

Comparison of Technology-Based Presentation Modalities in Multi-Stimulus Job Task  
Preference Assessments

BY

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THESIS

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## **DEDICATION**

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## **LIST OF ABBREVIATIONS**

ABLA	Assessment of Basic Learning Abilities
ADA	Americans with Disabilities Act
APA	American Psychiatric Association
APSE	Association of People Supporting Employment First
ASD	Autism Spectrum Disorder
BCBA	Board Certified Behavior Analyst
DSM-5-TR	Diagnostic and Statistical Manual of Mental Disorders, 5th ed. Text Rev.
GIFs	Graphic Interchange Format Images
ID	Intellectual Disability
IDD	Intellectual and Developmental Disabilities
IDEA	Individuals with Disabilities Education Act
IEP	Individualized Education Program
MSW	Multi-Stimulus With Replacement
MSWO	Multi-Stimulus Without Replacement
NLTS	National Longitudinal Transition Study
PS-ASD	Project SEARCH plus ASD Supports
RSA-911	Rehabilitation Services Administration data set
VR	Vocational Rehabilitation
WIOA	Workforce Innovation and Opportunity Act

## SUMMARY

The present study evaluated the effectiveness of video and electronic pictorial presentation modalities used in multiple stimulus without replacement (MSWO) job task preference assessments. Eight special education students with autism spectrum disorder (ASD) and intellectual disability (ID), ages 17 to 21, participated in the study. Work task preference assessments were conducted using objects, electronic pictures on an iPad, and videos on an iPad to present task choices. To validate results, preference hierarchies were compared between technology-based and object-based assessments, and task engagement was observed during performance of high and low preference tasks.

The electronic picture results matched object results with a moderate to strong correlation for six of eight participants, while the video results corresponded at least moderately to object results for five participants. Furthermore, task engagement data validated electronic pictorial assessment results for four participants, confirmed the high preference task for one, produced inconclusive results for one, and contradicted assessment results for two participants. Video-based assessment results were validated by task engagement for half of the participants. The object modality was accurate for nearly all participants. Results suggest that the electronic pictorial and video MSWO assessment of job task preferences are accurate and effective with some individuals and not as effective as the established object modality for others.

## CHAPTER I: INTRODUCTION

In preparation for adult life, the Individuals With Disabilities Education Act (IDEA, 2004) requires transition assessment of employment interests and preferences and development of a postsecondary employment goal for students with disabilities. The combined characteristics of autism spectrum disorder (ASD) and intellectual disability (ID) impede students' ability to communicate employment preferences through traditional career assessments and to participate in employment without supports. Employment rates for individuals with ASD are less than adequate, and many adults with ASD are unemployed or underemployed (Burgess & Cimera, 2014; Bush & Tassé, 2017; Farley et al., 2018; Roux et al., 2013). Individuals with ASD who have an additional diagnosis of intellectual disability (ID) are even less likely to obtain competitive employment outcomes (Chiang et al., 2013; Lord et al., 2020; Taylor & Seltzer, 2011). Given the inadequate employment outcomes for individuals with ASD and ID, the mandates of IDEA, and the need for student involvement in transition assessment, effective methods are essential to assess the employment preferences of transition-age students with ASD and ID in preparation for the workforce. Policies related to employment of people with disabilities, characteristics of individuals with ASD and ID, employment outcomes, and successful employment interventions that support the need for a systematic process to assess work task preferences were discussed.

### **Employment Policy Affecting People with Disabilities**

#### **The Rehabilitation Act and Americans with Disabilities Act**

Several federal laws support the preparation of youth and young adults with significant disabilities for employment. The 1973 Rehabilitation Act was the first disability civil rights law and an important victory in the disability rights movement. It prohibits discrimination on the

basis of disability in federal employment, programs, and activities (Rehabilitation Act, 1973).

Expanding upon the Rehabilitation Act, the Americans with Disabilities Act (ADA), which was signed into law in 1990, is a more comprehensive disability civil rights law. Specific to employment, the ADA prohibits discrimination based on disability by employers of 15 employees or more and requires businesses to provide reasonable accommodations to applicants and workers with disabilities (ADA, 1990). This law helped to secure the rights of individuals with significant disabilities in the workplace.

### **Employment First**

Current policy and thinking around employment for individuals with significant disabilities has shifted to more inclusive and personalized community-based employment, as exemplified by the employment first movement in the United States. Employment first is the philosophy that employment should be the first choice for individuals with significant disabilities. According to the U.S. Department of Labor (USDOL) Office of Disability Employment Policy, *employment first* is “a national systems-change framework centered on the premise that all individuals, including those individuals with the most significant disabilities, are capable of full participation in competitive integrated employment and community life” (n.d. -b, para. 1). Proponents of employment first, including the Association of People Supporting Employment First (APSE), advocate for jobs in the general workforce that are “in typical work settings, working side-by-side with people without disabilities, earning regular wages and benefits and being part of the economic mainstream of our society” (APSE, 2019, para. 2). Employment first policies that prioritize integrated employment over other options for individuals with disabilities are in place in 38 states, and 20 of those states have passed legislation supporting employment first (Hoff, 2019).

In the spirit of employment first, employment services for individuals with significant disabilities are moving away from sheltered work and traditional-supported employment toward customized employment. *Supported employment* is an evidence-based practice that has been used since the 1980s to place individuals with disabilities in community jobs and provide them with the supports to succeed in those jobs (Wehman et al., 2018). Customized employment differs from traditional-supported employment in that it includes an in-depth discovery process to learn about the job seeker's strengths, interests, preferences, and needs (Wehman et al., 2018). This information is then used in the customization of job responsibilities to create a match between the job seeker's preferences and abilities and the employer's needs (Wehman et al., 2018). The USDOL (n.d. -a) defined *customized employment* as "process for achieving competitive integrated employment or self-employment through a relationship between employee and employer that is personalized to meet the needs of both" (para. 1). Customized employment policies and practices are being adopted increasingly at state and local levels (USDOL, n.d. -a).

### **The Workforce Innovation and Opportunity Act**

Movement toward integrated community employment for individuals with significant disabilities in transition is supported by recent federal legislation. The Workforce Innovation and Opportunity Act (WIOA, 2014) the most recent amendment to the Rehabilitation Act, includes several provisions that support individuals with significant disabilities in attaining employment outcomes. WIOA requires allocation of 15% of state vocational rehabilitation VR funding for pre-employment transition services for students with disabilities. The aim is to provide VR services to students earlier in their high school years (Murthy et al., 2016; WIOA, 2014). As a result, the number of students with disabilities receiving VR services has increased substantially since WIOA was enacted (Rehabilitation Services Administration, 2020). WIOA also aims to

improve supported-employment services by extending the length of employment supports and including individuals with the most significant disabilities (Murthy et al., 2016; WIOA, 2014). Since the enactment of WIOA, the number of individuals with significant disabilities served by VR has increased (Rehabilitation Services Administration, 2020). Additionally, WIOA discourages segregated employment by limiting subminimum wage and prohibiting schools from contracting with segregated settings (Murthy et al., 2016; WIOA, 2014). These provisions encourage the transition of students with significant disabilities into employment in the community with competitive wages.

### **Individuals with Disabilities Education Act**

In 1975, the Education for All Handicapped Children Act (Public Law 94-142) was enacted, providing access to a free, appropriate public education for all students with disabilities, including those with significant disabilities who may have been previously excluded. Now called IDEA, amendments to the law mandate transition planning and services to students with disabilities. Transition planning and services were first required in the 1990 reauthorization of IDEA, and the transition requirements were refined in the 2004 reauthorization. *Transition services* are defined as “a coordinated set of activities” focusing on “academic and functional achievement” to support movement to “postsecondary education, vocational education, integrated employment (including supported employment); continuing and adult education, adult services, independent living, or community participation” (IDEA, 2004, SEC 300.43[a]). The transition services must be based on individual needs, consider “strengths, preferences, and interests,” and include “instruction, related services, community experiences, the development of employment and other post-school adult living objectives, and, if appropriate, acquisition of daily living skills and functional vocational evaluation” (IDEA, 2004, SEC 300.43[a]).

Postsecondary goals in the areas of “training, education, employment and, where appropriate, independent living skills” must be based on “age-appropriate transition assessments” (IDEA, 2004, SEC 300.320)[b][1]. IDEA specifically states that a student’s preferences and interests are to be considered in providing transition services (IDEA, 2004). Ideally, the postsecondary employment goal for a student with a disability would include a specific job or career field based on predetermined from an assessment of the student’s career interests and work preferences. Job task preference assessments can be used as a tool for transition planning, particularly in developing these postsecondary goals for students with significant disabilities.

### **Characteristics of Individuals With ASD and ID**

#### **Diagnostic Criteria**

According to the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed. text rev. [DSM-5-TR]), the diagnostic criteria for ASD include “deficits in social communication and social interaction” and “restricted, repetitive patterns of behavior, interests, or activities” (American Psychiatric Association [APA], 2022a, Diagnostic Criteria section section). These characteristics must be present from an early age and impair important areas of functioning (APA, 2022a). The DSM-5-TR specifies three levels of severity based on the amount of support the individual requires (APA, 2022a). Prior diagnoses of autistic disorder, Asperger’s disorder, and pervasive developmental disorder are included under the current DSM-5-TR definition of ASD (APA, 2022a).

Approximately one third of individuals with ASD have an additional diagnosis of ID (Maenner et al., 2021). The DSM-5-TR defines intellectual disability as “a disorder with onset during the developmental period that includes both intellectual and adaptive functioning deficits in conceptual, social, and practical domains” with the severity categorized as mild, moderate,

severe, or profound (APA, 2022b, para.1). These levels of severity are determined based on adaptive functioning in the DSM-5-TR, not test scores (APA, 2022b). However, tests of intelligence are used to establish a deficit in intellectual functioning, which is a criterion for a diagnosis of ID (APA, 2022b). Individuals with ID have IQ scores at least two standard deviations below the mean (APA, 2022b). IQ scores are often reported in research literature to describe participants with ID.

ASD and ID are both disabilities that affect people throughout their lifetime (APA, 2022a, b). The defining characteristics of ASD continue into adulthood for most individuals (Baghdadli et al., 2018; Matson & Horovitz, 2010; Shattuck et al., 2007; Simonoff et al., 2020) and affect outcomes in many aspects of life including employment (Eaves & Ho, 2008; Howlin & Moss, 2012). Intellectual ability and the development of speech by 5 or 6 years old are predictors of successful adult outcomes (Levy & Perry, 2011). Studies have found that adults with ASD and lower IQ scores are less likely to be employed (Chiang et al., 2013); Lord et al., 2020; Taylor & Seltzer, 2011). Individuals with significant disabilities who need supports in childhood and adolescence are likely to continue to need supports in adult life, especially for employment. Therefore, preparation for employment is an essential component of transition for students with ASD and ID, and job task preference assessments can be utilized in transition planning with these students.

### **Prevalence**

The prevalence of ASD is estimated be one in 44 children by the Centers for Disease Control and Prevention's (CDC) Autism and Developmental Disabilities Monitoring Network based on data on 8-year-old children collected at 11 sites in the United States in 2018 (Maenner et al., 2021). ASD was diagnosed with 4.2 times greater frequency in boys than girls (Maenner et



al., 2021). In the most current CDC study, 35.2% of children with ASD also had ID, as defined by an IQ score of 70 or lower, and there was not a significant difference in the rates of ID diagnosis between girls and boys with ASD (Maenner et al., 2021). These data suggest that a substantial number of children with ASD and ID will need transition supports in school in the coming years as they prepare for adulthood.

### **Characteristics Affecting Transition Assessment**

Communication challenges can be a characteristic of both ASD and ID, as defined by the DSM-5-TR (APA, 2022a, b). Individuals with ASD requiring the highest level of support needs might be nonverbal or speak a few understandable words; those requiring substantial support might speak simply; and those requiring only some supports might speak in more complex sentences and engage in conversations; however, all individuals with ASD struggle with the social aspects of communication (APA, 2022a). According to the National Longitudinal Transition Study (NLST) 2012, most students with ASD have challenges understanding what others say, and based on parental responses, half of the students have difficulty communicating in any way (Lipscomb et al., 2017b). Furthermore, individuals with all levels of ID experience some limitations in communication skills, which range from lack of verbal communication for those with profound ID to concrete or undeveloped communication for those with mild ID (APA, 2022b). Additional findings from the NLST 2012 reported that 60% of the children with ID have difficulty communicating and 69% have difficulty understanding what others say (Lipscomb et al., 2017b). Research shows that individuals with ASD who had communication challenges were less likely to achieve employment than those with better communication skills (Carter et al., 2011, 2012; Roux et al., 2013).

The communication challenges experienced by individuals with ASD and ID can make it difficult to express choices and preferences, which is a particularly important consideration in transition planning. Some students with ASD and ID lack the necessary communication skills to report their career interests in a transition interview. Additionally, because of the characteristics of this dual diagnosis, individuals with ASD and ID often have below grade-level academic skills and challenges with reading and writing (Dockrell et al., 2014; Schulte et al., 2016). This makes it difficult to complete transition assessments such as paper and pencil career interest inventories used with students with high incidence disabilities. Therefore, these students need alternative methods to assess employment preferences so that they can provide meaningful input in their own transition and employment planning despite significant challenges with communication and understanding. Work task preference assessments can be used as a systematic way to determine the preferences of individuals who would otherwise have difficulty expressing their likes and dislikes.

### **Employment Outcomes of Individuals With ASD or ID**

Individuals with ASD in the United States have high rates of unemployment, and many of those who are employed are not working full-time (Alverson & Yamamoto, 2018; Farley et al., 2018; Roux et al., 2013; Taylor & Seltzer, 2011). Studies of youth and young adults in transition, individuals accessing VR services, adults receiving intellectual and developmental disability services, and adults in longitudinal studies show disappointing employment outcomes for people with ASD and ID while in secondary school and in adulthood. The state of employment outcomes of individuals with ASD or ID demonstrates the need for better transition planning and preparation for employment while in school.

## **The NLTS-2**

The NLTS-2 conducted in the United States provided information on the transition from secondary school to adulthood for more than 11,000 special education students; data were collected in waves between 2001 to 2009 (Newman et al., 2011; Wagner et al., 2006). Study participants with severe disabilities including those with ASD and ID experienced low rates of employment during and after secondary school (Carter et al., 2011, 2012). Only 11% of students with ASD and 33% of students with ID who were classified as having a severe disability received employment wages, which included work study pay, while attending secondary school (Carter et al., 2011). Two years after completing school, only 26% of young adults with severe disabilities were working in paid employment, and those who were employed worked an average of 21 hours per week (Carter et al., 2012). Of those who were working, 43% were in a setting where most of the other workers also had disabilities (Carter et al., 2012).

According to the NLST-2, young adults with ASD and those with ID experienced lower rates of employment, worked less hours, received lower pay, and had less job variety than young adults with other high incidence disabilities (Roux et al., 2013; Shattuck et al., 2012). Compared to young adults with a learning disability (LD), speech/language impairment (SLI), or ID, those with ASD had the lowest rates of employment and highest rates of disengagement, which purports no involvement in postsecondary education or employment (Shattuck et al., 2012). In addition, data from the study showed that only 53.4% of young adults between the ages of 21 to 25 with ASD had ever been employed and only 33.6% were currently employed (Roux et al., 2013).

Wei et al.'s (2015) review of the NLST-2 found the data were used to identify transition-sequence clusters based on the trajectories of young adults with ASD. More than half of young

adults with ASD were primarily focused on postsecondary education after leaving secondary school, 29% were disengaged from education and employment, and only 13.6% of participants were focused on employment, of which the majority worked part-time. Rates of employment increased over time, but the rate of full-time employment was low even among those focused on employment rather than education (Wei et al., 2015). Analysis of NLTS-2 data show low rates of employment, especially full-time employment, for young adults with ASD within 6 years of leaving high school and an equally low rate of young adults with ASD disengaged from both employment and postsecondary education (Wei et al., 2015). Overall, the analysis of data shows mediocre employment outcomes for students and young adults with ASD.

### **NLTS 2012**

The NLTS 2012 gathered information on almost 13,000 students in 2012 and 2013 to investigate differences between students with and without IEPs, compare students with different disabilities, and make comparisons to past data (Lipscomb et al., 2017a/2017b; Liu et al., 2018). Based on NLTS 2012 data, teens between 16-19 years old with ASD were less likely to be employed in community-based work, any type of paid work, or any type of work at all (paid or unpaid) when compared to those without disabilities and those with ID (Roux et al., 2020). Overall, 40% of teens with ASD had some work experience within the past year (Roux et al., 2020). Among youth ages 14 to 21, 24.4% had paid work experience during the prior year, with higher rates of paid employment for older students (Qian et al., 2021). Only 25.3% of teens with ASD, ages 16 to 19, were paid employees in community-based work, which was less than half the rate for students without disabilities (Roux et al., 2020). Teens with ASD also worked fewer hours per week than those with ID and those without disabilities (Roux et al., 2020). Participation in school-sponsored work was higher for teens with ASD than those without IEPs

and showed an increase since NLTS-2; however, this represented only 20.2% of students with ASD (Roux et al., 2020). National data show that employment rates for students with ASD continue to lag behind students with other disabilities and students without IEPs.

### **VR Outcomes**

Information about individuals who receive VR services in the United States is collected annually in the Rehabilitation Services Administration data set (RSA-911). This data set can be used to examine employment outcomes of individuals with ASD or ID and factors related to attainment of competitive employment. Competitive employment is defined in the RAS-911 as full- or part-time “employment in an integrated setting, self-employment, or employment in a state-managed Business Enterprise Program [for which the worker is] compensated at or above the minimum wage” (Chen et al., 2015, p. 3018).

Competitive employment rates are low for individuals with ASD among youth and adults seeking employment through VR services. Based on RSA-911 data the employment rate for all individuals with ASD of all ages with closed VR cases in 2003 through 2012 was 37.57% (Alverson & Yamamoto, 2018). Among individuals with ASD who received services and had cases closed during 2013, the employment rate was 56.9%, with an average of 23.3 hours worked per week (Nye-Lengerman, 2017). Young adults with ASD between the ages 19 to 25 who had closed VR cases in 2013 experienced a 55.4% employment rate (Kaya et al., 2018). Less than half (46.7%) of young adults with ID, ages 19 to 25, had VR cases closed with competitive employment outcomes in 2013 (Kaya, 2018). Among people with ASD who had closed VR cases in 2015 through 2017, 51.9% of secondary students ages 16 to 21, 58.3% of non-secondary student youth ages 16 to 21, and 65.7% of young adults ages 22 to 39 were employed upon exiting VR services (Roux et al., 2021). Between 2015 and 2017, autistic youth

and young adults with the most significant disability or with co-occurring ID or psychiatric disability were less likely to obtain employment (Roux et al., 2021). Analysis of data on the outcomes of individuals with ASD or ID who received VR services showed historically modest rates of employment.

Although recent data show an increase in employment rates among individuals with ASD receiving VR services (Roux et al., 2021), many who are seeking employment are still not achieving the outcome of competitive, community-based work. These studies using RSA-911 data demonstrate less than optimal rates of employment, but do not represent the entire population of individuals with ASD or ID who might desire employment; the studies only include participants who seek and receive VR services. Although the RSA-911 data provide information on individuals with ASD and/or ID seeking employment through VR, other sources of information should be utilized to obtain more comprehensive overview of the employment outcomes of all individuals with ASD.

### **State Intellectual and Developmental Disabilities Agency Outcomes**

In contrast to the VR service system, state intellectual and developmental disabilities (IDD) agencies can provide long-term, ongoing employment support and services (Nord et al., 2016). Individuals who need a higher level of support might be able to receive employment services through state IDD agencies from programs such as those funded by the Home and Community Based Services Medicaid waiver, although these programs and their eligibility requirements vary across states (McDonough & Revell, 2010).

