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Adolescents with Low Vision: Perceptions of Driving and Nondriving

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Abstract: Two studies examined how adolescents with low vision perceive their ability to drive. The results of both studies indicated similarities in the participants' responses with respect to knowledge of visual impairment, information about options for driving with low vision, frustrations and obstacles imposed by not being able to drive, and independent travel skills.

The ability to obtain a driver's license has long been considered a rite of passage for and a milestone in the lives of adolescents. Not only is it a sign of independence, but it marks the beginning of true autonomy from parents and adult supervision. When 2,500 adolescents were asked, "What is the most important event in a teenager's high school life?" the number one response was the receipt of a driver's license (Peterson, 1992). Sebald (1983) noted that the ability to drive gives an adolescent higher standing among his or her peer group because the adolescent has greater independence and mobility.

Not being able to drive poses numerous challenges for individuals who are visually impaired, including adolescents. The community in which an individual lives often determines lifestyle decisions and level of independence. Corn and Sacks (1994) examined the impact of nondriving on adults with visual impairments (those who were blind or had low vision). They found that not being able to drive moderately affected the participants' chances to date, participate in social activities, and obtain employment. They also found that the participants felt a lack of spontaneity in their lives and needed to plan activities that required independent travel. Rosenblum and Corn (2002) examined the impact of nondriving on elderly adults with visual impairments and found similar outcomes.

While adolescence is a time to experience greater independence and autonomy, many adolescents who are visually impaired do not have the same opportunities to travel independently, spontaneously visit friends, or participate in age-appropriate activities. For example, several studies (Kef, 1997; Sacks, Wolffe, & Tierney, 1998; Wolffe & Sacks, 1997) found that students with low vision spent more time alone engaged in passive activities (talking on the telephone, watching television, and listening to the radio) and engaged in sleep than did their functionally blind or sighted peers.

Because adolescents with low vision often do not appear visually impaired--they may wear glasses or use optical devices, but they generally travel without a long cane and function as if they were fully sighted--and may not seem to require intense educational services from a teacher of visually impaired students or an orientation and mobility (O&M) instructor, they may have little information on their visual status and may be uncertain whether they will be able to drive (Sacks & Corn, 1996). In addition, family members, teachers, and counselors may not have the information or knowledge they need to help answer the adolescents' questions about driving with low vision (Sacks & Corn, 1996). Given the paucity of research, the authors set out to determine how adolescents with low vision perceived this issue. They wanted to determine (1) the participants' knowledge about driving, (2) the ways in which the participants travel in their communities, (3) the participants' future plans for living and traveling independently, and (4) family members' and educators' support for the participants driving or nondriving.

Method

To obtain comprehensive information on driving issues for adolescents with low vision, the authors designed two separate studies. Study 1 provided quantitative information, and Study 2 used qualitative strategies to provide a means of validating the results of Study 1. Study 2 also provided rich, thematic information to enhance the overall findings of these studies.

Study 1

Design of the questionnaire

The authors developed a 28-item questionnaire for which the participants were asked to select responses from a provided list. These questions included demographic information, information on experiences with driving, information on nondriving, and perceptions of the participants' travel skills and modes used for transportation. Other questions determined the participants' level of potential frustrations because of the inability to drive. The participants were asked to rate the top three frustrations from a list of nine items, which were taken from an initial study conducted by Corn and Sacks (1994). The final section of the questionnaire contained four open-ended questions on the participants' perceptions of how they will travel as adults, ability to provide written directions from home to school, what it would take to allow the participants to drive, and any other comments they wanted to make. Students with visual impairments who did not participate in the study reviewed the survey for clarity and understanding.

Participants

Requests from both authors were made to teachers and families throughout the United States for adolescent participants via postings on electronic mailing lists and word of mouth. Adolescents who met the following criteria were considered for the study: They were aged 14-18, were academic students who were within one year of their grade level in school, had low vision, and used print as their primary literacy medium.

Procedure

The teachers and families of adolescents who responded to the initial postings were contacted to determine if the adolescents met the study criteria and for their mailing addresses. Packets of surveys in regular print (12-point) and in large print (18-point), along with consent forms for the parents and adolescents, were sent to the teachers of students with visual impairments who met the research criteria. A total of 300 surveys were mailed, and 63 surveys were completed for a response rate of 20%. Although the percentage of returns was low, the authors obtained a good cross section of participants throughout the United States with respect to geographic location, type of community (urban, suburban, or rural), and gender.

