EFFECTS OF A RIDESHARE INTERVENTION FOR YOUNG ADULTS WITH INTELLECTUAL AND DEVELOPMENTAL DISABILITIES USING PREDICTOR COMPONENTS ON TRANSPORTATION SKILL ACQUISITION

by

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ABSTRACT

DARCY L. FREDRICK. Effects of a rideshare intervention for young adults with intellectual and developmental disabilities using predictor components on transportation skill acquisition. (Under the direction of DR. CHARLES L. WOOD)

Young adults with intellectual and developmental disabilities (IDD) accomplish outcomes in the areas of employment, continued education, and independent living at rates much lower than their peers without disabilities (Newman et al., 2011). Limited reliable and independent transportation is one barrier youth with IDD face in accessing these outcomes (Bross, Fredrick, & Kwiatek., 2023; Feeley et al., 2015). Research related to postsecondary transition planning has identified community experience, self-determination, and parent expectations/involvement as three predictors of postschool success (Mazzotti et al., 2016; Mazzotti et al., 2021; Test et al., 2009). I used a single-case multiple baseline across participants design to analyze the effects of a rideshare intervention on participants' independently completed rideshare steps and generalization of rideshare skills. This study extended research by Bross, Wood, and colleagues (2023) that demonstrated the efficacy of classroom and in-vivo instruction to teach young adults with IDD to use a ridesharing application. All three participants in this study reached mastery and generalized their skills to ride independently, to schedule a ride, and/or to travel to a location novel to the study. One implication of this research is that situated interventions that leverage predictors of postschool success and program for generalization can be effective in teaching young adults with IDD to independently access transportation and their community. Additionally, this study demonstrates that implementing transportation skill interventions within the existing routines of young adults with IDD for relevant participant outcomes can demonstrate a functional relation and be maintained and generalized.

DEDICATION

This dissertation is dedicated to Stella and Nora, it's all yours; everything of mine and anything you can dream up. Dream big. I love you with my whole heart. Forever. And to my own mother, who has been saying the same thing to me my entire life.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1: INTRODUCTION

Statement of the Problem

The mission of the United States Department of Education is "to promote student achievement and preparation for global competitiveness by fostering educational excellence and ensuring equal access" (U.S. Department of Education, n.d.). Excellence and equal access for all students was first established with the Education for All Handicapped Children Act of 1975 (Public Law 94-142) and reiterated 50 years later with Every Student Succeeds Act (ESSA) in 2015 and the Individuals with Disability Education Improvement Act (IDEIA) in 2004. Considered alongside the mission of the U.S. Department of Education, the passing of these legislative initiatives cement the purpose of education in the Unites States to promote global competitiveness for all learners including learners with intellectual and developmental disabilities (IDD). IDEIA mandates that transition services be "results oriented" to improve academic and functional achievement that will facilitate movement from school to postschool activities (IDEIA, 2004 [34 CFR 300.43][20 U.S.C. 1401 (34)]). That is, learners with IDD can expect an education that will prepare them to engage in continued education and training, employment, and community engagement. While special education has progressed significantly over the past 50 years, postsecondary outcomes related to education/training, competitive employment, and community engagement indicate that individuals with IDD do not experience these outcomes to the same extent as their peers without disabilities after exiting the K-12 school system.

The National Bureau of Labor and Statistics reports that in 2021, 19.1% of individuals with a disability were employed compared to 63.7% of individuals without disabilities. Similarly, the National Core Indicator report on *Individuals with Developmental Disabilities*,

which is the largest collection of information on the outcomes of public IDD systems internationally, reported that in 2020-2021 just 15% of individuals with IDD reported having a paid community job. Outcomes related to postsecondary education are similar. Specifically, data from the National Center for Educational Statistics for the 2015-2016 school year indicate that 19.4% of individuals enrolled in postsecondary institutions were individuals with disabilities compared to 80.6% of those enrolled without disabilities. Similarly, National Core Indicators for Intellectual and Developmental Disabilities (NCI-IDD) data from 2020-2021 indicate that individuals with IDD have limited engagement in their communities. These data indicate that just 26% of respondents reported participating as a member of a community group, 60% reported that they have not gone out for entertainment in the past month, and 67% reported not going out or going out just one to two times for an errand in the past month.

Historically, the U.S. Department of Education provided reports six and eight years after the National Longitudinal Transition Study (NLTS) on postschool outcomes of young adults with disabilities. The study gathered data on experiences and outcomes of students in special education classes over time. Within these reports, social and community involvement included measures of friendship interactions, community participations, and criminal justice system involvement (Newman et al., 2011; Sanford et al., 2011). According to these reports, six years after high school only 56% of young adults with intellectual disability and 54% with autism had participated in a lesson, community service activity, or community group in the last year. Weekly friendship interactions were reported as having no or fewer interactions by 20% of young adults with disabilities within the year (Sanford et al., 2011). This report also collected information about productive engagement related to any type of employment or training and just

69% of individuals with intellectual disability and 69% of individuals with autism reported they were engaged in community-based activities or other pursuits of their choice.

Research has identified several specific barriers that limit full participation in social and community outlets for individuals with IDD (Bedell et al., 2013; Obrusnikova & Cavalier, 2010; Tint et al., 2017). For example, Feeley and colleagues (2015) found that focus group participants reported navigating postschool transition was difficult because it necessitates securing viable transportation. Further, the participants reported that current transportation practices did not allow them to access all desired destinations, including employment, education, healthcare, and social destinations. The overwhelming majority reported that parents were the primary mode of transportation because other options were limited or did not provide the necessary supports the user needed. Further, Obrusnikova and Cavalier (2010) examined barriers impacting participation of youth with autism in afterschool activities. Barriers included intrapersonal factors, such as feeling tired or lacking in skills and interpersonal factors such as needing transportation or someone to drive them to after-school physical activities. In one review of literature, Verdonschot et al. (2009) found that a lack of transportation and not feeling accepted were factors impacting community participation for persons with IDD.

Difficulty accessing reliable and useful transportation in order to engage in one's community is a barrier children and adolescents with IDD encounter that is often maintained and further perpetuated into adulthood. In an interview of older adults with IDD, participants reported that they did not use public transportation and were reliant on others for transportation in order to access community options (McCarron et al., 2011). Further, transportation limitations were indicated as the greatest barrier for successful community participation. Other reviews related to the inclusion of individuals with disabilities broadly in community organizations found

similarly that reliable transportation or access to successful transportation was a significant barrier for participation in the community (Amado et al., 2013; Vogel et al., 2006).

In 2017, Wasfi and colleagues surveyed 114 individuals with IDD and found that transportation was a key factor determining their level of independence and self-determination. Specifically, the survey included questions about participants' travel behavior and their unmet travel desires. Of the respondents, 52% lived in a group facility while 39% lived in a private home, condominium, or apartment. Of those living in a private setting, just 8% of the participants reported living on their own. Unfortunately, while the majority of participants reported living in a group facility, the odds of an unmet, but desired work trip, increased with the frequency that a respondent made work trips and lived in a group facility. In other words, for those living in a group facility, those who made work trips were more likely to have desires for trips that were not met, perhaps indicative of individuals experiencing work trips and, in turn, wanting more of those types of trips.

It is important to note that the mission of the U.S. Department of Transportation is "to deliver the world's leading transportation system, serving the American people and economy through the safe, efficient, sustainable, and equitable movement of people and goods" (U.S. Department of Transportation, 2022). Recently, the Department added equity as a department-wide strategic goal with the aim of reducing inequities across transportation systems and the communities they affect. As of October 2022, the Department included language on their website about Disability Policy Priorities to help increase access to transportation for people with disabilities.

Considered together, both the mission of the Department of Education and the Department of Transportation emphasize the importance of equal access for all through the

services these respective departments offer. However, individuals with IDD do not access the benefits of these agencies to the same extent or at the same rate as their peers without disabilities. The relationship between education outcomes and transportation is interdependent. Without transportation, one cannot achieve education outcomes as independently as possible, and by accessing education outcomes, individuals need to engage in and improve their transportation skills. Survey results illustrated this interdependence as participants who took a particular type of trip (i.e., work, recreational, or social) where significantly more likely to report an unmet desire to take such trips (Wasfi et al., 2016). Another way to view this is that individuals with disabilities might only have a desire to do things that they have experience doing; and if they are without the transportation access to work, shopping, recreation, and social outings, they miss the opportunity to even desire and experience these types of trips. Transportation skills must be considered a top priority for individuals with IDD, particularly in preparation for life after high school.

A Solution Using Predictors of Postschool Success

Global competitiveness advanced through educational excellence for equal access reflects the function of public education to prepare all learners, including learners with IDD, for life after high school (U.S. Department of Education, n.d.). Transition outcomes were formally recognized in legislation in 1990 (IDEA) and further defined with its reauthorization as IDEIA in 2004 as a "results oriented process." Researchers in the field of transition then began to examine factors that predicted success in the aforementioned outcome areas in order to improve programming and transition planning as youth with disabilities prepared in-school for outcomes beyond school. Leading researchers in the field of transition conducted systematic literature reviews of correlational literature and established a list of predictors of postschool success. These reviews

included which outcomes areas certain in-school predictors are linked to for youth and young adults with disabilities (Mazzotti et al., 2021; Mazzotti et al., 2016; Test et al., 2009). In addition, Rowe et al. (2015) operationally defined and provided examples of many of these predictors in a Delphi study. A Delphi procedure gathers input from experts who then work until consensus to operationally define a topic (Linstone & Turoff, 2002). This research base continues to grow, and professionals within the field of secondary transition continue to examine ways to improve programming and outcomes for youth and young adults with disabilities.

Examples of the predictors of postschool success include parents' expectations, parent involvement, self-determination, community experiences, and others. In 2013, Mazzotti and colleagues, called for research to provide comprehensive understanding of the in-school predictors of postschool success for youth and target complex transition issues. One way to leverage the predictors and target specific goals is to implement interventions with parent engagement and involvement, including self-determination, and situating interventions within the existing community engagement repertoire of youth with disabilities. With the knowledge that accessible and meaningful transportation is a barrier to postschool outcomes for youth with disabilities, researchers could design interventions with parent involvement that allows youth and young adults with disabilities to (a) travel to locations of their choosing (self-determination) using their own devices to access the locations (community engagement) and (b) focus on generalizing the skills to a level of independent travel. While issues related to cost and access remain, community and state policy makers can work in conjunction with rideshare service providers to facilitate increased rideshare accessibility and supports for individuals with disabilities. Rideshare interventions have the potential to increase independent transportation access for individuals with disabilities.

Transportation Training Interventions and Programs

With knowledge of the importance of transportation skills and the need for interventions to teach these skills to youth and young adults with disabilities, researchers have begun taking a closer look at transportation training programs and their efficacy in supporting community participation and engagement. For example, Pfeiffer and colleagues (2019), provided one-on-one instructional programs to individuals with IDD to help them overcome transportation barriers. Using tools developed through the Kennedy Center, travel training programing, a pre-screening for travel training prerequisite skills, and a list of 25 transportation-related skills (e.g.,knowing/recognizing landmarks, identifies correct transit vehicle, stands at transit stop), researchers compared pre and post-test data collected by travel trainers. Participants included 87 participants with IDD ranging in age from 15 to 77 years old. Travel trainers rated the level of support required (measured using a 4 point Likert-type scale; physical prompt through completing the skill properly without assistance) for each of the 25 transportation-related skills before the first and after last session of training. Four of the original 25 skills were not counted because they were often inapplicable; and thus, often scored as misses (e.g., asking the driver for a transfer). The 21 remaining skills varied from easy to challenging (e.g., carries and appropriate identification card, leaves place or origin and arrives to transit stop on time), and the research team used a Rasch model for scoring. A Rash model is a psychometric model for analyzing categorical data wherein more challenging skills contributed more to the participants' overall skills score and less challenging skills contributed less. The travel training guide and curriculum (TCG), originally created in 1992 (Kennedy Center, 2012) has undergone five major revisions and includes eight steps for teaching independent travel on public transportation.

Individualizable features of TCG are instructions for increasing motivation, easing familial concerns, and teaching prerequisite skills (i.e., interacting with strangers, street crossing).

Following one-on-one instruction using the TCG, all participants made substantial gains in their independent travel skills on either bus (92%) or train (8%). Mean post-test scores of 58.5 (SD = 2.3) were substantially higher than pre-test scores of 40.20 (SD = 6.5). Demographic data collected as part of the study revealed that participants with ID (with and without autism) had less-well developed transportation skills than those with autism and no ID. Following intervention, those with ID made larger gains in travel skills than those with autism/no ID, so much so, that the travel skills of the two groups were comparable. This finding, coupled with the features of the TCG that were individualizable, demonstrate that travel training for all individuals with IDD can be successful and can be tailored to the unique needs of the individual. While the outcomes of this research were related specifically to public transportation by bus or by train, the implications for teaching travel skills for independence to individuals with IDD are important in the evolving travel skills for transition research. Pfeiffer and colleagues (2020) suggested that future research examine not just discrete travel skills, but comprehensive travel training while also considering the broader implications of travel for individuals with IDD.

Technology and Transportation Skills

Technology for transportation training has many applications. For example, Mechling and O'Brien (2010) used technology in the form of video modeling to teach three young adults with intellectual disability to recognize and request a bus stop. The study measured participants' skills requesting a stop as part of a video model, and then, provided an opportunity for participants to demonstrate their skills in real-life contexts. Computer-based video modeling for this intervention included a person-first perspective and, at times, verbal prompting to

demonstrate bus riding skills and stop requests. All participants demonstrated the skills and generalized the skills to the real-life context. One important limitation of this research was that none of the participants were offered an opportunity to perform the skill without a researcher present. Thus, video modeling can be an effective and efficient method for using technology to teach transportation skills, but real measures of generalization, maintenance, and independence should be prioritized going forward if young adults are expected to use these skills beyond the context of a research study.

Researchers have begun to examine various supports, interventions, and methods to remedy the barrier of transportation for independent access to postschool outcomes like employment, continued education, and community engagement. Davies and colleagues (2010) examined the effects of technology, specifically a Global Positioning System (GPS) transportation device, on the independent bus travel of individuals with intellectual disability. The GSP software, *Wayfinder*, was used on a small hand-help device designed to support independent bus transit for individuals with disabilities. *Wayfinder* is programmable for specific bus routes and provides opportunities for users to engage with the software during their trip. Users select their desired route from a home screen, then, follow prompts as the bus arrives, passes landmarks, waits at stops, and approaches a final destination. Like many support devices for youth and young adults with disabilities, *Wayfinder* is programmable. The software can be programmed to remind riders to "check for their backpack" if the rider is someone who is prone to forgetting their backpack. The device offers both written and audio prompts with visual supports, and users select buttons like "OK" or "Next" as they travel. GPS features within the software also provide for trip status, which is displayed in real time with an indicator at the bottom of the screen. Trip status depicts a figure moving from a starting point on the left side of

the screen to an ending point on the right side of the screen which provides an additional visual support for participants as they work through the entire travel process. Technology, such as *Wayfinder*, can be developed to meet the various needs of users based on feedback and user success.

Using *Wayfinder*, Davies and colleagues (2010) conducted a between-subjects design with a treatment and a control group. The treatment group used the GPS *Wayfinder* technology while the control group used traditional supports like a printed map and bus schedule. Participants, age 18 to 49 years old, included 23 adolescents and adults receiving some sort of transportation training through school or a community-based program. Using data-collection forms, the research team recorded errors and prompts for travel steps and landmarking. Errors, categorized into travel or landmarking, included items such as not ringing the bell in sufficient time before the bus stop, not getting off the bus, or passing a landmark and not pressing the "OK" button. Prompts, also categorized into travel and landmarking, included when the participants specifically requested help or if a prompt was needed to correct a landmarking error. Statistically significant differences between groups for travel errors, landmarking errors, and landmarking prompts were detected with unidirectional tests for mean differences, with fewer errors by those using the GSP system. Of note, the difference between the two groups for travel prompts (the only other measure) approached significance, but fell just short at $p = .088$. Another important finding between the two groups was that just one of the 12 participants in the "traditional methods" group successfully exited the bus at the correct stop compared to eight of the 11 participants in the "*Wayfinder*" group who successfully got off the bus at the correct stop. The results from this study indicate the usefulness of technology, specifically GPS (with real time tracking capabilities) in supporting individuals with disabilities to access a fixed route. In

their reporting, researchers indicated an important next step of exploring how this technology might be examined in a context where individuals with disabilities access transportation independently.

Transportation Skills Interventions and Parent Involvement

Transportation skills training is nuanced as the context for transportation, the individual, and the available resources vary from person to person. Within some transportation skills trainings, various predictors of postschool success are included to support postschool outcomes. Harriage and colleagues (2016) included parent interventionists, leveraging the predictor of parent involvement (and arguably parent expectations) within their travel skills training intervention. Individuals with autism were taught pedestrian skills and traveling on foot to access their community. The research team (a) highlighted parent implementers because parents often serve as long-time care and transportation providers and (b) identified successful, cost effective, and efficient training methods that could be provided by parent implementors that allow for continued and generalized skills as individuals add locations to their destination repertoire. The primary focus of the study was to examine the effect of behavior skills training on parent implementation of pedestrian safety skills training and the generalization of those skills. Researchers organized street types in (1) roads with no stop signs or pedestrian crosswalks, (2) roads with stop signs and pedestrian crosswalks, and (3) road with pedestrian signals. For generalization, participants used street types two and three served as follow up for street types one and two, respectively. The team also measured the impact of the parent implemented intervention on the pedestrian skills and skills generalization of individuals with autism. Participants included three individuals with autism, ages 14 to 23, and a parent for each individual. Researchers arranged the study so that participants crossed three different types of

streets with consideration for things like stop signs and pedestrian crosswalks. Training sessions were video-recorded, and parents were trained to use most-to-least prompting. Participants with autism were measured on their ability to independently complete a five-step pedestrian street crossing task. Levels of prompts were indicated on a five-point Likert-type scale such that independent steps were scored as 5 and full physical prompts to complete a step were scored as 1. For each crossing, participants could score between a five and a 25 across the full set of skills. Participants received a percentage score for street crossing by dividing the total points earned by the total possible points (25).

Harriage and colleagues (2016) used a single-case multiple baseline across participants design, families were concurrently enrolled while intervention was staggered. For baseline, parents and youth and young adults with autism were given opportunities to cross the street, and parents were told to interact with their child as they normally would. For intervention, parents received a 10 to 15 minutes behavior skills training session at home prior to visiting community sites for *in situ* street crossing trials. Parent implementors used the full physical prompting procedure for the first two trials, and subsequent, trials involved lesser prompting procedures depending on the behavior of the individual with autism. Following the first two trails, the parent and a researcher collaborated on levels of prompting for subsequent trials. The researcher also provided feedback to parents on implementation fidelity. Researchers arranged for a novel street crossing location to measure both parent implementation and young adult pedestrians' safety skills. Parents were able to provide intervention with fidelity, and in the two instances where they did not, feedback was sufficient to adequately address their implementation. Importantly, intervention implementation did not generalize to other street locations until parents were given behavior skills training for those locations. The research team hypothesized that this

lack of generalization could have been a result of the differences in the locations. In summary, this study highlights three important findings related to transportation skills training for youth and young adults with disabilities. First, young adults can be taught pedestrian skills, and the most-to-least prompting procedure is one method for training. Second, parents can be involved in training. Third, contextualizing transportation skills is important as generalization is often complex, and training at different sites presents various challenges. As researchers pursue methods for training transportation skills that individuals will maintain and generalize, special consideration must be given to the context in which the intervention is provided and to how the programming can be planned to maximize outcomes. Transportation skills taught in one location to mastery cannot be presumed as transportation skills in all contexts/locations.

A Possible Transportation Skills Solution

One possible solution for transportation skills training that addresses the nuance of location context while promoting generalization and maintenance is to use accessible resources within the transportation routines individuals with disabilities have already established. Mobile devices with location and route finding technology can be used to support individuals with disabilities navigating and accessing their communities (Brown et al., 2011). Bross, Wood, and colleagues (2023) examined the effects of an intervention to teach the use of a rideshare app to four young adults with IDD. Important implications from this research were the success young adults with IDD had accessing their communities using the ridesharing application. However, the devices used throughout the study belonged to researchers, and the intervention agent for all community-based instruction was also a researcher. In addition, the locations selected by the students were created for purposes of the research rather than places they truly needed to visit in their lives. Building on this research, the current study will support participants to use their own

devices, include their parents during intervention, and situate rides into the locations and contexts that participants need to access for existing activities in their lives in order to promote generalization and maintenance.

Significance and Contributions

The current study builds on existing research that has demonstrated the efficacy of travel skills training in the community (Pfeiffer et el., 2020), involving parents (Harriage et al., 2016), using technology (Davies et al., 2010; Mechling & O'Brien, 2010), and using ridesharing applications (apps) (Bross, Wood, et al., 2023) to examine the ways in which transportation experiences can be improved for individuals with IDD. Because the nature of transportation is so contextual, it is important to examine multiple methods for training so that a best fit model can be provided to suit all individuals no matter the context. The current study will provide insight for ridesharing applications such that it might reexamine the ways in which services are provided and adapted to increase accessibility for all individuals. Because transportation is a significant barrier for individuals with IDD, improved ridesharing accessibility can benefit companies by making their services more widely accessible to a population in need. The benefits of ridesharing applications is not limited to urban areas. It is possible that tracking technology, ride-requesting functions, and other features of ridesharing apps might be used in more rural communities to build their own more efficient and accessible transportation services for individuals with IDD.

Another potential contribution of the current study will be to examine the effects of an intervention that includes predictors of postschool success while simultaneously targeting a transition-related skill, independent transportation. Additional research related to transition skill development for individuals with IDD might consider ways in which predictors might be included when designing interventions or planning for programming. Finally, when designing

transportation-skills interventions for individuals with IDD, researchers may prioritize generalization by training within the context of the individuals' community or transportation patterns. Individuals might master skills to ride the bus for the purpose of a research study, but if individuals no longer use the bus following intervention, then, transportation skills and access to transportation remain barriers to community integration and participation.

Purpose of the Present Study

Transportation remains a barrier to competitive employment, postsecondary education/training, and engagement in the community. At the same time, transportation is often nuanced based on the location an individual is attempting to access various resources and experiences. Beyond the option of driving oneself, access to transportation is largely contingent on what public, paid, or other options are available. For this reason, it is important to examine transportation training options that prioritize the individual who will access the transportation, particularly the context in which that individual will access the transportation. While the focus of the current study is transportation by rideshare, the author does not believe that rideshare transportation is the ultimate solution for community access for individuals with IDD. Rather, if a young adult lives in a city with a robust train system and the individual frequents destinations within the community accessible by train, transportation skills training for train travel is a practical, perhaps primary, method for transportation for which that individual should seek training. The context for transportation, like much of the research related to transportation skills, is specific to the individual, their goals, and the community where they live. There is a growing body of literature that suggests transportation skills can be taught to individuals with disabilities, and within that research there is no specific mode of transportation that reigns supreme. Therefore, researchers should consider situating transportation training opportunities into the

community context of the individual with a disability rather than target a specific modality. In other words, to prioritize maintenance and generalization, researchers can train individuals to use transportation in the community and to the destinations that an individual already frequents. The difference being that transportation training targets independent transportation to the destinations that the individual currently accesses with supported transportation. Planning intervention in this way will allow young adults to use the outcome of intervention in a self-determined way such that the skill they learn allows them to independently access their community via rideshare transportation modality. The purpose of this study is to examine the following research questions:

Research Questions

The study will answer the following research questions:

1. What is the efficacy of an intervention consisting of instruction with practice, feedback, and an in-vivo checklist to teach young adults with IDD to transportation to community-based locations using a ridesharing app?
2. To what extent are ridesharing app skills generalized and maintained following intervention?
3. What is the social validity of the intervention for young adults with IDD using a ridesharing app as a mode of transportation within their communities?
4. What is the social validity of the intervention for parents of young adults with IDD using a ridesharing app as a mode of transportation within their communities?

Limitations/Delimitations

One limitation of this study will be the weak external validity associated with single-case methodology. However, single-case design, particularly the multiple-probe design procedure, provides a method for collecting data that demonstrates a functional analysis of the acquisition of behavior while establishing a stable baseline without an unnecessary or impractical extension of baseline probes (Horner & Baer, 1978). Methods in this study will seek to meet the criteria for single-case research as outlined by What Works Clearinghouse Handbook version 5.0 (What Works Clearinghouse, 2022).

Cost is prohibitive for this study as funding for rideshare services is provided by the researcher and access to ridesharing services can be cost-prohibitive when funding is no longer provided by the researcher. Additionally, there will be no discrete measure of parent involvement or expectation aside from a social validity questionnaire completed at the beginning and end of the study. Destinations for all travel are familiar to the participant which limits the assumption that they could use this skill to access a one-time or novel location going forward. Future research could examine the generalizability of the specific skill across locations no yet frequented by the participant.

While other hurdles, such as cost or availability of services, impact the access that individuals across the country have to rideshare services, implications from this research may provide important insights that can lead to continued changes to help improve accessible, reliable, safe, and independent transportation for individuals with disabilities.

Definitions

Community Experiences: "Community experiences are activities occurring outside the school setting, supported with in class instruction, where students apply academic, social, and/or general work behaviors and skills." (Rowe et al., 2015, p. 120).

Intellectual and Developmental Disability (IDD): include characteristics related to significant intellectual functional and adaptive behavioral limitations that are expressed through conceptual, social, and practical adaptive skills before age 18 mental or physical impairment manifested before age 22 that "results in substantial functional limitations" (p. 1684, PL 106-402, 2000,). Due to the overlaps in populations, it is common for those with intellectual disabilities and developmental disability to be considered together as individuals with intellectual and developmental disabilities (IDD).

Parent Involvement: "Parent involvement means parents/families/guardians are active and knowledgeable participants in all aspects of transition planning (e.g., decision making, providing support, attending meetings, and advocating for their child)." (Rowe et al., 2015, p. 122).

Parent Expectations: Modifiable belief or ideas about what one's child can do (Wehman, 2015*)*

Predictors: Variables correlated with improved postschool outcomes that meet quality indicators suggested by Thompson et al. (2005).

Postschool Outcomes: Indicator 14, The "percent of youth who are no longer in secondary school, had IEPs in effect at the time they left school, and were: (A) Enrolled in higher education within one year of leaving high school; (B) Enrolled in higher education or competitively employed within one year of leaving high school; and (C) Enrolled in higher education or in some other postsecondary education or training program; or

competitively employed or in some other employment within one year of leaving high school" (National Post-school Outcomes Center, 2014).

Self-Determination: "Self-determination is the ability to make choices, solve problems, set goals, evaluate options, take initiative to reach one's goals, and accept consequences of one's actions." (Rowe et al., 2015, p.121).

Travel Skills: "The ability to get to places outside the home independently" (Mazzotti et al., 2016, p. 212). The skills align with self-care/independent living predictor characteristics.

CHAPTER 2: REVIEW OF THE LITERATURE

Individuals with intellectual and developmental disabilities do not typically experience as positive of postschool outcomes in all areas recognized by IDEIA (2004) compared to their peers without IDD. Community integration is particularly important for young adults with IDD. While various factors influence outcome success, one major barrier includes challenges accessing transportation that are reliable, affordable, and practical in order to travel within the community. Transportation skills training, predictors of postschool success, and thoughtful planning for generalization and maintenance should be used together to support increased access and robust transportation for young adults with IDD to access positive postschool outcomes. Figure 1 provides the conceptual framework for this dissertation study and visually depicts the review of literature in this chapter.