The National Core Indicators (NCI) Adult Consumer Survey provides information about individuals in multiple states who received IDD services (Bush & Tasse, 2017; Nord et al., 2016). Based on data collected from 19 states during 2008 and 2009, Nord et al. (2016) reported

18- to 65-year-olds with ASD receiving IDD services were significantly less likely to work in community employment, including individual and group competitive and supported employment, than those without ASD. Community employment rates were 13.8% for adult IDD service recipients with ASD, compared to 19.7% for those without ASD (Nord et al., 2016). Additionally, 17.6% of adults with ASD receiving IDD services worked in sheltered employment, as did 24.2% of adults without ASD; however, community employment rates were significantly lower for individuals with more severe ID (Nord et al., 2016). Based on NCI survey data from 2011 through 2013, adults with ASD and ID who received IDD services were less likely to work in community or sheltered employment than those with Down syndrome and ID or those with ID only (Bush & Tasse, 2017). Among the IDD service users with ASD and ID, the majority (71.1%) did not work, but 18.5% worked in facility settings and 10.4% worked in the community (Bush & Tasse, 2017).

Based on NCI data from 2016 to 2017, 20.2% of individuals receiving IDD services were employed in paid work in the community and another 20.5% worked in paid sheltered work (Hiersteiner et al., 2018). Among IDD service users who were not employed in the community, 46.7% wanted a paid, community-based job (Hiersteiner et al., 2018). NCI data from 2018-2019 showed that 19% of overall IDD service users were employed in the community (NCI, 2020), and IDD service users with ASD were competitively employed at a lower rate of only 15% (NCI, n.d.). Overall, 44% of IDD service users who were not employed in the community desired employment (NCI, 2020). The NCI data show very low rates of integrated-community employment for adults accessing IDD services, particularly for individuals with ASD or both ASD and ID, although data show that many adults in the IDD system do want to work.

### **Other Employment Outcome Studies**

Longitudinal studies of groups of people with ASD also provide information on the employment outcomes of youth and adults with ASD and ID. Farley et al. (2018) conducted a study of mid-life adult outcomes for 162 individuals with ASD and where more than three fourths of them also had ID. The researchers found that more than half were not working, while 48% participated in some type of paid employment including competitive, supported, and sheltered work. Most of the workers who were competitively employed full- or part-time without ongoing supports did not have ID (Farley et al., 2018).

Another longitudinal study of individuals with ASD that collected data in 10 waves spanning 14 to 16 years also showed low competitive employment rates among individuals with ASD and ID (Chan et al., 2018). Based on data collected in 2008 from young adults who had exited secondary school in 2004 through 2008, the majority were in sheltered employment or day activity settings, and rates of competitive or supported employment were low (Taylor & Seltzer, 2011). Based on data collection points between 2011-2014), only 14.3% of individuals with both ASD and ID sustained competitive or supported employment for 10 or more hours per week over 18 months (Chan et al., 2018). In addition to large national data sets, longitudinal studies also demonstrate the less than adequate employment outcomes experienced by adults with ASD.

NLTS-2, RSA-911, NCI Adult Consumer Survey, and longitudinal study data show unsatisfactory employment outcomes for individuals with ASD and ID. The existing service systems are not adequately assisting people with ASD and ID in obtaining community employment. High rates of unemployment and underemployment especially among young adults, illustrate the need to better prepare for employment through effective transition services that include assessment of employment interests and preferences while they are in school.



## **Employment Supports**

Despite poor employment outcomes overall, some individuals with ASD and ID successfully find and maintain jobs in their communities when provided with appropriate supports and services. Intervention packages, service categories, and specific strategies can lead to positive employment outcomes for individuals with disabilities. Factors associated with successful employment include customized and supported employment, VR services, transition services and supports during high school, interventions using technology, and self-determination skills instruction during transition. The services and supports are discussed in this section.

### **Customized and Supported Employment Programs**

Customized, supported employment approaches can lead to successful employment outcomes for individuals with ASD and ID. In a study involving supported and customized employment strategies used with young adults with ASD, some of whom had ID, 27 out of 33 obtained competitive employment (Wehman et al., 2012). Employment support strategies included creating (a) job-seeker profiles, (b) job development and search based on the individual's interests and needs, (c) on-the-job training and support, (d) long-term employment, and (e) individual or community supports (Wehman et al., 2012). These intense supports that consider an individual's interests and preferences were associated with successful employment outcomes for most participants.

Building on the success of the employment supports in Wehman et al.'s (2012) study, Project SEARCH plus ASD supports (PS+ASD), a program designed to aid in the transition of students with ASD from high school to work, has also shown positive employment outcomes. A major component of the program was an internship in the final year of high school with ASD-specific supports including applied behavior analysis (Wehman et al., 2014). All of the

participants had ASD, and one fourth also had ID. A randomized clinical trial found that 87.5% of participants in PS+ASD achieved competitive employment one year after beginning the program compared to the control group that achieved only 6.25% (Wehman et al., 2014).

Participants in PS+ASD had much higher rates of employment at graduation, and at data points 3 months and one year after graduation, 87% were employed a year after graduation compared to only 12% in the control group (Wehman et al., 2017). A retrospective study comparing PS+ASD to supported employment without PS+ASD supports found that those who had gone through PS+ASD required fewer hours of support from VR for job development, had higher average wages, and had better retention rates (Schall et al., 2015).

A more current analysis of the effects of PS+ASD compared competitive employment outcomes of 18- to 21-year-old students with ASD participating in PS+ASD to those receiving typical transition services (Wehman et al., 2019). Students in the PS+ASD [condition] participated in the program full-time their final year of school, during which they received classroom instruction and completed three internships. Internships were designed based on participants' expressed interests; if no interest was identified, job coaches assessed "strengths, preferences, and interests" during the internships to refine the employment goal (Wehman et al., 2019, p. 1885). At graduation, 32% of PS+ASD participants were employed compared to only 5% of the control group. One year after graduation, PS+ASD participants had 73% employment rate compared to 17% for the control group. The authors described "personalized vocational assessment" as one of several key components contributing to the success of PS+ASD (Wehman et al., 2019, p. 1894). These studies of PS+ASD demonstrate that individuals with ASD and ID can achieve and maintain community employment when provided with intense, ASD-specific

supports upfront. These supports involve an individualized process that helps job seekers identify job preferences and career interests.

### **Transition and VR Services**

Specific-variables studies analyzing the NLTS-2 data set identified activities or interventions occurring during high school that were associated with better employment outcomes postschool. Paid work during high school (Carter et al., 2012), career counseling during high school, and contact between the school and employers or postsecondary vocational training programs (Chiang et al., 2012) corresponded to higher rates of participation in employment after high school. Parent participation in education and school-based transition supports were found to play a role in employment outcomes in students with ASD and lower daily functioning skills (Wong et al., 2021). In addition, activities provided by VR agencies associated with better competitive employment outcomes have been identified using RSA-911 data; they include counseling and guidance, job search assistance, job placement support, on-the-job supports and training, and maintenance services (Chen et al., 2015; Kaya et al., 2018; Nye-Lengerman, 2017). Receiving a greater number of VR services was correlated with obtaining competitive employment for individuals with ASD (Alverson & Yamamoto, 2018; Ditchman et al., 2018; Kaya et al., 2016; Kaya et al., 2018) and individuals with ID (Kaya, 2018).

Participation in employment preparation programs with intense supports and receiving employment-related services and supports while in school and from VR agencies can lead to successful employment outcomes. Studies show that comprehensive packages of supports and services can lead to employment (Schall et al., 2015; Wehman et al., 2012; Wehman et al., 2014; Wehman et al., 2019); however, the current research does not clearly show which specific interventions produce successful outcomes. The service and activity categories identified as

successful from the NLTS-2 and RSA-911 data sets are broadly defined and could vary by school, job seeker, and VR counselor. Additionally, these studies do not focus exclusively on individuals with both ASD and ID and might not include individuals with the highest support needs. More research is needed to determine specific tools that can be used with individuals with significant disabilities in preparation for employment and the interventions needed to assess job task preferences.

### **Technology-Based Interventions**

Interventions involving technology, especially video modeling and video prompting, have a growing research base for use in teaching vocational and life skills. National Professional Development Center on Autism Spectrum Disorders determined that technology-aided instruction and intervention were evidence-based practices (Wong et al., 2015). Modeling, which includes video modeling, was identified as an established practice by the National Autism Center (2015), and video modeling was determined to be an evidence-based practice by the National Professional Development Center on Autism Spectrum Disorders (Wong et al., 2015). A meta-analysis of single-case studies using video modeling to teach life skills such as community access, vocational skills, self-care, and chores produced a moderate-to-strong effect for participants (Hong et al., 2016). The majority of studies in the analysis included individuals with ASD and ID, and most of the studies involved participants over age 15 (Hong et al., 2016). Video models and video prompts delivered on computers, iPods, iPads, and other tablets have been successful in teaching a variety of job-related skills in school and community settings skills (Kim et al., 2022; Munandar et al., 2020; Seaman & Cannella-Malone, 2016; Walsh et al., 2017). Interventions using technology and video are effective strategies for vocational-skill instruction, but their application in employment assessment have not been fully explored.

### **Self-Determination and Choice-Making Interventions**

Self-determination is an essential component of transition planning and preparation for employment. Teaching self-determination skills during transition is an evidence-based practice (Test et al., 2009a), and self-advocacy/self-determination is a potential predictor of successful postschool outcomes in employment for students with disabilities (Test et al., 2009b). Self-determination includes making one's own decisions, acting of one's own volition, and being the causal agent in one's own life (Wehmeyer, 1992, 2005). A student's preferences about work should drive the process of transition planning for employment (Martin et al., 2005), but for individuals with ASD and ID, expressing a work preference can be difficult considering limitations in their ability to communicate and act independently.

According to the NLTS-2012, self-advocacy skills of students with the most significant cognitive disabilities, which include students with ASD, ID, and multiple disabilities who took alternate assessment, were rated lower than those with other disabilities. Students with lower self-advocacy and communication skills were less likely to meet with staff to develop goals (Johnson, 2020). Students with significant cognitive disabilities participated less and had less of a leadership role during IEP/transition planning meetings, compared to students with other disabilities (Johnson, 2020). Additionally, the NLTS-2 showed that students with ASD were less likely to meet with teachers to develop postsecondary goals and less likely to be active participants in transition planning than students with ID or other disabilities (Shogren & Plotner, 2012). Students with ASD and ID are not fully engaged in providing input for their transition planning, even though studies show that relying on others' opinions of a person's preferences can be inaccurate (Martin et al., 2005; Reid et al., 2007; St. Peter et al., 2021). This highlights the importance of assessing the preferences of individuals with disabilities to obtain accurate

information for transition planning; give them a voice in planning to for their future and promoting self-determination. Systematic methods of preference assessment can be used to learn about the employment preferences of individuals with ASD and ID and increase involvement in transition planning.

### **The Need for Employment Preference Assessment in Transition**

Attainment of integrated, community employment for a competitive wage is a challenge for individuals with ASD and ID. Multiple data sources such as the NLTS-2, RSA-911, NCI Adult Consumer Survey, and other longitudinal studies, confirm that employment rates of individuals with ASD are low (Alverson & Yamamoto, 2018; Bush & Tasse, 2017; Chan et al., 2018; Farley et al., 2018; Kaya et al., 2018; Roux et al., 2013; Shattuck et al., 2012; Taylor & Seltzer, 2011). The challenge of obtaining competitive employment for individuals with ASD and ID is greater than for those with ASD only or ID only (Chiang et al., 2012; Lord et al., 2020; Taylor & Seltzer, 2011). Among individuals with both ASD and ID, the majority are unemployed or work in sheltered employment (Bush & Tasse, 2017; Nord et al., 2016; Taylor & Seltzer, 2011). These outcomes underscore that people with ASD and ID are not receiving the supports and services necessary to secure and maintain competitive employment.

Federal policies such as the Rehabilitation Act and ADA promote the employment of individuals with disabilities in the United States (ADA, 1990); however, policies alone have not been enough to make community employment a reality for many individuals with ASD and ID. The employment first movement and related policies along with the more recently enacted WIOA 2014, advocate for more inclusive employment for people with significant disabilities (APSE, 2019; Hoff, 2016), but the requirements of the WIOA have yet to be fully implemented in all states (Curda et al., 2018). State VR services assist people with disabilities in securing

employment; however, many individuals with ASD and ID served by VR have not attained competitive employment outcomes (Alverson & Yamamoto, 2018; Burgess & Cimera, 2014; Kaya, 2018; Kaya et al., 2018; Nye-Lengerman, 2017). State IDD programs might provide employment services and supports to some individuals with ASD and ID, but most people with ASD and ID who are accessing IDD services are not employed (Bush & Tasse, 2017; Nord et al., 2016). Some individuals are not able to access appropriate services through either VR or IDD systems (Anderson et al., 2018). Even with the existing policies and services in the United States, individuals with ASD and ID are not adequately prepared to enter the workforce.

Preparation for employment should begin with transition planning and services while individuals with ASD and ID are in school. WIOA 2014 requires increased support for students with disabilities in transition by allocating VR funds for pre-employment transition services that focus on job exploration and identification of career interests (Curda et al., 2018). Furthermore, IDEA requires transition planning for students with disabilities that include employment transition assessment to determine preferences and interests as postsecondary employment outcomes for students with disabilities are developed (IDEA, 2004). However, assessing and identifying preferences of students with ASD and ID are challenging because they might not be able to complete traditional career assessments or articulate their employment preferences. Further research on methods of assessing employment preferences in transition-age students with both ASD and ID is needed.

Although overall employment rates are low, studies indicate that individuals with ASD and ID can obtain employment in their communities. Young adults with ASD in transition have been successful in obtaining and maintaining competitive employment following a supported, customized employment process and given ASD-specific supports (Schall et al., 2015; Wehman

et al., 2012; Wehman et al., 2014; Wehman et al., 2020. One of the major components of the process was the creation of a job-seeker profile, which explored the participants' strengths, interests, and needs prior to job development (Wehman et al., 2012). Personalized assessment throughout the internship process also explored interests and preferences to refine employment goals (Wehman et al., 2020). Assessing individual career interests and preferences of students with ASD in transition was part of a successful intervention that led to competitive employment. Some individuals with ASD and ID have become employed after accessing VR services, and research shows that individuals receiving these services are more likely to obtain competitive employment (Alverson & Yamamoto, 2018; Ditchman et al., 2018; Kaya et al., 2016; Kaya et al., 2018). The service category of counseling and guidance, which includes vocational counseling to identify career interests, was associated with improved competitive employment outcomes among job seekers with ASD (Chen et al., 2015). Career counseling during high school was identified by the NLTS-2 as an intervention associated with successful attainment of employment (Chiang et al., 2012). Although specific methods are not identified, services aimed at identifying employment interests seem to be related to better employment outcomes. Studies of comprehensive programs or broad service categories show the possibility of successful competitive employment, but do not pinpoint the specific strategies that are responsible for successful outcomes. More research is needed to identify the components that lead to employment and assess the effectiveness of specific methods of identifying employment interests and preferences of transition-age students with ASD and ID.

Interventions using technology such as video modeling on iPads have been effective in teaching vocational skills to individuals with ASD and ID but have not been explored as a way to conduct assessments of work task preferences. Preference assessments using technology that



include choices presented on computers or tablets, have been used successfully to assess other preferences (Brodhead, Abel et al., 2016a; Brodhead, Al-Dubayan et al., 2016b; Brodhead et al., 2017; Chebli & Lanovaz, 2016; Huntington & Higbee, 2017; Snyder et al., 2012; Wolfe et al., 2017). Systematic methods of work task preference assessment have been used with people with ASD and ID by presenting choices of objects, pictures, spoken words, and in one study, videos that represent work tasks (Cobigo et al., 2009; Horrocks & Morgan, 2009; Mithaug & Hanawalt, 1978; Reid et al., 2007; Reyer & Sturmey, 2006; Spevak et al., 2005). Therefore, work task preference assessments utilizing pictures and videos on iPads have potential for use as a transition assessment to prepare students with ASD and ID for employment.

### **Purpose of the Study**

In this study, existing procedures for job task preference assessment are combined with electronic presentation modalities. The purpose of the study is to determine the effectiveness of technology-based work task preference assessments with transition students with ASD and ID. Two methods of presentation that incorporate the use of technology--electronic pictures and videos on an iPad--were compared to an object-based work task preference assessment, and task engagement was observed to validate the assessment results.

### **Research Questions**

One overarching question and two subquestions were posed to help determine the effectiveness of technology-based work task preference assessments with the identified participants.

1. Are electronic picture-based and video-based multi-stimulus without replacement (MSWO) preference assessments effective in identifying work task preferences of transition-age students with ASD and ID?

- a. Do electronic picture-based and video-based assessments produce similar preference hierarchies to object-based assessments, a method with established validity?
- b. Are the preferences identified by object, electronic picture, and video-based assessments validated by task engagement during work sessions with preferred and non-preferred tasks?

## CHAPTER II: REVIEW OF THE LITERATURE

This chapter described the theory of behaviorism in relation to stimulus preference assessments and the theory of self-determination and causal agency theory in relation to the application of preference assessments in the lives of individuals with disabilities. A review of the research literature covered work task preference assessments used with individuals with ASD and/or ID, video-based career assessments, and technology-based preference assessments. This literature review exposed the gaps in the existing research and demonstrate the need for further inquiry in technology-based work task preference assessments for students with ASD and ID in transition.

### **Theoretical Framework**

The application of stimulus preference assessments to identify preferred work tasks is based on behavior theory. Behaviorism focuses on observable behavior and its relation the external environment, rather than internal thoughts and feelings. Behaviorism studies relationships between stimuli and responses as well as between behaviors and consequences. Operant conditioning, described by Skinner (1953), is concerned with the consequences that have an effect on behavior by increasing or decreasing the probability that a response will occur again. A consequence that increases the likelihood of a particular response is called a reinforcer, as it has a reinforcing or strengthening effect on the behavior (Skinner, 1953). In contrast, a punishment decreases the likelihood of a behavior (Skinner, 1953). These principles are applied to a wide variety of situations to understand human behavior and learning.

Stimulus preference assessments, including methods used to assess work task preferences, are designed based on the concepts of behaviorism and operant conditioning. Preference assessments are a systematic way of identifying which items or activities are more

and less reinforcing to a particular individual (Canella-Malone & Sabielny, 2020). During pre-exposure trials, the participant learns to associate a stimulus such as an object, electronic picture, or video clip, with the performance of a specific work task. An array of stimuli is then presented to a participant, and the participant makes a selection response (DeLeon & Iwata, 1996; Mithaug & Hanawalt, 1978). The participant is more likely to select the object, picture, or video that will have the consequence of engaging in a preferred work task (Mithaug & Mar, 1980). The present study also included observation of participants' on-task behavior while performing work tasks to validate the results of the preference assessment. It is assumed that an individual will be more likely to work at a task that they prefer (Bambara et al., 1994).

While behavior theory explains the mechanism of work task preference assessment, the concepts of self-determination and causal agency theory explain the importance of determining an individual's preferences for important life activities such as work (Shogren et al., 2015; Wehmeyer, 1992). In the 1990s, self-determination was conceptualized in relation to an individual with significant disabilities and defined as "the attitudes and abilities required to act as the primary causal agent in one's life and to make choices regarding one's actions free from undue external influence or interference" (Wehmeyer, 1992, p. 305). Causal agency theory furthers this idea. Self-determination is defined as a "dispositional characteristic manifested as acting as the causal agent in one's life" (Shogren et al., 2015, p. 258). Causal agency theory shifts the focus from behaviors to actions (Shogren et al., 2015). Self-determined actions are those that "function to enable a person to be a causal agent in his or her life" (Shogren et al., 2015, p. 258), and fall into categories of volitional actions, agentic actions, and action-control beliefs (Shogren, 2020; Shogren et al., 2015). The concept of volitional action is central to the purpose of preference assessments. "Volition refers to making a conscious choice based upon

one's preferences" (Shogren et al., 2015, p. 258), and volitional actions are comprised of the skills of "choice-making, decision-making, goal setting, problem solving, and planning" (Shogren, 2020, p. 30). Preference assessments provide a way for students with significant disabilities to act volitionally through opportunities to make choices based on preferences.