Study 2

Telephone interviews

To validate the findings from Study 1 and to obtain more in-depth information, the authors designed a 14-item questionnaire. The aim of the questionnaire was to obtain more detailed demographic information (grade in school and type of community in which the participant lived), a detailed description of the adolescents' visual impairments, and anticipated opportunities to drive.

For the participants who anticipated that they would not drive, a series of questions were designed to probe their knowledge about living arrangements, alternative transportation modes, opportunities to talk to others about not driving, and areas of frustration. A separate set of questions were developed for participants who believed that they would be able to drive. These questions included information about anticipated living arrangements as an adult, modes of instruction for driving with low vision, types of modifications used for driving, and alternatives if driving does not become an option.

Participants and procedure

Fifteen participants were randomly selected from a list of all participants who completed the initial survey in Study 1 and agreed to participate in Study 2. Each author interviewed the participants via telephone for 15 to 20 minutes. The interview questions were read to the students, and answers were recorded verbatim.

An author telephoned each participant selected from the list of potential participants. They introduced themselves, reminded the individuals of their participation in Study 1, and indicated that the interview would take about 15 minutes to complete. All the adolescents who were contacted agreed to participate in the telephone interviews. The authors read the questions to each participant, and responses were recorded verbatim.

Results

Study 1

Demographic findings

Of the 63 adolescents who participated in the quantitative study, 5 (6.5%) were in middle school, 14 (23.0%) were in their first year of high school, 14 (23.0%) were sophomores in high school, 13 (21.5%) were juniors in high school, 14 (23.0%) were seniors in high school, and 3 (3.0%) were freshmen in college. Of the 55 participants who provided information about their educational placements, 41 (74.5%) indicated they attended general education classes with support from a teacher of students with visual impairments or an O&M instructor. The remainder received a combination of general education and resource room support (*n* = 9, 16.5%), attended a specialized school for students with visual impairments (*n* = 3, 5.5%), or received other services (*n* = 2, 3.5%).

Information about visual impairment

Of the 63 participants, 55 reported 23 etiologies, and 8 stated that they did not know the etiology of their visual impairment. The most common eye diseases were albinism (*n* = 8, 14.5%), retinitis pigmentosa (*n* = 5, 9.1%), aniridia (*n*= 4, 7.3%), retinopathy of prematurity (*n* = 4, 7.3%), and 3 each (5.5%) for nystagmus, toxoplasmosis, optic nerve hypoplasia, high myopia, and achromotopsia. Eighty-two percent of the participants were congenitally visually impaired, including half the participants who reported that they had retinitis pigmentosa. The age of diagnosis for the other participants ranged from 18 months to 13 years, with a median age of 8 years.

The participants were asked to provide their visual acuity for each eye and both eyes together; information on visual fields was not obtained. Of the 63 participants, 21 (33.3%) had acuities better than 20/200, with the best acuity being 20/25; 28 (44.4%) were considered legally blind (based on their visual acuity), and 14 (22.3%) were unaware of their visual acuities.

Although the participants had various degrees of visual impairment, only half (53.3%) had undergone a clinical low vision evaluation. More interesting is the fact that only 29.5% of the participants reported using optical aids or devices. Forty percent of participants reported being shown an optical aid by a teacher of visually impaired students, an O&M instructor, or an eye care specialist.

Perceptions about driving

More than half (*n* = 34, 57.6%) the participants believed they would be able to drive; 3 participants did not respond or did not know if they would be able to drive. Of the 84% of the participants who had discussed driving with their families, three-fourths agreed with the statement, "My family understands where I'm at with my thinking about driving," and the remainder thought that their families were unrealistic or had opposing views about driving with low vision.

Half the participants indicated that they had driven a car with friends, siblings, and family members in empty parking lots, on quiet streets, or in the country on deserted roads. Despite these experiences, only nine participants, with a range of visual acuities including those with acuities of less than 20/200, received instruction in driver education. Twenty-one participants, about one-third, reported receiving instruction in nondriving (strategies to support a person who is unable to drive in the use of public transportation, for example) by an O&M instructor, teachers of students with visual impairments, and/or adults with visual impairments. Only six (9.5%) participants reported using the curriculum *Finding Wheels* (Corn & Rosenblum, 2000).