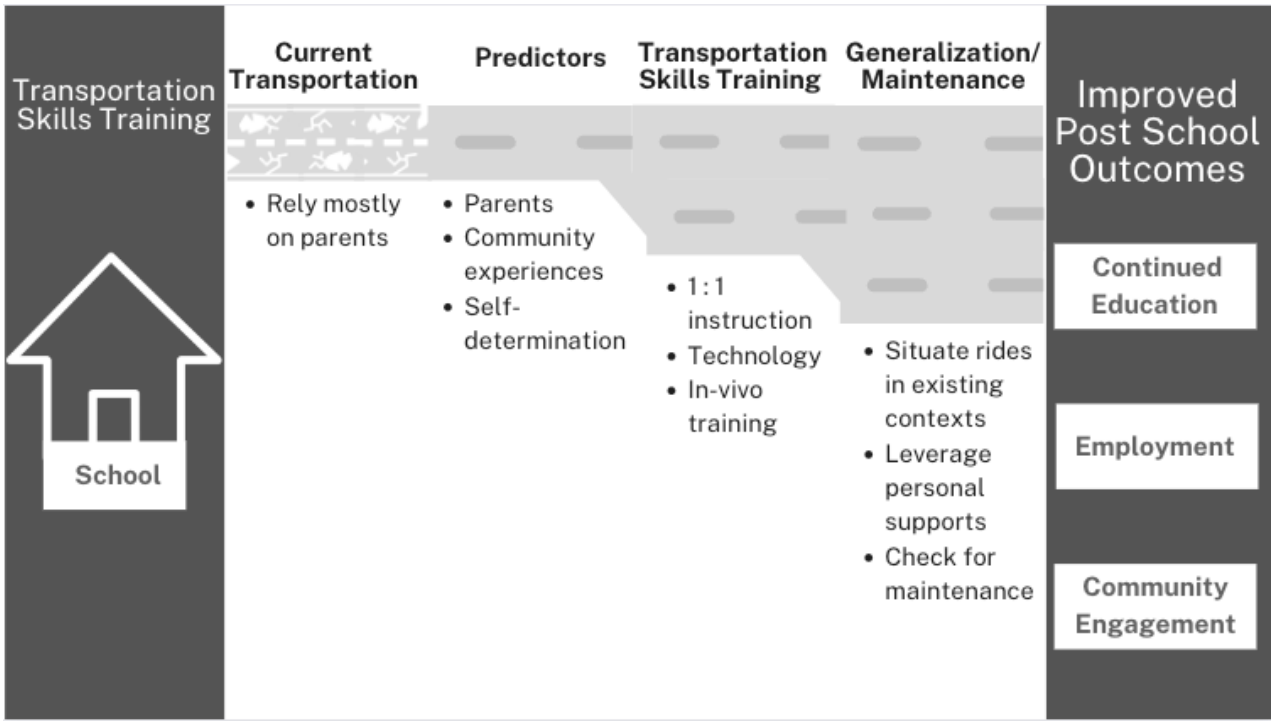

Figure 1

Logic Model

The mission of the United States Department of Education is "to promote student achievement and preparation for global competitiveness by fostering educational excellence and ensuring equal access" (U.S. Department of Education, 2023). This mission emphasizes preparing students for successful outcomes and ensuring that no one group of students receive educational programming or supports that are not equitable. In order to achieve success and contribute to global competitiveness, it is necessary to access, independently and at will, one's community. A community is a "local group of people who come to a common center for organized services – stores, schools, churches, libraries, movies, and medical and legal institutions" (Coyle, 1941, p.1290).

Students learn many of the skills they will use to engage in their communities while they are in school. However, without the ability to travel into and around their communities, there are limited opportunities to leverage these skills. The debate surrounding programming for students with disabilities has evolved over time, including the discussion of functional versus academic skills (Ayres et al., 2011; Ayres et al., 2012; Courtade et al., 2012), and in addition, separate versus inclusive programming (Carter et al., 2005; Dessemontet et al., 2012; Kurth et al., 2014). However, the priority remains that public education in the United States for students with disabilities should ensure equal access and prepare students for global competitiveness. Direct and explicit transportation instruction for individuals with disabilities must be considered in transition programming in order for students with disabilities to achieve equitable and competitive outcomes after school (Mazzotti & Rowe, 2015; Trainor et al., 2020). Simply put, without assurances that students have transportation and travel skills, students with disabilities will not have access to the full scope of opportunities in their community. If they are not provided programming and supports related to these skills, they will not have full access to their

communities once they finish school, they will not be equipped to achieve their postschool schools, nor will they be prepared for global competitiveness (Lubin & Feeley, 2016). Unfortunately, this means they have not received an education that is equitable to that of other peer groups.

Rather than speculate why these disparities exist, or worse blame learners, educators turn to research to better understand outcome disparities and practical steps towards bridging gaps for learners with IDD. Education research is valuable to further knowledge about education programming and policy. Educators, researchers, and the field of special education at large rely on rigorous scientific research to better understand what works for whom under what conditions based on the unique characteristics and needs in their field (Cook et al., 2009; Council for Exceptional Children [CEC], 2014). Organizations like CEC have issued statements about the priority for transition programming and the responsibilities education has for adults with disabilities. Specifically, CEC emphasizes the importance of transition programming that allows students to gain knowledge and skills so they can fully participate in their community. A division of CEC, the Division on Career Development and Transition (DCDT), also states that education's responsibility to adults with disabilities is to assist students in becoming contributing citizens, family members, employees, learners, and active participants in meaningful vocational, recreational, and leisure pursuits (DCDT, 2022).

Scientific research in education and the call for meaningful transition programming are two parts of a cycle that are constantly progressing the field of special education. The National Academy of Sciences outlines guiding principles for scientific inquiry specifically related to educational research (Towne et al., 2002). These guiding principles for scientific inquiry are directly related to the long-term goal of science, which is "to produce theory that can offer a

stable encapsulation of ‘facts’ that generalize beyond the particular” (p. 51). They offer principles of inquiry as a framework indicative of how inferences generally are to be supported through a set of interdependent processes, tools, and practices. While the Academy acknowledges that all principles may not apply to a single study, it is important that meaningful research first consider these guiding principles when approaching questions within education and education science. The six guiding principles of inquiry are that research should: (1) pose significant questions that can be investigated empirically, (2) link research to relevant theory, (3) use methods that permit direct investigation of the questions, (4) provide a coherent and explicit chain of reasoning, (5) replicate and generalize across studies, and (6) disclose research to encourage professional scrutiny and critique. These guiding principles are interrelated, and there is no significance to the order. The Academy states that in their view, science develops theory that is supported by pertinent evidence and allows for scientists to critique and consume each other’s work and provides a groundwork on which valid inferences are supported and characterized.

The Academy further explains each of these principles. For example, questions can be considered significant if they relate to prior research, pertain to important policy or practice, and seek to resolve a practical problem. The empirical nature of questions is determined if the topic or features of your questions can be observed. Observability is directly related to the principles that guide the methods used in scientific inquiry. The Academy indicates that scientific research should carefully consider the methodology when implementing a study as certain methods are better suited for certain research questions. Particularly within social sciences in education, measurement reliability and validity are key, as some measurement can lead to unintended social consequences. In considering design and measurement, the Academy emphasized that inferential

reasoning demonstrates understanding and consideration of a line of inquiry. Within the community of science, generalization and replication are means of strengthening theories while dissemination provides opportunity for rigor and meaningful new knowledge. Finally, the Academy emphasizes the importance of scientific theory within scientific research. Research with theoretical foundations is conceptually guided and establishes what researchers will observe and how they will observe it. Behavior is often measured in scientific education research, and the principles of applied behavioral analysis can help guide scientific research in education.

Baer and colleagues (1968) established dimensions of applied behavior analysis. In their description of research, the authors described how the study of behavior is uniquely situated. That is, researchers must balance a controlled setting for the sake of science, within an applied or realistic settings, in order to ensure that information from a study carries over to settings in which the behavior will naturally occur. Their definition of applied behavior analysis outlined an approach to examining behavior that was applied, behavioral, and analytic, as well as technological, conceptually systematic, effective, and demonstrates some generality.

The following paragraph summarizes how Baer and colleagues (1968) described the terms that define applied behavior analysis. First, applied addresses the types of problems being studied, including how are they relevant to this participant type, to humanity, and/or to education? Applied research is indicative of the close relationships among the behavior, the stimuli under examination, and the participants being studied. Second, behavioral in this framework refers to what a participant can be taught to do, and when collecting this information, it is important to consider what and whose behavior changed. Third, analytic in this context requires a demonstration of control or a “believable demonstration of the events that can be responsible for the occurrence or non-occurrence of that behavior” (Baer et al., 1968, p. 94).

Fourth, technological means that the techniques included for the behavioral application are described to a standard specific enough that a reader could replicate the behavioral application from the written description alone. Fifth, conceptually systematic refers to how the precise technical elements of procedures relate to principles of behaviorism. Sixth, effective refers to the degree of change in behavior such that the behavior change is socially important. Finally, seventh refers to generality, the idea that a behavior change be durable over time to ensure behavior is still used for the designed function beyond the context of the study.

The theoretical underpinnings of applied behavior analysis emphasize an approach to behavioral research that is useful beyond the context of a research setting and meaningful enough that behavior change is significant and maintained over time. The emphasis within this viewpoint is that behaviors are more or less likely to occur based on whatever happens immediately following the behavior. In other words, if a student raises her hand, and the teacher calls on the student, the student is more or less likely to raise their hand, depending on whether or not they want more of the teacher's attention or want to avoid the teacher's attention. Baer and colleagues (1968) presented the importance of the dimensions of applied behavior analysis as they allow for a society to consider the technology of its own behavior while supporting the application of mechanisms for teaching socially important behaviors. Herein lies the connection between the calls for improved outcomes for individuals with IDD (IDEA, 2004), the importance of a scientific approach to examining improvements (Towne et al., 2002), and applied behavioral analytic mechanisms to examine the ways and means for students with IDD to be prepared for global competitiveness (U.S. Department of Education, (2023).

History of Special Education and Transition

With consideration for the mission of the United States Department of Education, in pursuit of improved educational practices through science, and an approach rooted in the theory that behavior can be influenced by the environment, it is important to contextualize special education and secondary transition within an historical framework (Test & Fowler, 2018; Yell et al., 1998). Individuals with disabilities were not protected by federal laws until 1975 and, therefore, did not always have rights to the same education as their peers without disabilities. Further, the intended outcomes and purposes of education for this population were not always clearly defined. However, given the current mission statement from the United States Department of Education emphasizing achievement, global competitiveness, educational excellence, and equal access, it is clear that the field of special education has progressed towards delivering equitable education to all, including those with disabilities (U.S. Department of Education, 2023).

An overview of the history of education for individuals with disabilities provides some context for how this group of individuals slowly gained more equitable access to education over time. Rhode Island was the first state to pass a compulsory education law in 1852, and by 1918, these types of laws were present in all states (Yell et al., 1998). Compulsory education in the United States at that time, however, did not include provisions for students with disabilities. In fact, there were a number of cases that excluded this group. An 1893 Massachusetts Supreme Judicial Court ruled that a “weak-minded child” who was troublesome or distracting would be expelled from public school (Watson v. City of Cambridge, 1893). Other court decisions providing for the exclusion of students with disabilities and included a Wisconsin Supreme Court decision in 1919 (Beattie v. Board of Education, 1919), a Cuyahoga County Court of Appeals

decision in Ohio in 1934, and a 1958 decision by the Supreme Court of Illinois (Department of Public Welfare v. Haas). In spite of these exclusionary rulings, by the 1960s and early 1970s many states had passed legislation providing for the education of students with disabilities (Yell et al., 1998) in part because of social changes resulting from the Civil Rights Movement of the 1950s and 1960s.

Equitable opportunity was a cornerstone of the Civil Rights Movement, particularly the landmark case of Brown v. Board of Education (1954). A pivotal element of the Brown Legislation was the constitutional guarantee of equitable protection under the law within the 14th Amendment. Therefore, the court maintained, segregation by virtue of a person's unalterable characteristics was unconstitutional (Yell et al., 1998). The Brown decision provided the basis for what evolved into special education rights in public schools; however many of the resulting legislative and social changes were a result of fierce and persistent parental advocacy. Advocacy groups like the Arc established in 1950, CEC founded in 1922, and The Association for Persons with Severe Handicaps (TASH) established in 1974 were in large part responsible for the significant changes that followed the Brown ruling (Yell et al., 1998). The precedent established with Brown combined with the impassioned advocacy of interest groups led to many positive legislative outcomes impacting access to education for individuals with disabilities. However, between states, these laws varied such that federal legislation became the next important step. Between 1958 and 1965, congress passed three important acts that directed funds towards the education of students with disabilities including the expansion of teaching in the education of Mentally Retarded Children Act (1958), the National Defense Education Act (1958), and the Elementary and Secondary Education Act (1965). Once federal legislation prioritized education

for all students, legislation at the state level and advocacy led to a push for more equitable education for individuals with disabilities.

Significant legislative progress towards educational equity for students with disabilities continued in the 1970s. Section 504 of The Rehabilitation Act of 1973, a "civil rights declaration of the handicapped" was a major legislative victory for individuals with disabilities, establishing their protection against discrimination based on their disabilities. Section 504 requires that any agency receiving federal funding provide assurances of compliance to provide services for individuals with disabilities that are comparable to services provided to persons without disabilities. The Education Amendments of 1974, P.L. 93-380, authorized the creation of the Bureau of Education for the Handicapped and established the National Advisory Council on Handicapped Children (The Education Amendments, 1974). The momentum of legislative action continued with the Education for All Handicapped Children Act (EAHCA) of 1975, P.L. 94-142, which directed federal funding to states to assist in educating students with disabilities. EAHCA required non-discriminatory testing, established the right to the least restrictive environment, declared the procedural right to due process with parent involvement, and mandated the right to a free and appropriate education (Yell et al., 1998). The Individualized Education Program, or IEP, was another significant product of EAHCA.

In 1990, EAHCA, P.L. 94-142 was amended to the Individuals with Disabilities Education Act (IDEA) which addressed much of the problematic language from earlier decades (e.g., handicapped) and, among other updates, required for the first time that a transition plan be included on every student's IEP by age 16. The 1990 updates where particularly significant for transition-aged youth with disabilities because they mandated notification, participation, IEP content, and agency responsibility all related to transition services. In 1997, Amendments to

IDEA or P.L. 105-17 increased the required IEP standards and specifics so that annual goals and benchmarks were measurable for the sake of monitoring and ensuring progress, and it addressed proactive steps for addressing behavioral problems. Significant to transition planning, the 1997 reauthorization included language defining transition services as a "coordinated set of activities for a student with a disability" with the objective to be outcome oriented towards the move from school to postschool, including continued education, employment, adult services, and independent living or community participation. The definition also included clear language that these services be based on a student's needs, preferences, and interests related to instruction, related services, experiences in the community, preparation for employment, and when necessary, daily living skills.

Most recently, IDEA was reauthorized in 2004 as the Individuals with Disabilities Education Improvement Act (IDEIA). Important changes with the reauthorization in 2004 included: (a) requiring special education teachers to meet "high quality" standards, (b) moving towards full funding of special education, (c) eliminating certain paperwork requirements for IEPs and making changes to provisions for transition planning related to moving to a results-oriented process, (d) changing the due process requirements, (e) amending disciplinary procedures related to expulsion and suspension, and (f) and revising eligibility requirements (Smith, 2005). Language in the reauthorization emphasized the importance of a results-oriented transition planning process for students with disabilities, including measurable and appropriate goals for postsecondary life (Prince et al., 2013). Throughout the legislative progression towards more equitable special education, specific pockets of special education also evolved into major fields for programming and research. Transition is one of those major fields. Transition within education for individuals with disabilities, like the field of special education itself, has undergone

an evolution relative to policy, practice, and research. The field of transition planning and services within special education continues to progress as researchers, educators, and other stakeholders recognize the importance of preparing all individuals for global competitiveness through education.

History of Secondary Transition

The original outcome of focus in the field of transition was employment. Work study programming from the 1960s and federal initiatives to bolster employment have been in place since the 1950's (Rusch & Phelps, 1987). In these work study programs of the 1960s, youth with disabilities were provided controlled work in a school setting that led to a specialized job placement within the community (Ewig & Phelps, 1980). Parts C and D of the Vocational Education Act Amendments of 1968 provided funds from the National Institute of Education and served as an initial source of funding for vocational education (Vocational Education Amendments, 1968). In 1971, Dr. Marland Jr., the U.S. Commissioner of Education, stated that career education was the top priority of the United States Office of Education (Brolin, 1983). Though this marked an emphasis on education for the sake of employment. Shortly following Dr. Marland's declaration, the director of the Bureau of Education for the Handicapped (now the Office of Special Education Programming, OSEP) prioritized and made funding available for career education (Brolin, 1983).

In 1974, the Rehabilitation Act put a major emphasis on services for individuals with severe disabilities. The goal was for individuals with disabilities to be involved in the design and development of rehabilitative services that impacted individuals with disabilities such as transportation, housing, and employment (Rusch & Phelps, 1987). The U.S. Office of Career Education was officially established in 1974 with Dr. Kenneth Hoyt appointed as the director

(Brolin, 1983). Employment, as a targeted outcome of public education was becoming well established, and the timeline paralleled increased access to education for individuals with disabilities as the EAHCA (P.L. 94-142) ensured that children, ages three-21, were afforded a free and appropriate education. About this same time, concerned educators and education professionals began to coalesce their efforts to further increase knowledge and programming for individuals with disabilities in school for the sake of competitive employment. In 1975, a group of these educators met in St. Louis to discuss career education implemented by special educators. The following year CEC established its 12th division, the Division on Career Development (DCD; Brolin, 1983).

Throughout the 1980s, funding for special education related to career education was an important priority. In 1983, through the Amendment to the Education for Handicap Act (P.L. 98-199), Section 626, "Secondary Education and Transitional Services for Handicapped Youth", congress directed particular attention to the educational and employment transition difficulties faced by individuals with disabilities. As a result, the Office of Special Education and Rehabilitative Services allocated $6.6 million in annual grants and contracts to spend for the purpose of coordinating education, training, and related services (Rusch & Phelps, 1987). Legal protections and allocations of funding were provided for substantial growth in the area of what is now widely recognized as secondary transition for individuals with disabilities. With the evolution of the field, came some exploration of exactly what was involved in secondary transition.

In 1983, Madeine Will presented the Bridges model with three levels of support bridging the gap between high school and employment (Will, 1983). After some debate in the field about facets of life after high school other than employment, Halpern (1985) proposed a new model for

transition in which he articulated an important distinction, wherein community adjustment and not employment was the targeted outcome. He also published about the importance of "quality of life" related to transition outcomes for individuals with disabilities. In Halpern's model, three pillars (a) employment, (b) residential environments, and (c) social and interpersonal networks supported the overall objective of community adjustment which was the targeted outcome for transition from high school (Halpern, 1985). Halpern's model provided the impetus for the current approach to transition which targets outcomes in three major areas, employment, continued education and training, and community involvement.

By the end of the 1980s and the beginning of the 1990s, experts in the field of secondary transition and government agencies began to operationalize and measure various elements of secondary transition. For example, the U.S. General Accounting Office evaluated the effects of transition programming and concluded that more comprehensive and aggressive efforts were necessary to address what they identified as a complex school-to-work transition (Benz & Kochhar, 1996). In 1994, two important additions to the field of transition were added. One was to note the importance of self-determination (Scholss et al., 1994); and the other was the School-to-Work Opportunity Act (P.L. 103-239), wherein a framework for workforce development and school-to-work transition programs were defined with the intended purpose that all students (including those with disabilities) increase their opportunities to enter competitive careers after high school (Benz & Kochhar, 1996). By the late 1990s, there was an increased emphasis on what are now established transition outcomes. Researchers and practitioners sought to determine what works best to help individuals with disabilities prepare for adult life in the areas of employment, postsecondary education, and residential independence (Benz & Kochhar, 1996). More recently, with these established outcomes, researchers and practitioners have begun to

explore what factors during school that lead to success within these postschool outcome areas (Mazzotti et al., 2021; Mazzotti et al., 2016; Test et al., 2009). Currently, there is government funding, established research (Rowe et al., 2021; Test et al., 2009), and technical assistance centers, such as the National Technical Assistance Center on Transition: the Collaborative (NTACT:C), that function to progress the field of secondary transition for individuals with disabilities from high school to successful adult life.

Outcomes for Youth with Disabilities

Important changes to transition programming were included in the reauthorization of IDEIA in 2004. Notably, transition planning is to begin no later than age 16 and should include appropriate and measurable postsecondary goals based upon age-appropriate transition assessments related to the training, education, employment, and where appropriate, the independent living skills of the student (IDEIA, 2004). IDEIA states that the purpose of special education is to prepare students for further education, employment, and independent living as part of a free and appropriate public education (FAPE). Outcomes for postsecondary transition are often viewed within the three categories of postsecondary education and training, competitive employment, and independent living. Presently, states report annually on four transition related indicators of student outcomes: Indicator 1 (graduation), Indicator 2 (dropout), Indicator 13 (transition), and Indicator 14 (postschool outcomes; NTACT:C, 2014). Indicators 1 measures the percent of youth with IEPs who graduate from high school with a regular diploma; Indicator 2 measures the percent of youth with IEPs who dropout of high school; and Indicator 13 is a measure of the secondary transition components within students' IEP (NTACT:C Tree of Influence, 2014). Finally, and possibly more reflective of student success after high school, is Indicator 14: Post-School Outcomes. Indicator 14 measures postschool outcomes data for youth

who had IEPs who are no longer in secondary education settings. Data for this indicator are reported as a percentage of youth who have been competitively employed and/or enrolled in some type of postsecondary education within one year of leaving high school. Indicator 14 measures the percentage of youth no longer in high school, who had IEPs that were (a) enrolled in higher education one year after leaving high school, (b) enrolled in higher education or competitively employed one year after leaving high school, and/or (c) enrolled in higher education or in some other postsecondary education/training program, competitively employed, or in some other employment one year after leaving high school (Department of Education, SPP/ARP, n.d.). Because of the federally mandated requirements for Indicator 14, researchers and practitioners began to look closely at the effectiveness of the education students received with a particular focus on postsecondary transition outcomes. Indicator 14 became the measure of student engagement in either continued education/training and/or employment that has allowed schools, districts, states, and the federal government to track student postschool outcomes after exit from high school.

Much like the evolution of educational equity for students with disabilities, discussions about the effectiveness of their education also evolved. Initially, much of the focus was on whether or not students with disabilities were finding employment after they completed their high school education (Rusch & Phelps, 1987; Will, 1983). With the inclusion of transition planning in the IEP stated in the 1990 reauthorization or IDEA (P.L. 110-476), special education professionals and stakeholders began to consider employment along with other indicators of a meaningful education. The target for individuals with disabilities after high school became organized into three categories, postsecondary education and training, employment, and community engagement. The current consensus is that students with disabilities should be

preparing for postsecondary success in all three of these outcome areas, and Indicator 14 data collection has become a requirement of states to report as a reflection of educational programming preparing students for postsecondary life (IDEIA, 2004).

With postschool outcomes in mind, Trainor and colleagues (2020) suggest initially focusing on individual characteristics of the student. When identifying interventions, practitioners should consider the intersection of the individual's goals, specific needs, and functioning. While the authors admit that balancing individualization and implementation fidelity can be complex, to maintain the mandates of IDEIA (2004) and the priority for flexibility in programming with consideration for the student's specific goals, their culture, and the context within which they receive programming are critical (Trainor et al., 2020). Trainor and colleagues suggest other priorities for transition research, such as emphasizing transition planning that are skills and interest based rather than deficit based, examining outcomes over an extended period of time, understanding social (family) capital, and appraising transition programming.

In-School Predictors of Postsecondary Success

Research in the field of secondary special education and transition has led to the identification of in-school predictors of postschool success. Predictors of postschool success were originally identified in 2009 by Test et al., expanded upon in 2016 by Mazzotti et al., and most recently reviewed in 2021 by Mazzotti et al. to better understand the ongoing research related to investigating in-school facilitators that potentially impact postschool outcomes and transition programming. The 2021 review used the National Technical Assistance Center on Transition: The Collaborative's (NTACT:C) quality indicator checklist and levels of evidence criteria for correlational research (https://transition.org; Mazzotti et al., 2021). The 2021 systematic literature review identified 23 in-school predictors of postschool success that are

promising, research-based, or evidence-based. The purpose of this systematic literature review was to provide insight for practitioners, researchers, and the field of secondary transition at large about what in-school factors correlate to positive outcomes for students with disabilities after high school (Mazzotti et al., 2021). There are two important things to note about the nature of this research: (1) it is ongoing, so as new information about transition-age students is discovered, the level of evidence supporting these predictors or the number of predictors can change; and (2) these predictors, unlike practices, provide correlational data that offer insight into the longer-term outcomes associated with postschool success (enrollment in postsecondary education, competitive employment, and community access and integration; Mazzotti et al., 2021). Within the literature, these predictors are identified by their level of research support (promising, research based, or evidence based), and the literature provides information about what outcome area each predictor has been associated with (enrollment in postsecondary education, competitive employment, and community access and integration). In other words, predictors of postschool success are evolving, and new research should leverage information from the existing literature base to examine the full scope of predictors, their level of evidence, and how they can be implemented within transition programming for students with disabilities.

Correlational research has been critical in the improved understanding of what in-school factors contribute to postschool outcomes for individuals with disabilities (Mazzotti et al., 2021; Mazzotti et al. 2016; Test et al. 2009). Other attempts to better understand factors that contribute to postschool success for individuals with disabilities have utilized similar research practices. For example, in 2004, White and Weiner conducted correlational research over a three year span to identify which factors were and were not strongly correlated with successfully integrated employment for individuals with severe disabilities. In their justification for the research, the

team indicated that competitive, integrated employment was an important distinction from just "employment." Part of their argument was that the alternative to integrated employment was supported non-work programs which were a financial drain on the community. Additionally, individuals with disabilities were guaranteed the right to transition planning and programming that included formal transition employment as part of the IDEA 1997 and the 1998 Vocational Rehabilitation Act Amendments.

Following the original identification of predictors by Test and colleagues in 2009, Rowe et al. (2015) published a Delphi study wherein the predictors were operationally defined and program characteristics were identified for each of the original 16 predictors of postschool success. The research team used a nominal group technique to solicit input from experts in order to reach consensus on the operational definitions and program characteristics. The Delphi method is a structured method for communication with experts in which they provide feedback based on varied perspectives. In this particular Delphi study, Rowe and colleagues (2015) used input from 22 experts including: practitioners with 10 or more years of secondary education experience with youth with disabilities, service or research professionals with 10 or more years in career technical education, and authors or researchers of scholarly peer-reviewed publications.

The Delphi procedures involved an initial review to collect definitions of predictors from existing literature, soliciting input from the expert participants and voting on definitions; then, reviewing final definitions and characteristics to ensure students with varying disabilities and culture were represented. Following seven rounds of voting, experts reached consensus on an operational definition and essential program characteristics for each of the 16 in-school predictors of post-school success. For example, the predictor of parent involvement is defined as "parents/families/guardians who are active and knowledgeable participants in all aspects of

transition planning" (p. 122). Characteristics of the predictor include providing multiple options for involvement, collaborating with families, and actively engaging parents. The predictors of self-care/independent living include transportation as a characteristic. Two other predictors defined in the Delphi included community experiences and self-determination, both of which are relevant to this dissertation study. Community experiences are "activities occurring outside the school setting, supported with in-class instruction, where students apply academic, social, and/or general work behaviors and skills" (p. 120). Characteristics of community experiences include instruction for public transportation, providing instruction for safety, involving parents and supports for parents, and conducting assessments to determine resources. Self-determination/self-advocacy is defined as "the ability to make choices, solve problems, set goal, evaluate options, take initiative to reach one's goals, and accept consequences of one's actions" (p. 121). Characteristics of the predictor, self-determination/self-advocacy, include ensuring students have a means to functionally communicate, teaching students to monitor their own progress, and providing direct instruction in both school and community settings.