Although individuals with significant disabilities may not be able to control all aspects of their lives independently, they can be supported to act with volition and should be taught to express their preferences (Wehmeyer, 2005). Preference assessment can contribute to improved quality of life for individuals with disabilities because it gives individuals the ability to exert control over some aspects of their life through choice-making as well as allow them to experience the outcomes of those choices such as engaging in meaningful work (Canella-Malone & Sabielny, 2020). For students in transition, preference assessment is a way to express choices for major decisions as they enter adult life. The long reaching aim of the present study is that work task preference assessments can be used in making employment decisions that are in accordance with the individuals' goals for their life and leads to improved quality of life.

### **Work Task Preference Assessment Studies**

The research literature on work task preference assessment was reviewed including studies from peer-reviewed journals, published in English, that met the following criteria: (a) the study included participants with ASD and/or ID, and (b) the study's methods involved assessing preferences for specific work tasks. Older studies that described participants with outdated disability labels (e.g., mental retardation, pervasive developmental disorder) were included if the diagnosis is now classified as ASD or ID in the DSM-5-TR (APA, 2022a, b). Although preference assessments have been used to determine a wide variety of preferences such as preference for reinforcers and leisure activities, this review includes only included studies

exploring vocational task preferences. Studies assessing vocational preferences of job conditions such as working alone versus with others (Lancioni et al., 1995), task variation versus repetition (Lancioni et al., 1998b), or sedentariness versus mobility in task arrangement (Lancioni et al., 1998a), were excluded from this review unless there was a component of the study focusing on preferences for job tasks. Additionally, studies that focused on preference for broader career categories or jobs consisting of multiple tasks were excluded. Electronic searches were conducted using Google Scholar and ProQuest databases, and hand searches were conducted from the references of those that were included. An overview of the articles that met inclusion criteria is presented in Table I. Studies in the table are presented in chronological order to show how the line of research progressed over time.

**Table I***Summary of Work Task Preference Assessment Articles Included in Literature Review*

<b>Study</b>	<b>n</b>	<b>Age (years)</b>	<b>Disabilities of Participants</b>	<b>Focus of Research</b>	<b>Preference Assessment Type</b>	<b>Method</b>	<b>Key Results/Findings</b>
Mithaug & Hanawalt (1978)	3	19-21	1- ID, 2 - ID/Down syndrome	Evaluate effectiveness of an assessment procedure of prevocational task preferences of young adults with ID and communication and behavioral challenges  Validate the preferences determined by the assessment	Paired - tangible	Demonstration of assessment method  Validation through choices between high and moderate, low and moderate preference tasks	Most and least preferred tasks were identified for each participant. In phase two, 9/12 preferences (high, low, moderate) were validated, two were partially validated, and one preference was reversed.
Mithaug & Mar (1980)	2	19-20	ID, 1 - ID/Down syndrome	Determine reinforcing and punishing functional relationships between selection response and work on a task	Paired - tangible	Substitution of chosen tasks with more or less preferred tasks to see effect on subsequent choices	Reinforcing and punishing effects were demonstrated. Choice of an item increased when followed by a preferred task and decreased when followed by a non-preferred task.
Parsons et al. (1990)	4	31-38	3 - ID, 1 - ID/visually impaired	Evaluate the effects of task choice versus task assignment on work performance  Replicate prior studies	Paired - tangible	Observation of behavior in choice, assigned preferred, and assigned nonpreferred task conditions in alternating treatments design	The assessment determined preferred and non-preferred tasks for all participants. In the choice condition, high preference tasks were chosen 100%, 100%, all but one, and 60% of the time for the four participants. On-task behavior was higher for higher preference tasks and choice conditions. Disruptive behaviors were low overall.
Winking et al. (1993)	4	17-19	ASD/ID	To demonstrate an assessment process for use in job development	Behavioral observation	Demonstration of assessment process to identify preferred job tasks matching preferred conditions  Validation of preferred and nonpreferred jobs through observation of preference indicators and measurement of skills acquisition	Preferred and non-preferred tasks were identified for all participants. Clear differences in rates of preference behaviors validated preferences for 2/4 participants. Skill acquisition did not have a relationship to preference overall.
Bambara et al. (1994)	Exp. #1 - 3  Exp. #2 - 5	31-38	ID	Replicate Parsons et al., 1990  Evaluate the effect of choice on work performance with task preferences held constant	Paired - tangible	Exp. #1 - Observation of task engagement in high preference, low preference, and choice task conditions  Exp. #2 - Task engagement measured in choice or no choice conditions with low/moderate preference tasks	Exp. #1 - On-task behavior was highest in choice and high preference conditions and lower in the low preference condition.  Exp. #2 - On-task behavior was similar for choice and no choice conditions for moderately preferred tasks. One participant showed more on-task behavior during choice conditions even though he did not demonstrate a strong task preference.

Table I (continued)

Study	n	Age (years)	Disabilities of Participants	Focus of Research	Preference Assessment Type	Method	Key Results/Findings
Cole et al. (1997)	3	11-13	2 - ID/PDD, 1 - ID/ADHD	Evaluate the effects of choice, assignment of preferred, and assignment of nonpreferred tasks on work performance	Paired - tangible	Observation during assigned preferred, assigned nonpreferred, and choice work conditions	The most preferred task changed from pre- to post-assessment for all. Two participants had higher task engagement during chosen and assigned preferred work sessions than nonpreferred sessions, and one had high engagement across all work conditions. Disruptive behaviors were low overall. Rate of work was lowest during nonpreferred tasks and similar for chosen or assigned preferred work for all. One participant completed most work incorrectly, and two completed most correctly.
Reid et al. (1998)	3	30-73	ID/physical disability	Evaluate work task preference assessment method before beginning a supported job that would predict preferences on the job	Paired - tangible	Choice between high and low preference tasks during the workday	On the job, participants chose the most preferred task, as determined by the pre-work assessment, at least 75% of the time in choice work sessions.
Parsons et al. (1998)	1	38	ID/physical disability/deaf-blindness	Modify work task preference assessment for an individual with ID and deaf-blindness  Demonstrate an assessment that would represent preferences on the job	Paired - modified	Demonstration of modified preference assessment  Choice between high and low preference tasks on the job	During the assessment, the participant made a choice during 47% of choice presentations and the most preferred task was chosen 50% of the times it was presented. Work engagement was 100% on work trials following a choice. On the job, a job task choice was made in 75% of sessions, and the most preferred task was chosen 75% of the time.
Mulaire-Cloutier et al. (2000)	3	34-44	ID	Evaluate the effect of choice between preferred and non-preferred tasks and assignment of preferred and non-preferred task on happiness indicators and off-task behavior	One paired trial per day	Observation of behavior during work on a task chosen from two options, assigned work on the chosen task, and assigned work on the nonchosen task in alternating treatments design	For two participants, the most happiness indicators occurred during choice. For one participant, happiness on chosen and preferred tasks was similar. All showed the least happiness indicators during the assigned less preferred tasks. More off-task behaviors occurred during choice for one participant, and two had similar rates of off-task behavior in choice and preferred conditions.
Parsons et al. (2001)	3	29-50	ID/physical disabilities	Evaluate use of situational assessment for identifying work task preferences	Situational assessment	Observation of affective behavior and task engagement while performing tasks at a work site	Preferred and nonpreferred tasks were determined for all participants based on rates of affective behaviors. One participant had two tasks that were similarly preferred. Work engagement was highest on preferred tasks for all participants and lowest on nonpreferred tasks for two participants.
Lattimore et al. (2002)	3	25-29	ASD/ID	Evaluate a pre-work assessment with adults with autism that would represent preferences in a supported employment job	Paired	Choices between high and low preference tasks while on the job	Higher preference tasks were chosen more frequently on the job by all. Two participants with weaker preferences chose to alternate tasks on the job.



Table I (continued)

Study	n	Age (years)	Disabilities of Participants	Focus of Research	Preference Assessment Type	Method	Key Results / Findings
Worsdell et al. (2002)	4	Adults	ID	<p>Compare results from multi-stimulus and single-stimulus work task preference assessments</p> <p>Determine if results from either assessment predicted task engagement over longer 60 min session</p>	<p>Single stimulus</p> <p>Multi-stimulus</p>	<p>Comparison of results between single-stimulus and multiple-stimulus assessments</p> <p>Observation of work engagement during 60 min sessions with each task</p>	The multi-stimulus assessment determined a preferred task for all participants, and all engaged in one task exclusively. In the single-stimulus assessment, all participants had high levels of engagement for most tasks. High levels of engagement were observed during 22 / 28 of the work sessions. The single-stimulus assessment required more time, but showed greater agreement with engagement over longer work periods.
Lattimore et al. (2003)	5	26-38	2 - ASD/ID, 1 - ASD/ID/ Fragile X, 2 - ASD/ID/ hearing loss	<p>Evaluate a multi-stimulus with replacement (MSW) assessment for predicting community job preferences</p> <p>Evaluate MSW for predicting preference for alternating tasks on the job</p>	Multi-stimulus with replacement (MSW)	On-the-job choices between high and low preference tasks	Strong preferences were determined in five of eight assessments, and weaker preferences were determined in three. The most preferred task was always chosen first by all participants. Participants with weak preferences were more likely alternate tasks on the second and third choices in their work routine.
Hanley et al. (2003)	3	34-66	2 - ID, 1 - ID/hearing impairment	<p>Assess activity preferences with restricted response assessment</p> <p>Evaluate consistency of outcomes across two restricted response assessments</p> <p>Compare restricted response to free-operant assessment to determine which would yield more differentiated pattern of preference</p>	<p>Restricted response</p> <p>Free operant</p>	<p>Repetition of restricted response and free operant assessments</p> <p>Comparison between restricted response and free operant assessments</p>	The restricted response assessment better determined a preference hierarchy, but was more complex and less efficient. The free operant assessment did not produce a hierarchy. The two restricted response assessment had fairly consistent results, but the two free operant results varied across two assessment sessions and differed from the restricted response.
Hanley et al. (2003)	7	23-50	5 - ID, 1 - ASD/ID, 1 - Prader-Willi/ID	<p>Investigate methods to increase participation in nonpreferred activities by restriction of highly preferred</p> <p>Evaluate the effects of procedures to alter preference by response-contingent reinforcers</p> <p>Evaluate the effects of pairing noncontingent reinforcers with nonpreferred tasks</p>	Restricted response	Interaction with activity materials was recorded as interventions were implemented in attempt to alter rates of engagement in low preference tasks	The restricted response assessment identified a hierarchy of preferences. Engagement in lower preference activities was increased by restricting access to high preference activities, using access to high preference activities as contingent reinforcement, providing supplemental reinforcement for engaging in low preference activities when both high and low preference activities were concurrently available, and providing non-contingent reinforcement during non-preferred activities.

Table I (continued)

Study	n	Age (years)	Disabilities of Participants	Focus of Research	Preference Assessment Type	Method	Key Results/Findings
Verbeke et al. (2003)	4	30-47	ID	Determine if results of a work task preference assessment in a testing room predict performance in the work room of a day program	Paired - tangible	Behavioral observation during work on selected tasks during preference assessments and while doing tasks in the work room	On-task behavior during preferred tasks was similar in five of eight comparisons between the testing and work rooms. Aberrant behaviors were similar for three of four participants in the testing and work rooms. Indicators of happiness were low overall. When performance on preferred and non-preferred tasks was compared, observations of on-task, aberrant, and happiness behaviors did not validate the assessment results.
Spevak et al. (2005)	4	23-45	ID	<p>Study 1 - Evaluate the effect of choice between high and low preference tasks and assignment of a preferred task</p> <p>Study 2 - Evaluate the effect of choice versus assignment of moderately preferred tasks</p> <p>Study 3 - Evaluate the effect of choice versus assignment in a natural work environment with the regular instructor</p>	Paired - tangible	<p>Study 1 - Observation of behaviors during choice and no choice conditions with high and low preference tasks in an alternating treatments design</p> <p>Study 2 - Observation of behaviors during choice and no choice conditions with two moderate preference tasks in an alternating treatments design</p> <p>Study 3 - Observation during naturally occurring choice and assigned conditions</p>	<p>Study 1 - Preference assessment determined preferences with at least a 60% difference between high and low preference tasks. The assessment was validated by high preference tasks being selected in 94-100% of choices. There was little difference in behaviors between chosen and assigned high preference tasks. There were high levels of on-task behavior in choice and assigned high preference tasks.</p> <p>Study 2 - In the choice condition, three participants selected a task in 70 to 80% of trials. There were no major differences in behaviors and no unhappiness behaviors. Aberrant behavior was higher in than in study one.</p> <p>Study 3 - Two participants had no difference in on-task behaviors, and two had higher on-task behaviors during the assigned tasks. Aberrant behaviors were higher for one participant in the choice condition, and similar in both conditions for the other participants. Happiness behaviors occurred at low levels overall, but were twice as high in the choice condition for three participants, with most behaviors occurring in just two sessions.</p>
Reyer & Sturmey (2006)	9	27-47	ID	Assess ability to select preferred work tasks with different presentation methods as predicted by level of discrimination skills on Assessment of Basic Learning Abilities (ABLA)	Paired - tangible, picture, spoken word	Choices between high and low preference tasks presented in pairs using object, picture, and spoken word modalities	For five of nine participants, ability to choose with different presentation methods was predicted by the ABLA.

Table I (continued)

Study	n	Age (years)	Disabilities of Participants	Focus of Research	Preference Assessment Type	Method	Key Results/Findings
Reid et al., 2007	12	29-76	1 - ID 4 - ASD/ID, 7 - physical disabilities/ID	Evaluate time efficiency of assessment methods  Evaluate utility of different assessment methods  Evaluate accuracy of staff opinion of preferences	Paired - tangible  MSWO - tangible  Staff report	Demonstration of assessment procedure with MSWO followed by paired-stimulus preference assessment  Comparison between MSWO and paired-task assessments  Observation of behaviors while performing tasks during assessments  Staff ranking of preferred tasks	Preferences were identified for 11 of 12 participants, including seven with the MSWO and four with the paired-task assessment. The MSWO was quicker than the paired-task assessment. Staff report was quickest, but less accurate. Work engagement was high and problem behavior was low overall.
Horrocks & Morgan (2009)	3	18-22	ID	Compare video-based job preference assessment and multi-stimulus preference assessment to identify preferred and non-preferred jobs	Paired - videos MSWO - tangible	Comparison between video assessment of job types and tangible MSWO assessment	High preference jobs were the same between video and MSWO assessments for all participants. Hierarchies were similar for two participants.
Cobigo et al. (2009)	19	23-58	ID	Evaluate a vocational preference assessment method conducted by job coaches  Assess the social validity of the assessment by interviewing job coaches	Paired - tangible or pictures	Behavioral observed during task performance after selection in preference assessment  Semi-structured interviews with job coaches	A preferred task was identified for 12/19 participants. Job coaches expressed high satisfaction with the procedure. Positive emotional behaviors had no relationship with preference. All participants had some off task behavior.
LaRue et al. (2019)	6	21-41	ASD/ID	Design and evaluate a vocational assessment that uses preference for task features to identify matched and unmatched jobs	Concurrent operants - tangible	Concurrent operants assessment for task features  Behavior observed during matched and unmatched jobs  Concurrent operants assessment for matched and unmatched job tasks	Participants had preferences among the job task features. On task and disruptive behaviors did not have clear patterns. All participants chose their preferred task in most trials.
St. Peter et al. (2021)	3	15-17	ASD/ID	Compare results between paired-stimulus and multi-stimulus preference assessments  Compare administration time  Evaluate validity of results through observation of task engagement and teacher ratings of participants' happiness	Paired - pictures  MSWO - pictures	Comparison between paired and MSWO preference assessments  Task engagement observed on high and low preference tasks  Teachers' ratings of videos of students performing tasks	The MSWO took less time than paired-stimulus assessments. The highest preference tasks matched across assessment types for all participants. Moderate and low preference tasks did not match exactly. All participants had higher task engagement with the preferred task. Two had lower task engagement with less preferred tasks, and one had high engagement on all tasks. Teachers endorsed high preference tasks, but also endorsed some less preferred tasks.

Twenty-three articles were identified that included assessments of specific work task preferences used with individuals with ASD and/or ID. Seventeen of the 23 studies involved paired-stimulus assessment methods or choices between two options. Seven studies provided choices between multiple stimuli. Three of those studies compared multi-stimulus to paired-stimulus assessments, and one compared multiple and single stimulus assessments. Two other studies used behavioral observation during task performance to gauge work task preferences (Parsons et al., 2001; Winking et al., 1993). Each of these studies were described in the following sections and then compared to identify the gaps in the literature and need for further research.

### **Paired-Task Preference Assessments**

Beginning in the late 1970s, numerous studies have used paired-stimulus preference assessments to successfully determine work task preferences of individuals with significant disabilities (Mithaug & Hanawalt, 1978). To carry out the assessment, objects representing job tasks are presented in pairs, and participants choose one and worked on that task for a specified time (Mithaug & Hanawalt, 1978). The selected object is then paired with another randomly selected object until all pairings are exhausted (e.g., Mithaug & Hanawalt, 1978) or all paired combinations are presented in predetermined order (e.g., Cobigo et al., 2009). The selection percentage is used to determine which tasks are more or less preferred. The tasks selected with the greatest frequency, at least 70 to 75% of the time, are considered highly preferred and the tasks selected least, less than 20 to 25% of the time, are considered least preferred (Bambara et al., 1994; Mithaug & Hanawalt, 1978; Parsons et al., 1990). Tasks selected between 26 to 30% and 70 to 74% of the time are regarded as moderately preferred (Bambara et al., 1994; Mithaug & Hanawalt, 1978).

In the first study to examine the use of paired-task preference assessments for work task preferences, Mithaug and Hanawalt (1978) used the paired-task procedure with six work tasks to assess preferences of three individuals with ID, ages 19 to 21. Participants selected a task from two options presented on a tray and engaged the task for 7 min and then took a 2 min break before the next selection. It took 2 days with seven to eight task selections per day to assess all potential combinations of six tasks. A second phase of the study examined the validity of the preference assessment results. Using a reversal design, the preferred task and non-preferred task for each participant were paired with moderately preferred tasks in a forced-choice comparison. Nine of the 12 determinations of preference (i.e., high, moderate, low) from the first phase were consistent with the second phase; two were partially supported and one preference changed between the phases. The time of completion between Phase 1, 34 days, and Phase 2, 40 days was a limitation to the study; between that time one of the participant's preferences appeared to change. However, longer time periods more closely replicate conditions of ongoing employment.

In a subsequent study with two of the same participants with ID, ages 19 and 20, Mithaug and Mar (1980) confirmed the relationship between choosing an object and working on a task. Paired-task preference assessments were conducted following the procedures in the prior study (Mithaug & Hanawalt, 1978). Then the task preferences identified by the paired-task assessment were used to examine the relationship between objects and tasks. In the baseline condition, participants worked on the task that matched the task they selected. In substitution conditions, participants were given a task either more or less preferred than the one matching the object they selected. The frequency with which participants selected an object increased when the consequence was to work on a highly preferred task and decreased when the consequence was to work on a less preferred task. Participants were able to demonstrate an understanding that object

selection resulted in work on a specific task. As in the study conducted by Mithaug and Hanawalt with the same preference assessment procedure, preferences were identified, but administration time was not efficient. Additionally, associating objects with tasks that do not use those objects could be confusing to participants.

The paired-task preference assessment procedures have been used to identify preferences that are then used to evaluate relationships between other variables. The relationship between performing preferred work tasks, as identified by paired-task preference assessments, and task engagement has been explored in several studies. Observations of participants' behaviors have been used to validate the assessment results and preferences and to evaluate the effect of choice in studies of assigned versus chosen tasks (Bambara et al., 1994; Cole et al., 1997; Mulaire-Cloutier et al., 2000; Parsons et al., 1990; Spevack et al., 2005).