Independent travel

The participants were asked to evaluate their current independent travel skills within their community and the methods they use for travel. Almost half (48%) believed they had "excellent" or "great" travel skills, 32% believed they had "OK" travel skills, 17% reported they had "good" travel skills, and only 3% thought they had poor travel skills. Despite their perceived ability to travel independently, half the participants (52.5%) traveled most often with a family member or a friend; only 19% traveled alone. Five participants indicated that they used a cane during travel, and 12 said that they used a monocular telescope during travel.

Level of frustration

To determine the students' levels of frustration, the authors examined data by the participants' grade groupings and level of visual impairment. The participants rated their level of frustration on a scale of 1-3, with means closest to 1.00 indicating the highest level of frustration. As Table 1 shows, the highest levels of frustration were for "explaining to others why I can't drive," "not being able to travel where I want to go," "depending on my family for transportation," and "not being able to date someone because I don't have transportation." The younger participants' greatest frustrations were with "not being spontaneous," "explaining to others why I can't drive," and "depending on my family for transportation," whereas the older participants' greatest frustrations were with "not being to date someone because I don't have transportation," "not being able to travel where I want to go," and "explaining to others why I can't drive."

The levels of frustration were also examined by the participants' visual acuities. For those with acuities better than 20/150, the greatest frustrations were with "explaining to others why I can't drive," "not being able to travel where I want to go," and "having to use public transportation." For those who had acuities poorer than 20/200, the greatest frustrations were with "not being able to travel where I want to go," "explaining to others why I can't drive," "depending on my family for transportation," and "asking people for rides."

Open-ended questions

The open-ended questions expanded on the quantitative responses. The first asked the participants to explain how they believed they would get around as adults if they were unable to drive. The responses varied and did not generate any particular patterns with respect to levels of visual acuity, grade level in school, or geographic location. They included, "Move to a large city with a transit system, or if I make enough money, hire a driver"; "I don't know"; and "That is something I ask myself all the time, but I can't do anything about it."

To determine if the participants had knowledge of their community surroundings, as well as an ability to relay information to others, the authors asked the participants to provide driving directions from their home to their school. There were a wide range of responses. Again, no specific patterns were detected when these data were compared using the same variables. However, the participants who provided more in-depth directions described positive experiences with their O&M instructors. The responses included, "I never pay attention regarding how I get to school" or "Ooh, I don't know; you turn here, and you go that way." Others provided more detailed descriptions, such as "Leave the driveway, turn left, left on route 27, left on Cashew Drive, right on West Road, turn left a half mile down the road" or "North on New Hope, west on Washington, north on Van Barren."

The participants provided creative responses to queries about future advances for driving. Their responses centered on inventions like "cars that can't be dented and a computer that can tell if a pedestrian is crossing a street when it is dark or too bright or if you are close to a curb and are about to hit it" or "a robotic eye that I control just like my normal eyes. It would have perfect 20/20 vision and would be able to zoom in like military binoculars." The participants also discussed having surgery as a potential solution: "If there was a cure for RP [retinopathy of prematurity], then I could have eye surgery."

The participants' responses about driving and nondriving were poignant. The comments focused on the importance of driving for independence, "Driving is vital in my town for basic independence socially, financially, and in all other aspects. A person not driving would be miserable." One participant believed that not being able to drive was not an obstacle: "If I don't drive, it is not a big deal. I could be perfectly fine walking or taking city lines. Honestly, I won't have to worry about a car, taxes, or payments, so I'm OK without driving."

Study 2

The findings from the qualitative study support the findings from Study 1. The 15 students (9 male and 6 female) who participated in the study via telephone interviews came from 11 states (Arizona, California, Colorado, Massachusetts, Ohio, Pennsylvania, Tennessee, Texas, Virginia, Vermont, and West Virginia). The majority (60%) had visual acuities that were better than 20/150, 27% had visual acuities of less than 20/200, and 2 interviewees did not know their visual acuities. Of the participants, 40% were high school sophomores, 27% were high school juniors, and 33% were high school seniors; 5 lived in cities, 6 lived in suburban areas, and 4 lived in rural communities.

Knowledge of visual impairment

Similar themes regarding the participants' knowledge of their visual impairments were revealed in Study 2 as in Study 1. Some participants provided explicit explanations of their visual impairments, as in the following statement: "I have cone dystrophy, a form of macular degeneration. I have better peripheral vision than central vision. You have cones in your eyes, and mine are dying off." Others provided only the name of their visual condition. The participants who provided extensive information about their visual impairments indicated that they had ongoing service from a teacher of students who are visually impaired or an O&M instructor. This finding was consistent across grade levels, differences in visual acuity, and geographic location.