Community Experiences

As previously mentioned, community experiences are one predictor of postschool success, with correlational research indicating that these in-school activities are promising for improving outcomes in the area of employment (Mazzotti et al., 2021; Test et al., 2009). Community experiences are "activities occurring outside the school setting, supported with in-class instruction, where students apply academic, social, and/or general work behaviors and skills" (Rowe et al., 2015, p. 120). Community experiences are also linked to opportunities for individuals with disabilities to experience a degree of dignity of risk or the opportunity to engage in skills and activities in a natural setting where more realistic consequences for one's choices

are naturally present (Marsh & Kelly, 2018). Rowe and colleagues (2015) described characteristics of community experiences to include community-based instruction for the sake of teaching, assessing, and monitoring attainment of targeted skills while observing and documenting students' acquisition of targeted behaviors in diverse environments. The authors also included instruction for the use of public transportation, including parents and adult service providers, and providing supports for parents to support student involvement in community experiences.

There is an established link between community experiences as a predictor of postschool success. Community-based learning has been associated with school attendance, academic achievement, and career development (Albury et al., 2020; Mazzotti et al., 2021; Mazzotti et al., 2016; Test et al., 2009). Community-based experiences provide opportunities for students with disabilities and their teachers to generalize skills beyond the classroom. Teachers can use *in vivo* data collection, meaning in-persona and during live time, to glean important information about necessary goals and skill targets for learners with disabilities (Flanagan & Kutscher, 2020).

Research on social inclusion in the 1970's and 1980's was influenced by the deinstitutionalization of that time period. However, it was not long before researchers began to assess how individuals with disabilities participated as members of a community, making a distinction from the previous objective of simply having individuals with disabilities in the community (Amado et al., 2013). Within this early literature base, methods that included (a) routine experiences, (b) in the targeted environment, and (c) opportunities for meaningful interaction increased inclusive opportunities within the community (Amado et al., 2013). Understanding about experiences for individuals with disabilities within their community has evolved. Initially, the focus of research was primarily on opportunities for individuals with

disabilities to have access to the community. Current practices focus more on individuals being active members of the community, whereby, individuals with disabilities are provided supports and opportunities to engage in the community. The supports and opportunities allow individuals to acquire knowledge and skills that will help them become more integrated and prepared for life after high school (Amado et al., 2013). An emphasis on experiences within the community for improved learning has led to a bevy of studies related to various transition skills in which participants engage in some training in a community context.

Interventions to Support Community Experiences. There have been several intervention studies focused on teaching important skills in the community. First, Cihak and colleagues (2003) compared instructional arrangements of simulated and community-based instruction across both functional and vocational skills. The dependent variable measured task steps completed for targeted skills of sending a fax, using a debit card at an ATM, purchasing two items with a debit card, and using a copy machine to collate a newsletter. Researchers compared the instructional scheduling arrangements on the percent of steps performed independently. Instructional schedules included: (a) simulation only, (b) community-based instruction only, (c) a combined simulation and community-based instruction on consecutive school days, and (d) a combined simulation and community-based instruction on the same school day. The combination of simulation and community-based instruction on the same school day was significantly more effective for student acquisition of the targeted functional or vocational skill. However, students in the community-based instruction only condition acquired the target skill in the fewest number of instructional sessions. Overall, both combined instructional scheduling arrangements produced more efficient outcomes for generalization than either the simulation only or the community-based instruction only schedule.

Second, White and Weiner (2004) used a cross tabulation table and chi-squared analysis to examine the relationship between least restrictive environment, community-based training with on the job instruction and integrated employment outcomes. Specifically, they were investigating the relationship between the predictor (independent) variables (i.e., quantity of time spent in community-based training, quantity of time spent physically interacting with typical peers [LRE], intelligence quotient [as recorded in student record], physical disability, behavior disability, duration of time spent in on-the-job training) and the outcome (dependent) variable of employment. Community-based training was the most significant predictor of employment. Degree of integration with typical peers and on-the-job training were also strongly correlated with employment. In addition to their significant findings, the researchers reported two other findings of note. First, if on-the-job training increased and resulted in fewer community-based training skills, the likelihood of employment decreased. The authors expanded on this and reported that the more time spent in community-based instruction, the higher the percentage of graduates who were employed upon exiting their high school transition program increased. Second, the authors reported that correlations between intelligence quotient, ethnicity, or living at home with one's parents were not related to attaining employment after high school. Implications from this research suggest that training based in the community is significant and important for preparing individuals with disabilities for postschool employment. In preparing transition-age youth with disabilities for transition, community-based training and experiences are used for the sake of an authentic and natural backdrop for the targeted skills like social skills, domestic skills, accessing public transportation, and on-the-job training (White & Weiner, 2004).

Third, when necessary, transition components of the IEP target daily living and functional skills because individuals with disabilities benefit from explicit and specific

instruction for such skills. Examples of daily living skills include clothing care, using transportation, or accessing the community. Grocery shopping involves a number of daily living skills, like accessing ones' community, problem-solving, and financial management (Rowe et al., 2015). In a 2019 multiple probe across participants study, Gil and colleagues examined the use of cell phones and least-to-most prompting to teach young adults with intellectual disability grocery shopping skills. Researchers used technology (i.e., an iPad) and an application called First-Then Visual Schedule version 1.4 (Good Karma Applications, Inc., Valley Center, CA, USA) as a support that provided participants with pictures and item names as they shopped in the grocery store. The purpose of their study was to examine the effects of a least-to-most prompting schedule on young adults with ID using only the list on the iPad to shop in the grocery store. The research team also indicated that they were interested in the effects of generalization programming on the participants' ability to follow a sequenced grocery list and a list with new items on it.

Participants included three individuals between the ages of 19 and 21 all with moderate intellectual disability. Some study participants began in an initial baseline followed by iPad training and three subsequent phases of grocery list arrangements. In the first phase, least-to-most prompting was used as participants followed a six-item grocery list on the iPad. In Phase Two, four of the six items were put in a different order. Participants only moved to Phase Two if they met eligibility criteria from Phase One and proceeded to Phase Three only when they achieved eligibility criteria from Phase Two. In Phase Three, new items were added to the grocery list. During baseline, participants correctly completed between 28.6% and 42.6% of the steps on the task analysis. Two participants reached 71.5% and 78.8 % completed task analysis steps in Phase One, which was not enough to move to Phase Two, but was an improvement over

baseline scores. The third participant was successful through Phase Three, completing 87.6% of the task analysis steps correctly in the final phase. This study added to the literature base for teaching individuals with disabilities entirely within a community setting and simultaneously provided intervention and community experiences. The researchers noted that providing supplementary instruction in a school setting may have been helpful for students who did not meet mastery in early phases, suggesting that a combination of in-school and community-based instruction can be helpful at times (Gill et al., 2019).

In the Gill et al. (2019) study, the researchers asked participants' teachers to complete a survey pertaining to the social validity of their study. The teacher indicated that she strongly agreed that the target skill was important and a warranted intervention, the intervention included clear steps, was enjoyable for her, had a positive effect on the target skill, and that she would be able and willing to use it in the future. The teacher strongly disagreed when asked if the intervention was socially stigmatizing for participants. This study provides important insight into designing interventions to target independent living and community integration skills in a community setting. In other words, the predictor of community experiences was important in this study to target postschool outcome skills in the areas of independent living. Leveraging established knowledge in the field of secondary transition that community experiences are a predictor for postschool outcome success (Test et al., 2009). While participants made important gains with a completely in-community intervention, there are ways to target skills by combining in-school and in-community training.

Finally, like grocery shopping, navigating one's community is an important skill for independent life. An important part of navigation is problem solving when you find yourself in an unfamiliar place. Bassette and colleagues (2018) designed an intervention study to address

skills individuals with disabilities could use when they find that they are lost within their community. Three participants ranging in age from 13 to 17 with moderate intellectual disability were provided an intervention that included cell phone camera use, system of least prompts, and video modeling to teach skills for using a phone to take a photo when lost. As with other community-based interventions, researchers included intervention phases which provided for skill generalization and testing. Researchers used video modeling and a five-level system of least prompts to teach students a 15-step task analysis for taking pictures of their environment when they were lost. Using a single-case, multiple probe across participants design, the researchers measured how many steps of the task analysis for taking a photo of their location participants completed independently. Like all community-based training, setting was an important part of this research study. Baseline data were collected in the school hallway as participants were asked to 'pretend' they were lost and were provided the prompt "show me what you do when you're lost." For baseline, participants received no training on how to use the cell phone to take photos. Intervention was divided into three phases. In the first phase, students watched two videos demonstrating how to recognize that they were lost and what to take pictures of when this happened. The first video showed a model of a person (a) acknowledging she was lost, (b) noting that she would take a picture, and then, (c) pointing to an identifying sign for which a picture should be taken. In the second video, participants watched the sequence of buttons that needed to be pushed on the phone to take and send a photo. After watching the two videos in Phase One, a research team member provided the prompt "show me what to do when you're lost" and moved out of the line of sight of participants. The first phase took place in the school library, and if participants were unable to complete a step, a research team member appeared and provided prompting following a system of least prompts procedure until the participant completed the

task. Phases Two and Three followed an identical prompting and video demonstration procedure. The difference between these phases was that Phase Two occurred in a familiar department store in the community, and Phase Three took place in a novel community-based location, in this case, a grocery store. Participants made gains from baseline to Phase One, and all participants generalized the skill to an unfamiliar community setting. Results from this study demonstrated that minimal prompting was required for skill acquisition, and participants gained skills taking and sending pictures quickly. All participants reached 100% mastery in completing the steps of the task analysis in the final phase, when taking and sending pictures in an unfamiliar community setting. Cell phones where a useful and accessible support for the target skill in the community. Finally, all students reported that they enjoyed participating in the study and felt the skill they learned was important.

Using cell phones in the community to increase skills needed to access the community is a low cost, accessible way for individuals with disabilities to address challenges they might face as they transition from high school to independent life. Further, since these skills will be used in community contexts, training at school that eventually leads to community-based training increased community experiences while also improving participants' skill repertoire for community experiences in the future. Striking a balance between community-based instruction and adequate supports in the school context is important.

Next, Flanagan and Kutscher (2021) outline a four-step process for making the most of students' learning in community settings. The four step process included the following. First, identify the student's goal; second, choose an appropriate way to monitor progress; third, collect data; and fourth, track and analyze data results to make decisions. The authors emphasize the importance of systematically collecting and using data to evaluate the efficacy of practices

implemented in community settings. In addition to the nuance and natural environment made possible by community-based instruction, community settings can also be a way to assess student performance and needs as they prepare to engage as contributing citizens following their transition from high school to postsecondary life.

Finally, Amado and colleagues (2013) suggested that understanding individuals with disabilities within the context of their families nested within the varying contexts of their communities is essential for true community inclusion for individuals with IDD from diverse backgrounds. Community-based instruction is a way to provide community experiences which predict positive postschool outcomes for individuals with disabilities (Mazzotti et al., 2021; Rowe et al., 2015). Instruction in a community setting can be supplemented within school instruction or conducted completely within a community context (Trainor et al., 2020). Instruction within the community provides important opportunities for teachers to collect data, understand culture, and make decisions to help prepare students for successful secondary transition to independent life. Community-based instruction is often used to provide independent living skill instruction, to ultimately enhance community experiences for youth with disabilities, and researchers should continue to explore meaningful applications of this important predictor to support the knowledge and skills of young adults with disabilities.

Self-Determination to Support Postsecondary Outcomes

Self-determination, like community experiences and parent involvement, are predictors of postschool success (Mazzotti et al., 2021). Given calls for programming that includes predictors in contexts that meet the individual needs of students (Trainor et al., 2020), practitioners should consider interventions that include predictors to benefit young adults with disabilities. Predictors like self-determination, parent involvement, and community experiences

can be embedded and designed within interventions. For example, this dissertation study seeks to train individuals with disabilities to travel to community destinations that they regularly travel to as their parents ride along. The community in this sense is the community of places that they travel to which individuals have already built for themselves. Further, young adults with IDD will use their own devices to select rides and make choices throughout their transportation, providing multiple opportunities for self-determination. With this dissertation study, young adults with IDD will be participating in an intervention to train transportation skills; however, the intervention is situated in the predictors of self-determination, parent involvement, and community experiences are included as predictors of postschool success.

Nirje (1972) introduced the idea that individuals with disabilities have their choices, wishes, desires and aspirations considered as much as possible in "actions affecting them" (p.177). The premise is that individuals with disabilities have the right to control over their own lives. Literature from the 1980s and 1990s emphasized the importance of including individuals with disabilities in decision making related to their lives, which emphasized a growing trend related to quality of life and self-determination for these individuals (Shogren & Ward, 2018).

Self-determination means "acting as the primary causal agent in one's life and making choices and decisions regarding one's quality of life free from undue external influence or interference" (Wehmeyer, 1996, p. 22). Actions or events are considered self-determined when (1) the individual acts autonomously, (2) the behaviors are self-regulated, (3) the person initiates and responds to events, and (4) the person acts in a self-realizing manner (Wehmeyer, 1996). Self-determination includes making choices, solving problems, setting goals, evaluating options, taking initiative to reach one's goals, and accepting consequences of one's actions (Rowe et al., 2015). For students with disabilities, the skills associated with self-determination are positively

linked to the achievement of education-related goals, employment, community participation, and quality of life outcomes (Burkey et al., 2018; Mazzotti et al., 2021).

There is a growing link in research between self-determination and post-high school outcomes (Lachapelle et al., 2005; Martorell et al., 2008; Powers et al., 2012; Wehmeyer & Palmner, 2003; Whenmeyer & Schwartz, 1997). In 2015, Shogren and colleagues (2015) examined the efficacy of self-determination interventions in secondary school on adult outcomes. Results from analysis over time indicated that self-determination status upon exiting high school impacts adult outcomes. For example, self-determination status at Time 1 predicted status at Times 2 and 3 generating the implication that current self-determination predicts future levels of self-determination as students transition into adult life.

Next, Wehmeyer and Schwartz (1998) found significant differences in self-determination scores based on quality of life and no significant differences in quality-of-life groups based on Intelligence Quotient (I.Q.) scores or age. The authors determined that promoting self-determination contributes to a more positive quality of life for individuals with intellectual disability and noted the importance of providing opportunities for individuals to make choices about their own lives and to express self-determination often. However, Wehmeyer and Field (2007) noted that self-determination is not taught with a single lesson or intervention, rather the attitudes, knowledge, and skills must be nurtured and developed over time. Self-determination is "dispositional characteristics manifested as acting as the causal agent in one's life. Self-determined people (i.e., causal agents) act in service to freely chosen goals. Self-determined actions function to enable a person to be the causal agent in his or her life" (Shogren et al., 2015 p. 258).

Within secondary special education and transition services, promoting self-determination is considered best practice (Wehmeyer et al., 2012). Self-determination was included in the 1990 reauthorization of IDEA. Language mandated the needs, interests, and preferences of students with disabilities be taken into account when planning for the transition from school to adult life (IDEA, 1990). Following this mandate, a significant number of meta-analyses identified the importance of self-determination in secondary special education and transition services for students with disabilities. In 2006, Shogren and colleagues reviewed the degree to which research emphasized strengths and capabilities of individuals with intellectual disabilities and included elements to positive psychology or self-determination. Next, Chambers and colleagues (2007) reviewed the literature base to conduct a global review of research related to self-determination to provide direction for future research and practice. Specifically they found a need for improved teacher training and support, the need for implementation of strategies in school settings, the need to include families via instruction and involvement to support self-determination, and the need to begin self-determination programming at a younger age. In 2009, Cobb and colleagues systematically investigated reviews of self-determination, in a narrative meta-synthesis, to evaluate the different disability groups, instructional techniques, intervention curriculum, and outcomes related to self-determination research. The authors found that multicomponent self-determination interventions demonstrated greater positive transition outcomes. Then, in 2017, Ju and colleagues along with Mumbardo-Adam and colleagues (2017), added to the list of literature reviews focused on self-determination interventions. First, with a review of self-determination and education outcomes (Ju et al., 2017), and next, a review of how self-determination measures vary across different disability categories (Mumbardo-Adam et al., 2017). Ju et al. (2017) found that self-advocacy, self-awareness, problem solving, and goal

setting and attainment were all important components of self-determination and that training these skills lets to improved self-determination. Mumbardo-Adam et al. (2017) found that personal variables like disability classification, gender, or race/ethnicity should be considered important variables when understanding an individual's level of self-determination.

In a recent review to update the literature-base related to interventions to promote self-determination for students with disabilities, Burke and colleagues (2020) determined that interventions to promote self-determination can be effective for students across grade level, disability level, and settings. Two of the research questions in their review targeted how interventions, intended to promote how self-determination of students with disabilities, had been implemented, and what the outcomes were of these interventions for students with disabilities. Thirty-four articles were included in their review. Seven studies targeted a single component skill related to self-determination, and 27 included multi-component interventions teaching multiple skills associated with self-determination. Of the interventions that targeted a single-component, one of these was related to goal setting and attainment (i.e., Taylor-Ritzler et al., 2001). Specifically, researchers were measuring students' skills recruiting help, their help seeking behaviors, and the help they received as a result of their pursuits setting goals. For this particular study, the intervention was implemented by case managers with whom participants were familiar within the setting.

Another finding from the Burke et al. (2020) review was that 26 of the studies demonstrated the effectiveness of using interventionists, such as a teacher or parent, who are natural individuals within a setting. Given the importance of situating research and intervention into a context that is applicable and important for youth and young adults with disabilities, their families, and their teachers, it is important that for any of the studies that reported social validity,

participants reported positive outcomes related to participation. The review conducted by Burke and colleagues (2020) indicates that research related to interventions to promote self-determination have expanded over time, and from their review, they indicated positive outcomes of interventions to increase overall self-determination or a specific skill associated with self-determination (e.g., choice-making, problem-solving). Based on their review, the researchers suggested that interventions to promote self-determination and skills associated with self-determination have the potential to impact outcomes for students with disabilities, provide valuable guidance for practitioners to promote this body of knowledge and skills, and can be useful in the context of transition planning.

In 2020, Luckner and colleagues conducted a systematic review of 80 replication interventions to promote self-determination. They found seven of the 80 interventions focused primarily on an adult intervention for parents or teachers to support self-determination in youth suggesting that interventions that target stakeholders within the student's periphery can influence and promote self-determination for the student. Of the 80 studies, 32 focused on high school or transition-aged students. Of the 80 interventions, 14 addressed choice-making, decision-making, goal attainment, and goal-setting suggesting that the important elements of self-determination can be the focus of an intervention as a means to promote that specific skill and make gains towards the long-term outcome of becoming more self-determined (Luckner et al., 2020). The researchers suggested that future research on the component elements of self-determination is necessary to learn more about skill development across disability categories. Further, interventions for professional development and support for stakeholders (i.e., parents, guardians, support service workers, teachers) will help advance the knowledge base about best practices for supporting individuals with disabilities in gaining self-determination knowledge and skills.

Self-determination skill building is nuanced. For example, Burke and colleagues (2020) found that 27 studies in their review included self-determination as a component within a multi-component intervention. In these studies, self-determination was not the only specific or targeted component. For example, Van Laarhoven-Myers and colleagues (2016) tested an intervention, Multimedia for Youth to Voice Outcomes Individually Created for Empowerment (MY VOICE), for supporting 100 students with developmental disabilities in using media to have a voice in their transition planning IEP meetings was examined over a 3-year study. The authors emphasized participant self-determination by giving student participants tools to express their interests, needs, and strengths during their transition IEP meetings. MY VOICE promoted self-determination skills that supported students in planning and participating in their transition IEP meetings. Following the 3-year project period, researchers found that student participants preferred activities that helped them to find out what their interests where, provided opportunities to show what they wanted to do with their lives, and gave them choices for what they would like to do after high school.

The Van Laarhoven-Myers et al. (2016) study demonstrates the benefits of promoting self-determination knowledge and skills for youth with disabilities, specifically as related to importance of planning during the transition from high school to postsecondary life. By providing supports for students to engage in the transition planning process, students (a) experienced positive outcomes (e.g., showing what they wanted to do with their lives, looking into choices after school, and showing videos of their choices to others) related to the targeted intervention, transition IEP planning; and (b) gained experience related to self-determination which is positively related to postschool success. MY VOICE did not specifically target or measure self-determination. Rather, self-determination was included in the intervention, gains

were demonstrated within the intervention, and benefits were expected beyond intervention as self-determination is related to positive postschool outcomes. This is significant in that self-determination can be influence within an intervention to target a different skill. Families found the intervention to be socially valid, and both parents and young adults expressed positive views of the project and student participation in the project. Student choice, opportunities to practice self-determination, and family involvement throughout the study demonstrates how including predictors of postschool success (i.e., self-determination, parent involvement) can be leveraged within an intervention for student benefit.

Self-Determination for Students with Disabilities: Views of Parents and Teachers. Students are more likely to develop self-determination skills, if and when, they are provided opportunities to learn and apply the skills (Raley et al., 2018). Parents feel that students with disabilities should be informed and skilled participants in their IEP meetings and that self-determination skills should be taught to students with disabilities in school (Grigal et al., 2003). In a survey of 68 parents of young adults with intellectual disability or autism, Carter and colleagues (2013) found that parents felt it was very important for their young adult with a disability to learn each of the seven skills associated with self-determination (i.e., choice-making, decision-making, problem solving, goal setting, self-advocacy/leadership, self-management/self-regulation, and self-awareness/self-knowledge). Interestingly, there was a strong relationship between skills that parents indicated were *very important* and a low level of performance by the young adults with a disability. The authors outlined the importance of embedding self-determination into instruction for students so that they have increased opportunities to practice all seven important elements of self-determination. Carter and colleagues (2013) emphasized earlier parent survey research related to self-determination that suggested parents feel schools

could do more to foster self-determination skills for students with disabilities (e.g., Grigal et al., 2003).

Self-determination is highly valued by parents of individuals with disabilities; thus, self-determination and parent influence should be included in transition programming and interventions for individuals with disabilities (Carter et al., 2013; Grigal et al., 2003). Self-determination approaches can be infused into planning and programming for high school students with disabilities. If practitioners feel that self-determination programming adds too much to their overloaded schedule, they should look for ways to infuse opportunities for self-determination and the associated skills into existing programming and interventions as a way to provide increased opportunities for students.

Parent Expectations and Involvement

The development of self-determination for students with disabilities is often susceptible to the influence of parents (Abery, 1994; Field & Hoffman, 1994; Mithaug et al., 1998; Wehmeyer, 1996). Parent expectations and involvement are influential factors in child development. Parent expectations and level of autonomy are related as parents' behaviors and their activities align with their expectations and influence the behaviors of young adults, suggesting a link between parent expectations and autonomy or elements of self-determination (Bandura, 2006).

For students with disabilities, both parent expectations and parent involvement are predictors of success after high school (Mazzotti et al., 2021; Mazzotti et al., 2016; Test et al., 2009). Parent expectations are a promising predictor of postsecondary education and a research-based predictor of employment; parent involvement is a promising predictor of employment (Mazzotti et al., 2021). Parent involvement "means parents/families/guardians are active and

knowledgeable participants in all aspects of transition planning" (Rowe et al., 2014, p.122). Parent expectations are currently defined in terms of the outcome they predict. In other words, if parents expect that their child with a disability will: have a paid job (Carter et al., 2012; Doren et al., 2012; Papay & Bambara, 2014); attend postsecondary education (Doren et al., 2012; Papay & Bambara, 2014; Wagner et al., 2014); be self-supporting (Carter et al., 2014); and/or work and go to college (Chiang et al., 2012), there is a significant impact on the likelihood that their child will, in fact, achieve those outcomes (Mazzotti et al., 2016).

In a 2016 update to predictors of postschool success, Mazzotti and colleagues added parent expectations as a new predictor. The review determined that parent expectations met criteria for potential evidence predicting postschool education and employment outcomes, and there was emerging evidence for predicting independent living outcomes (Mazzotti et al., 2016). Wagner and colleagues (2014) examined confounding factors that impacted the influence of socioeconomic status on postschool outcomes for individuals with disabilities using data from the National Longitudinal Transition Study – 2 (NLTS-2). Outcomes from the NLTS-2 indicated yes or no to whether or not students had; (1) received a regular high school diploma, (2) ever attended college or postsecondary career technical education, (3) or ever held a competitive employment position. In this study, the research team coded potential mediators related to parents, including parental involvement at home, parental expectations for earning a regular high school diploma, and parental expectations for postsecondary education. Parental involvement significantly predicted attending a two- or four-year college or attending postsecondary education/training. Parent expectations significantly predicted the outcome of earning a high school diploma; similarly, parental expectations of attending a postsecondary education program significantly predicted the outcome of attending postsecondary education.

Another longitudinal examination of the influence of parent expectations found a similar relation between parent expectations and the outcomes of their young adult children with disabilities (Doren et al., 2012). Doren and colleagues conducted a secondary analysis of NLTS-2 data by examining data from three waves of the NLTS-2 which included data of 11,000 13 to 17-year-old students receiving special education services in the academic year 2000-2001. The researchers examined the following outcomes: (a) graduation from high school, (b) currently working, (c) currently attending or graduated from a postsecondary institution, and (d) currently working and attending or graduated from a postsecondary institution. The primary predictor variable, parent expectations, was measured with a questionnaire, and moderators related to demographic information included student gender, total household income, ethnicity, and primary disability category. In addition, students were asked a subset of questions related to autonomy or self-determination which was hypothesized to be mediating a variable. Parent expectations were significantly related to several outcomes. Specifically, results indicated that: (a) parent expectations for receiving a high school diploma were significantly associated with students graduating from high school, (b) parent expectations for working after high school were significantly associated with working after high school, (c) parents' expectations that their child would enroll in a postsecondary institution were significantly related to current enrollment in or completion of secondary postsecondary school, and (d) parents' expectations for working and postsecondary school enrollment were significantly associated with the adolescent working and being enrolled in postsecondary school. Disability status was found to moderate parent expectations, and parent expectations were significantly positively associated with a student's level of autonomy (i.e., self-determination). Given the influence of parent involvement and

expectations, it is important to consider ways in which parent influence can be included in interventions as practitioners work to support individuals with disabilities in transition planning.

Parents can be leveraged in two ways, by including them in skills training and by influencing their expectations. Parent expectations are not stagnant; knowledge-based training programs have been effective in increasing parent expectations specifically related to the employment of their child with a disability (Francis et al., 2013). Francis and colleagues (2013) focused on parent expectations when they used qualitative methods to examined the impact of a training program, Family Employment Awareness Training (FEAT). The training, which sought to increase expectations and knowledge of family members and other stakeholders related to employment outcomes for students with disabilities, occurred over a 2-day period. The majority of participants were family members although professionals also participated in the training. The research team administered a pre- and post-training assessment using one open-ended expectations question about employment and one Likert scale question about knowledge of transition services and employment options for youth with disabilities. Using interpretive qualitative methods, the team evaluated participant responses about expectations. They found that expectations increased following FEAT, and the majority of participants indicated increased confidence that competitive employment was a possibility for individuals with disabilities. More specifically, parent expectations at the onset of the study were described as somewhat dismissive, and following training their responses about their expectations were generally positive.

Once positively influenced, parent expectations can remain improved. Francis and colleagues (2015) conducted a follow-up study of parent participants one to two years after the initial FEAT training. The research team conducted surveys and semi-structured interviews using

a mixed-methods research approach. Results from their analysis indicated that participants rated their competitive employment expectations for youth with disabilities as average following training and one or two years later. This finding was notable given that pre-questionnaire data indicated that participants had generally poor expectations for individuals with disabilities related to competitive employment.

In addition to the influence of parent expectations and involvement, simply including parents through home-school partnerships can have important implications for identifying and supporting the cultural social capital of the family (Trainer, 2010). With consideration given to the influence of parent expectations and involvement on postsecondary outcomes for students with disabilities, it is reasonable that researchers have begun looking for ways to involve parents in transition planning and self-determination programming. A partnership between schools and families is an important way to prioritize cultural understanding in transition planning (Geenen et al., 2001). Transition planning is one area in which schools can encourage and facilitate parent involvement as a means to increase a cycle of empowerment (Defur et al., 2001).