Parsons et al. (1990) replicated the paired-task preference assessment with four adults with ID, while also investigating the effect of chosen versus assigned tasks on work performance. Preference assessment procedures were similar to those in the Mithaug and Hanawalt (1978) study and included five tasks. Participants worked on their chosen task for 10 min after selection. Assessments took approximately 90 min to complete and were repeated five times. Then, an alternating treatments design was used to compare participants' on-task and disruptive behavior between conditions when they were assigned preferred tasks, assigned nonpreferred tasks, or given a choice between preferred and nonpreferred tasks. When given a choice, participants selected their preferred task most of the time, validating the preference assessment results. Task engagement was the highest when assigned preferred tasks or provided with a choice of tasks. Disruptive behavior was low overall. This study demonstrates the

importance of identifying preferred work as task engagement is higher when individuals are performing work they like.

Bambara et al. (1994) also used paired-task preference assessments to investigate how choice and preference affect task performance. Preference assessments with five tasks were conducted with three adults with ID following the method introduced by Mithaug and Hanawalt (1978). Participants engaged in 15 min work sessions with their high preference task, low preference task, or a choice between high and low preference task. The highest task engagement was observed during high preference and choice conditions. In a second phase of the study, preferences of five adults with ID were assessed. Participants were assigned low-to-moderate preference work task or given a choice between tasks of similar, low-to-moderate preference. Performance was similar between the assigned task and choice conditions for four participants. Three of five participants selected one task with high frequency in the choice condition. One participant showed a higher rate of on-task behavior in the choice condition even though he did not show a clear preference for one task over another. This study replicated the findings of Parsons et al. (1990) and extended the research by showing that many participants will demonstrate a preference between moderate preference tasks, and the act of choosing might affect the work performance of some individuals.

Cole et al. (1997) continued the line of inquiry by investigating the effect of preference and choice on task engagement with three students, ages 11 to 13, with ID and challenging behavior. Two of the students had a diagnosis now classified as ASD. Paired-task preference assessments using five tasks were conducted in the classroom at the beginning and end of the study using procedures established by Mithaug and Hanawalt (1978). Task engagement and disruptive behaviors were measured during 5-min samples of 15-min work periods, and work

productivity was measured by the number of tasks completed and completed correctly per minute. Participants engaged in assigned preferred tasks, assigned nonpreferred tasks, or a choice between preferred and nonpreferred tasks. Two participants had higher task engagement and higher work rates while performing high preference and chosen tasks, and one participant had high rates of task engagement in all conditions and only slightly lower work rates on the nonpreferred task. Disruptive behavior was low overall. Rate of work was lowest during nonpreferred tasks and similar for chosen or assigned preferred work for all participants. One participant completed most work incorrectly, and the other two completed most work correctly. In a final preference assessment, the high preference task changed for all participants, while the low preference task remained nonpreferred. This study implemented the paired-task assessment with younger participants, and while task engagement and work rate validated results, the highest preference tasks changed from pre- to postassessment.

In another analysis of choice and preference conditions, Mulaire-Cloutier et al. (2000) compared choice of task, assignment of preferred tasks, and assignment of non-preferred tasks using measures of happiness and off-task behaviors with three adults with ID. A paired-work task preference assessment procedure was attempted, but participants' preferences varied daily; so instead, one paired choice was offered at the start of each series of work sessions to determine the preferred task for that day. All participants showed the least happiness and most off-task behaviors during assigned nonpreferred tasks. Two participants showed more happiness indicators when working on their chosen preferred tasks, but the other participant had similar measures of happiness during the chosen preferred task and the assigned preferred task. Two participants had similar rates of off-task behaviors during choice and assigned preferred tasks, and one participant had fewer off-task behaviors during the choice condition. A limitation of this



study is that the choice condition was the first of three work conditions, which could account for the higher rate of happiness behaviors and lower off-task behaviors of some participants.

Additionally, the inability to determine preference with the typical paired-task method and the variability of task preference across days could indicate a lack of strong preference among the task options.

Spevack et al. (2005) also used work task preference assessments to evaluate the effects of choice on behavior with three different procedures. In their first investigation, a paired work task preference assessment identified high and low preference tasks for four adults with ID, ages 32 to 45. On-task, aberrant, happiness, and unhappiness behaviors were measured while participants performed an assigned high preference task or a task chosen between high or low preference options. In the choice condition, the high preference tasks were selected 94 to 100% of the time, validating the assessment results. Little difference existed in the frequencies of on-task, aberrant, and happiness behaviors between the choice and assigned conditions, and unhappiness behaviors occurred with very low frequency overall.

In a second inquiry, paired work task assessments were conducted with four participants, of which three were from the first experiment, to identify two moderately preferred tasks chosen with similar frequency (Spevack et al., 2005). Participants worked on tasks in choice and assigned conditions, with the two moderately preferred tasks alternated in the assigned condition. Although the tasks had equal preference in the initial preference assessment, when repeatedly paired in the choice condition, three of four participants demonstrated a preference for one task over the other by selecting it in 70 to 80% of trials. No major differences in rates of on-task, aberrant, and happiness behaviors were noted between choice and assigned conditions, and no occurrence of unhappiness behaviors. For the three participants involved in both studies, aberrant

behaviors were higher in the second study involving performance of moderately preferred tasks compared the first study involving high preference tasks.

In the third phase continued by Spevack et al. (2005), behaviors were observed during choice and assigned tasks in an adult day-program classroom setting with instructors rather than researchers presenting choices and assigning tasks to four individuals who had participated in at least one of the prior inquiries. Tasks that had been selected by participants during prior choice sessions were used as the assigned tasks. Two participants had no difference in on-task behaviors across conditions, and two had higher on-task behaviors during the assigned tasks. Aberrant behaviors were higher for one participant in the choice condition, and similar in both conditions for the other participants. Happiness behaviors occurred at low levels overall but were twice as high in the choice condition for three participants. Overall, there were not major differences in on-task, aberrant, or happiness behaviors between choice and assigned choice conditions across the three phases of the study. The utility of the paired-task preference assessment in identifying high versus low preference tasks was demonstrated, and results were validated in the first inquiry.

Several studies have explored task choice versus task assignment using paired-task preference assessments to determine low, moderate, or high preference tasks for the assigned task conditions (Bambara et al., 1994; Cole et al., 1997; Mulaire-Cloutier et al., 2000; Parsons et al., 1990; Spevack et al., 2005). In most cases, the paired-task assessments were successful in identifying preferences and the assessment results were validated by participant's choices and/or task engagement. However, in Mulaire-Cloutier's (2000) study, the paired-task assessment did not identify consistently preferred tasks, though that could be due to participants' undifferentiated preference among the tasks offered. Use of behaviors such as on-task, off-task,

positive-affective, or negative-affective behaviors can be problematic when they occur at either very high or low rates across all conditions: therefore, ineffective in demonstrating differences between conditions or validating assessment results (Cole et al., 1997; Parsons et al., 1990; Spevack et al., 2005). Results for most participants in these studies show similar performance between chosen and assigned high preference tasks (Bambara et al., 1994; Cole et al., 1997; Parsons et al., 1990; Spevack et al., 2005) and between chosen or assigned moderate preference tasks (Bambara et al., 1994; Spevack et al., 2005); however, some participants in the Spevack et al. (2005) had more aberrant behaviors during moderate than high preference tasks. Interestingly, Cole et al. (1997) found that for all participants, preferred tasks changed after frequent exposure throughout the course of the study, and nonpreferred tasks remained consistent. This demonstrates the need for ongoing assessment as preferences change over time and show a possible satiation effect of repeatedly working on the same preferred task. Overall, in several studies investigating preference and choice, the paired-task preference assessment procedure successfully identified preferred work tasks for individuals with significant disabilities.

In another study using paired-work task preference assessment, Verbeke et al. (2003) examined whether performance on a preferred task, as determined by an assessment conducted in a testing room, would predict performance in another setting. A paired-task assessment using two familiar work tasks was conducted with adults with ID, ages 32 to 47, by presenting choices between the tasks followed by 5 mins of work on the chosen task during three sessions of five trials each. On-task, aberrant, and happiness behaviors were observed while they worked on the tasks. One week later, behaviors were observed for 5-min sessions while participants did the tasks in the classroom setting where they typically worked. Comparing performance on the preferred task in the testing room and work room, on-task behaviors were similar in five of eight

compared time periods; aberrant behaviors were similar for three of four participants; and indicators of happiness were low overall. When performance was compared between the higher and lower preference task done in the work room, measures of on-task, aberrant, and happiness did not show a difference or a clear pattern between conditions and therefore did not validate preference assessment results. A major limitation is the use of only two tasks, which were not selected based on perceived preference. It is possible that neither option was actually preferred. Additionally, a more meaningful generalization would be from the testing room to a community job site rather than another room in a day program setting.

A series of studies used paired-task assessments to evaluate work task preferences of workers before beginning supported employment in community work settings and then validated the results through actual on-the-job task choices (Lattimore et al., 2002; Parsons et al., 1998; Reid et al., 1998). A prework paired-task assessment was conducted with three workers with ID and physical disabilities, ages 30 to 79 (Reid et al., 1998). Because the assignments were new to the participants, they spent time becoming familiar with the tasks prior to assessment. Assessments were conducted by job coaches using procedures similar to Mithaug and Hanawalt (1978) with 3 min to perform the task after selection. Three or four sessions, consisting of all 10 combinations, were conducted with each person. After beginning the job, participants worked for 20-min periods on assigned preferred or nonpreferred tasks or their choice between the preferred and nonpreferred tasks. Participants chose to work on their preferred tasks at least 75% of the time, confirming the preferences of the prework paired-task assessment. This result was replicated with an adult participant with ID, physical disability, and deaf blindness using a modified assessment procedure that allowed the participant to touch and try the materials because he could not see them (Parsons et al., 1998). Three tasks were included in the

assessment, and choices between the high and low preference tasks were conducted on the job. The participant chose to work on his preferred task 75% of the time, validating the preference assessment results.

Lattimore et al. (2002) replicated Mithaug and Hanawalt's (1978) method with three participants with ASD and ID, ages 25 to 29. Preference assessment procedures were similar to Reid et al.'s (1998) and included four tasks. At the job site, participants were given choices between high and low preference tasks prior to three consecutive 10 min work periods per day. The paired-task assessment identified high and low preference tasks, and all participants chose their more preferred task with greater frequency on the job, confirming the assessment results. However, two participants chose to alternate between more preferred and less preferred tasks in their work routine at the job site. Paired-task preference assessments conducted prior to beginning supported employment were successful in predicting on-the-job task preferences (Lattimore et al., 2002; Parsons et al., 1998; Reid et al., 1998); however, they did not account for some workers' desire for variety during longer work sessions at community job sites (Lattimore et al., 2002). These studies demonstrate the utility of the paired-task preference assessment with individuals with ID and additional diagnoses who are preparing for supported work in the community.

Another line of inquiry involving paired-task assessments explores the use of alternative modalities to provide choices such as using pictures, spoken words, or videos instead of objects (Cobigo et al., 2009; Horrocks & Morgan, 2009; Reyer & Sturmey, 2006). Cobigo et al. (2009) conducted a study in which 16 job coaches assessed the preferences of 19 workers with ID, ages 23 to 58. One of the participants also had a diagnosis now classified as ASD. Four task choices specific to the individual's job were presented in pairs using objects for most participants, and

pictures for two individuals. Differing from prior studies, pairs of tasks were presented in a predetermined random order rather than including the previously selected task in the next pairing. After selection, the chosen task was performed for 3 min. On-task, off-task, and positive emotional behaviors were recorded but showed no significant relationship with preference. Preferred tasks with selection percentages of 70% or greater were identified for 12 of 19 participants. The social validity of the preference assessment was evaluated through interviews with the job coaches who expressed high satisfaction. This study demonstrated the use of the picture modality with two participants and the ability of the paired-task assessment to identify highly preferred tasks for most participants.

Alternative presentation methods other than task materials were also used by Reyer and Sturmey (2006) to evaluate understanding of tangible, picture, and spoken word representations of task choices. Nine participants with ID, ages 27 to 47, were evaluated using the Assessment of Basic Learning Abilities (ABLA) and classified into levels based on discrimination skills. A paired-task preference assessment was conducted using the same six tasks, and the highest and lowest preference tasks were then presented in pairs using task materials, photographs, or colored slips of paper paired with spoken words. Two of three participants who scored at Level 2 on the ABLA consistently selected their highly preferred work task with objects but not the picture or verbal presentation. One of three participants who scored at Level 4 on the ABLA selected her highly preferred work task consistently with object presentations and somewhat consistently with pictures but not with verbal presentation. The other two Level 4 participants did not consistently select one task with any presentation method. Two of three Level 6 participants consistently selected their highly preferred work task with all three presentation methods, although the highly preferred task was chosen less frequently in the spoken condition

for one participant. The third participant at Level 6 did not show a preference across presentation methods. This study had mixed results for the use of the ABLA to predict understanding of presentation methods for work task preference assessments. Five of nine participants were able to choose their preferred task with the presentation methods predicted by their ABLA scores. Discrimination skills may not have been the only factor affecting ability to understand different presentation methods, and some participants in this study might not have had strong preferences among the task options presented. Cobigo et al. (2009) and Reyer and Sturmey (2006) provided examples of alternative ways to present choices in paired-task preference assessments but with mixed results.

Although different from the forced-choice, paired-stimulus method utilized in many studies, a recent study by LaRue et al. (2020) presented job task choices in pairs using a concurrent operants procedure. LaRue et al. (2020) assessed job task preferences of six participants with ASD and ID, ages 21 to 41. In the initial phase of this study, preferences for the task features of interaction, complexity, and movement were assessed using a concurrent operants method. Participants were exposed to each condition, then chose one and experienced that condition for 2 min. In the second phase of the study, two job tasks that matched the participant's preferred conditions and two that did not match were designed. On-task and disruptive behaviors were observed while participants performed the matched and unmatched tasks. Finally, task preferences were assessed in the third phase of the study using a concurrent operants design. Materials for matched and unmatched job tasks were present on opposite sides of a room, and participants were asked to choose one. This was conducted at least four times with each person. All participants selected their matched job in the majority of trials. This study

successfully used paired task choices as a component of a multiphase assessment of vocational preferences and assessed preference for features of tasks as well as specific job task preferences.

### **Multi-Stimulus Preference Assessments**

In addition to paired-task assessments, work task preference assessments in which multiple options are presented at once have been used in several studies to assess task preferences for workers with significant disabilities (e.g., Hanley et al., 2003; Lattimore et al., 2003; Reid et al., 2007). In these assessments, the participant selects from three or more options representing job tasks. Selected materials are either removed or replaced on subsequent trials.

Lattimore et al. (2003) used a multiple stimulus with replacement (MSW) assessment method with five individuals with ASD and ID, ages 26 to 38, prior to beginning new tasks at a community work site. Three or four task options were presented at once, and all options were presented in each trial. Three participants completed two rounds of assessments with different tasks. Strong preferences were selected at least 70% of the time and identified in 5 of 8 assessments and weaker preferences were determined in the other three assessments. The MSW procedure did not generate preference hierarchies for all participants because some participants selected a highly preferred task in 100% of trials. When given a paired choice between more and less preferred tasks during longer sessions in their regular work routine, participants with strong task preferences chose to work on their preferred task, while those with weaker preferences chose to begin working on a more preferred task then switched between tasks for the remainder of the work session. This study showed a relationship between the strength of the preference as determined by selection percentage in a MSW assessment and a worker's desire to do one highly preferred task versus alternate tasks.



Comparing two different methods with multiple task options, Hanley et al. (2003a) assessed vocational and leisure activity preferences of three participants with ID, ages 34 to 66, using restricted response and free-operant assessment methods. In the restricted response assessments, participants were given access to seven activities and were able to interact with any of them during a 5 min period. The percentage of time intervals that the participants engaged with materials was used to determine if an activity was preferred based on specific rules, and activities were eliminated from the array of choices when a preference was established. During the free-operant assessments, participants were presented with materials for all activities for a period of time without removing materials, and the percentage of time spent with each of the materials was used to determine preference. Though the free-operant assessment was simpler to administer, results were not consistent across two assessment sessions nor consistent with the restricted-response assessment. The free-operant assessment revealed only the top preferences of the participants rather than a full ranking of all activities, while the restricted-response assessment generated a hierarchy of preferences but required more time and a complicated process.

In a subsequent inquiry, restricted-response assessment methods as described in the (Hanley et al., 2003a) study were used to gather baseline data on leisure and work task preferences, and several interventions were implemented to alter participants' preferences (Hanley et al., 2003b). Seven adults with ID, one of whom also had ASD, ages 23 to 50, participated in the study. Engagement in lower preference activities increased in several ways: (a) by restricting access to high preference activities; (b) by using access to high preference activities as contingent reinforcement, (c) by providing reinforcement for engagement in low preference activities when both high and low preference activities are available, and (d) by

providing noncontingent reinforcement during nonpreferred activities. This study provided further evidence of the ability of restricted-response assessment to generate a hierarchy of task preferences for individuals with significant disabilities.

Several studies compared multiple stimulus assessment procedures with other methods including single-stimulus, paired-stimulus, and staff reports (Horrocks & Morgan, 2009; Reid et al., 2007; St. Peter et al., 2021; Worsdell et al., 2002). Worsdell et al. (2002) conducted duration-based multi-stimulus and single-stimulus work task preference assessments with adults with ID who attended a sheltered workshop. The researchers validated the results through extended work periods with each task. In the single-stimulus assessment, participants were presented with materials for one task at a time and told they could do what they wanted during a 5 min period. All participants had high levels of engagement for almost all tasks. In the multi-stimulus assessment, materials for seven tasks were available during the 5 min period, and all participants engaged in one task exclusively. Then, participants took part in 60 min work sessions with each task, and high levels of task engagement were observed during 22 of 28 sessions. The multi-stimulus assessment revealed a preferred task for each participant but did not determine if participants would be engaged in the other task options. The single-stimulus assessment required more time to complete but matched the task engagement over longer work periods and demonstrated participants' willingness to engage with a variety of tasks. Neither of these procedures produced a preference hierarchy.

In another study comparing multi-stimulus assessment to other procedures, Reid et al. (2007) compared MSWO assessments, paired-stimulus assessments, and staff reports of preference of participants with ID, ages 29 to 76, some of whom also had physical disabilities or ASD. This study used staff rankings of current or familiar job tasks to select the tasks to be

included in object-based paired and multiple task assessments. All 12 participants were assessed with a multi-stimulus procedure and a strong preference was determined for seven (i.e., selected 70% of the time across 3-5 sessions). A paired-task procedure was then conducted with the other five participants, which determined a preference for four participants. Both multi- and paired-stimulus methods were more accurate than staff reports. The multi-stimulus assessment was less time consuming to administer but was not effective for all participants. The procedure of using MSWO and subsequent paired-task assessment as needed is an efficient way to determine preference that worked for 11 of 12 participants in this study.

St. Peter et al. (2021) compared the results, efficiency, and validity of paired-stimulus and MSWO job task preference assessments used with three students, ages 15-17, with ASD and ID. Prior to the assessments, they confirmed participants' ability to match pictures to the tasks and taught each participant how to complete eight tasks. They used pictures to conduct paired-stimulus assessments in 56 trials across 8 days and multiple-stimulus assessments, which were repeated on 3 days. Participants had 2 min access to the task after selection. Task engagement was measured during 10-min work sessions with tasks identified as high or low preference. Additionally, special education teachers viewed 30 video clips and rated happiness, engagement, and the likelihood of them selecting a task for the student. For all participants, the MSWO assessments took less time than the paired stimulus. The paired and MSWO assessments identified the same most preferred task for all participants, but the least preferred and moderately preferred tasks varied between assessment types. Task engagement data validated the results for high preference tasks. One participant had high engagement for all tasks. Two participants were less engaged during tasks that the paired-stimulus assessment showed to be less preferred; so, paired stimulus results were slightly more accurate in those cases. Teacher ratings did not

correspond closely with assessment results, which emphasized the need to assess the preferences directly. Moreover, the picture presentation modality was used successfully in both paired- and multiple-stimulus assessments in this study.