Potential for driving

While the majority of adolescents in Study 1 believed that they would be able to drive in the future, only 5 of the 15 adolescents in Study 2 believed they would be able to do so. The responses from the participants in Study 2 reflected a more guarded theme. For example, one participant who had several retinal detachments said, "I have talked to all my eye specialists, and it depends on my vision because it fluctuates a lot." These themes reflected apparent differences between the quantitative and qualitative findings. The authors suspect that more in-depth interviewing on a personal level provides more realistic responses.

Participants' plans for nondriving

The findings regarding plans for nondriving were similar in both studies. As in Study 1, the thoughts of the participants in Study 2 varied with regard to their future needs as nondrivers. No participant in either study had a clear plan of where he or she would live following graduation. Two-thirds of the participants in Study 2 said that they would probably move to a larger town or city, where they would use a combination of modes of transportation, including walking, using public transportation, using paratransit, and getting rides from others. Five participants indicated they would live at home and would receive rides from family members or friends. Three participants anticipated that their future spouses would be the primary source of transportation.

Another theme that became apparent through the more extensive interviews was that the participants rarely discussed issues related to nondriving in the future with family members or teachers. As an 18-year-old participant stated, "On occasion I talk to my parents. The conversations have been OK. We talk about where I can live. Different states allow you to drive with different optical glasses that can help you drive. My state doesn't allow that." A statement that was typical of those participants who did not talk to others was, "I talk to my VI teacher. I don't really talk about it much. It upsets me."

Frustrations and obstacles

The responses in Study 2 more clearly identified the participants' frustration with not being able to drive. Although these participants expressed feelings similar to those in Study 1, their responses seemed more intense, especially the responses of those who lived in suburban areas. A female participant commented, "Being 16 and not having a driver's license is frustrating. If I can't drive, I'll cry." The following was typical of the responses from the male participants: "All these people at school have a nice car. A car demonstrates who you are in a very real way, and I kind of miss out on that."

Although half the participants were unable to identify obstacles that they may face as adult nondrivers, all the participants thought that not having to pay for gas or car insurance was a real asset. Those who did identify obstacles reflected on two specific themes. They described frustrations with getting to desired places and a lack of spontaneity. They also described concerns about potential employment, as in this statement: "Some of the obstacles I may encounter are I can't go on trips without planning, where I work depends on where I live, transportation may limit what I do for fun, and I have to schedule everything in advance." Another participant commented: "Probably, my job choices would be limited. In our global economy, I might be able to work digitally, but I would have problems with business trips."

Driving with low vision

Only four participants in Study 2 had some knowledge of options for driving with low vision. Of the four, only one provided information about driving with low vision. He stated: "I know that there are places, like in Houston, where there is special training to learn to drive with low vision. I know the person learns to use a telescope mounted on glasses to find objects in the distance. I know you have to have good peripheral vision to drive. I can see distances, but my peripheral vision is not good."

Discussion

Few studies have documented the issues that individuals with visual impairments face regarding driving. The majority of studies have examined the impact of nondriving on adults who are visually impaired. This investigation set out to examine the issues that adolescents with visual impairments encounter regarding their potential to drive and the obstacles and challenges that they will face as young adults. The findings from both studies substantiate one another and clearly demonstrate the need for educators and families to tackle this important curricular area. By using the qualitative findings as a means of validating the results of the first study, the authors believe that the results have greater credence and strength. While the nature of both studies required the participants to use self-reports, rather than more objective measures, the information they provided has great utility for teachers, counselors, and families. These data also document that adolescents with visual impairments require more insights into and information about the nature of their visual impairments, information on driving with low vision, and strategies to deal with nondriving alternatives.

A weakness of the study was the lack of information on the participants' visual fields. As a result, it was difficult to clarify if the students who had good central acuities but restricted visual fields perceived themselves as being able to drive or as competent travelers. In future studies, it would be important to obtain data on visual fields and to ask the participants to describe how they function with a visual field loss with respect to independent travel and the potential for driving. In addition, to provide more robust information, it would be useful to use a triangulation methodology whereby teachers and family members are asked to complete surveys and interviews similar to those completed by the adolescents. Then, comparisons could be made among the three groups.