In a randomized control trail with a delayed-exposure group, one study examined the impact of a transition planning model in which families and students were the central focus (Hagner et al., 2012). The model was designed to empower individuals with disabilities and their families by educating them and helping them to connect with community resources as part of the transition planning process. In their study, Hager and colleagues (2012) included family members as participants in training sessions with information about resources and transition planning, and facilitators assisted students and families through a structured transition planning process. Outcome targets for the training were transition goals and a plan for implementation. Following the program, participants reported significantly higher student and parent expectations

for the future along with higher self-determination and vocational decision-making. Results from the study support the idea that involving families in transition planning can have important implications for the families, the student, and transition outcomes overall.

Next, Carter and colleagues (2012) found no relationship between parental education level, employment, income, and ease of transportation and paid employment after high school for students with disabilities. However, it was found that parental expectations were a very strong predictor of student employment after high school. Parental expectations related to their child with a disability getting a paid job after high school had five times greater odds of their child actually being employed after high school. Further, parent expectations that their child would eventually be self-supporting had three times greater odds of their child gaining employment after high school. Regular household chores were also linked to increased odds for employment and a combined model of all three factors (i.e., ADD the three factors here) remained significantly higher related to employment for youth with disabilities after high school. Parent influence on young adult success beyond high school is not limited to the influence of parent expectations, the degree to which parents are involved in their young adults' transition planning process also has important implications for young adult success (Wagner et al., 2014).

Involving parents as interventionists. Parent involvement includes a number of ways in which parents, family members, or guardians engage in activities related to the transition planning or education of a student with a disability. Parent involvement is an established predictor of postschool success. It was initially reported as a predictor in a systematic review of literature (Test et al., 2009), defined in a Delphi study by field experts in the field of secondary transition (Rowe et al., 2015), and supported by in an updated systematic literature review (Mazzotti et al., 2016). Transportation or travel skills were also included in the 2016 review of

predictors (Mazzotti et al., 2016) These predictors overlap as young adults with disabilities prepare to access their communities in a self-determined way using transportation. Youth and young adults with IDD often rely on their parents for transportation, and some parents report their child's dependence can be a burden (Feeley et al., 2015). Parents are an important part of a child's development from youth into adulthood. Parents typically maintain a lasting and influential role within their child's natural environment (Maughan et al., 2005). In particular, parents of children with disabilities have intimate knowledge of their son or daughter, such as knowledge about goals, interests, support needs, and preferences. Additionally, parents are present as a child progresses through school and more than likely, a parent's support does not terminate upon the child's high school graduation. Given parents' knowledge of their child, the unique understanding of their child's postschool goals and objectives, and the long-term relationship within transition planning with their child, parents have the potential to play a pivotal role in their child's acquisition and development of transportation skills (Maughan et al., 2005).

Parent involvement can be leveraged in intervention packages to target multiple objectives. For example, Kim and Park (2012) examined the impacts of a family-involved Self-Determined Learning Model of Instruction (SDLMI) package on the academic engagement and goal attainment of students with disabilities who exhibited problem behavior. Academic behavior was measured through direct observation and a checklist, while goal attainment was measured with the Goal Attainment Scale. First, family members where trained on check-in-check-out (CICO) cards and implementation. Next, teachers applied the SDLMI in class and involved families by having them help check student homework, have conversations with their child about their activity sheets, and mark the CICO cards if students demonstrated the target behavior.

Students significantly increased their academic engagement, and there was a noticeable difference in their goal attainment. Overall, the team determined that involving families in the SDLMI process had a positive effect on students' academic engagement, thereby, demonstrating the powerful influence of leveraging parents in programming to support youth and young adults with disabilities.

In another parent-implemented intervention, researchers evaluated the impact of an *in vivo* pedestrian safety skill intervention for three individuals with autism (Harriage et al., 2016). Parents implemented a most-to-least prompting procedure in community contexts at actual crosswalks. All child participants demonstrated significant improvements in pedestrian skills, and these skills were maintained at a one-month follow up (Harriage et al., 2016). Implementation fidelity was collected using a checklist, and when parents implemented steps with less that 80% accuracy, the interventionist intervened to provide support. Implementation fidelity is imperative to ensure that an intervention is provided accurately. Steps for maintaining implementation fidelity are critical when someone outside of the intervention team (e.g., parents) is implementing procedures.

Both parent expectations and parent involvement are significant in influencing interventions for students with disabilities, particularly related to transition planning. Parent expectations can be increased (Francis et al., 2013), and parent expectations and involvement are in-school predictors of postschool success (Test et al., 2009; Mazzotti et al., 2016). Because of the influence of parent expectations and involvement, practitioners have begun to develop interventions that include parents in the areas of employment (Francis et al., 2013), self-determination (Hagner et al., 2012; Kim & Park, 2012), and transportation (Harriage et al., 2016). Including parents and family members in transition planning also allows for more

culturally responsive programming (Hagner at el., 2012). Given the impact that parents can have on various elements of transition planning and outcomes, it is important to include parents in interventions that target transition skills where possible. Parents can be included, and their expectations can be influenced through improved knowledge of a targeted outcome, like employment (Francis et al., 2013). Transition research, including research related to supporting young adults with disabilities in accessing transportation, should identify ways to include parents for the sake of increasing the parents' expectations and improving in-school and postschool outcomes for young adults with disabilities. Parents observing young adults engaging in specific skills can increase their knowledge and thus increase their expectations of their child using a specific skill. For this reason, parent involvement or participation as their young adult learns transportation skills could have important implications for their expectations following transportation skills training.

Generalization for Transportation

Programming for outcomes based on knowledge of the predictors (e.g., community engagement, self-determination, and parent involvement/expectations) is one way to improve the efficacy and efficiency of interventions for youth with disabilities. In the same way that practitioners should program for outcomes, practitioners should consider the importance of generalization as it relates to providing community experiences for youth with disabilities. Nothing should be trained if not trained for generalization (Cooper et al., 2019). According to behavior analysts, behavior change that is most socially significant and enduring is behavior change that is used in all relevant settings and accompanies other functionally-related responses (Cooper et al., 2019). In other words, behavior change that is generalizable is paramount.

In their seminal article about the dimensions of applied behavior analysis, Baer et al. (1968) noted behavior change has generalizability when it is durable over time, appears in a variety of environments, and spreads to a variety of related behaviors. “When a learner emits a trained behavior in places or at times without having to be retrained completely in those places or times, or emits functionally related behaviors that were not taught directly, generalized behavior change is evident” (Cooper et al., 2019, p. 715). Planning any intervention, particularly for students with disabilities, and particularly, when intervening to train skills for life beyond the context of in-school supports, training for generalization is essential, otherwise learned behaviors are limited to factors and contexts from training.

Generalization is the continued performance of a target behavior beyond the context of intervention. A target behavior that occurs even one time outside of the context of instruction has been generalized. Stokes and Baer (1977) reviewed behavioral literature for generalization, which they argued is an operant response that can be programmed for, and they defined the nature of generalization as relevant behavior occurrence beyond trained conditions without the scheduling of those same conditions from training. Stokes and Baer determined that “generalization can be claimed when no extratraining manipulations are needed for the extratrained changes” (p. 350). Types of generalization include generalization across subjects, settings, people, behaviors, and/or time. Cooper and colleagues (2019) organize these categories of generalization into setting/situation generalization and response generalization. Setting/situation generalization refers to “the extent to which a learner emits a target behavior in a setting or stimulus situation that differs from the instructional setting in any meaningful way” (p. 716). Response generalization, in contrast, refers to the “extent to which a learner emits untrained responses that are functionally equivalent to the trained target behavior” (p. 718).

Cooper and colleagues (2019) outline two important steps when programming for generalization. First, practitioners should choose a target behavior that will meet natural contingencies of reinforcement. Second, practitioners should specify all variations of the target behavior along with additional settings and/or situations where the target behavior should and should not occur. In order to meet the first step, behaviors to train should be selected based on the likelihood that outside of the context of training and supports, the learner can eventually use the behavior to access something naturally reinforcing, or a naturally existing contingency. In planning for desired variations of a behavior or variations of the context in which a behavior will occur, practitioners should first list all of the behaviors that need to be changed, list all of the settings and situations in which the target behavior should occur, and then, consider if the pre-intervention planning is worth the given outcome. Once a practitioner has determined the behavior and the situations and settings where the behavior should take place, the final step is consideration for strategies and tactics that will promote generalized outcomes (Cooper et al., 2019).

In their review of the generalization literature, Stokes and Baer (1977) categorized methods for programming for generalization into nine categories. Their list included (a) train and hope, (b) sequential modification, (c) introduce to natural maintaining contingencies, (d) train sufficient examples, (e) train loosely, (f) use indiscriminable contingencies, (g) program common stimuli, (h) mediate generalization, and (i) training "to generalize." In their early examination of generalization programming within behavioral research, Stokes and Baer found that train and hope and sequential modification were the most common and least analytical treatments for generalization. Conversely, the remaining seven technologies (i.e., introduce to natural maintaining contingencies, train sufficient examples, train loosely, use indiscriminable

contingencies, program common stimuli, mediate generalization, and training "to generalize.") were directly related to generalization. The early work of Stokes and Baer (1977) informed intervention programming for generalization that is still widely applied in today's behavior analytic programming and research.

These methods for programming generalization have been refined into five strategic approaches by Cooper and colleagues (2019). The first strategic approach involves teaching enough relevant stimuli and response requirements because most behaviors are performed in a variety of ways in multiple situations. To do this, practitioners must teach enough examples of cues that indicate a behavior should be used and enough examples of how the behavior response can be performed. For example, a telephone ring or encountering a person are both cues that indicate a behavior response for greetings such as "hello" or "hi, how are you." Additionally, in some cases, it is important to teach the specific setting and situations in which a behavior should not occur (i.e., non-examples). The second strategic approach involves creating an instructional setting that is similar to the settings in which the behavior is expected to generalize. Methods for doing this include programming common stimuli or including features of the generalized setting during training, and teaching loosely or including variations of non-relevant stimuli during training so that the learner does not inadvertently become reliant on some irrelevant stimulus to prompt the behavior. For example, a teacher might have students sit at a table or café type arrangement when teaching conversation skills rather than in their school desk to provide for generalization of conversation skills to a restaurant or café setting. The third strategy for programming generalization is to maximize contact with the generalization setting by teaching such that levels of behavior required in the generalized setting are eventually required during training, or programing for indiscriminable contingencies, or planning that the learner always

contacts reinforcement in a way that mirrors generalized situations. This can be achieved with variations in the schedule of reinforcement delivery or by delaying rewards. For example, when learning to ride a bike, a parent might provide just enough support that the learner does not fall, but not so much support that they are pushing the bike. Each time the learner hops on to ride, they access the "feeling" of balancing. The fourth strategy for programming generalization is to mediate generalization or employ some tactic or individual as a mediating support. One way to achieve this is with a mediating stimulus. A mediating stimulus is something that a learner uses for training that can be used beyond training for behavior in the generalized setting. An example of a mediated support would be learning to grocery shop with a list organized by sections of the store. The list format might remain a tool used in all grocery shopping trips to help the shopper organize and systematically move through the store. The final strategy for programming generalization is to train to generalization. Practitioners might directly instruct learners to generalize or be systematic and reinforce variations of a behavior that will serve as generalized responses after intervention. For example, a teacher might systematically reinforce a student's correct identification of a picture of a bird, a stuffed animal bird, a video of a bird, and a bird in the wild. There are multiple strategies for programming generalization, all of which can be employed to help support learners to engage in functional behaviors beyond the context of training and within the generalized setting. This dissertation is prepared to employ all five methods for programming generalization; (1) cars, and drivers will be different for each ride, (2) in-vivo instruction will occur in a rideshare, (3) each ride, pick up, and drop off will occur in the generalized setting, (4) young adults will be given wallet-sized cue cards for the task analysis and additional support, and (5) the final phase of intervention is to allow young adults to ride independently.

Without generalization, behavior instruction is short sighted. Cooper and colleagues (2019) suggest that the most difficult and important challenge for practitioners implementing behavior change programs is to help learners achieve generalized behavior change that is socially significant. Behavioral interventionists should program as though generalization can never be assumed, and therefore, programming for generalization is always essential (Stokes & Bear, 1977). The argument for the essential consideration for generalizable programming is simple, if the behavior was to only occur within the context of intervention; then, intervention conditions must be maintained for as long as the behavior is expected. Well known behavior analysists Donald Baer (Stokes & Baer, 1977) and B.F. Skinner (1953), both emphasized the importance of generalization. They frame this importance for practitioners by suggesting that we should never assume learners will employ skills beyond the context of an intervention setting. If we are truly in the business of making significant socially relevant behavior change, we must plan for behaviors and programming that learners can use to live more full lives beyond the boundaries of the intervention such that no extra cues or manipulations are necessary (Stokes & Baer, 1977). Generalization is an essential component of learning socially significant behaviors and responsible and effective practitioners must program for it. Without consideration for generalization, some researchers may find that skills are not performed following the context of a research study. This study will prioritize generalization by including methods for programming for generalization (Stokes and Baer, 1977) and strategic approaches (Cooper et al., 2019) in order to target continued use of the transportation skill beyond the context of intervention.

Teaching Transportation Skills

Many of the skills that young adults learn during transition programming function to increase their independence and community engagement after high school. They may learn

employment skills, skills for continuing their education, and communication or social skills. However, in order to access employment, continued education, or opportunities for community and social engagement, they must have access to reliable transportation. Transportation is a functional living skill and an important outcome for secondary transition (Rowe et al., 2015). Young adults, their parents, and professionals who work to support individuals with disabilities have all noted that independent and reliable transportation is a barrier to full community engagement (Bross, Fredrick, & Kwiatek., 2023; Feeley et al., 2015). In response to the need for reliable and independent transportation, a number of research teams (Bross, Wood, et al., 2023; Brown et al., 2011; Harriage et al., 2016; Pfeiffer et al., 2017) have begun to examine ways to teach transportation skills to youth with disabilities. Transportation or travel skills are defined as the ability to get to places outside the home independently (Carter et al., 2012). These skills might include navigation skills, pedestrian skills, and driving skills, as well as the ability to use public transportation and rideshare services, such as Lyft or Uber.

Using data from the NLTS-2, Zalewska and colleagues (2015) evaluated individuals with autism and their employment outcomes based on factors related to personal traits (i.e., self-determination and social skills) and external factors (i.e., job search strategies and access to transportation) to identify which were significantly related to employment. Employment outcomes were measured based on individuals who had worked for pay since leaving high school. The factors, including summative self-determination scores, social skills, and job search strategies, were not significantly associated with postschool employment. One subscale of self-determination, psychological empowerment, was associated with employment. Transportation was the only factor they studied that was significantly associated with postschool employment. Specifically, individuals with a means of independent transportation had a nearly five times

greater chance of being employed compared to peers who did not report an independent means of transportation.

To learn more about the challenges of transportation, Wasfi and colleagues (2017) surveyed individuals with developmental disabilities. Participants reported being an automobile passenger, walking, using public transportation, or paratransit to travel to their desired locations. Only 30% of the participants reported the use of public transportation; while, 62% reported using paratransit. Despite reporting the use of varied means of transportation, participants noted they felt access to transportation was limited in multiple locations which restricted trips for shopping, recreation, and social purposes. The participants also noted barriers associated with transportation such as reliability of the service, availability in their neighborhood, and understanding and interpreting schedules. Transportation remains an important piece of the puzzle as young adults with disabilities prepare for life after high school related to employment and general community access. However, given knowledge that systematic and comprehensive programming is useful, interventions targeting various means of transportation have been investigated as researchers work toward making a more meaningful impact on the transportation options for young adults with disabilities who strive for increased participation in their communities (Bross, Wood, et al., 2023; Brown et al., 2011; Davies et al., 2010; Harriage et al., 2016; Mechling & O'Brien, 2010; Pfeiffer et al., 2017).

While transportation skills and skills for independent transportation are recognized as important for young adults with disabilities, there is still much to discover about ways to program for and teach these skills. Pfeiffer and colleagues (2017) examined the effects of a popular training program from the Kennedy Center on the travel skills of individuals with disabilities and discovered that effective programming can increase travel skill competencies.

The Kennedy Center uses a *Travel Training Guide and Curriculum* (The Kennedy Center, 2012) to teach individuals with disabilities to use public transportation. Participants engaged in an average of six sessions each lasting about 90 min and overall, all participants made significant gains in the skills (e.g., recognizing landmarks, identifying correct vehicle, waiting at a correct location, or being prepared with correct fare) needed for independent travel. Pfeiffer and colleagues (2017) collected the pre- and post-test scores of 87 individuals on a travel skills evaluation that indicated participants' level of support using transportation. Using a Likert-type rating scale, participants support needs were scored from a 0, meaning a physical prompt was needed, to a 3, meaning the skill was completed independently. The majority of participants reported traveling by bus (92%), while the remaining participants used the train (8%). The majority of participants used transportation to travel to work (39%), followed by school (18%), general purposes (17%), and leisure (15%).

Further, the Pfeiffer research team collected data on the types of learners who participated in the training. They found that while age and gender had no relationship to travel skills, individuals with ID (with and without autism) had travel skills that were less-well developed at the start of the program than those with autism and no ID. However, individuals with ID made larger gains in travel skills such that all groups had comparable levels of travel skills post intervention. An important finding from this research is that structured and comprehensive programming can be used to teach transportation skills to individuals with disabilities (Pfeiffer et al., 2017).

Comprehensive and lasting changes in the transportation skills of young adults with disabilities necessitate that they can access transportation and that they have the navigation skills necessary to utilize transportation options independently. Navigation skills are necessary to

independently access one's community (Brown et al., 2011). Some researchers have begun work combining location global position system (GPS) technology and games to teach individuals with disabilities navigation skills (Brown et al., 2011). Additionally, technology for games and location services is becoming more prevalent and accessible. As part of a larger project examining the effects of games-based learning, Brown and colleagues (2011) developed location-based services that functioned to support individuals with disabilities learning new routes to work. During implementation, the research team provided opportunities for individuals with disabilities to engage with the technology, an app call Route Mate. Features included in the app were provided opportunities for individuals to set times for departure, find alternate routes, estimate arrival times, personalize location-based reminders, and access multiple modes that allowed for planning or use. Ultimately, the team found their app that used games-based learning and location services was effective for individuals with disabilities to use in planning and rehearsing independent travel routes (Brown et al., 2011). While there are multiple means of transportation individuals can use to access their communities, this research provides important insight into how technology and programming can be used to support learners with disabilities to successfully and independently navigate their communities.

Including Parents in Transportation Skills Training

An existing and often powerful support for individuals with disabilities are family members, particularly parents. Parents are often well versed in their young adults' knowledge, and they represent a long standing support that will be in place once students leave high school. Parents and family members have a vested interest in the success and wellbeing of their young adult. Increasing independence for a young adult decreases dependence on that young adult's parents. However, parents reported a lack of engagement in transition planning and preparation

as a result of barriers such as stress, limited resources, lack of cultural capital, and low self-efficacy (Hirano et al., 2017). As recently as 2018, Hirano and colleagues reported limited experimental research on parent-involved transition planning.

To better understand the potential influence of parents on the transportation skills of their young adults, Harriage and colleagues (2016) examined the use of parents as implementers in teaching pedestrian safety skills to young adults with autism. Parents were given behavior skills training for how to use a most-to-least prompting procedure to teach their young adults how to cross the street. Parent training included instruction, modeling, rehearsal, and feedback from the research team as well as feedback following intervention sessions in which implementation fidelity fell below 80%. Three different street crossings were used to measure generalization. While researchers found that parents required support to generalize the prompting and intervention procedures to different street crossings, the team attributed this to the differences in traffic volume at the different street crossings. Once parents received feedback on their intervention however, training increased safety skills behavior for all individuals during and after intervention. This research demonstrates the potential impact of parents as implementors in training safety street-crossing skills for adolescents and young adults with mild and extensive support needs (Harriage et al., 2016). To this end, skills necessary for pedestrian transportation can be effectively taught by someone with whom the young adult is familiar, like a family member. Understanding ways to bridge the gap between young adults who struggle to find independent transportation and existing supports can help alleviate the isolation young adults with disabilities face accessing transportation independently (Pfeiffer et al., 2020). In planning supports for individuals to help them independently learn transportation skills and access their communities, existing supports like family members (Harriage et al., 2016) or technology (Bross,

Wood, et al., 2023; Brown et al., 2011; Davies et al., 2010; Mechling & O'Brien 2010) have been demonstrated to be effective.

Interventions using Public Transportation

In many communities a public transportation system offers opportunities for individuals to access their communities without driving. To this end, researchers have examined systematic and effective ways to teach youth and young adults with disabilities the skills necessary for using public transportation. Technology like a GPS (Davies et al., 2010) and video modeling (Mechling & O'Brien, 2010) provide accessible and useful ways to support youth and young adults with disabilities in accessing transportation.

Davies and colleagues (2010) compared two groups of individuals using a between-subjects design to examine how technology supports (i.e., personal digital device and GPS technology) compared to traditional supports (i.e., paper schedule) for independently accessing the public city bus. The experimental group received technology-based supports, and the control group relied on more traditional support methods like a written bus schedule and a printed map. The technology-based supports leveraged a personal digital device and GPS technology through a system called WayFinder which provided prompts and information about bus schedules and routes. In the experimental group, 73% of participants with ID were able to identify their correct destination, request a stop, and exit the bus at their location as compared to just 8% of the participants in the control group. None of the participants had previous experiences using the bus independently, and so, results from this study emphasize a real opportunity to leverage technology in supporting individuals with disabilities to access existing means of transportation that do not include driving.

In a similar study, Mechling and O'Brien, 2010 used computer-based video instruction (CBVI) to teach three young adults with ID, ages 19 to 20 years old, how to ride the public bus, identify landmarks, and request a stop. They used a single-case, multiple probe across participants design and person-first perspective video models with voice over to teach a single bus route with three visual landmark cues as participants rode the bus and requested a stop at a destination. The research team found the CBVI was effective and efficient for teaching all student participants to use landmarks, and then, request a stop using the bus signal to access a location in their community using public transportation. Not only were participants able to reach mastery in six or fewer trials, some participants were able to maintain skills following completion of the study. Following CBVI condition settings, participants were evaluated on their ability to generalize location landmarks across novel settings, Two of the three participants were able to generalize with 100% accuracy.

Interventions using Rideshare

Over the past 20 years, technology has influenced much of our day-to-day lives. Navigation is now easily accessible in most automobiles or on cell phones, and transportation services like taxis have grown to include rideshare services like Lyft and Uber (Ridester, 2013). Rideshare services connect drivers and passengers to accessible transportation options. The rideshare drivers use their personal cars, and their passengers use their smartphones to access rideshare services within their community. The rideshare apps allows users to schedule or request rides, see real-time driver location updates, and pay for rides (Ridester, 2013). Rideshare services offer real-time navigation and shared location access through their app for the safety of riders and drivers. Ridesharing transportation is another option for young adults with disabilities to access their communities in lieu of driving.

Bross, Wood, and colleagues (2023) used a single-case, multiple baseline across participants design to examine the use of classroom and community-based instruction (CBI) to teach young adults with disabilities to use ridesharing applications to access their community. Four young adults with intellectual disabilities were given classroom and CBI for the skills necessary to use Lyft. Skills for using Lyft were presented in a classroom setting using a PowerPoint presentation. The steps for using a rideshare were organized into a 10-step task analysis. Participants used a task analysis card to safely use Lyft after selecting from a menu of location destinations. Location destinations included a donut shop and a grocery store in the nearby area. Following intervention, two participants demonstrated a functional relation between the intervention and correctly completing the steps for safely using Lyft. The two other participants improved skills from baseline to intervention, but the data pattern could also be interpreted to demonstrate that they were learning from their experiences as well as learning as a function of the intervention. All participants maintained their skill one month following intervention. This research demonstrated yet another potential means for transportation, outside of driving, for young adults with disabilities. Limitation from this study included that participants using research team members devices, parents were not included, perhaps as even an interventionist, there were measures of maintenance but not generalization, and the cost of these app can be prohibitive. Leveraging existing supports, such as parents or technology skills, has been useful to provide increased transportation access for individuals for whom adult life may be limited for lack of reliable and independent transportation.

Conclusion

The current dissertation study extends the transportation skills literature for transition-aged individuals with IDD by including predictors of postschool success (i.e., self-determination,

parent involvement and expectations, community experiences) and programming for generalization. In this extension of research conducted by Bross, Wood, and colleagues (2023), young adult participants will use their own devices and travel to locations in their community using rideshare. The destinations will be locations that the young adults with IDD already travels to, so that the target skill is situated in the context of the young adult's existing transportation repertoire. Finally, parents will ride along with their young adults and be included in safety features of the Lyft app so that they can track their young adult's location in transit. A final phase of the study will provide for an opportunity in which the young adult can ride independently in the Lyft (without a research team member) if they choose. As an additional measure of social validity, the current study will include a pre- and post-intervention survey for parents. Parents will complete a survey related to parent expectations about their child's skills and ability using rideshare before and after the project. The history and legal implications of public education indicate that students with disabilities can expect that upon graduation they will be prepared to engage competitively and globally. Principles of applied behavior analysis indicate that we can use changes in the environment to train for behaviors using systematic and thoughtful design and implementation. Finally, research for transition programming has outlined targets for life after high school and summarized current knowledge related to predictors of those targeted outcomes. The current study seeks to leverage this information in order to conduct an intervention study to teach young adults with IDD to independently access their communities, including their preferred destinations, with the help and support of their parents such that the young adults continue to use rideshare services long after the study is completed. In addition to the research questions listed in Chapter 1, the current study will use measures of social validity

pre- and post-intervention to glean information about young adult participants' self-determination as well as parents' expectations.

CHAPTER 3: METHOD

This chapter details the participants, procedures, and other aspects of the research conducted in the present study. Information about the method provided herein functions to reflect the attitudes of science, specifically: determinism, empiricism, experimentation, replication, parsimony, and philosophical doubt. This information is provided to (a) inform the reader about the methods used to examine the research questions and (b) document progress in the area of transportation research for individuals with disabilities in order to contribute to efforts to understand and remedy shortcomings in this area. The purpose of this study was to examine the effects of a parent-involved transportation skills training intervention on the rideshare usage and generalization of rideshare usage skills for young adults with intellectual and developmental disabilities (IDD).

Institutional Review Board and Data Usage Agreement

The researcher completed a full institutional review board submission (IRB) prior to any recruitment or implementation of this research. A research team was gathered, their collective CITI training was documented, and the researcher completed the steps for the University of North Carolina at Charlotte's IRB. The university IRB approved all elements of the research project, including the research team members, project consent and assent scripts, intervention and data collection materials, and data collection and usage agreements before participants were recruited. The protocol for all elements of the project were secured and shared with all team members for the sake of clarity and procedural integrity.

Participants

Participants for this study were three young adults with IDD and a parent or guardian counterpart. In this study young adults with IDD participated in a dyad with a parent though

inclusion criteria allowed for a parent or guardian. Because all participants participated with a parent, this description used the language “parent,” though a parent or guardian was allowed. Though the primary research questions were related to young adults with IDD, their parents rode with the young adult for a baseline and an intervention phase ride; and therefore, parents were a participant group. Participants were recruited from schools and community organizations where the researcher had an established relationship. Parent participants met with the lead researcher to learn about the project and have questions answered. Additionally, parents and young adults met with the lead researcher to discuss transportation routines and schedules. Parents also accompanied their child for one baseline and one intervention data collection ride. Finally, parents were added to the Lyft accounts of their child so that each ride a young adult participant took, scheduling, travel, driver, and arrival detail were automatically shared with parents.