Another study compared a video-based, paired preference assessment with an object-based, multiple-stimulus assessment of work preferences with 18- to 22-year-old students with ID (Horrocks & Morgan, 2009). Three high preference and three low preference job tasks in which the participants had prior experience were selected by the participants' teachers. In the video assessment, a job coach presented 2- to 4-min video clips of the six job types (e.g., mail carrier, fast food worker) in pairs on two computer monitors. A MSWO preference assessment was conducted with materials representing six job tasks. Participants were able to engage with the materials before the assessment and after selection. For all participants, both types of assessment determined the same job to be the highest ranked with some variability among the subsequent rankings. Higher and lower preference jobs determined in the assessments without considering specific rank matched the teacher reports. The results of the two assessments are similar, which indicates with further study, video presentation could be a useful option for assessing vocational preferences.

### **Use of Behavioral Observation to Assess Work Task Preference**

Work task preferences have also been measured through behavioral observation in two studies. Winking et al. (1993) assessed job task preferences by observing preference and nonpreference behaviors while participants performed jobs in a hotel. Although the aim of the study was to validate an assessment process involving identification of work variables for use in job development, a key component of the study was job trials with specific work tasks. Participants included four students with ASD and ID, ages 17 to 19. They were observed while

doing four different assigned tasks for hour-long work periods during which behaviors were observed and skill acquisition was measured. High preference and low preference tasks were identified for each participant based on the occurrence of preference behaviors, although for one participant, the rate of preference behaviors between the two tasks presented no significant difference. A consistent relationship between skill acquisition and preference was nonexistent as two participants had higher skill acquisition with the most preferred task and two had higher skill acquisition for the less preferred task. While this study demonstrates the use of behavioral observation to determine work task preferences, results were inconsistent, and the number of participants was a limitation.

In another study using behavioral observation, affective like and dislike behaviors were measured to assess work task preferences that were validated through observation of work engagement (Parsons et al., 2001). One participant clearly demonstrated task preference with both like and dislike behaviors by showing high occurrence of like and low occurrence of dislike behaviors on one task, while showing the reverse on another task. One participant's least preferred task was identified by higher occurrence of dislike behavior, but like behaviors were infrequent across tasks; therefore, the task determined to be more preferred was actually a least disliked task. A third participant showed a clear dislike for one task and similar levels of like behavior for two tasks with no dislike behavior during one and very little dislike behavior during the other. For all participants, work engagement was highest with the most preferred task and lowest with the least preferred task. In this study, overall results suggest that observation of like and dislike behaviors can be used to determine task preferences.

### **Comparison of Work Task Preference Studies**

Twenty-three studies were identified that included assessment of work task preferences of individuals with ID or ASD. The participant characteristics, settings where assessments were conducted, variations in assessment methods, and procedures for validating assessment results are discussed here to identify gaps in the research warranting further study.

### **Participants and Setting**

All 23 studies in this review included participants with ID. Nine studies included participants also diagnosed with ASD or disabilities that are now classified as ASD. The number of participants ranged from one to 19, with three or four participants being the most common. Participants' ages ranged from 11 to 76 years old. The majority of studies involved adults, and only one study included children, ages 11 to 13 (Cole et al., 1997) and two included teens, ages 15 to 17 (St. Peter et al., 2021; Winking et al., 1993). Six studies used work task preference assessments with individuals who would be of transition-age in school, between ages 16 and 21, and of those studies, only three had participants with ASD. Although a number of studies explored the topic of work task preference assessments, most focused on adults with ID. In addition, three of the studies in this review included transition-age participants who also have ASD and one of the studies used a multi-stimulus procedure (St. Peter et al., 2021). Research on the efficacy of work task preference assessments with young adults in transition who have both ASD and ID is insufficient.

The studies were conducted in settings that included classrooms, job sites, and segregated settings for individuals with disabilities; some studies utilized more than one location. Ten studies involved activities at community job sites. Fourteen studies conducted research in segregated settings such as sheltered workshops, training programs, day programs, and

residential settings specifically for individuals with disabilities. Only three studies were conducted in school classrooms—this number corresponded to the scant number of studies with school-age participants, evidencing that job task preference assessments have not been widely researched as a transition assessment used in schools.

### **Assessment Procedures**

The research literature includes articles describing several methods of assessing work task preferences by observing behaviors while performing tasks or presenting choices between tasks. Of the 23 articles included in this review, 17 used work task preference assessments that presented choices in pairs. The majority of studies involving paired-task assessments utilized the method first described by Mithaug and Hanawalt (1978) with some variations in procedures across studies. The time given for access to the task after selection ranged from 10 s (Reyer & Sturme, 2006) to 10 min (Parsons et al., 1990), with 3 min being the most common (e.g., Reid et al., 1998). In the original procedure described by Mithaug and Hanawalt, participants selected a task by removing it from a tray and placing it on the table. Most subsequent studies using paired and multi-stimulus choices defined a selection response as the participant pointing to, touching, or naming the task materials (e.g., Lattimore et al., 2002), with some studies also recording pushing away the undesired task as a selection (Cole et al., 1997; Verbeke et al., 2003). Seven studies in this review included presentation of multiple work task options at once, using MSW, MSWO, restricted response, and free-operant procedures. MSWO and restricted response assessment methods had the advantage of generating a hierarchy of preferences. Studies comparing MSWO and paired-task procedures showed that the MSWO was more efficient (Reid et al., 2007; St. Peter et al., 2021). Two studies used behavioral observation to assess task

preferences (Parsons et al., 2001; Winking et al., 1993). Though useful in validating preferences, observation alone does not provide opportunities for participants to express their choices.

### **Tasks to Be Assessed**

To meet the inclusion criteria of this review, all studies assessed preferences for work tasks and two studies also included leisure activities (Hanley et al., 2003a; Hanley et al., 2003b). Most work tasks involved the duties associated with office work (e.g., stuffing envelopes), cleaning (e.g., mopping), and tasks commonly done in sheltered workshops or prevocational training (e.g., sorting, simple assembly). Preference assessments were comprised of two to eight tasks per assessment. In six studies, work tasks used in the preference assessment were determined based on an interview or questionnaire completed by someone familiar with the participant so that the tasks in the assessment were personalized to that person's potential preferences as judged by someone who knew them (Hanley et al., 2003a; Hanley et al., 2003b; Horrocks & Morgan, 2009; Reid et al., 2007; St. Peter et al., 2021; Winking et al., 1993). In the other studies, tasks included in the assessments were based on other factors such as tasks available at the participant's current job, work available at local community or sheltered work sites, or tasks readily available in a training program. While both methods of identifying tasks could be useful in different situations, gathering information on what an individual might like would be helpful in task selection when the preference assessment is used as a transition assessment in preparation for customized employment.

### **Presentation Modalities**

The majority of studies of job task preference used objects or task materials to present options, and only five studies utilized other presentation modalities for choices. Four studies used pictures (Cobigo et al., 2009; Reyer & Sturmey, 2006; Spevack et al., 2005; St. Peter et al.,



2021) and one used spoken words (Reyer & Sturme, 2006) to represent specific task options. Horrocks and Morgan (2009) used videos to present choices, but the videos depicted jobs rather than one specific task. Only two of the studies compared presentation modalities (Horrocks & Morgan, 2009; Reyer & Sturme, 2006). More research is needed to determine the accuracy and validity of work task preference assessments using modalities other than objects.

### **Validation of Assessment Results**

Many of the studies in this review measured additional variables or conducted procedures to validate the results of the work task preference assessments. Several studies looked at preference in comparison to factors related to work effort with the idea that workers would work more readily at tasks they enjoyed. More than half of the studies in this review used a measure of work engagement or on-task behavior. Task analysis was used to measure skill acquisition in one study (Winking et al., 1993). One study gauged productivity by measuring work rate and rate correct (Cole et al., 1997). Other studies looked for the occurrence of aberrant, disruptive, or problem behaviors (Cole et al., 1997; LaRue et al., 2019; Parsons et al., 1990; Reid et al., 2007; Spevack et al., 2005; St. Peter et al., 2021; Verbeke et al., 2003). Additionally, seven studies measured behaviors that validate the preference assessment by showing the participants' happiness, unhappiness, like, or dislike of the tasks they were performing (Cobigo et al., 2009; Mulaire-Cloutier et al., 2000; Parsons et al., 2001; Spevack et al., 2005; St. Peter et al., 2021; Verbeke et al., 2003; Winking et al., 1993). In some cases, behavioral observations were useful in confirming assessment results or showing differences in responses to different work conditions; however, it was difficult to draw conclusions when behaviors occurred at a low rate or not at all in some studies.

### **Need for Further Research**

Work task preference assessments have been studied since the late 1970's with individuals with disabilities (Mithaug & Hanawalt, 1978). However, most of this research has been conducted with adults. An effective method of assessing work preferences would certainly be a useful tool in transition assessment, but work task preference assessments have not been thoroughly researched with transition-age students. Much of the research on work task preference assessment involves participants with ID, with limited inclusion of individuals with ASD. Further study is warranted with youth and young adults with both ASD and ID. Additionally, multi-stimulus assessment procedures have been shown to be an efficient method of work task preference assessment but have not been studied as comprehensively as paired-task procedures (Reid et al., 2007). More research is needed to determine the utility of MSWO assessments as transition assessments. Finally, most of the existing research uses objects to represent job tasks. Few studies have used pictures (Cobigo et al. 2009; Reyer & Sturmey, 2006; St. Peter et al., 2021), and one study compared a video job assessment to a tangible MSWO (Horrocks & Morgan, 2009). Presentation modalities using current technology could be incorporated in work task preference assessments.

### **Video-Based Career Assessments**

Videos as a presentation modality to assess job preferences were compared to a preference assessment for specific tasks in one study with individuals with ID (Horrocks & Morgan, 2009). However, several studies using videos to assess career preferences were identified, but they did not meet the criteria for the prior review because they involved overall job types rather than specific tasks. In these studies, videos were used in computer-based assessments of career preferences that focused on broader career categories (Davies et al., 2018;

Ellerd et al., 2002; Ellerd et al., 2006; Hall et al., 2014; Morgan, 2003; Morgan & Horrocks, 2011; Stock et al., 2003) or specific community jobs (Walsh et al., 2019). This section described these seven studies that involve technology-based career interest assessments.

Single-stimulus and paired-stimulus procedures have been used in video-based career preference assessments. Ellerd et al. (2002) compared single and paired-stimulus assessments used with individuals with ID and traumatic brain injury. In the single-stimulus assessment, 2-min clips depicting general work conditions and key tasks for five different jobs were presented one at a time and participants were asked to touch the screen if they liked the job. In a paired-stimulus condition, videos were presented side by side on a screen with one video playing then the other, and participants were asked to select the one that they would like to do. The paired-stimulus method was more discriminating and was better able to determine a hierarchy and degree of preference for the different jobs when compared to the single-stimulus assessment.

A paired-stimulus video assessment was developed to assess preferences for a greater range of job options including video clips with narration for 120 different jobs (Morgan, 2003). Initial questions about working conditions narrowed the choices to 20 different jobs, which were presented in 10 forced-choice pairs during the assessment. When the initial results from the 56 transition-age students with ID or learning disabilities were compared to a retest 60 days later, selections of preferred work conditions remained consistent, but specific job choices were less consistent. The correlation was low between results of the video-based assessment and results from a published assessment using line drawings, although the two assessments did not depict all of the same jobs (Morgan, 2003). This study provides an example of video-based assessment, but reliability and validity could be improved.

A subsequent study using the same video-based assessment compared job selections from the assessment to observations at community job sites (Ellerd et al., 2006). Participants included 20 students with ID who were 18 to 21 years old. Participants were shown videos of different jobs presented in pairs, and then they selected their preferred job from the pair for 20 jobs that were presented twice in different combinations. Participants observed two highly preferred and two nonpreferred jobs in the community, then reported if they would like to do that job. After the observations, the participants were presented with pairs of photographs taken during the visits and asked to select the job they would want to do. Participants indicated that they would like to do the jobs that the assessment identified as highly preferred and selected these jobs with greater frequency than the nonpreferred jobs, but many participants indicated that they would also like the other nonpreferred jobs. Although test-retest reliability was not high for specific job choices, neither was there a correlation with a published picture-based assessment; the assessment was validated by participants' preferences in actual community work tryouts.

Community job performance has been used to evaluate a video-based work-minute preference assessment (Morgan & Horrocks, 2011). Three 18- to 19-year-old students with mild to moderate ID who could verbally identify preferences and who had some basic vocational skills participated in the study. The video preference assessment involved selecting from four work task choices on a screen. The results were used to arrange one high preference and one low preference job trial in the community for each participant. Participants worked daily for three 25-sessions in random order, which consisted of the high preference job, the low preference job, and a choice session using photos of the jobs for choice making. All participants had a higher percentage of intervals on-task during the high preference job compared to the low preference job. One of the participants refused to work at the low preference site after the first session.

During the choice sessions, two participants selected their high preference job each time and one participant selected each site half of the time. At the end of the study, all participants named the high preference job as the job that they liked better; two of the three participants self-reported better job performance at the high preference job. This study shows that video-based job preference assessment results correspond to actual preferences at community work sites. This type of assessment was successful for individuals with ID who have some verbal ability and existing vocational skills.

Subsequent studies used this assessment method along with a skills assessment to determine job preferences and matches using a web-based program called Your Employment Selections (YES; Morgan, 2008; Hall et al., 2014). In this assessment, a facilitator rated the participant on 106 dimensions, and the program computed a match score for different jobs based on the importance of the skills in performing that job. The program identified the participants' strengths and weaknesses related to the preferred job (Morgan, 2008). The YES assessment was used to identify the degree of preference and match for four young adult participants with mild to moderate ID (Hall et al., 2014). Participants worked at a high preference/ high match and low preference/low match jobs at community sites with job coaches. All participants had higher accuracy and productivity at the high preference/high match jobs, and all indicated that they worked better at and were more satisfied with the high preference/high match job. Three of four participants chose that job every time they were asked. One of the participants requested breaks while working only at the low preference/low match site. With a small group of participants, use of a video-based job preference assessment along with a job match assessment successfully identified community jobs that participants expressed satisfaction with and were able to perform with higher productivity and accuracy than other less preferred, not as well-matched jobs.

Another video-based work preference assessment, called WorkSight, was developed and used to assess students in a community-based transition program and adults receiving community ID services (Stock et al., 2003). All participants were over age 18 and had ID. This assessment included five video clips of common tasks for each of 12 job categories such as food service, animal care, and auto repair. The participant decided the order in which to play two videos, then selected the preferred job out of 30 pairs of videos. The preferred job categories determined by the assessment were correlated with teacher or staff ratings for several but not all job categories. Teachers and staff rated the WorkSight assessment as more effective and efficient than other existing assessments and rated it higher in enjoyment, motivation, and promoting self-esteem in participants. Test-retest reliability varied across job categories. Some job categories that were less reliable might have been too broad by including a wide variety of tasks in the videos representing those categories. For example, the warehouse job category included videos depicting box handling and forklift driving. This forced-choice paired video assessment might not have been specific enough to accurately determine preferences for job categories with a wider variety of job tasks. A preference assessment for specific work tasks rather than broad job categories could be more accurate in determining preferences.

In addition to computer-based career assessments, a tablet-based application called MyJobQuest has been developed to assess career choices (Davies et al., 2018). Twenty adults with ID, ages 20 to 60, used the assessment to make choices between 30 pairs of videos, which included videos of five job tasks from each of 12 categories. They watched two videos in the order of their choice and then selected a thumbs up symbol by the picture representing their preferred video. Employment support providers predicted the top three and bottom three job categories for each participant. The results from the chi-square analysis confirmed that the

assessment results matched the staff predictions of preferred and nonpreferred job categories. Additionally, only two participants needed assistance to use the assessment on the iPad. This study demonstrated that videos on an iPad can be used to assess career preferences through an application that most participants could use independently.

Walsh et al. (2019) also assessed job preferences via an application on an iPad. Three participants with ASD and ID, ages 20 to 21, were shown video models on a computer of adults performing 12 jobs, which were supported employment positions available in the community. Still images from the videos were presented as paired choices in the myPref app. Six jobs were included in each assessment of 30 trials, and each participant completed two assessments to assess all 12 jobs. Task analysis was used to measure participants' skill in performing their three highest and lowest preference jobs. Then, participants engaged in weekly sessions at three job placements that met different conditions: high preference/high skill, high preference/low skill, and low preference/low skill. When asked at the end of each week, all participants indicated that they enjoyed the high preference jobs most. Job coaches who did not know which job fit the different conditions indicated that one of the high preference jobs best suited the worker. During the job trials, percentage of steps performed correctly was higher on both high preference tasks as compared to low preference/low skill tasks for all participants. Performance on high preference/low skill jobs improved to levels of independence similar to the high preference/high skill jobs. Skill in performing the low preference jobs increased somewhat but remained lower than the high preference jobs. The preference assessment was successful in identifying high preference jobs, which were validated by performance, choices on the job, and job coach reports. This study demonstrated the successful use of electronic pictures, in the form of still images from videos, in a paired-stimulus format.

These studies involving video-based assessments of work preferences demonstrate the use of technology to present options of job categories (Davies et al., 2018; Ellerd et al., 2002; Ellerd et al., 2006; Hall et al., 2014; Morgan, 2003; Morgan & Horrocks, 2011; Stock et al., 2003) and specific community job placements (Walsh et al., 2019). Single-, paired-, and multiple-stimulus assessment procedures were used to assess career preferences. Many of the participants in these studies had mild or moderate ID, some had verbal communication ability, and some had learning disabilities without ID. Only one study included three participants with ASD and ID (Walsh et al., 2019). There is insufficient evidence to determine the efficacy of this type of assessment with individuals with more significant disabilities or with ASD and ID. It is possible that these assessments would be too broad or complex for some individuals.

Additionally, many of these assessments are not personalized to the hypothesized preferences of the individual taking the assessment, and only one was customized to specific jobs available in the individual's community. The development and validation of a work task assessment method that uses current technology is needed to assess preferences for specific job tasks efficiently for individuals with both ASD and ID.

### **Electronic Picture and Video-Based Preference Assessments**

In recent years, researchers have explored the use electronic means of presenting choices in preference assessments using current technology (Brodhead et al., 2016a; Brodhead et al., 2016b). Research on the use of videos or electronic images to present choices in preference assessments of specific job tasks is still limited. However, videos and electronic pictures have been used in assessments of other preferences (Brodhead et al., 2016a; Brodhead et al., 2016b). A review of the literature was conducted to identify preference assessment studies from peer-reviewed journals that met the following criteria: (a) paired-stimulus or multi-stimulus



preference assessments methods were used, (b) electronic pictures and/or videos were used to represent choices during the assessments, and (c) participants had ASD and/or ID. Studies using technology such as a tablet (e.g., iPad) as a reinforcer, leisure activity, or alternative or augmentative communication (AAC) option were excluded because these studies included tablets as a tangible item rather than using the technology to present choices. Electronic searches were conducted using Google Scholar and ProQuest databases, and additional articles were identified from hand searches of the references of relevant studies and literature reviews. Twenty-two articles met the inclusion criteria including Horrocks and Morgan's (2009) study using a video-based work task preference assessment and Walsh et al.'s (2019) study that presented paired-electronic picture choices. An overview of these studies is presented in Table II. Studies are presented chronologically to show the progression of the research over time. In the following sections, studies of preference assessments using electronic pictures and videos are summarized and compared to identify gaps in the research and areas that warrant further inquiry.

