind of thing. (Participant 11)

Some participants explained that they heard back from students only when adverse outcomes occurred and additional support was needed:

So we've had people that we evaluated and I'd had real questions about, and they've never come back. Got their license by one way or another, and then had accidents after that and then came back to see us. I'm like, “Oh, didn't we see you before?” “Yeah. Like, well, can you—now—you've gotta fix this now. He's had three accidents.” (Participant 3)

Specialized driving instructors also acknowledged that not knowing their students' outcomes was a consistent challenge:

That's probably the biggest empty spot for me I guess at the moment is I don't necessarily know—of the clients we have that have gotten [their] license, what percentage of them are driving all the time, doing everything we want them to be doing, and what percentage fell back, their parents don't let them drive or they never get access to a car or they haven't been behind the wheel since they last drove with us? That's what . . . we don't always know. . . . We know what we achieved and what they were able to do when we finish with them. But sometimes that's the other piece is to know, are they continuing with that level of independence? (Participant 5)

Discussion

This study provides critical insight into the behind-the-wheel experiences of specialized driving instructors and illustrates the specific needs of autistic adolescents who are learning to drive. Autistic youth have characteristics that present unique challenges in achieving this important developmental milestone; however, through extensive individualization, specialized driving instructors described efforts to build on students' strengths and support their development of fitness to drive. Despite the intensive nature of the instruction, participants acknowledged that they infrequently knew their students' licensure outcomes. However, among those for whom outcomes were known, licensed autistic drivers commonly drove only with supervision, on the basis of instructors' guidance to families. These results highlight that although licensure is a feasible outcome for autistic adolescents, developing fitness to drive independently is a complex and time-intensive process requiring skillful and rigorous specialized instruction.

Instructors frequently observed common clinical features of autism that impeded adolescents' fitness to drive, including mental inflexibility, distractibility, and an inability to anticipate or respond to social cues. With regard to social cues, autistic adolescents may struggle with predicting others' behavior and not take appropriate anticipatory action (Monahan et al., 2013; Sheppard et al., 2017). These challenges may in part reflect executive dysfunction related to planning, impulse control, set shifting, and initiation of appropriate action in response to social stimuli, which may worsen during adolescence (Luna et al., 2007; Rosenthal et al., 2013). Specialized driving instructors reported extensively addressing these impairments in the course of their instruction to enhance students' fitness to drive. Continued efforts to identify effective practices and strategies that provide students with the skills to manage these weaknesses are critical to enhancing the safety of autistic drivers as they pursue licensure.

In addition to the cognitive challenges noted here, instructors frequently encountered students with motor coordination difficulties. Although significant impairments in motor coordination have been reported among autistic adolescents compared with nonautistic adolescents, these weaknesses have rarely been examined in relation to driving (Ming et al., 2007; Monahan et al., 2013). Evidence suggests that autistic youth exhibit particular challenges with manual dexterity, which is more complex and may require rapid integration of information (Whyatt & Craig, 2012). In the driving setting, these types of activities may include steering, managing lane changes, and maintaining a safe following distance. These activities are frequent challenges among autistic student drivers. In turn, instruction often focused on practicing these skills both behind the wheel and in simulators to enhance students' driving fitness.

It is notable that although interview participants described challenges in the course of instruction, they also believed that autistic students had strengths that assisted them in becoming safe drivers. Namely, although mental inflexibility was a challenge in the course of instruction, many specialized driving instructors believed that it resulted in students being adherent to the rules of the road and ultimately increased their driving fitness. Research has suggested that autistic adolescents are more risk averse than their nonautistic peers (Gosling & Moutier, 2018; South et al., 2014). This risk aversion and strict rule following may enable autistic drivers to adhere to rules they readily memorize. In addition, although organizing and integrating information was a challenge for many students, they often displayed a keen ability to observe their surroundings. Rather than needing to teach autistic students observation skills, instructors shifted their focus to helping students organize observations and use relevant information to make driving decisions.