Inclusionary and Exclusionary Criteria

Young adult participants with IDD were selected based on the following criteria: (a) the student qualified for IEP services based on IDD or other related diagnosis (e.g., autism spectrum disorder, pervasive developmental disorder-not otherwise specified [PDD-NOS]); (b) the student was 18 years or older; and (c) the student had the social and communication skills necessary to navigate the community or familiar locations based on parent estimation. Parent participants were eligible if they agreed to meetings, and if they were the parent of a young adult who was also participating. Potential participants were not considered eligible for the study if they had prior experience using Lyft or other rideshare services independently. Initially, the inclusion criteria for age was between the ages of 18 and 26. As a result, the lead researcher submitted an IRB amendment so that there was no age limit for participation in the study. It was discovered during recruitment that an additional criteria for inclusion was that the young adults had to have

their own cell phones in order to add and use the Lyft app. Demographic information for all three participants can be found in Table 1.

Table 1

Participant Demographic Information

	Participant Demographics		
	Jalen	**Kurt**	**Oscar**
Age	19	19	19
Gender	Male	Male	Male
Race/ethnicity	White	White	White
Disability	Neurofibromatosis-1	Down Syndrome	Intellectual Disability
School Setting	Post-secondary Program	Post-secondary Program	Post-secondary Program
Degree of Rideshare Experience	Never order, ride along only	Never order, ride along only	Never order, ride along only

Jalen

Jalen (pseudonym) was a 19 year-old White male with Neurofibromatosis-1, and autism. He was enrolled in a post-secondary program at a local community college. Jalen was employed at a grocery store where he earned competitive wages and worked a few days each week. Jalen had not ridden in or ordered a rideshare before participating. Jalen downloaded the Lyft app in order to participate. Jalen and his mother attended his "Getting started" meeting. His primary rides for participation were to and from school and to and from work. Beyond trips to work and to school, Jalen's transportation routines included trips to the mall with friends, trips to the park for an exercise group, and trips to friends' houses. Jalen reported that his mother was his primary mode of transportation prior to participating in the study.

Kurt

Kurt (pseudonym) was a 19 year-old White male with Down Syndrome. He was enrolled in a post-secondary program that focuses on life skills and employability skills. Kurt had not ridden in or ordered a rideshare before participating. He was employed part time at a sandwich shop where he earned competitive wages. Kurt downloaded the Lyft app in order to participate. Kurt attended his "Getting started meeting along with both of his parents. His primary ride for participation were to and from school and to and from work. During his getting started meeting, Kurt indicated that beyond school he used transportation for getting to football and spending time with friends. His primary mode of transportation prior to the study was different members of his family.

Oscar

Oscar (pseudonym) was a 19 year-old White male with an intellectual disability. He was enrolled in a post-secondary program that focuses on life skills and employability skills. Oscar had ridden in a rideshare before but never ordered one on his own. Oscar downloaded the Lyft app in order to participate. Oscar's primary transportation routines for participation were to and from school and appointments. Oscar and his mom attended his "Getting started" meeting. Oscar did not have a job at the time of the study, but was preparing for an internship and a college program. He indicated that he liked to travel to friends' houses, the movie theatre, and sports. Oscar's primary mode of transportation before the study was his mom.

Settings

There were three settings for this project. Settings included the online meeting platform Zoom, homes, and the rideshare cars. Parent meetings occurred via Zoom or at a participant's home. One young adult also received training at his house in between rides from school and to

work. For the other two participants, instruction took place in a classroom setting at the private separate school that they attended. The classroom was in a home that the school uses for teaching transition skills and the classroom was arranged like a living room with seating for many people. The lead researcher used her laptop for all training lessons to share the PowerPoint presentation.

The rideshare car setting was in the community. There was no one specific location for this part of the project as young adults, their parents, and the intervention team used Lyft to ride from familiar departure locations to familiar arrival locations. The expectation was that each participant left from and arrived to separate locations, and each participant could depart and arrive to multiple locations. Example of locations traveled by the young adults included a gym, their place of employment, coffee shop, library, school, appointments, etc. The participants rode in a different Lyft car for each ride. While there were various differences across these settings, the underlying features remained the same. Cars were driven by Lyft drivers, and the cars and drivers reflected the standards outlined on the Lyft website.

Following baseline and intervention phases of the study, participants were given the option to participate in three generalization rides. First, participants were given the option to ride alone in a Lyft car as a research team member followed ensuring that someone was with the participant at the departure and arrival location. A second option for participants for generalization was to use the “schedule” feature in the Lyft app to schedule a ride in advance for a later date and time. A third optional step of generalization was for participants to ride to a familiar location that they have not used rideshare for as part of this study. In other words, there was a final setting which was familiar to the participant but that they had not taken a ride to during baseline or intervention. For all generalization sessions, participants were given the option

at the start of each ride to ride alone or with a research team member following in their car while the participant rode with a Lyft driver.

Materials

Materials used for this study included a PowerPoint presentation to teach young adults with IDD the steps for safely using rideshare, a rideshare task analysis checklist, a fidelity checklist for training, a checklist for interobserver agreement, a planning document, and a wallet-sized task analysis card (see Appendices A-F). Additional materials included: young adults' phones with the Lyft app downloaded, Lyft gift cards for funding rides in increments, a planning spreadsheet to schedule rides and research team members, and pencils for data collection. The researcher used previous Lyft rideshare research to guide the design of the PowerPoint instructional materials, the fidelity checklists, and the task analysis (Bross, Wood, et al., 2023). Steps in the task analysis were modified so that only the steps necessary for independent and safe Lyft ride usage were included. Further, these discrete steps were written so that they can be observed by a research team member beyond the context of the participant riding in the Lyft car. Steps were written this way so that when participants agree that they would like to ride independently in the Lyft, without a research team member, the participants' accuracy using the rideshare service could still be measured and compared to baseline and intervention phases. The researcher also used feedback from previous rideshare studies (Bross, Wood, et al., 2023) to guide the design of a wallet-sized task analysis card.

Researcher

I am a third-year doctoral student in special education at the University of North Carolina at Charlotte. My primary areas of research and study are in secondary transition and applied behavior analysis. At the time of the study, I was Project Coordinator of an Institute of Education

Sciences grant called CIRLCES that facilitates interagency collaboration for transition planning to help improve outcomes for youth and young adults with disabilities. I was also part of the research team working to develop and identify the effects of the Goal Setting Challenge App on secondary student goal attainment and self-determination. Additionally, I gained experiences related to transportation and travel skills in three studies prior to this dissertation study. I am the second author on a qualitative study wherein young adults with IDD, their parents, and community service providers were interviewed about barriers that exist for young adults with IDD as they try to access transportation and the community. I also worked as a research assistant on a rideshare study upon which many of the elements of this study were based, and I conducted a pilot investigation to assess the measures and procedures for this study (Fredrick et al., 2022). Prior to enrolling in the PhD program, I spent seven years as a secondary special education teacher. My experiences included community partner outreach, transition planning, and the day-to-day responsibilities of being a classroom teacher.

I, as the researcher, designed training materials, gathered and adapted data collection tools, and designed intervention phases with the guidance of my dissertation committee chair and other committee members. I trained research team members in the data collection processes and fidelity protocol, arranged schedules for all participants and research team members, and interpreted and reported the results of pre- and post- intervention measures as well as all other data collected. I was responsible for gathering assent and consent documentation from all participants, storing information securely, obtaining IRB from the university, and administering gift cards for the use of the Lyft app.

Interventionists

Primary Interventionists

In addition to the researcher, the research team comprised two primary interventionists. The primary interventionists were two doctoral students from the University of North Carolina at Charlotte in the Department of Special Education and Child Development. All three interventionists had experience as classroom teachers working with secondary-aged students with disabilities. Primary interventionists completed extensive coursework related to research methodology and single-case methodology. The primary interventionists were trained on both baseline and intervention procedures including data collection and prompting procedures. The researcher conducted assessments to ensure that the primary interventionists tracked the steps completed by each young adult participant with IDD. Additionally, the members of the research team were part of the initial research team for which this current study replicated. Systematic changes were discussed at the onset of this study, and the team members demonstrated an inability to collect data or low measures of procedural fidelity or interobserver agreement, the team would meet to discuss and retrain for accuracy. The team coordinated so that once participants shared ride needs for the week, the primary investigators used a Google Document sign-up page to plan who would ride with what participant and when. Next, the researcher shared ride schedules and plans with participants and their parents. The team referenced the Google Document in communicating to coordinate opportunities to collect both interobserver agreement (IOA) and procedural fidelity checks. For IOA, a second member of the research team was present and collected data on the participants' steps using rideshare. Following the data collection session, the research team members compared their scores and calculated agreements and divided by the number of agreement and disagreements. This number was multiplied by 100

to calculate a percentage. For 30% of lessons a second researcher was present to measure procedural fidelity of the researcher-implemented intervention lesson using PowerPoint. In addition, the secondary researcher measured IOA of the task analysis during the in-vivo ride.

Secondary Parent Observers

Three parents served as participants for this study. In order to evaluate the influence of research participation on parents, they participated in planning steps prior to baseline so that they understood the study and how the Lyft app works. Each parent rode in the Lyft with their son during one baseline ride and one intervention ride. They were accompanied by a primary interventionist for all sessions. The team of primary interventionists and the researcher collected social validity data on parent expectations before baseline and after intervention. Interventionist, either the researcher or a research team member was also present for all sessions to ensure the young adult was supported according to study design.

Experimental Design

A single-case multiple probe design was used to examine the effects of a parent-involved rideshare intervention on the rideshare usage and generalization of rideshare usage skills for young adults with IDD. The multiple probe allowed for comparisons within and across successive alterations across conditions, and data were collected to measure the changes across the successive condition alterations (Murphy & Bryan, 1980). In this study, the successive conditions were the different young adult participants with IDD. The multiple probe design is flexible and rigorous in that it allows for intermittent measurement and is well-suited for behaviors that are not dangerous (Ledford & Gast, 2018). The study design included baseline and two phases of intervention. Participants began baseline simultaneously and began intervention at separate, staggered times to control for history effects. The first participant entered intervention

following a stable baseline while the other participants remained in baseline. Once there was a demonstration of treatment effect for Participant 1, and Participant 2 had a stable baseline, Participant 2 entered into intervention Phase 1. The project followed this pattern for all participants. For each participant, movement from Phase 1 to Phase 2 of intervention was contingent on mastery criteria and participant willingness to travel independently.

Procedures

The study was organized into five phases: planning phase, training phase, baseline phase, intervention phase, and generalization phase. The elements of each phase are outlined in Table 2. All components of a preceding phase had to be completed before participants progressed on to a later phase. Phases 1 and 2 involved planning and sharing information with parents. Phase 3 was baseline data collection, Phase 4 was intervention, and Phase 5 was an optional phase for measuring generalization. Components of each phase are provided in Table 2.

Table 2.

Phases of Rideshare Study

Phase 1	● Student location and schedule assessment ● Parent expectation and social validity measurement (researcher-developed) ● Confirm parent availability for parent rides ● App download, gift card loading, share settings ● Share information about study and safety procedures o Procedures for scheduling rides
Phase 2	● Implementor schedule coordination and research team sign ups

Table 2.

Phases of Rideshare Study (continued)

Phase 3 (Baseline)	● Student baseline data collection wherein researcher takes steps to avoid incidental training
Phase 4 (Intervention)	● Classroom lessons ● Add location labels ● In vivo instruction ● Rideshare riding
Phase 5 Generalization (*Optional)	● *Use rideshare to a previous/practiced destination without a parent or research team member in the car. Research team member follows. ● *Use rideshare to a location that is familiar, but has not been traveled to in a rideshare as a part of the study, without parent or research team member in the car. Research team member follows. ● *Use rideshare scheduling features to schedule a ride in advance and the ride without parent or research team member in the car. Research team member follows. ● Parent expectation and social validity measurement

Phase 1

In Phase 1, each young adult and parent participant engaged in a planning process with the researcher. Participants listed the existing destinations that they travel to and shared information about their commutes. Together with the researcher, each young adult and parent participant completed a form that included their schedules with travel times and routines across

the week. The researcher put this information into a secure shared document for planning purposes. During Phase 1, the researcher met with each young adult participant in person to download the Lyft app and set up safety features including automatic location sharing with the parent participant and researcher. At the time of the study, the Lyft app included a feature wherein users could opt to automatically share all ride information with another party. Shared information included details about the car and driver that picked up the rider as well as real-time ride tracking on the app.

Participants' rides were paid for by the funding provided by multiple grants. In order to allow participants to use their phones, the researcher provided digital Lyft gift cards in $50 increments for young adult participants with IDD to use on the Lyft app. The gift card increments were intended to provide enough funding so that riders could use Lyft for study purposes but were given in increments to mitigate instances of young adult participants using the gift card for rides beyond the scope of the study. In Phase 1, the pre-intervention assessment for parent participants related to social validity took place. Finally, the research team introduced parents to the calendar sharing and planning tools (Appendix A).

Phase 2

In Phase 2, the research team entered information about the participant's destination and transportation routines into secure folders so that the information could be shared with parents and research team members but not with anyone else. The research team used tools (e.g., Google spreadsheet in a Google Drive) to coordinate schedules and plan rides for the duration of the study. The research team also used this information for large-scale planning to ensure that enough research team members were available to ride along, collect data, collect interobserver agreement data, and follow rideshare rides when necessary.

Phase 3

In Phase 3, baseline data collection began. In order to avoid *in situ* training, interventionists provided a scripted prompt to the young adults. First the research team member said, “Where do you want to go?” and waited for a response from the participant. Then the researcher would say, “Okay, take us there.” The research team member used a copy of the task analysis to monitor the steps the young adult took in requesting, getting into, and ending a ride. If young adults performed a step incorrectly, or did not perform a step, the researcher took the participant’s phone and held it so that the young adult could not see the screen or the actions that the interventionist was taking. The interventionist performed only one step and then handed the phone back to the participant. For steps such as asking the driver’s name or buckling their seat belt, participants were given a 3 sec time delay, and if they did not complete the step or they performed the step incorrectly, the interventionist simply performed the step for the learner as discretely as possible to avoid training during baseline.

Phase 4

The intervention began in Phase 4. During intervention, young adult participants received a lesson from the research team using PowerPoint. Slides included a script and followed the same steps outlined to parents during Phase 1. After the presentation, the researcher used a script to present an activity to young adults. The activity involved sequencing the steps using laminated picture cards with text. Finally, a research team rode with participants for one ride, giving instruction on the task steps and answering any questions young adults had. Following this initial training ride, a parent rode with the young adult in the Lyft car while a member of the research team provided prompting using least-to-most prompting procedures. A research team member

was present for all rides during the intervention phase to record data on prompting procedures and to provide prompts.

Phase 5

Generalization was measured in Phase 5. Before each ride in this phase a research team member confirmed with the young adult participant if they wanted to ride alone while the research team member followed in their car. Parents were made aware that young adults would be followed and were still able to follow or watch the ride route from the app features that allowed them to track the riders' route in real time. If young adult participants were successful riding independently, they were given two additional opportunities to ride independently, (a) to a destination that they had not traveled to during the study, and (b) using the schedule features to plan a ride ahead of time. This destination could be novel or familiar. Finally, all participants (i.e., parents and young adults) completed post-assessments of social validity. The young adult survey focused on the young adults' satisfaction with using rideshare as a mode of transportation. The parent survey included follow up questions about their expectations related to their son's use of rideshare.

Data Collection Procedures

Dependent Variable

The primary dependent variable for this study was the number of task analysis steps completed independently by the young adult participant with IDD (see Appendix A). The research team used paper data collection sheets and a pencil to track young adult participants' completion of task analysis steps and made notes about the level of prompting the participant required. A least-to-most prompting procedure was used to prompt participants during intervention. Least-to-most prompting involved providing an opportunity for the participant to

perform the task analysis steps before giving the least amount of assistance. Each incorrect response led to a stronger prompt in the prompt hierarchy. Least-to-most prompting is useful when individuals demonstrate rapid skill acquisition (Cooper et al., 2020), and in the case of this intervention, previous research indicated that participants rapidly gain skills using ridesharing applications (Bross, Wood, et al., 2023). If a participant was unable to perform a step in the task analysis independently after 5 sec, a member of the research team provided the least intrusive prompt, a verbal reminder of the step. If, after another 5 sec, the participant did not perform the step, the researcher moved to a more intrusive prompt, pointing at the screen to direct the participant. Finally, if the participant still did not perform the task analysis step after two prompts and 15 sec, the researcher modeled the task analysis step by performing the step so that the participant could observe what was happening. The tasks analysis consisted of 11 steps, and data on all 11 steps was collected outside of the ride portion of the Lyft experience. In other words, all data were collected outside of riding time to ensure that data collection procedures for the optional final phase (generalization) were no different than data collection from other phases of the project. First, young adults needed to use app features to request the Lyft ride and find a meeting location (steps 1-5). Second, young adults needed to ensure safety by confirming their driver's identity and buckling their seat belt (steps 6-9). Finally, young adults needed to exit the Lyft appropriately and tip their driver (steps 10-11). Steps were counted as completed independently or completed with a prompt. The data collection sheet also provided space for research team members to take notes about the ride because rideshare drivers are different each time. The research team also recorded information about the distance of the ride, the cost of the ride, and the remaining balance on participants' gift cards to ensure that participants were prepared with new funds for next rides.

Secondary Measures and Social Validity

In addition to the primary dependent variable, the researcher collected data on secondary variables for social validity, particularly those related to the in-school predictors of postsecondary outcomes for individuals with disabilities (Mazzotti et al., 2016; Mazzotti et al., 2021; Test et al., 2009). These included a parent pre- and post-intervention measure of parent expectations and involvement and a social validity survey for young adult participants (researcher-developed). Each of these secondary measures was intended to evaluate the impact of predictors, including parent expectations and involvement and community experiences. Pre-intervention assessments for parents included a measure of expectations and involvement (i.e., researcher-developed). Post-assessments for parents included measures of expectations (i.e., researcher-developed).

Social validity was conducted using young adult and parent surveys (Appendices G & H) following intervention. In addition, both participant groups were given an opportunity to participate in an interview related to the social validity of the project and to provide additional comments to share about their experiences. Wolf (1978) described the importance of social validity relative to the goals, procedures, and effects (intended and unintended) of an intervention. Social validity provides an opportunity for the consumer, as a representative of society, to indicate the social relevance of the outlined goals, procedures, and outcomes in a study. For this study, parents and young adult participants were asked about the goals, procedures, and outcomes of the study in order to capture the perceived social validity of the most involved stakeholders.

Generalization Measure

Generalization is a key component of this research. Participants traveled to and from familiar locations (i.e., locations already in their transportation repertoire) using their own devices to access Lyft services. Young adult participants traveled to more than one familiar location as part of the research study which allowed for generalization of their ridesharing skills across locations. Young adult participants were given the opportunity to navigate the app to schedule a ride for a later time. This step provided an opportunity for young adults to demonstrate generalization as they navigated the app with no training or instruction. Finally, the Lyft app sent different drivers in different cars every time a rider used the service. For this reason, young adult participants engaged in the app services across multiple drivers and cars. Generalization was programmed into the study and was measured at the end in the optional Phase 5 if (a) the young adult participant chooses to ride independently (with a research team member following in her own car), or (b) if the young adult chose to ride to a new destination independently, or (c) the young adult chose to use the ride scheduling features. Additionally, settings and responses were rich in the nuance of a natural context, including weather, other people, and traffic patterns. The study utilized three of the seven tactics outlined by Stokes and Bear (1997) for generalization: (1) teaching so that responses enter the natural community, (2) training multiple and diverse exemplars, and (3) using stimuli that are found in the generalized setting. These correspond to elements of this study such that: (a) participants accessed rides to and from locations that they already travel to; (b) they accessed different cars on different days, driven by different drivers, possibly to different locations; and (c) they accessed locations of their choosing, a natural consequence of using rideshare, as part of the intervention.

Interobserver Agreement

Interobserver agreement refers to the extent to which two observers agree after independently record behaviors (Ledford & Gast, 2018). Interobserver agreement in this study was to the extent to which two observers independently record the same behavior as occurring or not occurring during the rideshare session. Interobserver agreement was collected for 7 of 60 sessions, rational for this is included in this section. Research team members rode in the rideshare for all rides with the parents and young adults. Had research team members scored lower than 90% for interobserver agreement, the team planned to meet to discuss differences and retrain involved members of the research team.

Implementation Fidelity

Implementation fidelity refers to the degree to which a research team member adheres to the task steps of instruction. Implementation fidelity was measured by a second member of the research team while the lead researcher implemented instruction. The secondary team member marked a tally for each step of instruction that the lead research conducted during power point, practice, and in-vivo instruction. Implementation fidelity for this study was collected for one of three intervention sessions.

CHAPTER 4: RESULTS

This chapter summarizes the results of the study. First is a summary of implementation fidelity and interobserver agreement. Next, this chapter details the results of the study and the information is organized as responses to each research question. Included throughout this chapter are graphs and tables for clarity.

Implementation Fidelity

Implementation fidelity data were collected for 33.3% of instructional sessions; however, implementation fidelity was scored for Jalen only. An additional member of the research team watched the lead researcher deliver the intervention and marked each step of instruction that the lead researcher completed. Jalen's intervention sessions were the only ones that occurred at a time when more than one research team member was available. Implementation fidelity was 100% on instruction for Jalen.

Interobserver Agreement

An additional member of the research team collected data at the same time as another member of the research team to determine interobserver agreement (IOA). IOA data were collected for 7 of 60 sessions (11.7%) across all participants. IOA data were collected for 4 baseline sessions and 3 intervention sessions. Following the session, the two members of the research team compared their scores. IOA was calculated by the total number of agreements divided by the number of agreements plus disagreements. This number was multiplied by 100 to calculate a percentage. Interobserver agreement was 100% for all 7 sessions.

Results for Research Question 1: What is the efficacy of an intervention consisting of classroom instruction with practice and feedback and an in-vivo checklist to teach young adults with IDD to travel to community-based locations using a ridesharing app?

There was a functional relation between the intervention and the number of task steps completed independently and correctly for all three participants. Results from all three participants are shown in Figure 2 . I relied on visual analysis of the graphed data to determine a functional relation. When the intervention was introduced to each participant, the data showed an immediate increase, an increase in the level and trend. Across baseline, participants demonstrated a relatively stable pattern of correct responses prior to intervention. Following intervention, all participants' data increased to a higher, stable level. Additionally, there are no overlapping data points between the baseline and intervention phases for all three participants. Figure 2 shows that all three participants reached mastery criteria of at least three consecutive 100% sessions during intervention. Even with a staggered intervention, it was when, and only when the intervention was introduced that all three participants' performance increased to mastery. The following sections describes the results of the study by participants. Specific information about the performance of Jalen, Kurt, and Owen is organized accordingly.

Jalen

Jalen completed 5 baseline data sessions. During baseline, Jalen completed a mean of 60% of steps independently (range = 46% - 69%). Jalen's baseline data were relatively stable with three consecutive sessions of 61.51% independent steps correct before intervention. Jalen completed 8 sessions after receiving intervention. Following intervention, Jalen completed between 84.6% and 100% of task steps independently. Jalen's mean score for independent correct steps in intervention was 98.1% and he reached mastery after four sessions. Jalen

completed seven 100% independently correct sessions before moving to the generalization phase.

Kurt

Kurt completed 9 baseline data sessions. During baseline, Kurt completed a mean of 53% of steps independently (range = 46% - 61%). Kurt's baseline data were somewhat variable with three consecutive sessions of 53.8% independent steps correct before intervention. Kurt completed 8 sessions after receiving intervention. Following intervention, Kurt completed between 76.9% and 100% of task steps independently correctly. Kurt's mean score for independent correct steps in intervention was 93% and he reached mastery after seven sessions. Kurt completed four 100% independently correct sessions before moving to the generalization phase.

Oscar

Oscar completed 14 baseline data sessions. During baseline, Oscar completed a mean of 59% of steps independently (range = 39% - 69%). Oscar's baseline data were relatively stable with some variability at the beginning and end of baseline. Oscar completed 7 sessions after receiving intervention. Following intervention, Oscar completed between 76.9% and 100% of task steps independently. Oscar's mean score for independent correct steps in intervention was 95% and he reached mastery after six sessions. Oscar completed four 100% independently correct sessions before moving to the generalization phase.

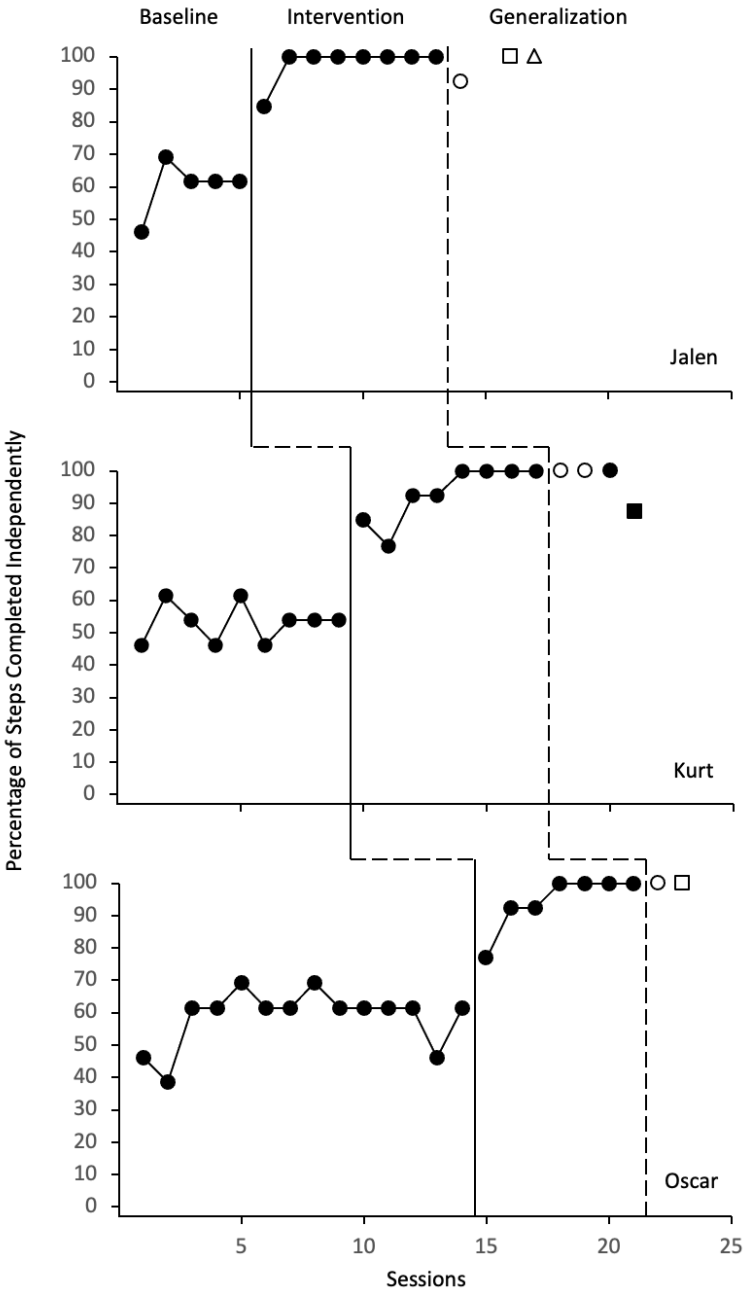

Figure 2

Percentage of Rideshare Steps Completed Independently

Note: open circles = follow ride; squares = scheduled ride; open squares = scheduled follow ride; triangle = novel to study ride; open triangle = novel to study follow ride

Results for Research Question 2: To what extent are ridesharing app skills generalized or maintained following intervention?