**TABLE II***Summary of Technology-based Preference Assessment Articles Included in Literature Review*

Article	n	Age (years)	Disabilities of Participants	Focus of Research	Preference Assessment Method	Preferences assessed	Technology Used	Methods	Key Results/Findings
Lee et al., 2008	7	33-50	1 - ASD 6 - ID	Investigate relationship between discrimination skills and stimulus modalities (object, pictorial, spoken, video) to assess leisure activity preferences	Paired - tangible, picture, spoken word, video	Leisure activities	Computer monitor	Assessment methods comparison	Object modality was effective in identifying high preference tasks for participants at Assessment of Basic Learning Abilities (ABLA) levels 3, 4, and 6. Picture modality was effective in identifying high preference tasks for one of two participants at ABLA level 4. Video and spoken word presentations were effective for ABLA level 6.
Horrocks & Morgan, 2009	3	18-22	ID	Compare preferences from video-based job preference assessment to MSWO job task preference assessment	Paired - videos; MSWO - tangible	Jobs	2 computer monitors	Assessment methods comparison	High and low preference jobs were consistent between video and MSWO assessments for all. Two participants had similar overall hierarchies.
Mechling & Moser, 2010	5	11-13	4 - ASD/ID 1 - ASD/ID/ADHD	Use of multi-stimulus with replacement (MSW) assessment to determine if students with ASD prefer to watch videos of themselves, familiar adults, or familiar peers complete preferred and routine tasks	MSW - electronic picture	Types of video models	Laptop	Repeated assessment	Preferences were individualized with no clear pattern from collective means. All participants chose each option at least once per session. Individual preferences were identified for 3/5 of participants - one for each type.
Snyder et al., 2012	6	3-5	ASD	Compare preference hierarchies from preference assessments with videos of tangible stimuli and assessments using tangible stimuli	Paired - tangible, video	Tangible items - toys	DVD players	Assessment methods comparison	Correlations between hierarchies were statistically significant for 4/6 of participants. The top ranked stimulus was the same for five and bottom ranked was the same for four. Video assessments took longer than tangible and required more effort.
Clark et al., 2015	4	9-11	ASD	Compare paired-stimulus tangible preference assessment to video preference assessment without access to determine if contingent access to items is necessary and validate preferences thru reinforcer assessment	Paired - tangible, video	Tangible nonfood items - toys, DVD, music player	2 iPads	Assessment methods comparison Concurrent operants reinforcer assessment	Preference assessment results suggest that several items were preferred. Highly preferred items from video assessments were reinforcing for three of four participants when compared to moderately preferred reinforcers from the tangible assessment. Highly preferred items from the tangible assessment were more reinforcing than those from the video assessment for two participants.
Brodhead et al., 2016b	4	4-12	ASD	Compare results of brief video MSWO to a brief tangible MSWO	MSWO - tangible, video	Tangible items - toys	iPad	Assessment methods comparison	Overall correlation between video and tangible MSWO was strong and statistically significant. The top preference was the same for 3/4. Two had statistically significant correlations between hierarchies. One participant had variable results.

Table II (continued)

Article	n	Age (years)	Disabilities of Participants	Focus of Research	Preference Assessment Method	Preferences assessed	Technology Used	Methods	Key Results/Findings
Brodhead et al., 2016a	5	4-11	ASD	Compare electronic pictorial MSWO to tangible MSWO  Evaluate reinforcing efficacy of high and low preference toys identified in assessments	MSWO - tangible, electronic picture	Tangible items - toys	iPad	Assessment methods comparison  Concurrent operants reinforcer assessment	Four participants had matching high preferences between assessment types, three had the same low preference toy, and one had no matches. Three had statistically significant correlations between hierarchies. Overall correlation between tangible and electronic picture assessments was strong and statistically significant. In the reinforcer assessment, all engaged more with the highly preferred toy.
Chebli & Lanovaz, 2016	5	4-11	ASD	Compare effects of high and low preference videos identified by a tablet-based preference assessment	Paired - video	Videos	Tablet computer	Concurrent operants reinforcer assessment	The preference assessment was validated by the reinforcer assessment, as all participants had high response rates with their preferred video.
Brodhead et al., 2017	4	4-7	ASD	Compare MSWO with and without access assessments for activity preferences  Compare efficiency of assessments with and without access  Evaluate reliability of instructor reports	MSWO - video with access and without access	Activities	iPad	Assessment methods comparison	The highly preferred activity was the same or within one rank for all participants. The least preferred was the same or within one rank for three of four participants. Overall correlation between assessment variations was strong and statistically significant. Three participants had strong correlations, but only one was statistically significant. Duration averaged 4.3 min without access and 42.6 min with access. Instructor report/MSWO-with access correlations were not statistically significant overall or for individual participants.
Huntington & Higbee, 2017	3	13-23	ASD	Evaluate use of a video preference assessment to identify reinforcing social interactions	Paired - video	Social interactions	2 Computer monitors	Alternating treatments reinforcer assessment	Preference hierarchies were identified for all participants. For all participants, the highest preference interaction had a higher rate of responding during reinforcer assessment compared to low preference and baseline conditions.
Wolfe et al., 2017	3	4-11	ASD	Determine whether videos are an effective modality to present social interaction choices in preference assessment  Compare video assessment with and without access  Evaluate whether highly preferred interactions functioned as reinforcers	Paired - video with access and without access	Social interactions	iPad	Assessment methods comparison  Concurrent operants reinforcer assessment	One participant had the same preference hierarchy with and without access, one had the same highest preference, and one had no match. Reinforcer assessment confirmed high preference interactions for two participants. Reinforcer assessment showed that the without access assessment was more accurate for one participant. Average duration was 10.5 min with access and 9 min without access.

Table II (continued)

Article	n	Age (years)	Disabilities of Participants	Focus of Research	Preference Assessment Method	Preferences assessed	Technology Used	Methods	Key Results/Findings
Broadhead & Rispoli, 2017	3	6-7	ASD	Evaluate use of video preference assessment for novel stimuli without access by comparing to tangible assessment  Evaluate effect of exposure to stimuli	MSWO-tangible with access and video without access	Tangible items - toys	iPad	Assessment methods comparison	Correlations were strong for all and statistically significant for two of three of participants. Correlations were stronger between tangible assessment and subsequent second video assessment compared to the first video assessment, showing a small effect of exposure to stimuli.
Davis et al., 2017	2	5-9	1 - ASD/visual impairment  1 - Down syndrome	Examine use of paired-stimulus video assessment to identify preferences for social interactions  Compare reinforcer efficacy to rank order identified in preference assessment	Paired - video	Social interactions	iPad	Progressive-ratio reinforcer assessment	The reinforcer assessment validated the high preference social interactions identified by the preference assessment for both participants. Ranks of high, moderate, and low preference interactions had a 1.0 correlation for one participant with ASD. For the other participant, there was a moderate correlation between the preference assessment and progressive-ratio analysis rankings.
Curiel et al., 2018	5	9-25	3 - ASD  1 - other health impairment (OHI)  1 - emotional impairment	Determine if video preferences can be assessed by a web-based brief MSWO assessment	MSWO - electronic picture	Videos	iPad	Demonstration of assessment	Preference hierarchies were generated for all participants. Two participants showed more differentiated responses overall and higher selection percentages (83% and 73%) for the highest preferred videos. Three participants had less differentiated hierarchies and smaller differences in selection percentages between the highest and lowest preferred videos.
Broadhead et al., 2019	5	3-7	ASD	Replicate prior studies of video-based assessments without access  Validate results by comparing the reinforcing value of tangible and video depictions of stimuli	MSWO - video without access	Toys	iPad	Concurrent operants reinforcer assessment	The video MSWO without access accurately predicted a reinforcing toy for all five participants. For four of five participants, videos of preferred toys functioned as reinforcers in place of the tangible items.
Curiel & Poling, 2019	5	18-25	ASD	Replicate prior study of web-based assessment of video preferences  Assess reinforcer efficacy	MSWO - electronic picture	Videos	iPad	Single operant, progressive ratio reinforcer assessment	One participant left the study due to side bias. A preference hierarchy was generated for the other four participants. All had higher rates of responding during the high preference video. Two had high rates of responding with both low and high preference videos.

Table II (continued)

Article	n	Age (years)	Disabilities of Participants	Focus of Research	Preference Assessment Method	Preferences assessed	Technology Used	Methods	Key Results/Findings
Walsh et al., 2019	3	20-21	ASD/ID	Evaluate video models plus myPref app as a prework assessment  Examine effects of high preference/high match, high preference/low match, and low preference/low match jobs on job performance	Paired - electronic picture	Supported employment jobs	iPad	Demonstration of assessment process  Alternating treatments  Validation of results through choices in the community and job coach report	Job performance was higher on high preference tasks for all participants. After job trials, performance on high preference/low skill jobs increased to percentages close to the high preference/high skill jobs, while skill in performing the low preference jobs increased somewhat. All participants indicated that they enjoyed the high preference jobs most. Job coaches all indicated that one of the high preference jobs best suited the worker.
Curiel et al., 2020	4	11-14	3 - ID  1 - ID/OHI/visual impairment	Further validate a web-based MSWO to assess video preferences using reinforcer assessment	MSWO - electronic picture	Videos	iPad	Concurrent operants reinforcer assessment	Hierarchies were generated for all four participants, but two had less differentiation. Two participants had clearly high response rates for high preference videos, one alternated between videos, but had higher response rates with high preference video, and one had undifferentiated responding.
Morris & Vollmer, 2020	4	8-12	ASD	Compare preference assessments for social interaction with electronic picture and GIFs used to present social interactions	Paired - electronic picture and video (GIF)	Social interactions	Touchscreen laptop computer	Assessment methods comparison  Reinforcer assessment; Modality preference assessment	Two participants had the same hierarchies between picture and GIF assessments, while two had unmatched hierarchies. GIF-based assessments were highly correlated with reinforcer assessments for all four participants. Picture-based assessments were highly correlated with reinforcer assessments for two participants. Three participants preferred GIFs, while one participant's modality preference varied by social interaction.
Curiel et al., 2021	4	4-15	2 - ASD  2 - ASD/ADHD	Conduct MSWO with multiple devices  Compare parent/staff rankings to MSWO  Assess reinforcing effects of stimuli	MSWO - electronic picture	videos	4 Samsung Galaxy Tab A tablets	Comparison between MSWO results and parent/ staff reports  Concurrent operants reinforcer assessment	The MSWO preference assessment generated hierarchies for all participants. Staff/ parent reports did not match MSWO hierarchies for any participants. High preference videos acted as reinforcers for all participants.
Huntington & Schwartz, 2021	1	24	ASD/ID/bipolar disorder	Evaluate effect of assessor on social interaction preferences  Evaluate effectiveness of interactions with different assessors  Evaluate videos used for pre-exposure	Paired - video	Social interactions	Laptop computer	Comparison of assessment results across different assessors  Reinforcer assessment	The participant's interaction preferences varied across people - one interaction was preferred with his mother and a different interaction was preferred with staff and the researcher. Rates of work were higher in high preference conditions, which varied between his mother and others. Work rates were higher with his mother than other assessors.

**Table II** (continued)

<b>Article</b>	<b>n</b>	<b>Age (years)</b>	<b>Disabilities of Participants</b>	<b>Focus of Research</b>	<b>Preference Assessment Method</b>	<b>Preferences assessed</b>	<b>Technology Used</b>	<b>Methods</b>	<b>Key Results/Findings</b>
Davis et al., 2021	5	5-10	4 - ASD 1 - Down syndrome	Compare video and picture presentations in preference assessments for social interactions  Evaluate reinforcing effects of high preference social interactions	Paired - picture and video	Social interactions	iPads	Assessment methods comparison  Concurrent operants reinforcer assessment	Two participants had undifferentiated responses. Two had the same high preference and three had same low preference interaction between assessment types. On the reinforcer assessment, the matching high preference interaction was validated by higher response rates for two participants. For the other participant, the reinforcer assessment, showed the high preference interaction from the video-based assessment was more reinforcing than the interaction identified by the picture assessment.

### **Electronic Picture-Based Preference Assessments**

Eight studies used still images presented on the screen of a computer or tablet as a way to present choices during preference assessments. Six of these studies used multi-stimulus assessment procedures, and two used a paired-stimulus procedure. Preferences for types of video models, tangible reinforcers, videos, social interactions, and community job placements have been assessed with the electronic picture modality.

In a study comparing preferences for types of video modeling, Mechling and Moser (2010) used an electronic picture-based preference assessment to determine whether students with ASD, ages 11 to 13, would choose to watch videos of themselves, familiar adults, or familiar peers performing routine and preferred tasks. Using a MSW procedure, participants selected from a laptop screen three images of different people completing the same task. Then they watched the video clip associated with their choice. Ten sessions consisting of 10 trials were conducted with each participant. There was no clear overall pattern across participants. Preferences seemed to be individualized as two participants did not show a preference. Of the three who did have a preference, each preferred a different type of video modeling. This study demonstrated a MSW preference assessment procedure using electronic images; still, a preference was not demonstrated for all participants and the study did not include a validation component to evaluate the utility of the preferred video models.

Electronic-pictorial preference assessment has also been used to evaluate preferences for toys as reinforcers (Brodhead et al., 2016). MSWO preference assessments were conducted with children with ASD, ages 4 to 11, comparing results from tangible stimuli to electronic pictures shown in rows on an iPad. Each type of assessment was repeated three times over 3 days for each participant. A subsequent reinforcer assessment was conducted with three of the five

participants: one with the same highest and lowest preference toys on the tangible- and electronic-picture assessments, one with the same highest preference toy, and one with no match between the highest or lowest preference items. Participants placed a paperclip or penny into a colored cup near the high or low preference toy identified by the electronic picture-based assessment to gain 30 seconds of access to the toy. A cup with no associated toy was present as a control. Based on Spearman's rank order correlation, strong correlations between the hierarchies were generated by the tangible- and electronic-pictorial assessments for four of five participants, and statistically significant correlations for three participants. The overall correlation was strong and statistically significant. During the reinforcer assessment, all three participants engaged more with the high preference toy, validating the reinforcer identified by the electronic-pictorial preference assessment. This study shows successful use of electronic picture-based preference assessment for toys used as reinforcers.

As part of a series of studies using a web-based program to determine video preferences, Curiel et al. (2018) assessed two 9-year-old participants from a school for students with emotional and behavioral needs and three young adult participants with ASD, ages 20 to 25, in a transition program. The MSWO preference assessment began with a sampling phase involving exposure to a still frame from each video followed by a 30 second viewing of the video. Then, participants selected between still frames on an iPad screen and viewed the selected video for 30 seconds before being presented with the next array of choices. A preference hierarchy was established for each participant by ranking the average selection percentages for each video across three assessment sessions. Two participants, including one with ASD, showed more differentiated responses with higher selection percentages, 83% and 73%, for their highest preferred videos. In comparison, the other three participants had lower selection percentages,



ranging from 58-61%, for their highest preference video and a smaller difference in selection percentage between the highest and lowest preferred videos. The lack of differentiation could be due to inclusion of only preferred videos. This study demonstrates an efficient procedure for conducting a preference assessment for videos using a web-based program. However, the study did not use a reinforcer assessment to evaluate the reinforcing value of the video clips or validate the assessment results.

Curiel and Poling (2019) replicated the electronic pictorial MSWO assessment used in Curiel et al. (2018) and added a reinforcer assessment to validate the preference assessment results. Young adults with ASD or developmental disabilities, ages 18 to 25, in a public school transition program completed the web-based MSWO three to five times following the procedure described by Curiel et al. (2018). One participant demonstrated a side bias and did not complete the study, but a preference hierarchy was generated for the other four participants. High preference and low preference videos identified by the assessments were included in a single-operants reinforcer assessment. In a baseline condition, participants were shown how to press a play button on the display screen. In reinforcement conditions, either the high preference or low preference video played for 10 s when the play button was pressed. The number of times the button needed to be pressed to start the video increased as the assessment progressed. All participants had higher rates of button pressing for their high preference video, although two participants had high rates of responding for both high and low preference videos. In this study, the MSWO using still images from videos successfully generated hierarchies for preferred videos that were validated by a reinforcer assessment, but the MSWO procedure was not successful for one individual who showed a side bias.

Further investigation of the web-based electronic-pictorial assessment of video preference was carried out by Curiel et al. (2020) with four middle school students with ID, ages 11 to 14. The MSWO assessment was conducted as in prior studies (Curiel et al., 2018; Curiel & Poling, 2019), and then a concurrent operants-reinforcer assessment was performed to validate the results. Reinforcer assessment sessions started with demonstration of how to press and hold a button to access the high preference video, low preference video, and a blank screen. Then, all three options were available, and the participant selected and watched their chosen options for as long they wanted within 5 min sessions. Hierarchies were generated by the MSWO preference assessment for all four students in three to five assessments with varying degrees of differentiation between selection percentages. In the reinforcer assessment, two participants had higher response rates for high preference videos, and one participant alternated between high and low preference videos but selected the high preference option more frequently. One participant selected all three options at times and had lower response rates overall. Again, this study demonstrated that a MSWO procedure with electronic images can be used to assess video preferences, and the results were validated for three of four participants.

Curiel et al. (2021) continued the line of research using still images to assess video preferences with a MSWO procedure, but this study used four separate Samsung Galaxy Tab A tablets presented side by side on the table rather than displaying all choices on one screen. Additionally, MSWO results were compared to staff or parent rankings and reinforcing effects of the stimuli were evaluated to validate the MSWO results. Four children with ASD, ages 4-15, participated in three or five preference assessment sessions. In a subsequent concurrent operants-reinforcer assessment, the thumbnail images from the high preference and low preference videos identified by the MSWO along with one black screen as a control were presented on tablets

placed in front of a sorting or puzzle activity. Participants gained 30 s access to the video when they completed the activity in front of the tablet. Hierarchies were generated from the electronic-pictorial MSWO for all four participants, but the hierarchies did not correspond to parent or staff rankings for any of the participants. All participants showed higher rates of responding to the activities associated with their high preference video identified by the MSWO assessment; thus, the MSWO results were validated by the reinforcer assessment. This study shows that multiple devices can be used effectively in a MSWO assessment procedure, and it demonstrated the importance of systematically assessing preferences rather than relying solely on staff or parent report.

In a recent study, Morris and Vollmer (2020) compared preference assessments using electronic pictures to those using graphic interchange format images (GIFs)--short looping videos without sound. Four children with ASD, ages 8 to 12 who could not match the picture or GIF to the action, participated. Preferred social interactions were assessed using a paired-stimulus format with four interactions and a control option. Reinforcer assessments were conducted using shapes presented on a computer screen associated with different interactions, which were delivered when participants selected the shape. Interactions were restricted from the array in subsequent phases when they were selected the majority of the time. Rank order correlation was used to compare the preference-assessment hierarchies to reinforcer-assessment hierarchies. To evaluate preferred modality, paired pictures and GIFs of the same interaction were presented on the screen then were displayed full screen when selected. Two participants had the same hierarchies between picture and GIF assessments, and two had differing hierarchies. GIF-based preference assessments were highly correlated with reinforcer assessments for all participants, and picture-based assessments were highly correlated with

reinforcer assessment results for two children. One participant's modality preference varied for different social interactions, while the other three preferred GIFs. This study demonstrated the efficacy of a GIF-based, paired-task preference assessment for social interactions for all participants, while an electronic picture-based assessment was only effective with half of the participants. This study was the first to evaluate technology-based stimulus modality preferences of children with ASD and with most preferring GIFs.

Of the eight studies using the electronic-picture modality to assess preferences of individuals with ASD and/or ID, most involved a MSWO-assessment procedure with one study using a MSW procedure and two using a paired-stimulus procedures. The majority of studies used electronic pictures to assess video preferences. Preferences for tangible reinforcers, social interactions, and job placements were each assessed in one study. Most of the participants in these studies were children, but three of the studies included young adults in their twenties (Curiel et al., 2018; Curiel & Poling, 2019; Walsh et al., 2019). Five of the studies validated the preferences determined in the assessment through a subsequent reinforcer assessment (Brodhead et al., 2016; Curiel & Poling, 2019; Curiel et al., 2020; Curiel et al., 2021; Morris & Vollmer, 2020). Overall, the electronic-pictorial preference assessment procedures described in these studies were moderately successful and were able to identify preferences for most but not all participants. Further inquiry is needed to extend the research to explore the use of electronic images to assess preferences of additional activities such as specific work tasks.