Need to understand visual impairment

The data from both studies suggest that the participants knew the names of their etiologies, but there was great variance in how they explained their visual impairments to others. Some participants provided detailed descriptions and accurate information about their etiologies, whereas others provided only the names of their eye diseases or conditions. Not only were the participants unable to provide accurate information, they were unable to communicate their visual impairment needs to others. In fact, those who had acuities better than 20/150 ranked "telling people that I have a visual impairment" as a highly frustrating experience. It appeared that when students had frequent discussions with a teacher of students with visual impairments or an O&M instructor, their feelings of self-worth and competence in discussing their visual impairments were positive. It would seem critical for teachers to provide students with accurate information about the student's visual impairments to enhance their advocacy and social communication skills, especially in employment and advanced educational settings.

It was surprising to learn that fewer than a third of the participants used optical devices regularly. More telling is the fact that only four participants knew about options for driving with low vision. One may suspect that adolescents from urban areas or those with better visual acuities would have been exposed to this information, but this was not the case. In fact, the students who had knowledge about driving with low vision had poorer acuities and lived in a variety of geographic locations.

Need to alleviate frustrations about driving

The participants' responses illustrated high levels of frustration and feelings of great sadness about not being able to drive. Even though the participants said that they had opportunities to drive a car on several occasions in a variety of environments, they expressed great frustration about the lack of control and autonomy in their lives. It is critical for adolescents with low vision to have ongoing opportunities to develop alternative strategies for not being able to drive like using money for purchasing a car to hire taxis or drivers or developing a reciprocal agreement with friends who drive whereby they do a service in return for rides.

Family members, along with professionals, must consistently work with students (from an early age) to develop useful and workable solutions for transportation. It is equally important for professionals and families to provide opportunities for students to vent their frustrations and anger about not being able to drive and the potential lack of control that not being able to drive poses. Engaging adolescents in structured discussion groups, implementing a curriculum for alternatives to driving, and exploring with students the regulations and options for driving with low vision can alleviate feelings of despair and helplessness.

Need to understand options for driving with low vision

Both studies substantiated that the adolescents were uncertain about their potential for driving in the future. The participants in both studies seemed to have a realistic view about the restrictions they would face if they obtained a driver's license, but were more fatalistic about employment opportunities or living arrangements as adults. Even though the data from both studies clearly demonstrated that the participants had experiences driving a car and thought, for the most part, that they would be able to drive, only a small proportion participated in driver education or were aware of their states' regulations for driving with low vision. Professionals who work with adolescents with visual impairments must educate their students and families about their states' requirements for driving with low vision. It is equally important for educators and low vision specialists to work together to provide honest information about a student's potential to drive and the specialized training needed to obtain a driver's license.

Furthermore, the ability to be a good driver may be predicated on adolescents' skills as independent travelers and efficient users of low vision devices like telescopes. Yet, the number of students who traveled independently, used a white cane for travel, or used optical devices for spotting signs or traffic signals was surprisingly small. Although no clear patterns emerged from the data, one may suspect that the students who had visual acuities better than 20/150 did not think that they needed specialized devices or skills to travel independently or to drive a car.

Conclusion

The findings from these studies clearly document the importance of driving for students with low vision. The participants' responses were honest and articulate. Their feedback substantiated the findings of earlier studies and acknowledged that the issues that adolescents with low vision face with respect to driving or nondriving are especially critical in the transition from school to adult life. Professionals and family members often focus on academic success and forget that driving a car allows an individual the greatest level of independence and autonomy. Young adults with low vision may be grappling with issues related to driving and may be dealing with issues of social isolation, interdependence, and locus of control. It is essential for teachers and rehabilitation professionals to find time to discuss and explore solutions for these issues with the young people with whom they work. Generating solutions and alternatives are the keys to assisting adolescents through this difficult process.

To solidify and substantiate the findings from these studies, future research needs to obtain an even larger sample and obtain information about the visual fields of each participant. Using a computer-based survey, along with a triangulation methodology, may enhance the number of potential participants and generate more objective data. In addition, future studies may use focus groups to determine if there are differences between adolescents who are served via an itinerant model versus those who received support in a resource room or specialized school setting.

Finally, it is essential that teachers, counselors, O&M instructors, and rehabilitation professionals recognize that the issue of driving is a serious one for adolescents who are visually impaired. Not only must ongoing discussions be facilitated by the adults who care about these students, but a structured, organized curriculum or set of activities must be initiated in the hopes that adolescents will view driving or alternatives for nondriving as an informed choice, rather than as obstacles. By doing so, teachers and families will ensure that these adolescents will have a smooth and effective transition to adult life.

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