All participants were given all options for generalization rides. There were three types of generalization rides in this study: (a) follow rides, (b) scheduled rides, and (c) novel to study. First, participants were given the option to ride alone in the rideshare car with a member of the research team following ("follow rides"). Next, participants were given the option to use the Lyft ridesharing app to schedule a ride for a later time ("scheduled rides"). This required generalization as the steps for scheduling a ride are somewhat different than ordering a ride on demand which is how participants were taught. Finally, participants were given the option to use rideshare to travel to a location that they had not traveled to as part of the study, this was called a "novel to study" ride. For both "scheduled rides" and "novel to study" rides, participants were able to choose if they wanted the ride to be a "follow ride" or a ride along (i.e., with a research team member) ride. All three participants completed multiple generalization rides; however, each participant made different choices for which rides to take. The choices and results of their independently completed steps for generalization rides are described next.

Jalen chose follow rides for all three of his generalization rides. First, he rode a familiar route, using the typical rideshare steps while a member of the research team followed. He completed 92.3% of the steps independently. Jalen forgot to check the license plate when the driver arrived and even told the research team member that he missed this step when he arrived at his destination. Second, Jalen generalized his use of rideshare to travel to get his haircut. He had not traveled to this location for the study before. A member of the research team followed for this ride and Jalen completed 100% of the steps independently. Finally, Jalen scheduled a ride to a familiar destination and rode the next day. The sequence for this task involved more

steps and Jalen completed all of the steps (100%) independently. A member of the research team followed as Jalen rode in the car for this ride. Jalen completed all opportunities for generalization and scored between 92.3% and 100% independent steps correct. His average across the three generalization rides was 97% steps completed independently.

Kurt chose follow rides for two of his four generalization rides. First, he rode a familiar route, using the typical rideshare steps while a member of the research team followed. He completed 100% of the steps independently. Then, Kurt scheduled a ride to a familiar destination and rode the next day. The sequence for this task involved more steps and Kurt completed 14 of 16 steps (87.5%) independently. Kurt asked that a member of the research team ride with him for his scheduled ride, so he did not ride independently. Is it important to note that at this time Kurt was not choosing between riding alone or not going/having his parents drive him, rather, Kurt was choosing between riding with a member of the research team or not riding with a member of the research team. Kurt completed 3 of 4 opportunities for generalization and scored between 87.5% and 100% independent steps correct. His average across the three generalization rides was 96% steps completed independently.

Oscar chose follow rides for both of his generalization rides. First, he rode a familiar route, using the typical rideshare steps while a member of the research team followed. He completed 100% of the steps independently. Second, Oscar scheduled a ride to a familiar destination and rode the next day. The sequence for this task involved more steps and Oscar completed all of the steps (100%) independently. A member of the research team followed as Oscar rode in the car for this ride. For two generalization opportunities, Oscar 100% independent steps correct.

One participant, Kurt, demonstrated maintenance by continuing to use the rideshare app following his participation in the study. Following completion of his participation in the study, Kurt's family reached out to the lead researcher to inform her that Kurt would use rideshare the next week to get to school and get home from school. While the lead researcher was not present to collect data on the accuracy of Kurt's efforts completing the steps of the task analysis, she was able to confirm that he made it to and from school safely and independently using rideshare because Kurt's rideshare usage was still shared with her from his participation in the study.

Results for Research Question 3: What is the social validity of the intervention for young adults with IDD using a ridesharing app as a mode of transportation within their communities?

All three young adult participants were given social validity surveys following their participation in the study. The survey included nine questions with a Likert-type scale for responding and three open-ended questions. The Likert-type scale ranged from 1, strongly disagree to 5, strongly agree. Option 3, allowed for participants to indicate unsure. Likert-type questions on the social validity questionnaires revealed that all participants strongly agreed that: 1. "the rideshare app was easy to use", 2. "I liked taking rides by myself in the rideshare", 3. "I felt independent when I traveled to locations on my own in the community in the rideshare, 4. "I liked using a rideshare app more than my current way of going places in the community", 5. "I will continue using the rideshare app after this study", and 5. "I will use rideshare to travel to more locations in my community in the future." (list SV response options). Participants "agreed" or strongly agreed (mean = 4.6) for both prompts 1. "I liked using the ridesharing app to travel to locations in my community" and 2. " I liked the PowerPoint visual to learn how to use the rideshare app." Participants felt neutral, agreed, or strongly agreed that "I liked having an

instructor in the car when I was learning how to use the rideshare app." Table 3 demonstrated the results from the young adult social validity survey.

There were three open ended questions for young adult participants following participation in the study. Two of the three participants responded to these questions. The first question asked, "what did you like best about using the rideshare app?" Young adults responded: "I just like it" and "I liked using it". The second asked, "what did you like least about using the rideshare app? Young adults responded: "Some of the people, but I did like others" and "Nothing". Finally, question 3 asked, "what was hard for you when using the rideshare app? Young adults responded: "No" and "It wasn't hard."

Table 3

Social Validity Range and Average Scores by Young Adult Participants

Questions	Jalen	Kurt	Oscar	Average Rating
Young Adult Social Validity				
I liked using the rideshare app to travel to locations in my community.	4	5	5	4.6
The rideshare app was easy to use.	5	5	5	5
I liked the PowerPoint visual to learn how to use the rideshare app.	5	5	4	4.6
I liked having an instructor in the car when I was learning how to use the rideshare app.	3	5	5	4.3
I liked taking rides by myself in the rideshare.	5	5	5	5
I felt independent when I traveled to locations on my own in the community in the rideshare.	5	5	5	5
I liked using a rideshare app more than my current way of going places in the community (e.g., parent driving me, sibling driving me).	5	5	5	5

Table 3

Social Validity Range and Average Scores by Young Adult Participants (continued)

I will continue using the rideshare app after this study.	5	5	5	5
I will use rideshare to travel to more locations in my community in the future.	5	5	5	5

Note. Based on a 5-point Likert scale. 1 = strongly disagree, 2 = disagree, 3 = unsure, 4 = agree, 5 = strongly agree.

Results for Research Questions 4: What is the social validity of the intervention for parents of young adults with IDD using a ridesharing app as a mode of transportation within their communities?

All three participants had one baseline ride with a parent. Two parent participants completed an intervention ride along. Parents of young adult participants completed two social validity surveys: a pre- and a post-study social validity survey. Three parents completed the pre-assessment and five parents completed the post-assessment.

Likert-type Pre- and Post-Study Social Validity Responses

Social validity pre-questionnaires indicated that all parent participants either slightly agreed, agreed, or strongly agreed that 1. “rideshare is an effective option for addressing the transportation needs of my young adult”, 2. “my young adult can secure and use funds to access rideshare”, 3. “my young adult will continue to use rideshare after the completion of this study”, 4. “I use rideshare”, 5. “learning to use rideshare is consistent with my young adult’s transition goals”, 6. “my young adult will be safe when using rideshare in the community independently,” 7. “I would feel more comfortable with my young adult using rideshare if my young adult could select from preferred/familiar drivers”, and 8. “it is important for my young adult to access/use publicly available transportation independently to access the community.” These scores stayed

about the same between pre- and post-study surveys. Parents were also asked about the skills they thought their young adult would need to successfully navigate the rideshare app. Ranges and mean scores from this survey are depicted in Table 4. For all skills (social interactions, app/app features, necessary planning, and safety features with the app) parent agreement increased that their young adult had the skills necessary to successfully use rideshare.

Post-intervention social validity surveys from parents indicated that they agreed or strongly agreed that the length of time and effort for the study was reasonable. All parents strongly agreed that the research team took appropriate steps to ensure their child's safety, the total time required for themselves and their young adults to participate in the study was manageable. Parents indicated that they did not know or strongly disagreed that they would "not be interested in continued participation or learning more about rideshare use for my young adult."

Table 4

Social Validity Range and Average Scores by Parent Participants

Questions	Pre Ratings Range	Post Ratings Range	Average Rating Pre	Average Rating Post
Pre and Post Intervention Parent Survey				
Rideshare is an effective option for addressing the transportation needs of my young adult.	5 - 6	5 - 6	5.3	5.2
My young adults can secure and use fund to access rideshare.	4 - 5	4 - 6	4.3	5
When using a ridesharing app my young adult will successfully navigate				
…the social interactions necessary.	3	4 - 6	3	4.8

Table 4

Social Validity Range and Average Scores by Parent Participants (continued)

…the app and app features.	3 - 4	4 - 6	3.6	5.4
…the necessary planning.	3 - 4	4 - 5	3.6	4.8
…the safety feature within the app.	2 - 3	4 - 5	2.6	4.8
My young adult will continue to use rideshare after the completion of this study.	4 - 6	4 - 6	5	5.2
I use rideshare.	4 - 6	4 - 6	5	5
Learning to use rideshare is consistent with my young adult's transition goals.	4 - 6	4 - 6	5	5.6
I would need support to facilitate my young adult's use of rideshare.	3 - 4	1 - 6	3.6	3.8
My young adult will be safe when using rideshare in the community independently.	4 - 5	4 - 5	4.3	4.8
My young adult has the skills necessary to use rideshare independently.	3 - 5	5	4	5
I would feel more comfortable with my young adult using rideshare if my young adult could select from preferred/familiar drivers.	5 - 6	5 - 6	5.6	5.6
It is important for my young adult to access/use publicly available transportation independently to access the community.	4 - 5	5 - 6	5	5.6
Post Intervention Parent Survey				
The length of time my child spent learning to use rideshare was reasonable for the purposes of learning to use rideshare independently.	5 - 6		5.8	
My effort observing and engaging in the study was reasonable.	5 - 6		5.6	

Table 4

Social Validity Range and Average Scores by Parent Participants (continued)

The research team took appropriate steps to ensure my child's safety throughout the study.	6	6
The total time required for me to participate in this rideshare study is/was manageable.	6	6
The total time required for my young adult to participate in this rideshare study is/was manageable.	6	6
I would **not** be interested in continued participation or learning more about rideshare use for my young adult.	0 - 1	0.4

Note. Based on a 0 to 6-point Likert scale. 0 = Unsure or don't know, 1 = strongly disagree, 2 = disagree, 3 = slightly disagree, 4 = slightly agree, 5 = agree, 6 = strongly agree.

Open Ended Pre- and Post-Study Social Validity Parent Responses

Parents were also asked to answer open-ended questions pre- and post-intervention. Pre- and post- study responses were similar. When asked, "What do you expect to be the most significant challenge for your young adults to safely use ride share?," parent responses included ideas related to communication, awareness, problem-solving, and opportunities to practice. When asked to respond to the statement: "The cost of rideshare makes it a reasonable option for my young adult to use for transportation," parent responses indicated that occasional use would be an option, but concerns such as surge pricing, high costs for longer rides, and daily/routine use would not be reasonable. The last pre- and post-study open-ended question for parents was "Learning to use rideshare is a reasonable/sensible way for my young adult to access the community, Why or why not?" For this question parents indicated that rideshare is reasonable in that it is readily available and offers independence. Parents responded that their young adults may be limited by things like cost and safety. One parent responded, "Rideshares are

sensible…daily use is too expensive and surge pricing is problematic." Another parent said, "I view rideshare as one of several transportation modalities that [my son] should use." Parents' post-study comments related to reasonability of rideshare for their young adult to access the community. For example, parents responded that rideshare "gives him more independence in a more controlled environment" and that it is "a very independent option to access the community. Safety and cost are my biggest concerns." A parent also noted, "other forms of transportation are not always available." These quotes reflect general opinions from parents that rideshare was a viable option, but not an absolute solution.

Open Ended Post-Study Social Validity Responses

There were two questions unique to the post-study parent social validity survey for parents. All parents noted that their young adults enjoyed being in the study and that their young adult's demonstrated independence as part of the study. The first question asked, "Do you believe your young adult enjoyed using rideshare in this study? Why or why not?" All parents indicated that their young adult enjoyed participation. One parent wrote, "He loved it and what the independence of using it." The second question asked parents "Did your young adult's participation in this research study change your expectations of how they might independently access transportation?" One parent wrote, "Absolutely, it reduced some concerns about safety, It also provides a viable option for future transportation." Another parent responded, "Yes, I am much more confident about his potential to live independently one day, thank you!" In summary, all parents indicated that they felt their young adult enjoyed participation in the study and noted that ridesharing allowed them to independently access their existing transportation routines in the community.

CHAPTER 5: DISCUSSION

The purpose of this study was to examine the impact of an intervention on the independent rideshare skills of young adults with IDD and the generalization of these skills. A secondary purpose was to evaluate the views of participants and their parents related to the social validity of the intervention. A single-case multiple baseline across participants design was used to determine the impact of the intervention on the rideshare skills of three young adult males with IDD. Results indicated a functional relation between intervention and participant skill for all three participants. The intervention included predictors of post school success (i.e., community experience, self-determination, and parent involvement/expectations) and programming for generalization. All three participants also demonstrated generalization of rideshare skills toward independence, scheduling, and new locations. Additionally, both young adult participants and parents indicated that they enjoyed participating in the study and felt the skills gained were socially valid. A discussion of the research questions, results, and themes from this study are discussed in this section. Further, I will detail contributions to the literature, limitations of the current study with suggestions for future research, and implications for practice.

Discussion of the Effects of the Intervention on the Dependent Variable

Predictors of Positive Post-School Outcomes

All participants in the study reached mastery and demonstrated generalization of the skills for requesting a Lyft. Visual analysis of the multiple baseline design showed a functional relation with participants completing steps of a task analysis to use rideshare independently after classroom instruction and in-vivo practice. The data showed an immediacy of effect and a "believable demonstration of the events that can be responsible for the occurrence or non-occurrence of the behavior" (Baer et al., 1968, p.94).

The intervention included several predictors of postschool success while specifically targeting independent transportation skills. The predictors of postschool success included community-based instruction, self-determination, and parent involvement. Information about specific elements of this research provide insight for programming transition and transportation interventions for individuals with IDD while answering the call to better understand the predictors of post-school success by evaluating what works for whom and under what conditions (CEC, 2014; Cook et al., 2009). Test and colleagues (2009) identified 16 predictors of postschool success, and two subsequent reviews of the literature (Mazzotti et al., 2016; Mazzotti et al., 2021) confirmed those predictors and identified additional predictors. In 2016, Mazzotti et al., identified goal setting, parent expectations, travel skills, and youth autonomy/decision-making as additional predictors of postschool success bringing the total to 20. In 2021 Mazzotti et al, presented ongoing evidence for existing predictors and identified psychological empowerment, self-realization, and technology skills as three additional predictors. There are currently 23 predictors of postschool success identified by this literature base (Mazzotti et al., 2016; Mazzotti et al., 2021; Test et al., 2009). Researchers have emphasized the need to include predictors of post school success into contexts that meet the individual needs of students (Trainer et al., 2020). This study situated transportation training into the existing transportation routines of participants. The participants met mastery, generalized and maintained the skill, and indicated that they enjoyed the experience.

This study focused on three predictors of postsecondary success: (a) community experiences, (b) self-determination, and (c) parent involvement and expectations. Community experiences are a promising predictor related to employment (Mazzotti et al., 2021; Test et al. 2009) and are defined as “activities occurring outside the school setting, supported with in-class

instruction, where students apply academic, social, and/or general work behaviors and skills" (Rowe et al., 2015, p. 120). Characteristics of community experiences include community-based instruction for teaching, assessing, and monitoring skill acquisition and documenting student performance in diverse settings (Rowe et al., 2015). Researchers have discussed the importance of opportunities for individuals with IDD to acquire knowledge and skills to target long-term community integration (Amado et al., 2013). The target skill for this study, using rideshare, was experienced and measured completely in the community. Further, measures of participant performance and data recording were tracked in the same context. It was important to create a measure that was feasible in the community setting and that could be used across conditions.

Within transition planning for individuals with IDD, it is critical to include community-based training and experiences specifically for the natural context in which target skills, social skills, domestic skills, and transportation skills can occur (White & Weiner, 2004). Steps for the rideshare task analysis were all steps that took place in an authentic rideshare setting in the community while ensuring safety and proper independent use of the app. Designing a task analysis for community-based instruction provided an opportunity for the measure to take place in the authentic setting, allowing for a realistic measure and facilitating generalization and maintenance. Using in-vivo data collection is one way that practitioners can gain insights into the necessary skills and targets for learners with disabilities (Flanagan & Kutscher, 2020). Participants were trained in a rideshare ride or with in-vivo instruction, which was a community experience. Following instruction with a community experience, all participants increased their number of rideshare steps completed independently and the research team used technology to teach independent living skills. Methods in this study provided inclusive opportunities for individuals with IDD (Amado et al., 2013) by situating the experiences in the authentic

environment and allowing for meaningful interactions with the target environment. Similar to other community-based interventions for individuals with disabilities, participants used cellphones to support community access (Bassette et al., 2018). In this study, participants used their own cell phones to access their community through the rideshare app. Technology, particularly a cell phone, was one way that this study included a support that allowed participants to experience positive outcomes. Additionally, participants gained experience using their own devices which is positively related to self-determination, another predictor of post-school success (Van Laarhoven-Myers et al., 2016).

Self-Determination as a Predictor of Post-School Outcomes

Self-determination is a research-based practice for employment and education outcomes and a promising predictor for independent living outcomes (Mazzotti et al., 2021; Test et al., 2009). The design of this study incorporated many elements of the definition for self-determination including making choices, solving problem, setting goals, evaluating options, taking initiative to reach one's goals, and accepting consequences of one's actions (Rowe et al., 2015). In this study, participants used their own devices to access their existing transportation routines allowing them to exercise self-determination as the causal agent in their life, emphasizing their strengths and capabilities (Shogren et al., 2015). Additionally, social validity surveys from young adult participants indicated that they enjoyed participating in this study and felt independent accessing their communities using rideshare. Like previous studies, this study included elements of self-determination within a multi-component intervention (Burke et al., 2020) that highlights the importance of self-determination as a predictor. Prior to intervention, participants and their parents had a "getting started" meeting with the lead researcher. In this meeting, the participant and their parents shared their existing transportation routines, and the

researcher shared what each study phase involved and how the young adult would use their own device for rideshare. In this way, young adults with IDD participated and planed their rideshare experiences demonstrating elements of self-determination, similar to how young adults plan and participate in their transition preparations (Van Laarhoven-Myers et al., 2016). “Getting started” meetings provided an opportunity for young adults with IDD to participate and demonstrate delf-determination while allowing parents to be involved in understanding the study and rideshare plans.

Parent Expectations and Involvement as Predictors of Post-School Outcomes

Parent expectations and parent involvement are the final two predicators of post-school success that were systematically included in this study. Parent expectations are a promising predictor of postsecondary education and a research-based predictor of employment. Additionally, there is emerging evidence relating parent expectations to independent living outcomes. Parent involvement, a promising predictor of employment (Mazzotti et al., 2021; Mazzotti et al., 2016; Test et al., 2009) means that parents or families are “active and knowledgeable participants in all aspects of transition planning” (Rowe et al., 2014, p.122). In this study, parents attended the “getting started” meeting, were added to their young adult’s Lyft accounts so that the ride requests and locations of the young adult were always shared with the parents, at least one parent rode for each participant’s baseline ride and two parents rode for an intervention ride, and parents were given a pre- and post-study social validity survey to share information about their expectations and experiences related to the study. Parent responses to social validity surveys are discussed in greater detail below; however, it is important to recognize that parents were involved from the onset of the study, and all participants reached mastery and generalized their skills beyond intervention.

Each participant was given a gift card for Lyft at the completion of this study. The lead researcher, who was included on all participant accounts to receive notifications of ride requests and usage, continued to get notifications from participants who were still using rideshare after the study ended. Existing research on parent expectations indicates that parent expectations related to a certain outcome are linked to the likelihood that an individual achieves that outcome. Specifically, parent expectations that their child will have a job (Carter et al., 2015; Doren et al., 2012; Papay & Bambara 2014); attend postsecondary education (Doren et al., 2012; Papay & Bambara 2014; Wagner et al., 2014); be self-supporting (Carter et al., 2014); and or work and go to college (Chiang et al., 2012) are all linked to the child achieving that outcome. By including parents in the "getting started" meetings and having participants share locations, this study, like other studies, worked to include parents in transition planning to increase a cycle of empowerment (Defur et al., 2001). Study design and preparation that allowed students to participate in Lyft rides in authentic settings, using their own devices to access their existing transportation destinations, while sharing information and planning with parents leveraged predictors related to positive postschool outcomes. Additionally, the success of each participant, the parent and young adult opinions that the intervention was socially valid, and the generalized and continued use of rideshare after intervention demonstrates the efficacy of the program as a lasting model for one way to address transportation access for young adults with IDD.

Predictors Linked to Post-School Outcomes

Predictors are linked to outcomes, or long-term success in the areas of employment, continued education, and community success (Mazzotti et al., 2021). With the 1990 reauthorization of IDEA (P.L. 110-476) the target for individuals with disabilities after high school became organized into three categories: postsecondary education and training,

employment, and community engagement. Further, as citizens of the United States, young adults with and without disabilities are afforded the supports of departments such as the U.S. Department of Education and the U.S. Department of Transportation. The mission of the United States Department of Education is "to promote student achievement and preparation for global competitiveness by fostering educational excellence and ensuring equal access" (U.S. Department of Education, n.d.).The mission of the U.S. Department of Transportation is "to deliver the world's leading transportation system, serving the American people and economy through the safe, efficient, sustainable, and equitable movement of people and goods" (U.S. Department of Transportation, 2022). The current study was an effort to help young adults with IDD to access their community and the opportunities afforded by that access, particularly related to employment, education, and independent living. Of note, destinations participants accessed by rideshare while participating in this study included a post-secondary education program, places of employment, a service provider, and an independent living appointment (i.e., a haircut). It is educators' responsibility to assist adults with disabilities to become contributing citizens, family members, employees, learners, and active participants in a meaningful vocation (DCDT, 2022). The results of this study suggest that using rideshare is one possibility for young adults with IDD to engage in the outcomes education is responsible for affording them.

Transportation is one reason why individuals with disabilities are unable to access positive postschool outcomes their communities. Many youth and young adults with IDD report they are automobile passengers, or they walk, use public transportation, or paratransit to access their desired locations (Wafsi et al., 2017). Unfortunately, walking, public transportation, and paratransit are not always available for the locations individual want to access. As a result, youth and young adults with IDD must often rely on someone to drive them to wherever they want to

go. For these reasons, it is critical that researchers continue to learn ways that individuals with IDD can access transportation in their communities. Individuals in this study were able to access their transportation routines independently using rideshare. Independent transportation use by individuals with IDD is critical in accessing outcomes as it has been linked to a five times greater chance of being employed as compared to individuals without independent transportation (Zalewska et al., 2015). There is a history of calls for researchers to consider interventions, such as this one, that seek to address the needs of individuals with IDD in preparing for adult life in order to access all three outcome areas (Benz & Kochlar, 1996). This study specifically targeted transportation skills in order to increase access for individuals with IDD.

Transportation Skills

Independent transportation skills were the targeted dependent variable in this study. Transportation is a functional living skill and an important outcome for secondary transition (Rowe et al., 2015). Unfortunately, youth and young adults with disabilities face challenges accessing independent and reliable transportation (Bross, Fredrick, & Kwiatek., 2023; Feeley et al., 2015). Often young adults with IDD rely on their parents or family members for transportation which parents report can be burdensome (Feeley et al., 2015). This study leveraged the parents' input in supporting independent transportation for youth with disabilities. Direct and explicit transportation instruction is one way that young adults with IDD can ensure access to equitable outcomes after high school. Research to support independent transportation skills for youth and young adults with disabilities is becoming more prominent. This study supports existing research which indicates that effective programming can increase transportation skill competencies for individuals with IDD (Pfeiffer et al., 2017). The transportation skills used in this study were maintained and generalized into a final phase. This

demonstration of effect from the current intervention is important as understanding ways to bridge the gap between young adults with IDD and access to reliable independent transportation can also help to alleviate isolation some youth and young adults report as a result of limited independent transportation (Pfeiffer et al., 2010). Past explorations into transportation skills have examine public transportation (Mechling & O'Brien, 2010)), navigation skills (Brown et al., 2010; Davies et al., 2010), and technology supports (Bross, Wood, et al., 2023; Brown et al., 2011; Davies et al., 2010; Mechling & O'Brien, 2010). This specific study was an extension of a study conducted by Bross, Wood, and colleagues (2023) which taught young adults with disabilities to use rideshare. However, programming in the present study included elements to help support maintained use and access at the end of the study, as well as incorporate locations in which the young adults visited as regular aspects of their life.

Discussion of Generalization and Maintenance Results

Opportunities for Generalization

Generalization is a critical outcome of effective instruction (Stokes & Baer, 1977). There were three primary opportunities for generalization in this study. First, participants were given the option to ride alone while a member of the research team followed in another car, "follow" rides; second, participants were given the opportunity to travel to a location that they had not traveled to as part of the study, "new to study" rides; and third, participants were given the opportunity to use the app to schedule a ride for a later time, "schedule" ride. Scheduled rides required a slightly different sequence of app navigation steps at the beginning of the task analysis. The research team scored participants' task completion as a percentage so that generalization measures of "scheduled" rides could be compared to all other scores. Stokes and Baer (1977) also describe generalization as an operant response that can be programmed for

(Stokes & Baer, 1977). Each of the generalization opportunities was programmed to give participants the opportunity to demonstrate the skills they learned during the intervention to access transportation beyond the trained conditions. Jalen was the first to complete a "follow" ride. He scored 92.3% on this ride, missing the step of matching the license plate on the car with the license plate listed on the app. It is worth noting that as soon as Jalen got out of the car he said, "I forgot to check the license plate" indicating that he knew the step and simply forgot. Jalen's next two generalization probes were a "novel to study" ride and a "scheduled" ride. Jalen completed 100% of the steps accurately for these two probes. Kurt's first two generalization probes were "follow" rides and he completed them with 100% accuracy. For his next generalization opportunity, Kurt chose to ride with a member of the research team. This was a perfectly acceptable opportunity to demonstrate the self-determination skill of choice making (Rowe et al., 2015). For Kurt's final generalization probe he scored 87.5% in scheduling a ride, still well above his highest score of 61.5% in baseline. It was important for participants to choose the ride alone for "follow" rides in order to mimic the same choice participants would have in using rideshare to access their community. "Follow" rides provided for generalization at an increased level of independence. Generalization is the most socially significant and enduring behavior change that is used in all relevant settings and accompanies other functionally related responses (Cooper et al., 2020). Oscar completed two "follow" rides at 100% accuracy and one of these was a "scheduled" ride. Jalen, Kurt, and Oscar all rode in a rideshare for at least two "follow" rides at 100% accuracy, demonstrating generalization.

Behavior change has generalizability when it is durable over time, appears in a variety of environments, and spreads to a variety of related behaviors (Baer et al., 1968). Opportunities for generalization were also present by virtue of the applied, community-based setting of the

research study. Community-based instruction offers nuance and a natural environment making these settings ways to assess student performance and needs as they prepare to engage as contributing citizens following their transition from high school to postsecondary life (Flanagan & Kutscher, 2021). Jalen was the only participant to use rideshare to a "novel to study" location for generalization. He completed the steps with 100% accuracy. For this ride, Jalen rode to get a haircut. This opportunity was useful because it aligned with one of the steps Cooper and colleagues (2019) describe as important in programming for generalization; this ride was a behavior that met the natural contingencies of reinforcement. In other words, this ride allowed Jonathan to go to get a haircut independently, a naturally reinforcing consequence of traveling to a place. Early researchers emphasized the importance of generalization noting that programming for generalization is always essential (Stokes & Baer, 1977). They emphasize that researchers should never assume learners will employ skills beyond the context of an intervention setting. The implication is that in designing intervention, we should design so that the skills we target might function beyond the context of our intervention. We must plan for behaviors and programming that learners can use to live full lives beyond the boundaries of the intervention such that no extra cues or manipulations are necessary (Stokes & Baer, 1977). The "follow" rides, "new to study" rides, and "scheduled" rides were all part of the study design intended to provide opportunities for participants to access transportation beyond the boundaries of the intervention.