To overcome students' challenges and bolster their strengths, instructors engaged in a prolonged and highly customized training experience that focused on slowly building skills from basic to more complex. At present, evidence to support specific skills training related to driving continues to be insufficient. However, a recent systematic review by

Beisbier and Laverdure (2020) concluded that there is moderate evidence to support instructor coaching and behind-the-wheel skills training. Such approaches were reflected in instructors' descriptions of their efforts to build and scaffold students' driving-related skills while helping students gradually learn to partake in other key tasks related to operating a motor vehicle, such as vehicle repair and interaction with police.

Instructors estimated that fewer than 1 in 3 autistic students who sought specialized training successfully obtained their driver's license. This is consistent with previously reported quantitative data regarding the proportion of autistic adolescents who become licensed (Curry et al., 2018). Although these data indicate that licensure is feasible, many instructors noted that even once licensed, students may drive only on familiar or low-risk routes or with their parent or other trusted adult in the vehicle. These limits were often recommended by instructors and are similar to those required by state-level GDL programs for novice drivers. Although GDL provisions are based on age at licensure, the restrictions on driving for autistic youth may provide an effective way to mitigate risk while promoting skill building and independence (Governors Highway Safety Association, 2020). In some instances, instructors were aware of students' driving outcomes only if families sought additional training or support. Instructors described having limited information on outcomes of other students, highlighting the critical need for future research to assess the impact of intensive training on longer term driving outcomes, quality of life, and ADLs.

This study has several limitations. First, we interviewed only specialized driving instructors who had advanced training as either occupational therapists or LDIs with expertise working with autistic adolescents. We are therefore unable to describe the practices of nonspecialized instructors who may provide driving education to autistic students. Unfortunately, access to the specialized instruction detailed in this study may be limited by geography, finances, or other barriers, so these learning-to-drive experiences and instructional approaches cannot be considered standard practice currently available to all autistic drivers. Second, although we conducted interviews until thematic saturation was reached, it is possible that there are experiences or strategies that were not elicited in these interviews. Last, participant recruitment relied on both purposive and snowball sampling. It is likely that participants may have shared instructional strategies with one another, resulting in the elicitation of similar approaches across interviews.

Implications for Occupational Therapy Practice

This work offers novel insight into the practices of specialized driving instructors teaching autistic adolescents to drive. Although these adolescents have unique challenges in both social interaction skills (including both processing and response) and motor coordination, instructors acknowledged that they were able to address these challenges through extensive individualization of teaching strategies. Moreover, many instructors noted that autistic students had unique strengths that may enhance their fitness to drive. This study has the following implications for occupational therapy practice:

- Given their training, specialized driving instruction provided by occupational therapists includes formal and informal assessment of cognitive, attentional, motor, and other skills to help autistic adolescents achieve fitness to drive.
- Strengths-based approaches may be particularly valuable for practitioners in helping autistic adolescents learn to safely drive and in addressing skill challenges.
- A creative approach to layering skills both inside and outside of the vehicle helps build students' competence and fitness to drive and advance toward licensure.
- Specialized driving instructors can implement strategies commonly used in other settings (e.g., education and vocational training) to promote success among autistic adolescents, such as repetition, modeling, and opportunities for safe failure with correction.

Conclusion

Enhancing access to independent transportation is critical to addressing barriers to continued education, employment, and community participation among autistic adolescents and youth during the transition to adulthood. The results of this study suggest the importance of individualized, strengths-based approaches to support autistic adolescents in overcoming challenges experienced in developing fitness to drive. However, continued efforts to develop, refine, and understand access to the specialized instruction described in this study are imperative in supporting autistic adolescents as they learn to drive and use other forms of transportation. Future research must address the experiences of autistic adolescents and their families who have received specialized instruction and to rigorously and systematically evaluate licensure and driving outcomes. In addition, research examining perspectives and experiences of nonspecialized driving instructors is critical to understanding the learning-to-drive experiences that may be more common among autistic students. Although this study provides direction for intervention and services, understanding the strategies that are most effective at improving autistic adolescents' fitness to drive and establishing standard practices to support this important developmental milestone are critical. 🏠

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