### **Video-Based Preference Assessments**

Fifteen studies were identified that involve the use of videos to present choices during preference assessments, including Morris and Vollmer's (2020) study comparing electronic picture and GIF video modalities. Video-based preference assessments have been used to

evaluate preferences for activities, tangible stimuli, videos, and social interactions. This section described studies using videos in paired-stimulus and multi-stimulus assessment procedures.

### **Paired-Stimulus Video-Based Preference Assessments**

Videos have been used in paired-stimulus assessments to present choices to participants with ASD and/or ID in 11 studies. A study comparing object, picture, spoken word, and video presentation modalities in leisure activity preference assessments was conducted with adults with ASD or developmental disabilities who had different levels of discrimination skills (Lee et al., 2008). An initial paired-stimulus preference assessment was carried out using objects to represent six leisure activities. The highest and lowest preference activities were used in paired-stimulus preference assessments with object, picture, spoken word, and video presentation modalities. In the video-based assessment, a video without sound was played on the left side of a computer monitor while the right side was blank. After, a different video was played on the right side with the left side blank. Then, both videos were played simultaneously on different sides of the screen and the participants selected one. Participants with Level 3 ABLA scores chose their preferred activity accurately using objects but were inconsistent with the other presentation methods. Participants who scored at Level 4 on the ABLA also chose their preferred activity most consistently with objects. One of the two participants with Level 4 scores also selected their preferred activity consistently with pictures. The Level 6 participants selected their most preferred activity every time with the object, picture, video presentation methods, and very consistently with the spoken word presentation. The results of this study involving object, picture, and spoken word presentation modalities are consistent with prior research using the ABLA to predict accurate presentation modalities, except for the performance of one Level 4

participant. The video presentation method was more effective with participants with greater discrimination skills.

Videos as a presentation modality have also been used in paired-stimulus assessments to identify reinforcers. In the first study to explore the use of videos to represent tangible, nonfood reinforcers, the preference hierarchies were compared between tangible and video-based, paired-stimulus assessment (Snyder et al., 2012). Assessments were conducted with six preschool children with ASD using established paired-stimulus procedures. In the video-based assessment, videos of unfamiliar children playing with toys were shown one at a time on two DVD players side by side. A second video assessment session was conducted with three of the participants using videos from a point-of-view perspective showing a child's hands playing with the toy, which improved correlations of the rankings to a statistically significant level for two participants. A modification was made for one participant who showed a bias for choosing from one side, and a second assessment was conducted with videos playing simultaneously. Even with the modification, correspondence between the hierarchies was still low for that participant. Statistically significant correlations were found between the rankings in the hierarchies for four of six participants. The top ranked stimulus was the same in the tangible and video presentation conditions for five of six participants, and the bottom ranked was the same for four of six participants. Comparison of preference hierarchies between the established tangible paired-stimulus preference assessment procedure and the video presentation modality validated the use of the videos as a presentation method. Modifications to the videos to show point of view models improved correlations slightly.

Research has also explored the use of videos in paired-stimulus preference assessments without access to the selected stimuli. Clark et al. (2015) studied the effectiveness of video-based

preference assessments without access with four children with ASD, ages 9 to 11. This study included a subsequent a reinforcer assessment with a concurrent operants design. For the preference assessment, videos of an unfamiliar person using toys, DVDs, or a music player were shown one at a time on two iPads, then played simultaneously during the selection. During the reinforcer assessment, three chairs were present and sitting behavior was measured. One chair functioned as a control, and the participants received a consequence in the form of an item determined to be of high, moderate, or low preference in the tangible preference assessment or highly preferred in the video preference assessment, when they sat in one of the other two chairs. Comparisons were made between the high preference item identified by the video assessment and each of the stimuli selected from the tangible assessment as well as between the high and moderate preference items from the tangible assessment. The high preference item from the tangible assessment was accessed more often than the high preference item from the video assessment for two participants. The video high preference item was accessed more often than the tangible moderate preference item for three of four participants. These results suggest that the video-based preference assessment without access to stimuli was able to identify items that functioned as reinforcers; however, the items did not appear to be as reinforcing as those identified in the tangible preference assessment.

Video preference assessment has also been used to identify videos to be used as reinforcers. Chebli and Lanovaz (2016) used a paired-stimulus assessment to determine preferred videos of five children with ASD, ages 4 to 11, and validated the results through a concurrent operants-reinforcer assessment. Preference for six videos were assessed by showing screenshots of two videos side by side on a computer tablet with a Windows operating system. Participants touched one and watched 30 seconds of that video, then touched the other to watch 30 seconds of

the other video. They then selected between the two screenshots for another 30 seconds to view that video. This procedure took 60 to 80 min per assessment, split into multiple sessions. In a subsequent reinforcer assessment, participants were able to watch their most preferred or a less preferred video contingent on sitting on a chair with a tablet that would play that video.

Participants sat on the chairs associated with their preferred videos most of the time and did not sit in the chairs with their less preferred videos, which validated the results of the video preference assessment. The video-based, paired-stimulus in this study effectively identified reinforcing videos for all participants.

Several studies have used video-based assessments to examine preferences for reinforcing social interactions. Wolfe et al. (2017) implemented a paired video-based assessment to identify preferred and non-preferred social interactions (e.g., verbal praise, high fives) in children with ASD, ages four to 11. Preference assessments with and without access were compared, and a concurrent operants-reinforcer assessment in which social interactions were provided contingent upon stringing beads was conducted to validate the results. Assessments began with pre-exposure trials in which participants were shown videos of unfamiliar people engaging in social interactions, and then they engaged in the depicted interaction with a therapist. Next, participants made selections from two videos playing simultaneously on two iPads placed side by side. The assessments with access took longer to administer on average than those without access. Two of the three participants had highly correlated preference hierarchies and the same highest preference between the access and no access assessments.

During the reinforcer assessment, both of these participants had inconsistent responses at first but showed higher response rates with the highest preference interaction after several sessions. The hierarchies of the third participant had a negative correlation, and the highest



preference interaction from the access and no access assessments were included in the reinforcer assessment. The high preference interaction from the no access assessment functioned as a reinforcer. This study shows that video preference assessments without access can be as useful as those with access for some individuals but with a shorter administration time.

In another study of social interaction preferences, a paired, video-based preference assessment was conducted involving three individuals with ASD, ages 13 to 23, and subsequently validated with a reinforcer assessment (Huntington & Higbee, 2017). During the preference assessment, videos showing social interactions between unknown people were played simultaneously on two computer screens side by side. The participants selected one and engaged in the interaction with the researcher for 30 s. The initial video preference assessment did not yield clear preference hierarchies for two participants; thus, it was repeated with different social interactions. Preference hierarchies were successfully determined for all three participants. A reinforcer assessment was conducted with a multiple-baseline, alternating treatments design. Familiar tasks that participants did not complete at high rates were selected for each participant. In the baseline condition, the task was presented, and no reinforcement was given. In the treatment conditions, high preference or low preference social reinforcement as determined by the video preference assessment was provided after a successful task completion. One participant initially had undifferentiated rates of task completion but eventually showed higher rates of task completion in the high preference condition. For all participants, task completion was highest given the high preference social interaction as a reinforcer. The reinforcer assessment validated the video-based preference assessment results.

Davis et al. (2017) conducted paired-stimulus, video-based preference assessments of social interactions and then evaluated the strength of the identified reinforcers. One boy with

ASD and one boy with Down syndrome participated. Videos of the participant and researcher doing the social interactions were presented on two iPads side by side. The video on the left was played and followed by the video on the right. The participant selected between the two by touching the iPad. Preference assessment results were used to select high, medium, and low preference social interactions to be used in the progressive-ratio analysis. Participants were reinforced by social interactions for putting pegs in a peg board, and the number of pegs required to receive the social interaction was increased until the participant was not able to meet the criterion within 3 min. From that point, the highest number of pegs was determined as the break point. For both participants, the most preferred social interaction resulted in the highest break point. For the participant with ASD, a very strong correlation of 1.0 between the preference assessment and progressive-ratio analysis results was noted. For the other participant, the medium preference interaction had a slightly lower break point than the lowest preference interaction with a moderate correlation between the preference assessment and progressive-ratio analysis. This study is another example of the successful use of video-based preference assessments to identify reinforcing social interactions.

Davis et al. (2021) compared video and picture presentation modalities in paired-stimulus preference assessments for social interactions and attempted to validate results with a reinforcer assessment. Social interaction preferences of five boys, ages 5 to 10, with ASD or Down syndrome were assessed using videos of themselves engaging in interactions with the assessor and using still photos taken from the videos. Choices were presented with two iPads in the video-based assessments and with two pictures printed on paper in the picture-based assessments. Two participants did not have differentiated responding and did not select any interaction in 80% or more opportunities. The other three participants had differentiated preference hierarchies with

the video modality. Two of those participants also had differentiated hierarchies with the picture modality and matching high and low preference tasks between the two modalities. A reinforcer assessment was conducted with those three participants using Lego blocks of three different colors that corresponded to a control condition and two different social interaction conditions. For the two children with matching hierarchies, the high and low preference interactions were used. They both demonstrated higher rates of stacking Lego when it was associated with their high preference interaction. The high preference interaction from each modality was used for the other participant. He had higher rates of stacking associated with the interaction identified as high preference by the video-based assessment. The results of this study validated the video-based, paired-stimulus preference assessment for three children; however, the assessment was not effective in generating preference hierarchies for all participants. Additionally, the video modality was effective with more participants than the picture modality.

Huntington and Schwartz (2021) evaluated preferences for social interactions across assessors with a 24-year-old man with ASD, ID, and bipolar disorder. First, a preassessment was conducted in which two videos depicting preferred and nonpreferred activities played continuously on a loop, side by side on a computer screen; the participant was asked to select and complete an activity. Initially he did not meet the criteria of selecting the preferred item at least 80% of the time. As a consequence, errorless teaching was implemented, and he then responded by selecting the preferred activity with 100% accuracy. Next stimulus preference assessments for social interactions were conducted by his mother, a known staff person, and an unknown researcher. Five videos of unknown people engaging in social interactions specific to the participant's preferences were demonstrated. Then the videos were presented in pairs on a computer screen, and the participant engaged in the chosen interaction with the assessor. The

participant's interaction preferences varied across people: One interaction was preferred with his mother and a different interaction was preferred with the staff person and researcher. Next, a reinforcer assessment was conducted with the different assessors and the interactions identified as preferred with that assessor. He was asked to sort silverware under three conditions: no consequence, receipt of high preference interaction, and receipt of nonmatching preference interaction. Rates of work were higher in the high preference conditions, but the nonmatching interaction appeared to have some reinforcing effect as work rates were higher than with no consequence. Work rates were higher with his mother than with the staff or researcher. Overall, reinforcer assessments validated the preference assessment results. This study shows that social interaction preferences can be assessed with a paired-video procedure, and preferences could vary depending on who is delivering the social interactions. Additionally, this study demonstrated a preassessment procedure to teach choice-making with paired videos.

### **Multi-Stimulus Video-Based Preference Assessments**

Multi-stimulus preference assessment procedures have been used in video-based preference assessments. Brodhead et al. (2016b) compared MSWO preference assessments using tangible stimuli and videos. They conducted three preference assessments for toy preferences with each presentation method with four children with ASD and compared the rank order of preference between the tangible and video methods using Kendall's tau. Three of four participants had a matched top preference between the presentation modalities. Two participants showed statistically significant correlations between hierarchies; one had a strong but not statistically significant correlation between hierarchies, and one participant had variable results and nonsignificant correlations. Overall correlation between results on the tangible and video MSWO preference assessment methods was strong and statistically significant.

In another comparison involving MSWO assessments, Broadhead et al. (2017) compared results of video-based MSWO preference assessments with access to selected stimuli to results of an assessment without access and to instructors' rankings of children's preferences. Administration time was also compared across modalities. Children with ASD were presented with choices between videos of activities (e.g., jumping on a trampoline) playing continuously on an iPad. In the no access version of the assessment, children immediately moved on to the next choice after making a selection. In the assessment with access, they were given 2 min to do the activities they selected. Spearman's rank order correlations were calculated for each participant that found three of four participants had strong correlations, but only one was statistically significant. Overall correlations were statistically significant between access and no access assessments but not statistically significant between instructor rankings and assessments with access. The average administration time of 4.3 min for assessments without access was more efficient than assessments with access, which took 42.6 min on average. This study shows the efficacy of video-based MSWO-procedure and the importance of conducting preference assessments rather than relying solely on the opinions of others. Additionally, preference assessments without access reduce administration time and have potential use for situations when immediate access to multiple activities is not feasible.

In a study that further explored the use of MSWO assessments, Brodhead and Rispoli (2017) evaluated whether video-based preference assessments could be used to assess the preferences for novel stimuli--toys that the participants had not seen before. Video-based MSWO preference assessments were conducted with three children with ASD, ages 6 to 7, without giving them access to the toys. During the assessments, videos of hands using the toys played simultaneously in the Keynote application on an iPad. Next, tangible stimulus preference

assessments were conducted with 15 s access to the toys after selection. Then the video-based assessments were repeated again without access. Rank order correlations between the first video-based assessment and tangible assessment and between the second video assessment and tangible assessment were strong for all participants and statistically significant for two of three participants. Correlations between the second video and tangible assessments were slightly higher than the correlation between the first video and tangible assessments for two participants, indicating a small effect of exposure to the toys. This study shows that video-based preference assessments on the iPad without access to the stimuli produce similar results to preference assessments using tangible stimuli.

Brodhead et al. (2019) also conducted video-based MSWO assessments without access to stimuli with five children with ASD, ages 3 to 7. Prior to the assessments, the participants had 2 min exposure to each toy, and they completed a matching assessment in which they were all able to select the video or toy that matched the toy shown. Then, the MSWO video preference assessment was conducted without access to the toys. Next, high and low preference toys identified by the preference assessments were used in concurrent operants-reinforcer assessment to validate the results. In the tangible condition, three chairs were placed at a table, and the high and low preference toys were placed by different chairs, and one chair had no toy. For the video condition, iPads showing the high preference toy video, low preference toy video, and no video were placed at the chairs. Engagement with the toys or videos was measured during 2-min sessions. The video MSWO without access preference assessment accurately predicted a reinforcing toy for all five participants. For four participants, videos of preferred toys produced similar results to actual toys in the reinforcer assessment. This study replicates prior findings and

validates the utility of the video-based MSWO without access in identifying reinforcing toys in children with ASD.

### **Comparison of Technology Preference Assessment Studies**

The utility of electronic picture and video-based preference assessments to identify a variety of preferences in individuals with ASD has been demonstrated in the research literature. Electronic pictures or still frames from videos have been used to assess preferences for toys, specific videos, types of video models, social interactions, and job placements. Videos have been used to represent options in preference assessments to evaluate preferences for toys, activities, and social interactions.

### **Participants and Setting**

Nearly all of the studies in this review included participants with ASD with the exceptions of studies by Horrocks and Morgan (2009) and Curiel et al. (2020) that included participants with ID without an ASD diagnosis. Participants' ages ranged from 3 to 50 years old. Most studies were conducted with children. Four studies included transition-age participants, individuals between 16 and 21 (Curiel et al., 2018; Curiel & Poling, 2019; Horrocks & Morgan, 2009; Walsh et al., 2019) and four involved young adults (Curiel et al., 2018; Curiel & Poling, 2019; Huntington & Higbee, 2017; Huntington & Schwartz, 2021); however, Lee et al.'s study included older adults. Transition-age participants were underrepresented in these studies, particularly high school age teens. The use of technology-based preference assessments with transition-age individuals warrants further study. The majority of the studies were conducted in clinic settings such as those that provide applied behavior analysis or autism-specific therapies, and six studies were conducted in schools. Other locations included an inpatient setting, a facility for adults with disabilities, a university campus, a VR training center, community job sites, and

the participant's home. Only two of the studies with transition-age participants were conducted in school settings.

### **Assessment Procedures**

Paired-stimulus preference assessments were used in 12 studies, and multi-stimulus assessment procedures were used in 11 studies. All but one of the multi-stimulus assessments used a MSWO procedure; Mechling and Moser (2010) conducted MSW assessments. None of the studies compared technology-based paired and multi-stimulus procedures. The number of stimuli used in the assessments ranged from two to nine, though one study had 12 total options in two rounds of assessments of six each. One study initially assessed preferences for six stimuli, then included two of those in subsequent assessments (Lee et al., 2008). Six studies included assessments that did not allow access the chosen stimuli immediately after selection (Brodhead et al., 2017; Brodhead et al., 2019; Brodhead & Rispoli, 2017; Clark et al., 2015; Walsh et al., 2019; Wolfe et al., 2017). In the studies that did include access after selection, the time that the participants could access the stimuli ranged from 3 s to 3 min, with 30 s as the most common length of access.

### **Technology**

Eight studies presented choices using still electronic images and 15 used videos to depict choices. Several ways of presenting still- or moving-electronic images were used in the research with variations in the type and number of devices. Some of the video-based assessments used still pictures during the choice selection but also showed videos in each trial (e.g., Chebli & Lanovaz, 2016). The majority of video-based assessments had videos playing continuously. Tablets and most frequently iPads were used in the majority of the studies to show preference assessment choices to participants; computers were used in seven studies and DVD players in



one study. Fourteen studies presenting choices with pairs or arrays appearing on the same screen were selected; seven studies used two different devices to present paired choices, and one study used four tablets to present multiple options.

### **Methodology**

Research on electronic-picture and video-based preference assessments has explored these topics using the following study designs: (a) repeated administration of the assessment, (b) comparison between different types of assessment, (c) reinforcer assessment following preference assessment of reinforcing stimuli, and (d) validation through choices and performance at community job sites. All studies had single subject designs. Two studies involving electronic picture-based assessments used repeated administration of the same type of assessment without a validation component (Curiel et al., 2018; Mechling & Moser, 2010). Twelve studies compared different types of preference assessment by administering both assessments to the same participants. Six of those studies compared a video-based assessment to an assessment using tangible stimuli to establish validity (Broadhead & Rispoli, 2017; Brodhead et al., 2016a; Brodhead et al., 2016b; Clark et al., 2015; Lee et al., 2008; Snyder, Higbee & Dayton, 2012), and two studies compared preference assessments with and without access to stimuli shown in the videos (Brodhead et al., 2017; Wolfe et al., 2017).

### **Need for Further Research**

Preference assessments using technology that include electronic pictures and videos have been studied with individuals with ASD to evaluate preferences for tangible items, activities, videos, social interactions, and community jobs; however, the use of technology-based preference assessments has not been thoroughly studied for work task preferences. To date, only one study evaluated the use of videos for specific job task preference assessments (Horrocks &

Morgan, 2009), and one study used stills from video models to present community job options (Walsh et al., 2019). In addition, transition-age youth were underrepresented in these studies of technology-based preference assessment, as the majority of studies were conducted with children.

The use of technology-based work task assessments has potential advantages over tangible assessments that should be explored. Using objects to represent job tasks in preference assessments has challenges such as when the representative objects are bulky or differently sized. For example, large items such as a vacuum cleaner or shredder are difficult to present in an array and might limit the number of items that can be included. Large items can cause the array of choices to spread over a larger area that requires increased effort to reach items positioned farther away. Large objects presented alongside smaller objects also take up more of the visual field. These factors could cause a participant to select based on factors other than the preference. These tasks could be better represented through electronic pictures and videos that are the same size and easily viewed together on the screen. Both videos and electronic pictures can represent job tasks that cannot easily be represented by an object. Video also has the advantage of showing the complexities of stimuli that would not be possible using objects or still pictures (Huntington & Higbee, 2017). For work task preference assessments, a video shows the dynamic action of the job task rather than just the object used to complete the task. For some objects, it may be unclear how the item is to be used, particularly if it is a common item that could be used in multiple tasks. However, electronic pictures could have advantages over video because they can be easier to create and require less editing. Also, viewing multiple videos might be distracting or visually overwhelming for some individuals. Electronic pictures provide additional context and details about the task without movement. Technology-based assessments might be engaging for students

simply because they involve popular technology such as tablets. Both electronic-pictorial and video-based work task preference assessments have advantages over object-based methods that are worth exploring as transition assessments with students with ASD and ID.