Programming for Generalization

Nothing should be trained if not trained for generalization (Cooper et al., 2020). Combined with the understanding that individuals with disabilities identify transportation as a barrier to accessing their community (Bross, Fredrick, & Kwiatek, 2023; Feeley et al., 2015) it

was a priority in this study to thoughtfully plan for generalization. Cooper and colleagues indicate that many behavior change interventions fall short in addressing the importance of generalization. The most difficult and important challenge for practitioners implementing behavior change programs is to help learners achieve generalized behavior change that is socially significant (Cooper et al., 2020). Stokes and Baer (1977) listed nine categories for programming for generalization. Following a review of literature, they determined that seven of the nine were directly related to generalization. The seven categories for programming where refined into five strategic approaches by Cooper and colleagues (2020) to help practitioners better program for generalization.

Each of the five strategic approaches was planned for in the design and implementation of this study. Participant generalization data are indicative of the design for generalization. The five strategic approaches include: teaching enough relevant stimuli and response requirements, creating an instructional setting that is similar to the settings in which the behavior is expected to generalize, maximizing contact with the generalization setting by teaching such that levels of behavior required in the generalization setting are eventually required during training or planning so that the learner always contacts reinforcement in ways that mirror generalized situations, employing some tactic as a mediating support, and training to generalization. This study included elements of the five strategic approaches. Teaching enough relevant stimuli and response requirements was included each time the participants worked with the actual app or the various drivers. Because the study was conducted in an authentic setting for authentic transportation needs, participants were in a setting similar to the expected setting and accessed their actual destinations or the natural reinforcer as part of completing a ride. Finally, the visual card and app provided a mediating support and the opportunities for generalization at the end of the study

ensured that participants were trained to generalization. All participants in this study demonstrated generalization of rideshare skills. For all generalization opportunities, participants in this study demonstrated 87.5% accuracy or better. Seven of the eight generalization measures were completed with 100% accuracy.

Further, each participant demonstrated at least two different instances of generalization. Jalen demonstrated all three. While this current study did not control enough for an exploration into which elements of study design were most responsible for generalization, a number of features were implemented to promote generalization. First, participants used their own devices. The research team used a system of gift cards and shared google files to track funding to ensure that participants had enough money for rides each day. This was an extension of previous research by Bross, Wood, and colleagues (2023) during which participants used the phone of research team members to request rides. It was important to leverage technology along with community-based instruction as an effective combination for teaching independent living skills, previously done with some success related to generalization (Gil et al., 2019). In addition to the use of participant devices to request and use rideshare, all of the places participants departed from and arrived to were part of participants' existing transportation routines. It was important in designing this study so that participants used rideshare to access locations in their community that they had already established as important. The alternative would have been to contrive situations for rideshare use and the team felt this would limit the generalization and maintenance of rideshare.

Given the significant barrier posed by limited transportation options for individuals with IDD, future research related to transportation and travel skills should train for generalization and maximize contact with the generalized setting such that the transportation skills (e.g., pedestrian

skills, public transportation, driving, rideshare) are situated and feasible for the transportation goals and objectives the young adults already demonstrate. Providing demonstrations that a young adult can walk independently or use a train are limited to the context of those demonstrations. Therefore, in order to program for generalization and allow for maximum contact with the generalization setting, transportation skill training situated into existing transportation routines prepares participants to continue to demonstrate those skills provided they meet mastery within the context of the intervention and that the intervention is socially relevant. Finally, in programming for generalization, this intervention included the implementation of a wallet-sized task analysis card. This feature was an extension of the rideshare study conducted by Bross, Wood, et al. (2023) in which a bookmark-sized task analysis was available for participants to reference. In the original study, the mediating support included pictures of the steps being completed. For this study, I simplified the visual supports to be visible and small enough to fit on a card the size of a credit card. This mediating support was designed so that young adults could carry the card inconspicuously and use the support only when they needed. One important feature of the support were visuals that outlined the safety steps related to checking the license plate and asking the driver "Who are you picking up?" With the exception of Jalen's first "follow" ride, all participants used both safety checks for all generalization probes.

Lastly, in preparing participants to maintain and generalize their rideshare skills beyond the context of this study, the research team helped participants set up their Lyft accounts such that their location was always shared with a parent. This added feature allowed for parent involvement and additional safety. Leveraging safety features of the app and including parents

was another way the team helped to ensure that participants were using the app during the study in the same way they would use the app in maintaining and generalizing the skills.

Discussion of Social Validity Results

Social Validity for Participants

To best understand if young adults valued the rideshare intervention, it was important to gain their perspectives on rideshare, especially as it related to acting as the causal agent in their own life (Wehmeyer & Field, 2007). Participants' responses on the social validity questionnaire confirmed the importance of using a rideshare. Transportation skills are important for individuals with IDD particularly in creating opportunity for community access (Mazzotti & Rowe, 2015; Trainor et al., 2020). All participants strongly agreed that the app was easy to use, they liked taking rideshare by themselves, they felt independent when traveling to locations on their own, and they liked using rideshare more than their current method for traveling places in the community (for all participants this was having a family member drive them). They indicated they would continue to use rideshare after the study, and would use rideshare to travel to more locations in the community in the future. Situating rides into participants' existing transportation routines and allowing them to participate in planning which using their own devices was planned to promote self-determination and increase the social validity of the study. Promoting self-determination provides opportunities for individuals with intellectual disabilities to make choices about their own lives, contributing to a higher quality of life (Wehmeyer & Schwarts, 1998). Further, participants experienced rideshare over multiple opportunities. Wehmeyer and Field (2007) note that self-determination is not taught with a single lesson or intervention, rather the attitudes, knowledge, and skills must be nurtured and developed over time. Participants agreed with or strongly agreed that they likely using the rideshare app to travel to locations in their

community. Participants indicated that they liked the PowerPoint visual to learn how to use rideshare, but they only slightly agreed with this statement on the questionnaire, which may mean that improved intervention materials may be worth exploring. Participants were either unsure, agreed, or strongly agreed that they like having an instructor in the car when learning how to use rideshare. This was notably the lowest of the social validity scores and may be an indication of participants' desire for independence. "Follow" rides in this study presented opportunities for individuals with disabilities to experience a degree of dignity of risk. Dignity of risk is the opportunity to engage in skills and activities in a natural setting where more realistic consequences for one's choices are naturally present (March & Kelly, 2018).

Social Validity for Parents

This study incorporated predictors of post-school success (e.g., community experiences, self-determination, parent involvement and expectations). While parent involvement and expectations were not the primary focus of this study, parents were involved in "getting started" meetings and rides to leverage their influence. Because parent expectations and involvement were not a primary outcome measure, the research team decided to include parent data as a social validity measure. Parents completed a pre-study and post-study social validity questionnaire. Parent responses to social validity questions did not change substantially from pre- to post-study measures. Parents generally agreed that rideshare was an effective option for addressing the transportation needs of their young adult, that their young adult would continue to use rideshare after the study, and that learning to use rideshare was consistent with the transition goals of their young adults. Pre- and post-study social validity parent measures demonstrated some change when parents were asked about the specific skills necessary for using rideshare. For example, when asked if their young adult would have the social interaction skills necessary to successfully

navigate rideshare, parents' ratings increased from a three (slightly disagree) to a 4.8 (nearly strongly agree). An increase in agreement was noted for all other skill areas that parents were asked to address; skills with the app and app features, skills planning, and skills related to safety. Because parent measures were somewhat informal as social validity, assumptions from these data may be nuanced. However, the change in parents' beliefs about their young adult's skill using rideshare support the notion that involving families in transition related activities can have important implications for the family, the student, and transition outcomes overall (Hager et al., 2012). Parents' expectations aligned with the success of their young adult related to rideshare. The link between parent expectations and the success of a young adult with intellectual disabilities has been demonstrated in other outcome areas such as having a paid job (Carter et al., 2012; Doren at al., 2012; Papay & Bambara, 2014), attending postsecondary education (Doren et al., Papay & Bambara, 2014; Wagner et al., 2014), being self-supporting (Carter et al., 2014), and/or working and going to college (Chiang et al., 2012). Further, in this study, young adults were learning an independent living skill related to transportation. Parent involvement and expectations related to the success participants experienced supports literature by Mazzotti and colleagues (2019) related to emerging evidence that parent expectations are a predictor of independent living outcomes.

Involving parents in rides and in preparing young adults with independent living skills provides an opportunity for young adults to demonstrate their skills which may provide increased expectations and support from parents. While there are no data related to socio-economic status of the participants and their families, one final important note related to expectations is that rideshare does require funds. The success of Jalen, Kurt, and Oscar is notable, but without considering family finances, it would be hasty to assume rideshare could serve as a permanent

solution for all transportation needs of young adults with IDD. Including parents in home-school partnerships is useful in identifying the capitol available to families (Trainor et al., 2010). Parents of participants in this study noted the financial strain related to concerns such as surge pricing or expense for frequent use.

Contributions to Literature

The current study makes a number of contributions to the current literature. First, there is limited research addressing solutions to community access barriers that individuals with disabilities face as a result of limited transportation options. Research examining solutions to these barriers is limited; however, the current study extends the literature related to a number of studies. For example, researchers have examined transportation skill interventions that include a predictor component such as parent involvement (Harriage et al., 2016) or community-based settings and experience for training (Mechling & O'Brien, 2010). The current study adds to this literature by demonstrating positive effects of a transportation intervention that included predictors of post-school success.

Another contribution of the current study is the extension of information related to technology that can support independent transportation for individuals with IDD. Davies and colleagues (2010) used GPS technology to support individuals using public transportation. The current study extends this literature by demonstrating how GSP within the Lyft app can be used to support individuals with IDD in safely accessing their communities with independent transportation.

Another transportation study examined the impact of a comprehensive intervention, rather than an intervention for a discrete skill, to teach transportation skills using a public bus (Pfeiffer et al., 2020). The current study has added information about a comprehensive

intervention for rideshare skills. Comprehensive transportation interventions help to bridge the gap young adults with IDD face in accessing their community independently because of limited transportation.

Finally, the current study extends literature published by Bross, Wood, and colleagues (2023) on teaching individuals with IDD to use rideshare. In the Bross, Wood, et al. study, participants used the researcher's devices and chose locations that they did not routinely frequent. Additionally, parents were not included in the study and the team did not collect data on the generalization of ridesharing skills. The current student provided authentic experiences using rideshare by situating rides into participants' existing transportation routines and allowing participants to use their own devices. The current study also included parents in the planning, in one ride, and in location sharing through the app. Parent involvement and measures of social validity related to parent experiences add to the literature related to important predictors of postschool success. Most notably, the current study provided an opportunity for young adults with IDD to choose to ride independently in a rideshare for "follow" rides. These opportunities are the most authentic rideshare experiences afforded by research to date. Future transition and transportation related studies should continue to examine ways in which final stages of research provide for authentic opportunities for individuals with IDD to independently demonstrate knowledge and skills.

Limitations and Suggestions for Future Research

This study examined young adult skills using an app in an applied setting. The research team worked to limit the contrived elements of the rideshare experience in order to promote maintenance and generalization (Cooper et al., 2020). The highly controlled features of systematic research and the nuanced features of applied experiences in a natural setting

intersected in this study and presented limitations. The limitations in this study fall into one of two categories. First, limitations as a function of the controlled and experimental nature of the study. Second, there were limitations as a function of the nuanced and applied natural experience of the study.

Limitations as a Function of the Controlled and Experimental Nature of the Study

The first limitation as a function of the experimental nature of this study was that there were three participants. In order to measure, compare, and evaluate their behavior over multiple sessions, it was important to limit the number of participants for accurate and adequate data collection. A larger participant pool could yield greater external validity; however, this study prioritized authentic rideshare experiences that could be systematically measured and as a result could only accommodate a small number of participants. Future research should investigate the skills of young adults with IDD using rideshare on a larger scale. Increasing the number of participants would require a substantial research team, significant resources, and a significant budget. However, the success of all three participants from this study, the indication that both participants and parents found the study socially valid, and the importance of transportation in accessing postschool outcomes are all reasons why this type of research should continue on a greater scale. Future research could also be advantageous for ridesharing companies in addressing a transportation need of individuals with disabilities. Finally, a larger participant pool may allow for an evaluation of barriers such as financial capital, availability of rideshare, and rurality. Future studies could also include participants in other disability categories.

Another limitation of the current study as experimental research was that young adult participants were never entirely without a research team member. While the final phase of the study provided for an independent “follow” ride, the participant was with a research team

member as they requested a ride and when they arrived to their location. This may have impacted Kurt's choice in not having a follow ride for two of the opportunities in the generalization phase. Kurt was not choosing between "not going" and "going in a rideshare alone," instead, Kurt was choosing between, "have the researcher ride with me" and "have the research not ride with me." It was impossible to eliminate the natural reinforcing or punishing effects of spending time with a familiar researcher. This was also evident in some exchanges between rideshare drivers and participants. For example, if there was difficulty communicating or understanding one another, it was common for either the driver or the participants to look to the researcher to facilitate. Future research may evaluate transportation skill using video recording or bug-in-each technology to eliminate any confounding influence from the presence of a research team member.

Next, the task analysis for requesting and using Lyft was written for a routine app experience in part to allow for measurement of the task analysis steps across phases. However, there was nuance in the app interface and driver interactions as part of the study, and the measure did not always allow the research team to capture the variation. The variance in driver behaviors or app features could not be controlled for, and the results of this study can only assume the success of participants in the situations presented. There were no instances of "problems" or a break in the sequence of steps for which a participant might have to problem solve. Future research may work to teach variations of rideshare experiences to prepared learners for instances that participants in this study did not encounter (e.g., a car breaking down, a driver behaving in an-unsafe way, a road closure).

Another limitation for this study was that rides were routine transportation only, with the exception of the "novel to study" ride in generalization. This means that while rides included elements of self-determination as situated in participants existing routines, rides did not allow for

spontaneous outing or transportation choices. Future research might evaluate the skills of young adults using rideshare skills when an impromptu desire to go somewhere occurs.

Finally, in order to demonstrate effect and control for history, participants had to begin intervention at different times. For this reason, one participant spent an extended time in baseline which may have impacted his performance or feelings about rideshare. Given 14 opportunities in baseline, Oscar could have easily begun to develop habits of relying on the researcher or becoming accustomed/familiar with riding in tandem rather than learn to experience rideshare naturally and independently from the beginning. Future research may use different design methods such as group design or a multiple probe design to allow for a demonstration of effect without impacting a participant's introduction to and acquisition of rideshare skills.

Limitations as a Function of the Nuanced and Applied Setting

Other limitations of this study were a function of the applied context. In programming for generalization, maintenance, and self-determination it was important that the study take place where authentic transportation needs of participants currently existed. Therefore, the study was somewhat limited by the app and by the ride schedules of participants. The app was not written for research, but it was important for generalization and maintenance that participants use the real app for real purposes in real settings. For example, situations like the app not always showing a "standard ride" or prompting offers in route could not be planned for because the algorithms and "app behavior" are unknown to the general public and by extension, the researcher. Future research may combine efforts with app developers to allow for a training setting, or version of the app where a research team could control the app experience for participants in order to design more nuanced and various experiences in preparation for the variation of authentic rideshare use.

Another limitation as a result of the using the study in the applied setting was the cost of rideshare. The lead researcher was able to secure two small grants to pay for rides; however, there were still residual costs and future research would need to secure significant funding to continue rides in the authentic environment. This limitation highlights the financial burden participants would take on when choosing to continue rideshare use, and it demonstrates how cost can be limiting for individuals with disabilities in accessing their community using rideshare. For example, if rideshare is a realistic option, but in order to get to your job, you need to ride at a time when prices are higher, young adults may find that they spend a substantial part of their paycheck just to independently access transportation. Future research should examine the funding channels of existing transportation supports for individuals with disabilities and examine rideshare algorithms to find solutions such that individuals with IDD can access their community independently.

Another limitation of this study were the low number of opportunities to evaluate IOA and implementation fidelity. The logistics of this study were resource intensive, and collecting data for IOA or fidelity for a minimum of 30% of sessions would have greatly increased time and cost. Both time and monetary cost were significant in this study. In order to situate rides into the existing context of participants' transportation routines, researchers rode with participants one way, and then needed transportation back to their car. The time and monetary cost in this situation would double, and rides required significant funding. Otherwise, the researchers would have to wait for the participant's return ride. While rides were all within a 15-mile radius of the recruitment location, research team members still faced challenges in arranging for more than one research team member to be present for collecting IOA and implementation fidelity data. Ultimately, the team prioritized the rides and transportation needs of the participants over the

strict measures required for rigorous research. Future research may consider ways in which a team could still allow for authentic rideshare experiences and have resources to collect all necessary data measures.

Finally, a 3sec time delay in baseline was different from the 5 sec time delay for intervention. This difference could be a confounding variable given and future research should focus on an improved approach to setting a time delay. For example, future research may conduct a brief assessment of participants pace using apps and responding to verbal prompts, this information could be used to guide the amount of time included in the time delay so that participants would be given enough time to complete steps without pressure, but not too much time that they felt uncomfortable or confused.

Implications for Practice

There are a few implications for practice resulting from the current study. First the intervention intentionally included predictors of post school success. The literature base related to the predictors of postschool success for individuals is IDD continues to grow. To better understand best practice for supporting transition for individuals with disabilities it is important to continue this research. Practitioners can replicate interventions or practices that have demonstrated effect and in doing so, include predictors to increase the impact of intervention by targeting outcomes and a specific skill simultaneously. The current study included self-determination, parent involvement and expectations, and community experiences in replicating a training for transportation skills. Teachers and school personnel may consider other ways of including one or more predictors in daily practice or when training transportation skills.

Anther implication for practice is planning for generalization and maintenance. “The most difficult and important challenge facing behavioral practitioners is helping learners achieve

generalized change in socially significant behaviors" (Cooer et al., 2020, p. 753). In this study, the measurement, environment, and auxiliary participants (parents) were included specifically so that young adults would have the opportunity to use rideshare alone, or in an environment that most closely mirrored the authentic environment. Because all participants shared their Rideshare usage with the lead researcher, she was notified on the app that participants continued to use rideshare independently after the study was over. Participants used rideshare to get to and from school, work, and related services. It is important, particularly related to transition skills, that knowledge and skills are training for generalization and maintenance. Interventions that effectively target knowledge and skills necessary for a successful transition to independent adulthood are important; however, interventions that target these skills such that they are maintained or generalized beyond the context of the study are paramount.

A final limitation of this study and the use of rideshare for individuals with disabilities is cost. The cost for continued rideshare use was an expressed concern from the majority of parent participants. Additionally, the current study used significant funding to pay for all of the rides, but went over budget. Future research should work with funding agencies and even app companies to facilitate a sustainable solution to the barrier that cost presents for individuals with disabilities in accessing meaningful and independent transportation with rideshare.

Conclusion

Identifying transportation solutions is critical for increasing access to postschool outcomes for individuals with IDD (Mazzotti & Rowe, 2015; Trainor et al., 2020). Without reliable and independent transportation, individuals with IDD are limited in the degree to which they can access an independent adult life. The current study leveraged predictors of post school success (Mazzotti et al., 2016; Mazzotti et al., 2021; Test et al., 2009) in tandem with

programming for generalization (Cooper et al., 2020; Stokes & Baer, 1977) to teach young adults with IDD to independently access their exiting transportation routines using rideshare. This study demonstrates the importance of thoughtful programming for authentic outcomes. Young adult participants in this study have continued to use rideshare independently beyond the context of this research despite not having the app on their phone at its inception. Given the importance of transportation and our knowledge of predictors and programming for generalization, this study lays a groundwork for continued efforts to remedy the limited transportation options available to young adults with disabilities. This study demonstrated that situated intervention for relevant participant outcomes can demonstrate a functional relation and be maintained and generalized.

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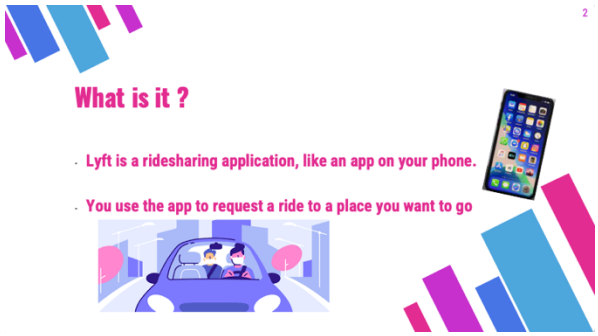
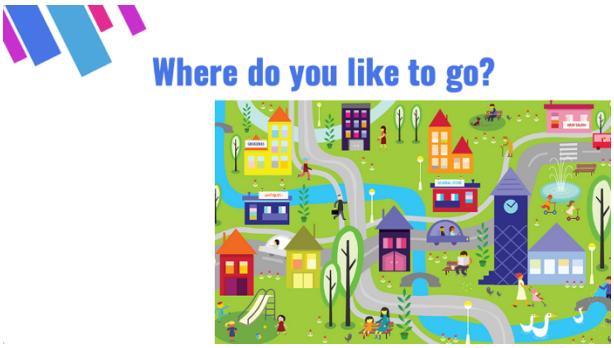
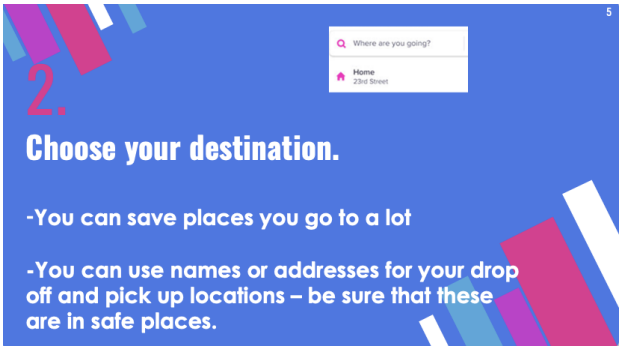
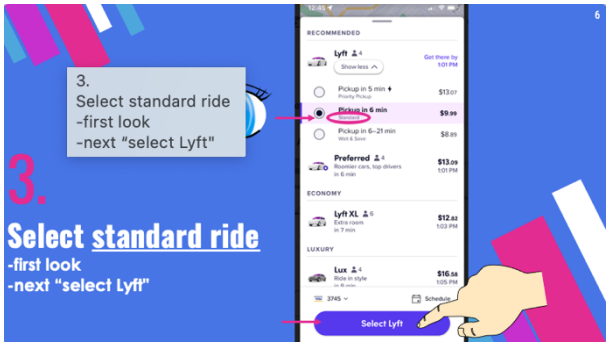
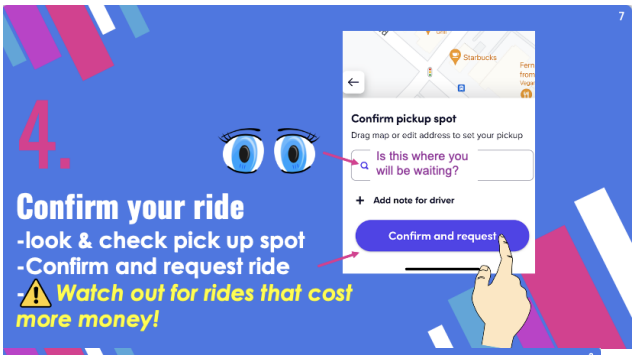
APPENDIX A: RIDESHARE TRAINING POWERPOINT PRESENTATION

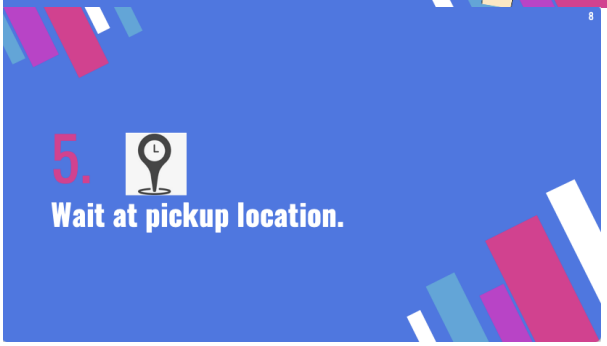


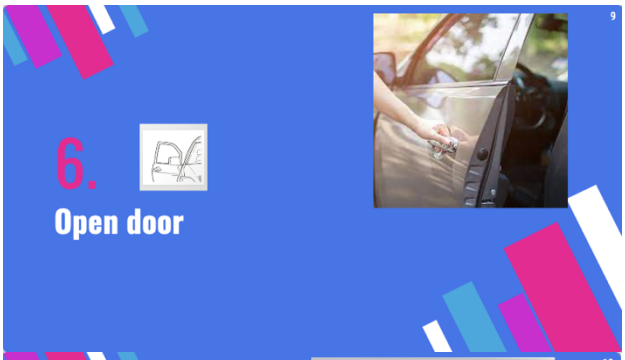


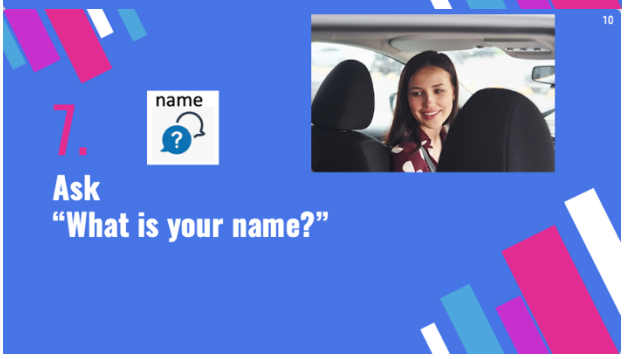





7
4.
Confirm your ride
-look & check pick up spot
-Confirm and request ride
-⚠ Watch out for rides that cost more money!
Starbucks
Confirm pickup spot
Drag map or edit address to set your pickup
Is this where you will be waiting?
Add note for driver
Confirm and request


8
5.
Wait at pickup location.


9
6.
Open door


10
7.
name
Ask
“What is your name?”

11

8. 

Get into car if name matches.

12

9. 

Buckle seat belt.

13

10. 

Get out of the car at your destination.

-Get out on the sidewalk side or in a parking lot to avoid danger.

14

11. 

Input $1.00 and select "tip driver".

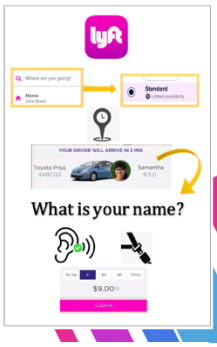
-you can also give 5 stars if you had a nice time.

15

Questions?

16

Help Card



17

Extra Help

Choice 1

Hello, my name is Rider.

Sometimes talking to people is hard for me. One thing you can do to help is ask me yes or no questions and give me time to think.

Thank you!

Choice 2

In case of emergency
please call:
(704) 123-4567

Or deliver to:
123 Cruising Town Blvd.
Charlotte, NC 28123

APPENDIX B: RIDESHARE TASK ANALYSIS

Step 1: Select Lyft icon
Step 2: Input destination (address, name, or saved location)
Step 3: Select standard ride
Step 4: Confirm
Step 5: Wait in one place for car
Step 6: When car arrives, look at license plate
Step 7: Open door
Step 8: Ask “Who are you picking up”
Step 9: If name matches, get into the car
Step 10: Buckle seat belt
Step 11: Get out of car at destination *(Safely without reminders)*
Step 12: Select $1.00 for tip
Step 13: Submit tip

APPENDIX C: FIDELTIY TASK ANALYSIS

Check these activities as you complete them in training.

	Training Step
	Present PowerPoint
	Ask for questions
	Role play
	Download app
	Share rides with researcher and family member
	Add first gift card
	Share methods for scheduling rides

APPENDIX D: INTEROBSERVER AGREEMENT SHEET & DATA COLLECTION

Date: _____ Time: _____
Arriving to: _____ Leaving from: _____
Researcher: _____ Pseudonym: _____
Primary or IOR: _____ Data point: _____

Baseline Implementation and IOA

Statement of Objective: "**Where do you want to go**?" *Wait for response.* "**Take us there**"
For each step, provide the prompt: it's time for the next step. Wait 3 seconds. If the learner does not start the next step complete the step for them, ensuring that they CANNOT see or hear what you are doing (e.g., ask for the phone and request the Lyft, confirm the name of the driver by leaning in so that the participant cannot hear). Mark I for Independent and R for a researcher completed response

Step	I or R	IOA	Notes
Step 1: Select Lyft icon		Yes☐ No☐	
Step 2: Input destination (address, name, or saved location)		Yes☐ No☐	
Step 3: Select standard ride		Yes☐ No☐	
Step 4: Confirm		Yes☐ No☐	
Step 5: Wait in one place for car		Yes☐ No☐	
Step 6: Look at license plate (when car arrives)		Yes☐ No☐	
Step 7: Open door		Yes☐ No☐	
Step 8: Says "Who are you picking up"		Yes☐ No☐	
Step 9: If name matches, get into the car		Yes☐ No☐	
Step 10: Buckle seat belt		Yes☐ No☐	
Step 11: Get out of car at destination *(Safely without reminders)*		Yes☐ No☐	
Step 12: Select $1.00		Yes☐ No☐	
Step 13: "tip driver"		Yes☐ No☐	
Total I:___/13(%) Total R:___/13(%)		IOA: /13(%)	

Driver chat: _____ Rider chat: _____
Music: _____ Other notes: _____

Date:		Time:	
Arriving to:		Leaving from:	
Researcher:		Pseudonym:	
Primary or IOR:		Data point:	

Miles	
Estimated time	
Price for ride	$
Tip	$
Total	$
Card Balance	**$**
Need to add funds?	Yes☐ No☐

1	2	3	4	5	6	7	8	9	10	11	12	13
7.6%	15.3%	23.1%	30.7%	38.5%	46.2%	53.8%	61.5%	69.2%	76.9%	84.6%	92.3%	100%

APPENDIX E: PLANNING DOCUMENT

Confirm weekly schedule
Look at calendar for dates across months
Relay process for sharing dates:
Load money onto participant card
Load sharing capability onto participant and guardian phones

Home	Shop store	Rec Center	Train Gym	Building
567 Orange Ave., Charlotte, NC 28222	321 Main St., Charlotte, NC 28223	3010 Quail Rd, Charlotte, NC 28200	101 Park Dr. Suite A1 Charlotte NC 28211	123 Pear Ave, Charlotte, NC 28201

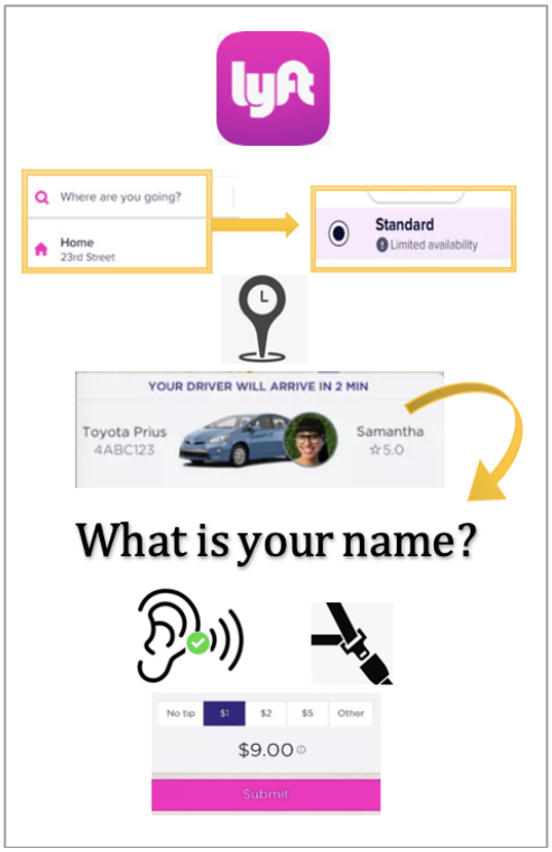
Estimates in the schedule are calculated according to desired arrival time - estimated travel time (Google maps) - 15 minutes for use/ waiting for ride. Times were calculated using information about the time of day and day of the week. Lyft cost estimates do not include time of day or day of the week factors.

Weekly Schedule

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Start: 10:00a Home Arrival:10:15a Shop Store 7 miles, 22 min. Est: $15-18	Start: 2:45 Building Arrival: 3:00 Rec Center 5 miles, 16 min. Est: $8-10	Start: 9:45a Building Arrival: 10:00a Rec Center 5 miles, 15 min. Est: $8-10	Start: 2:45p Building Arrival: 3:13p Train Gym 5 miles, 20 min. Est: $15-18	Start: 1:30p Building Arrival: 2:00 Rec Center 5 miles, 16 min. Est: $8-10	Start: 10:30a Building Arrival: 11:00a Rec Center 5 miles, 16 min. Est: $8-10	Start: 9:40a Home Arrival: 10:00 Shop Store 7 miles, 24 min. Est: $15-18
Start: 2:00 Shop Store Arrival: Home 7 miles, 20 min. Est: $	Start: 4:00 Rec Center Arrival: Home 5 miles, 10 min. Est: $	Start: 11:00a Rec Center Arrival: Home 5 miles, 10 min. Est: $	Start: 5:00 Train Gym Arrival: Home 5 miles, 15 min. Est: $	Start: 3:00 Rec Center Arrival: Home 5 miles, 10 min. Est: $	Start: 12:00 Rec Center Arrival: Home 5 miles, 10 min. Est: $	Start: 2:00 Shop Store Arrival: Home 7 miles, 20 min. Est: $
				Start: 3:10p Home	Start: 12:10p Home	

				Arrival: 3:30p Shop Store 7 miles, 35 min. Est: $15-18	Arrival: 12:30p Shop Store 7 miles, 35 min. Est: $15-18	
				Start: 7:00p Shop Store Arrival: Home miles, min. Est: $	Start: 6:00p Shop Store Arrival: Home miles, min. Est: $	

APPENDIX F: Wallet Sized Task Analysis Card



APPENDIX G: YOUNG ADULT SOCIAL VALIDITY MEASURE

Post-Study Experience using Rideshare:
Mark how much you agree or disagree with the statements below.

Strongly disagree No way! 1	Disagree Maybe not 2	Unsure or N/A I don't know 3	I agree Sure 4	Strongly agree Oh yes! Big time! 5

1. I liked using the rideshare app to travel to locations in my community.
   1 2 3 4 5
2. The rideshare app was easy to use.
   1 2 3 4 5
3. I liked the PowerPoint visual to learn how to use the rideshare app.
   1 2 3 4 5
4. I liked having an instructor in the car when I was learning how to use the rideshare app.
   1 2 3 4 5
5. I liked taking rides by myself in the rideshare.
   1 2 3 4 5
6. I felt independent when I traveled to locations on my own in the community in the rideshare.
   1 2 3 4 5
7. I liked using a rideshare app more than my current way of going places in the community (e.g., parent driving me, sibling driving me).
   1 2 3 4 5
8. I will continue using the rideshare app after this study.
   1 2 3 4 5
9. I will use rideshare to travel to more locations in my community in the future.
   1 2 3 4 5

Open Ended Questions:

1. What did you like best about using the rideshare app?

2. What did you like least about using the rideshare app?

3. What was hard for you when using the rideshare app?

APPENDIX H: PARENT PRE- AND POST- SOCIAL VALIDITY MEASURE

Adapted from Adapted from (Carter et al., 2011 & Chafouleas et al., 2011)

General Experience

1. Transportation modalities that my young adult has successfully and/or reliably used include:
   _____Rideshare (uber or lyft)
   _____Driving (getting a driver's license)
   _____Public transportation
   _____Supported transportation (disability services)
   _____Someone will drive them
   _____A family member will drive them
   _____Other (please specify) _____
2. Transportation that I expect my young adult will one day use to access their community include(s)(check all that apply):
   _____Rideshare (uber or lyft)
   _____Driving (getting a driver's license)
   _____Public transportation
   _____Supported transportation (disability services)
   _____Someone will drive them
   _____A family member will drive them
   _____Other (please specify) _____

Likert Scale Questions

Use the scale below to indicate how much you agree or disagree with the statements

Unsure or don't know	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
0	1	2	3	4	5	6

1. Rideshare is an effective option for addressing the transportation needs of my young adult

   0 1 2 3 4 5 6

2. My young adult can secure and use funds to access rideshare.

   0 1 2 3 4 5 6

Unsure or don't know	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
0	1	2	3	4	5	6

3. When using a rideshare app my young adult will successfully navigate…

   a. the social interactions necessary.

   0 1 2 3 4 5 6

   b. the app and app features.

   0 1 2 3 4 5 6

   c. the necessary planning.

   0 1 2 3 4 5 6

   d. the safety features within the app.

   0 1 2 3 4 5 6

4. My young adult will continue to use rideshare after the completion of this study.

   0 1 2 3 4 5 6

5. I use rideshare.

   0 1 2 3 4 5 6

6. Learning to use rideshare is consistent with my young adult's transition goals.

   0 1 2 3 4 5 6

7. I would need support to facilitate my young adult's use of rideshare.

   0 1 2 3 4 5 6

8. My young adult will be safe when using rideshare in the community independently.

   0 1 2 3 4 5 6

9. My young adult has the skills necessary to use rideshare independently.

   0 1 2 3 4 5 6

10. I would feel more comfortable with my young adult using rideshare if my young adult could select from preferred/familiar drivers.

    0 1 2 3 4 5 6

11. It is important for my young adult to access/use publicly available transportation independently to access the community.

    0 1 2 3 4 5 6

Likert Scale Questions (Post Project)

Unsure or don't know	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
0	1	2	3	4	5	6

1. The length of time my child spent learning to use rideshare was reasonable for the purposes of learning to use rideshare independently.
   0 1 2 3 4 5 6

2. My effort observing and engaging in the study was reasonable.
   0 1 2 3 4 5 6

3. The research team took appropriate steps to ensure my child's safety throughout the study.
   0 1 2 3 4 5 6

4. The total time required for me to participate in this rideshare study is/was manageable.
   0 1 2 3 4 5 6

5. The total time required for my young adult to participate in this rideshare study is/was manageable.
   0 1 2 3 4 5 6

6. I would **not** be interested in continued participation or learning more about rideshare use for my young adult.
   0 1 2 3 4 5 6

Open Ended Questions

1. What do you expect to be the most significant hurdle for your young adult to safely use rideshare independently?

2. The cost of rideshare makes it a reasonable option for my young adult to use for transportation. Why or why not?

3. Learning to use rideshare is a reasonable/sensible way for my young adult to access the community. Why or why not?

Open Ended Questions (Post Project)

1. Do you believe your young adult enjoyed using rideshare in this study? Why or why not?

2. Did your young adult's participation in this research study change your expectations of how they might independently access transportation?

APPENDIX I: YOUNG ADULT CONSENT FORM

Department of Special Education and Child Development
9201 University City Boulevard, Charlotte, NC 28223-0001

Consent by Young Adult to be Part of a Research Study

Title of the Project: *Increasing Community Engagement of Transition-age Youth with Disabilities via a Ridesharing Application*
Principal Investigator: Darcy Fredrick, MAT, Doctoral student, Department of Special Education and Child Development, UNC Charlotte
Research Advisors: Charlie Wood, PhD, Leslie Bross, PhD, Valerie Mazzotti, PhD, Department of Special Education and Child Development, UNC Charlotte

You are invited to participate in a research study. Participation in this research study is voluntary. The information provided is to help you decide whether or not to participate. If you have any questions, please ask the principal investigator.

Important Information You Need to Know:

- The purpose of this study is to teach transition-age youth with disabilities to access locations within their local community by using a ridesharing application, Lyft.
- If you choose to participate, you will be asked to participate in three instructional lessons about how to use a ridesharing application. You will also be asked to download, share, and use Lyft to travel to locations within a 20-mile radius of your start location.
- A parent or guardian will also be included for two rides and asked questions related to their expectations of their young adult using rideshare.
- If you choose to participate, the three instructional lessons will require approximately 45 min to 1 hour of your time. In addition, the study requires approximately 12-15 behavioral observations within the community to practice using Lyft. Each behavioral observation will be a duration of 30 min to 1 hour of your time.
- Potential risks or discomforts from this research include experiencing challenges while navigating the community. Research staff cannot remove the element of risk or the possibility of discomfort relating to participation. However, research staff will make an effort to support you during this process.
- Benefits may include learning how to use a ridesharing application to travel within your community, visiting different locations, and becoming more independent.
- If you choose not to participate, you may still participate in regular community-based instruction and activities through your program or organization.

Please read this form and ask any questions you may have before you decide whether to participate in this research study.

Why are we doing this study?
The purpose of this study is to teach transition-age youth with disabilities to access a target goal location within their local community by using a ridesharing application, Lyft.

Why are you being asked to be in this research study.
You are being asked to be in this study because you are a transition-age youth who is 18 years or older with a documented disability who participates in a program or organization that conducts community-based activities and has a willing parent or guardian who will participate for 2 rides.

What will happen if I take part in this study?
If you choose to participate in this study, you will be asked to use Lyft to travel to locations within a 20-mile radius of your start location (likely the program or organization through which you participate in community-based activities). The study requires approximately 12-15 behavioral observations with a duration of 30 min to 1 hour for each observation.

We will collect information about your use of the Lyft ridesharing application and transportation skill acquisition.

What benefits might I experience?
Benefits may include learning how to use a ridesharing application to travel within your community, mastering the skills necessary to independently access a target location within your community, and becoming more independent.

What risks might I experience?
In addition to the risks involved in using the Lyft app and riding in a vehicle, potential risks or discomforts from this research include experiencing challenges while navigating the community, such as getting lost and/or feeling frustrated while using the application. Research staff cannot remove the element of risk or possibility of discomfort relating to participation. However, research staff will make an effort to support you during this process. Specifically, the research staff will travel with you or follow your Lyft while you ride so that you can engage independently. Research staff will also have access to your location only while you are in the Lyft through tracking capabilities within the app.

All research involves a chance that something bad might happen to you. This may include the risk of personal injury. In spite of all safety measures, you might develop a reaction or injury from being in this study. If such problems occur, the researchers will use reasonable efforts to help you get medical care, but any costs for the medical care will be billed to you and/or your insurance company. UNC Charlotte has not set aside funds to pay you for any such reactions or injuries, or for the related medical care.

How will my information be protected?
We plan to publish the results of this study. To protect your privacy, we will not include any information that could identify you. We will protect the confidentiality of the research data by not using your name on any paper data collection forms and storing all data collected in locked filing cabinets in the primary researcher's office.

Other people may need to see the information we collect about you. These people may include members of the research team, other people who work for UNC Charlotte, the partnering program/organization, or other agencies as required by law or allowed by federal regulations.

How will my information be used after the study is over?

After this study is complete, data collected about your use of the ridesharing application will be stored in the principal investigator's office and/or password-protected computer for up to three years. All of the data will be de-identified. No information or data about you will be shared without additional informed consent.

Will I receive an incentive for taking part in this study?
You will receive a $50 Lyft gift card for your participation in this study. Please note you must complete the study in its entirety to receive the $50 gift card.

If your total payments from UNC Charlotte are greater than $600 in a calendar year, this information will be submitted to the Internal Revenue Service (IRB) for tax reporting purposes. By law, payments to subjects are considered taxable income.

What are my rights if I take part in this study?
It is up to you to decide to be in this research study. Participating in this study is voluntary. Even if you decide to be part of the study now, you may change your mind and stop at any time. You do not have to answer any questions you do not want to answer.

Who can answer my questions about this study and my rights as a participant?
For questions about this research, you may contact Darcy Fredrick at dfredri6@uncc.edu or (404) 285-5496. You may also contact her faculty advisor, Dr. Charlie Wood at clwood@uncc.edu. (704) 687-8395.

If you have questions about your rights as a research participant, or wish to obtain information, ask questions, or discuss any concerns about this study with someone other than the researcher(s), please contact the Office of Research Protections and Integrity at 704-687-1871 or uncc-irb@uncc.edu.

By signing this document, you are agreeing to be in this study. Make sure you understand what the study is about before you sign. You will receive a copy of this document for your records. If you have any questions about the study after you sign this document, you can contact the study team using the information provided above.

CONSENT TO PARTICIPATE (Young adult participant)
I understand what the study is about and my questions so far have been answered. I agree to take part in this study. By signing below, I affirm I am a minimum of 18 years old and my own legal decision maker.

_____
Young Adult Name (PRINT)

_____
Young Adult Signature Date

_____
Name and Signature of person obtaining consent Date

APPENDIX J: PARENT CONSENT FORM

CHARLOTTE

Department of Special Education and Child Development
9201 University City Boulevard, Charlotte, NC 28223-0001

Parent or Guardian Consent to be Part of a Research Study

Title of the Project: *Increasing Community Engagement of Transition-age Youth with Disabilities via a Ridesharing Application*
Principal Investigator: Darcy Fredrick, MAT, Doctoral student, Department of Special Education and Child Development, UNC Charlotte
Research Advisors: Charlie Wood, PhD, Leslie Bross, PhD, Valerie Mazzotti, PhD, Department of Special Education and Child Development, UNC Charlotte

Your young adult is invited to participate in a research study. Participation in this research study is voluntary. The information provided is to help you and your young adult decide whether or not to participate. If you or your young adult have any questions, please ask the principal investigator.

Important Information You Need to Know:

- The purpose of this study is to teach transition-age youth with disabilities to access locations within their local community by using a ridesharing application, Lyft.
- If you and your young adults choose to participate, they will be asked to participate in three instructional lessons about how to use a ridesharing application. they will also be asked to download, share, and use Lyft to travel to locations within a 20-mile radius of your start location
- A parent or guardian will also be included for two rides and asked questions related to their expectations of their young adult using rideshare.
- If you and your young adult choose to participate, the three instructional lessons will require approximately 45 min to 1 hour of your young adult's time. In addition, the study requires approximately 12-15 behavioral observations within the community to practice using Lyft. Each behavioral observation will be a duration of 30 min to 1 hour of your young adult's time.
- Potential risks or discomforts from this research include experiencing challenges while navigating the community. Research staff cannot remove the element of risk or the possibility of discomfort relating to participation. However, research staff will make an effort to support your young adult during this process.
- Benefits may include your young adult learning how to use a ridesharing application to travel within their community, visiting different locations, and becoming more independent.
- If you and your young adult choose not to participate, your young adult may still participate in regular community-based instruction and activities through your program or organization.

Please read this form and ask any questions you may have before you and your young adult decide whether to participate in this research study.

Why are we doing this study?
The purpose of this study is to teach transition-age youth with disabilities to access a target goal location within their local community by using a ridesharing application, Lyft.

Why are you being asked to be in this research study.
You and your young adult are being asked to be in this study because you are a transition-age youth over the age of 18 with a documented disability who participates in a program or organization that conducts community-based activities and has a willing parent or guardian who will participate for 2 rides.

What will happen if I take part in this study?
If you and your young adult choose to participate in this study, they will be asked to use Lyft to travel to locations within a 20-mile radius of their start location (likely the program or organization through which they participate in community-based activities). The study requires approximately 12-15 behavioral observations with a duration of 30 min to 1 hour for each observation.

We will collect information about your young adult's use of the Lyft ridesharing application and transportation skill acquisition.

What benefits might I experience?
Benefits for your young adult may include learning how to use a ridesharing application to travel within their community, mastering the skills necessary to independently access a target location within their community, and becoming more independent.

What risks might I experience?
In addition to the risks involved in using the Lyft app and riding in a vehicle, potential risks or discomforts from this research include experiencing challenges while navigating the community, such as getting lost and/or feeling frustrated while using the application. Research staff cannot remove the element of risk or possibility of discomfort relating to participation. However, research staff will make an effort to support your young adult during this process. Specifically, the research staff will travel with your young adult or follow their Lyft while they ride so that they can engage independently. Research staff will also have access to your young adult's location only while they are in the Lyft through tracking capabilities within the app.

All research involves a chance that something bad might happen to your young adult. This may include the risk of personal injury. In spite of all safety measures, your young adult might develop a reaction or injury from being in this study. If such problems occur, the researchers will use reasonable efforts to help your young adult get medical care, but any costs for the medical care will be billed to you, your young adult and/or your insurance company. UNC Charlotte has not set aside funds to pay you or your young adult for any such reactions or injuries, or for the related medical care.

How will my information be protected?
We plan to publish the results of this study. To protect your young adult's privacy, we will not include any information that could identify them. We will protect the confidentiality of the research data by not using their name on any paper data collection forms and storing all data collected in locked filing cabinets in the primary researcher's office.

Other people may need to see the information we collect about your young adult. These people may include members of the research team, other people who work for UNC Charlotte, the partnering program/organization, or other agencies as required by law or allowed by federal regulations.

How will my information be used after the study is over?
After this study is complete, data collected about your young adult's use of the ridesharing application will be stored in the principal investigator's office and/or password-protected computer for up to three

years. All of the data will be de-identified. No information or data about your young adult will be shared without additional informed consent.

Will I receive an incentive for taking part in this study?
Your young adult will receive a $50 Lyft gift card for their participation in this study. Please note your young adult must complete the study in its entirety to receive the $50 gift card.

If your young adult's total payments from UNC Charlotte are greater than $600 in a calendar year, this information will be submitted to the Internal Revenue Service (IRB) for tax reporting purposes. By law, payments to subjects are considered taxable income.

What are my rights if I take part in this study?
It is up to you and your young adult to decide for your young adult to be in this research study. Participating in this study is voluntary. Even if you decide for your young adult to be part of the study now, you or your young adult may change your mind and stop at any time. You and your young adult do not have to answer any questions you do not want to answer.

Who can answer my questions about this study and my rights as a participant?
For questions about this research, you may contact Darcy Fredrick at dfredri6@uncc.edu or (404) 285-5496. You may also contact her faculty advisor, Dr. Charlie Wood at clwood@uncc.edu. (704) 687-8395.

If you or your young adult have questions about their rights as a research participant, or wish to obtain information, ask questions, or discuss any concerns about this study with someone other than the researcher(s), please contact the Office of Research Protections and Integrity at 704-687-1871 or uncc-irb@uncc.edu.

CONSENT TO PARTICIPATE Parent or Guardian Consent
By signing this document, you are agreeing to [your child's **OR** the person's named below] participation in this study. Make sure you understand what the study is about before you sign. You will receive a copy of this document for your records. If you have any questions about the study after you sign this document, you can contact the study team using the information provided above.

I understand what the study is about and my questions so far have been answered. I agree for [my child OR the person named below] to take part in this study.

_____
Young Adult Name (PRINT)

_____
Parent/Guardian Name (PRINT)

_____
Parent/ Guardian Signature Date

_____
Name and Signature of person obtaining consent Date

For the research team only:
_____ Initial to confirm that assent for the corresponding participant has been signed.

APPENDIX K: RECRUITMENT FLYER

CHARLOTTE

Department of Special Education and Child Development
9201 University City Boulevard, Charlotte, NC 28223-0001

Ridesharing Application Research Study Informational Flyer

- *Are you a young adult over the age of 18 with a diagnosis of autism spectrum disorder (ASD) and/or intellectual disability (ID)?*
- *Do you have limited or no experience using a ridesharing application, such as Lyft or Uber, to travel to locations within your local community?*
- *Do you desire to be more independent and access at least one target location goal within your local community, such as a restaurant, place of employment, appointment, class, leisure activity, or other location according to your own interests?*

The Department of Special Education and Child Development at UNC Charlotte is seeking young adults over the age of 18 with ASD and/or ID to participate in a research study. Young adults who desire to use a ridesharing application, such as Lyft or Uber, to travel to locations within their local community are eligible to participate. Young adults will participate in a minimum of 12 behavioral observations in Summer and Fall of 2023. The behavioral observations consist of using Lyft or Uber to travel to a target location of the participants' choice within a 20-mile radius of the young adult's starting location. You will be supported while navigating the community. For example, sharing location safety features with research team members when using the ridesharing application. Young adults will be supported in the development of their transportation skills by using technology-based direct instruction, feedback, and in-person coaching.

**Please note signed consent is required for participation and young adults may withdraw their participation at any time. Young adults who complete the study will receive a $50 Lyft gift card.*

If interested, please contact **Darcy Fredrick**, Doctoral Candidate in the Department of Special Education and Child Development at UNC Charlotte.
Phone: (404) 285-5496
E-mail: dfredri6@uncc.edu

APPENDIX L: RECRUITMENT EMAIL

Recruitment via E-mail:

Hello.
My name is ___. For those of you who don't know me, I am currently a __(current role, e.g., doctoral student, faculty member)__ at The University of North Carolina at Charlotte within the Department of Special Education and Child Development. Before coming to UNC Charlotte I worked as a __(previous role)__ for __(time and/or organization)__. I was provided your contact information by __(contact)__. I am part of a research team at the university that is examining ways in which youth with disabilities can independently and safely access ridesharing applications such as Lyft or Uber. The project is being led by Darcy Fredrick, a doctoral student at the University of North Carolina at Charlotte. The goal of the research is to teach young adults individualized travel skills. In other words, we want to teach young adults how to access places they already travel to with supports that are tailored to the young adult.

Eligible participants are over the age of 18 qualify for special education services (an IEP), and are currently not using a ridesharing application regularly or independently to access their community.

As a participant, you will designate a target location you wish to travel to or already travel to, and the team will provide training and support to help you access that location. Participants will be provided gift cards for the ridesharing app and upon completion participants will receive compensation for their time and contribution.

If you fit the above eligibility criteria and are interested in participating, please contact Darcy Fredrick at dfredri6@uncc.edu or by phone at (404) 285-5496.

Darcy Fredrick, MAT | Doctoral Student
Department of Special Education and Child Development
UNC Charlotte | Cato College of Education
Phone: (404) 285-5496 | E-mail: Dfredri6@uncc.edu

Leslie Ann Bross, Ph.D., BCBA-D | Assistant Professor of Special Education
Program Director, Graduate Certificate in Autism Spectrum Disorder
Department of Special Education and Child Development
UNC Charlotte | Cato College of Education
Phone: (704) 687-0889 | E-mail: lbross@uncc.edu

Recruitment Follow Up via E-mail:

Hello.
My name is ___. For those of you who don't know me, I am currently a __(current role, e.g., doctoral student, faculty member)__ at The University of North Carolina at Charlotte within the Department of Special Education and Child Development. I was provided your contact information by __(contact)__. I am following up with an email sent on __(date)__ related to

participation in a research study. I am part of a research team that is examining ways in which youth with disabilities can independently and safely access ridesharing applications such as Lyft or Uber. The project is being led by Darcy Fredrick, a doctoral student at the University of North Carolina at Charlotte. As you may recall, the goal of our research is to teach young adults individualized travel skills. In other words, we want to teach young adults how to access places they already travel to with supports that are tailored to the young adult.

Eligible participants are over the age of 18, qualify for special education services (an IEP), and are currently not using a ridesharing application regularly or independently to access their community.

As a participant, you will designate a target location you wish to travel to or already travel to, and the team will provide training and support to help you access that location. Participants will be provided gift cards for the ridesharing app and upon completion participants will receive compensation for their time and contribution.

If you fit the above eligibility criteria and are interested in participating, please contact myself at __(Email and/or phone) or Darcy Fredrick at dfredri6@uncc.edu or by phone at (404) 285-5496. We are happy to answer any questions or discuss the research further.

Thank you!

Darcy Fredrick, MAT | Doctoral Student
Department of Special Education and Child Development
UNC Charlotte | Cato College of Education
Phone: (404) 285-5496 | E-mail: Dfredri6@uncc.edu

Leslie Ann Bross, Ph.D., BCBA-D | Assistant Professor of Special Education
Program Director, Graduate Certificate in Autism Spectrum Disorder
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