### **Summary**

Work task preference assessments have been used to evaluate the preferences of individuals with disabilities who would otherwise have difficulty expressing what work they would like to do. Behavior theory can be used to explain the mechanism of preference assessment, and self-determination and causal agency theory illustrate the importance of assessing preferences of individuals with significant disabilities to include the individual's voice in transition planning. Twenty-three studies that date back to the late 1970s have explored the topic of assessing work task preferences of individuals with ASD and/or ID. Most of this research was carried out with adult participants with ID, but this assessment procedure could be useful for students in transition with both ASD and ID. The majority of studies presented task options in pairs; however, multi-stimulus procedures might be quicker to administer and warrant further study. Additionally, most of the research on preference assessments for specific work tasks used objects to present task choices. The use of pictures in four studies (Cobigo, Morin & Lachapelle, 2009; Reyer & Sturmey, 2006; St. Peter et al., 2021; Spevack et al., 2005) and video clips in one (Horrocks & Morgan, 2009) show the possibility of different presentation modalities that should be explored further. Video-based career interest assessments have been used with individuals with less significant disabilities, but the use of broad career categories could be too complex for some students with ASD and ID. An electronic-pictorial assessment of community job preferences was successful with a small number of participants with ASD and ID. The

electronic picture and video presentation modality warrant further study with transition-age individuals with ASD and ID.

Electronic pictures and videos have been used in stimulus preference assessments with children and adults with ASD to assess preferences other than career interests including (a) preferences for tangible nonfood reinforcers, (b) leisure activities, (c) videos, and (d) social interactions. The majority of participants in these studies were children with some adults also included in a few studies. However, transition-age youth were underrepresented. Electronic pictorial and video presentation methods have some advantages over object-based assessment methods, but their use as transition assessments of specific work task preferences for youth and young adults with ASD and ID has not been fully explored. The successful methods of work task preference assessment can be combined with the technology that has been effective in assessing other preferences to develop a technology-based work task preference assessment. The aim of this study was to evaluate the effectiveness of electronic picture-based and video-based MSWO preference assessments with students with ASD and ID in transition.

## CHAPTER III: METHODOLOGY

### **Setting and Participants**

This study was conducted at two sites. The first site was a nonpublic special education school in a large midwestern city. All students attending the school had IEPs with a primary educational eligibility of autism. Most students at the school also had a secondary eligibility or documentation of ID. At the time of this study, 26 students were enrolled at the school in Grades 2 through 12. The students were enrolled through age 22 and those students received transition services. School student demographics were as follows: 50% White, 11.5% Black, 27% Hispanic, 7.7% two or more races, and 3.8% Asian. The second site was a transition program that was part of a public high school in the suburb of a large midwestern city. Students attending the transition program were ages 18 to 22 and were receiving transition services after completing their academic high school requirements. The program enrolled 40 special education students with disabilities that included ASD, ID, multiple disabilities, specific learning disability, and emotional disabilities. The transition program had 54% White, 42% Black, 2% Hispanic, and 2% Asian students.

Assessments and research activities were completed during the school day with some activities taking place in classrooms and school office spaces. The rooms used for the study activities contained a desk or table large enough to present six moderately sized objects and a chair for the participant. In addition to the indoor spaces, two students participated in a weeding task outdoors at the first school site. Locations were selected to minimize distractions and allow for video recording of activities without recording unnecessary background noise. At the first research site, research activities were conducted in several classrooms and one office, depending on scheduling and room availability. Efforts were made to keep the location as consistent as

possible so that the same location was used for same participant each time and one location was used for each phase of the study, as much as possible. At the second site, all participants completed all study activities in the same room.

After the Institutional Review Board issued its approval (see Appendix A), school administrators from each site identified potential participants for initial eligibility (see Appendix B) and sent recruitment materials provided by the researcher to the parent(s) or guardian(s) of eligible students (see Appendix C). Eligibility criteria for participants included (a) having an IEP and receiving special education services, (b) autism listed as the primary disability on the IEP, (c) documentation of intellectual disability, (d) at least 15 years old, (e) documentation of legal guardianship if age 18 or older, (f) ability to see objects placed on the table in front of them, (g) ability to see pictures and videos on an iPad screen, (h) ability to point to or touch objects on the table in front of them, (i) ability to point to or touch picture and videos on an iPad screen, (j) understanding of English, and (k) parent or guardian who understands English.

At the first site, nine potential participants were identified, and eight permission forms were returned. Three individuals did not provide assent (see Appendix D) to participate, and five students agreed to participate and completed all study activities. At the second site, recruitment materials were returned for five potential participants. Two potential participants did not meet eligibility criteria, one based on disability as reported by their teacher and one based on age reported by the parent; therefore, they were excluded from the study. Three participants met eligibility criteria, provided assent, and completed all study activities. In total, eight special education students from two school sites participated in this study. Participants ranged in age from 17 to 21 years old. Seven participants were male, and one was female. Each participant was assigned a pseudonym to protect their confidentiality. Participant demographics including age,

gender, ethnicity as reported by parent or guardian, primary mode of communication observed during the study, IQ score and source, and the research site are displayed in Table III.

**TABLE III**

*Participant Characteristics*

Participant	Age	Gender	Ethnicity	Communication	IQ Score and Assessment	Site
Cameron	20	M	Black	Verbal speech	45 - Stanford Binet Intelligence Scales, 5th Edition	1
David	17	M	White/ Hispanic	Verbal speech	47 - Reynolds Intellectual Assessment Scale	1
Elijah	18	M	Asian	Verbal speech	Not reported	1
Elliot	19	M	Black	Verbal speech	Not reported	2
Emily	21	F	White	Verbal speech	Not reported	2
Joseph	20	M	Black	AAC device	Not reported	2
Marshall	21	M	White	Verbal speech	Not reported	1
Shane	19	M	White	AAC device	49 - Wechsler Intelligence Scale for Children, 5th Edition	1

*Note.* AAC = augmentative and alternative communication

**Design and Methodology**

A methods comparison and evaluation of predictive validity were applied to evaluate the effectiveness of electronic picture and video presentation modalities in job task preference

assessments. New variations of work task preference assessment, electronic picture-based and video-based MSWO were compared to an established assessment method, tangible stimulus MSWO. Subsequently, the predictive validity of the electronic picture-based and video-based MSWO assessments were evaluated by observing the task engagement of participants while performing the high and low preference work tasks determined by the MSWO preference assessments.

### **Materials**

For each job task included in the object-based preference assessments, an object was identified to represent the task. Six objects were chosen for each participant to represent the six work tasks in their tangible stimulus preference assessments. The objects consisted of materials used to perform the work task. For example, a hanger represented hanging shirts, and a hole punch represented punching holes in papers. For each job task included in the three-task, video-based assessments, a video clip was created from the recordings of the six-task, object-based assessments. Videos were edited to 5- to 10-second clips that showed the participant manipulating the materials to perform the work task and included the key actions of the task. When possible, the video clips featured close-ups of the actions being performed from a point-of-view perspective because a prior study of video-based preference assessments demonstrated this perspective to be effective (Snyder et al., 2012). The videos were sized to approximately 560-point width by 315-point height on the iPad screen so that three videos could be presented simultaneously on the screen using a horizontal orientation in the Keynote application, similar to prior studies of video-based MSWO assessments (Brodhead et al., 2017; Brodhead et al., 2016b). Still frames from the videos that show the participant performing the task were used for the electronic pictorial representation of each work task in the three-task, electronic picture-based



assessments. These electronic pictures were the same size as the videos and were presented using the Keynote application as in a prior study of electronic pictorial MSWO assessment using an iPad (Brodhead et al., 2016a). A black, Generation 8 iPad with a black case was used for all preference assessments. Task materials were gathered for each task so that sufficient materials were available for the participants to work on each task in one-minute increments during the preference assessments and for up to 5 minutes during longer work periods.

## **Procedure**

### **Parent/Guardian and Teacher Questionnaires**

A questionnaire was completed for each participant by the parent or guardian and the participant's special education teacher. The parent/guardian questionnaire (see Appendix E) was completed and returned by the parent or guardian with the initial consent form. Upon receipt of a completed consent form, the teacher questionnaire (see Appendix F) was distributed to the participant's special education teacher. The questionnaires included items intended to gather demographic information and confirm eligibility. The parent or guardian reported the participant's age and ethnicity. The teacher reported the participant's disabilities, and if available, IQ score and the assessment used to obtain the score. Both the parent/guardian and teacher answered questions to confirm that the participant met the eligibility criteria of being able to see the study materials and perform the selection responses.

The parent/guardian and teacher questionnaires included task lists generated from the most common job types for individuals with ASD who entered the workforce after receiving vocational rehabilitation services (Roux et al., 2016). The tasks were selected from the following job families: (a) office and administrative; (b) food preparation and serving; (c) building, grounds, cleaning, or maintenance; (d) sales; and (e) production. The final task list for each site

was created by the researcher with input from the school administrator or teacher as to what type of tasks would be possible at the school site. Tasks that could not be completed at the site such as those that required specialized equipment, interaction with others, or locations that could not be replicated in the assessment setting were not included. The tasks listed on the questionnaire could be done in one-minute increments, be carried out continuously for 5 minutes, and be represented by an object. Respondents who completed the questionnaire offered their opinion of each participants' preference for the job tasks using a 4-point scale consisting of *really dislike*, *dislike*, *like*, and *really like*.

### **Initial Assessment of Independence and Selection of Tasks**

Independence was assessed on potentially preferred and nonpreferred tasks, identified from responses on the parent/guardian and teacher questionnaires. Tasks for which both the parent/guardian and teacher indicated the same response of *really dislike* or *really like* were given priority followed by tasks indicated as *really like* by one respondent and *like* by the other respondent or *really dislike* by one respondent and *dislike* by the other. Efforts were made to select a variety of tasks across job categories. Each participant's independence was assessed for at least six potentially preferred and six potentially nonpreferred tasks.

The procedure for the initial assessment of independence followed an "I do, we do, you do" sequence with the following steps:

1. The researcher demonstrated the task.
2. The participant completed the task being prompted as needed by the researcher [given the least to most prompting as needed.

3. Data were recorded on each step as the participant completed the task a second time, given least to most prompting. If the participant performed the task without prompting on their first attempt, a second trial was not necessary.

Task analysis (see Appendix G) was used to assess the participants' level of independence in performing job tasks. The tasks were broken down into steps, and a score was given for each step based on how much prompting they needed to complete that step. The percent of independence was calculated by subtracting the total score from the highest possible score:  $5 \times x$ , where  $x$  is the number of steps, then divide by the highest possible score. A score of 100% independence indicates that the task was performed without assistance. The prompt hierarchy, descriptions of prompts, and corresponding scores are presented in Table IV.

**TABLE IV**

*Prompt Hierarchy With Description and Score*

Prompt	Description	Score
Independent	No assistance provided	0
Gestural	Pointing or motioning	1
Verbal	Spoken cue	2
Model	Demonstration of the step	3
Partial physical	Physical touch, less than full guidance (e.g., tap on the arm)	4
Full physical	Fully guiding the participant (e.g., hand-over-hand)	5

A minimum score of 60% independence was required for the task to be included in a participant's preference assessments, to minimize any confounds related to task difficulty. All of the work tasks for a participant had similar independence scores within 20 percentage points (e.g., 60-80% or 75-95%), to minimize a confounding effect of receiving more or less prompting. If three preferred and three nonpreferred tasks with a similar level of independence were not identified or if independence did not meet the 60% criterion, additional assessments of independence were conducted. When more than six tasks met criteria, tasks were chosen to represent different job types; an example would be a cooking task and a cleaning task rather than two cleaning tasks. Multiple tasks with similar materials (e.g., wiping tables using spray bottle and towels and cleaning windows using spray bottle and towels) were not included in the assessment for the same individual.

### **Preference Assessments**

At least 12 preference assessments were conducted with each participant. Three object-based assessments were conducted with six tasks. The results of these initial tangible preference assessments were used to select tasks of high, moderate, and low preference for inclusion in subsequent three-task preference assessments. Next, nine total three-task preference assessments were conducted with different presentation modalities used for the task choices that included three tangible stimulus, three electronic picture-based, and three video-based assessments. The procedure for the assessments was similar to prior studies conducted by Horrocks and Morgan, (2009) and Reid et al. (2007). For most participants, three 6-task, object-based preference assessments were conducted over 2 days. A fourth assessment was added for two participants. Then, the three-task assessments were conducted three per day for 3 days with the order randomized and counterbalanced. A 5-minute break was provided between assessments

occurring on the same day. The schedule was adjusted as needed to accommodate participants' stamina and attention.

### **Six-Task Object MSWO Preference Assessment**

The initial tangible MSWO preference assessment (see Appendix H) began with an activity to associate the objects with the tasks. The participant was presented with an object and then worked on the corresponding task for one minute or until completion or refusal. This was repeated with each object presented in random order. After the first assessment, this pairing procedure was omitted, and the assessment began with the presentation of the first job task choice. All objects were spaced evenly and randomly forming an arc on the table. The researcher prompted the participant to "pick one" and recorded the participant's selection response. After selecting, the participant was given materials for that task and a timer was set for one minute. The participant was prompted to begin the task and given least to most prompting as needed to complete the task correctly or if assistance was requested. When the one-minute timer ended, the task materials were removed. The remaining task objects were presented in an arc in random order, and the participant made the next selection and worked on the selected task. This was repeated until all tasks were completed. If the participant did not select a task within 10 seconds, the instruction was repeated. If the participant still did not make a selection after another 10 seconds, the objects were reordered, and the instruction was repeated. If no selection was made after another 10 seconds, the assessment session ended.

For Elijah, the first participant to complete the six-task preference assessments, the initial tryouts to associate the object with the task were conducted during three 6-task preference assessments. When the researcher noticed a pattern of selection during the choice trials that matched the order in which the objects had been presented during the pairing procedure, a fourth

6-task assessment was conducted without the pairing procedure, and the pairing procedure was only conducted during the initial assessment for subsequent participants. A fourth assessment was also conducted with Joseph because during his second 6-task assessment, he only selected a task during the first presentation of objects and did not select an object when the second array of choices was presented even with repeated cues and reordering of the options.

### **Three-task MSWO Preference Assessments**

Three-task assessments (see Appendix I) were conducted with the lowest preference task, a moderate preference task, and the highest preference task from the initial six-task, object-based assessments. The moderate preference task was the task ranked third or fourth in the overall hierarchy with more consistent rankings across the three assessments. For example, a task with the following rankings third, fourth, third would be selected as the moderate preference task, rather than a task ranking first, third, and sixth.

### **Three-Task Object MSWO Preference Assessment**

The procedure for the three-task, object-based MSWO assessment was like the six-task assessments but only using three tasks. There was not an initial pairing of the objects with the tasks, as the tasks and objects were the same as in the prior six-task assessments. The assessment began with the presentation of three objects in an arc in front of the participant. The participant selected and worked on tasks, and the chosen objects were removed in subsequent trials until all tasks had been selected.

### **Three-Task Electronic Picture MSWO Preference Assessment**

The electronic picture-based assessments followed a procedure much like the object-based assessment, but electronic pictures of the tasks being performed were used in place of actual objects. In the initial electronic picture-based assessment, each picture was presented by

itself on the iPad screen, and then the participant worked on that task for one minute or until completion or refusal to complete. This initial pairing of the pictures with the tasks was only conducted in the first electronic picture-based assessment. To present the task choices to the participant, three pictures were presented in horizontal orientation on the iPad screen in the Keynote application, resembling a study Brodhead et al. (2016a) conducted that used electronic pictures to present choices of toys. The participant was asked to pick one object. The selection response was recorded, and the participant engaged in the task for one minute or until completion or refusal. As in the tangible stimulus assessment, the participant was given 10 seconds to make a selection before being prompted again to pick one. If a selection response did not occur within 10 seconds after the second prompt, the pictures would be reordered and presented again. If no selection was made from the reordered pictures, a cue to pick one would be given after 10 seconds. If there was no response after another 10 seconds, the assessment session would end. It was not necessary to reorder the pictures or end the session in this study. After the participant worked on a selected task, the remaining task choices were presented in a horizontal orientation in the Keynote application on the iPad. They were centered but not resized on the subsequent trials.

### **Three-Task Video MSWO Preference Assessment**

The video-based assessment was conducted in a similar manner to the electronic picture-based assessment, except that video clips were presented instead of electronic pictures. To pair the videos with their corresponding tasks in the initial video-based assessment, each 5- to 10-second video clip was played alone on an iPad. Then the participant worked on the associated task for one minute or until completion or refusal. The second and third video-based assessments did not include the pairing steps and began with the presentation of the first choice. The

participant was presented with three video clips played in a loop in random order in a row of three on the screen of an iPad in horizontal orientation; this process is similar to prior studies of video-based MSWO preference assessments (Brodhead et al., 2017; Brodhead et al., 2016b). The participant was asked to pick one, the selection response was recorded, and the participant engaged in the task for one minute or until completion or refusal. Participants were given 10 seconds to make a response before receiving a second prompt. If there was no response 10 seconds after the second prompt, the videos were reordered and presented again. A prompt was given if no selection was made after 10 seconds; the session ended if there was no response within 10 seconds of the additional prompt. Reordering of videos was not necessary in the present study. After completion of the selected task, the previously chosen video was removed from the display, and the remaining two videos presented for the next choice were evenly spaced apart on the iPad screen. The participant worked on the chosen task for one minute or until completion or refusal. In the third trial, only the final video was presented: centered but not resized on the iPad screen. The participant worked on the final task for one minute or until completion or refusal.

### **Observations of Task Engagement**

To confirm the preferences determined by the previous assessments, participants worked on their highest preference and lowest preference job tasks for 5-minute work periods. If all three presentation modalities generated the same overall highest and lowest preference tasks, those two tasks were included in this phase of the study. If task preferences differed across assessment types, all three tasks were used. For Elijah, the first participant to engage in work periods, only two tasks were used for work periods even though a different least preferred task was selected with the electronic picture modality. For all subsequent participants, all three tasks were used in



work periods if there was any discrepancy between modalities with either the highest or lowest preference task.

Participants worked at each task for 5-minute intervals in an alternating treatments design similar to Parsons et al. (1990). At the beginning of the initial work session with each task, the researcher demonstrated the task for one trial (e.g., for the task of hanging shirts, one trial would consist of hanging one shirt), and the participant did the task given least to most prompting as needed for one trial. A timer was set, a cue was given to begin work, and the participant was provided with enough materials to work on the task for 5 minutes. The participant was given assistance or prompted if requested or if necessary for correct performance of the task while they were engaged. If the participant was not engaged in the task, prompting was given after one continuous minute of disengagement. The researcher provided least to most prompting to the participant until the participant began working or refused to work. If they refused to begin working after being prompted, the prompt was given again after one continuous minute of disengagement. Data were recorded on task engagement using momentary time sampling every 15 seconds during the entire work period based on video recording (see Appendix J).

Up to four work sessions were conducted per day. Scheduling was modified as necessary to meet participant needs and accommodate class schedules. The participants took 5-minute breaks between work periods. The order of the tasks was randomized and counterbalanced. At least five work sessions were completed with each task, and work sessions were conducted as needed until a pattern emerged.

### **Final Assessment of Independence**

After completing all work sessions, participants' independence was assessed using task analysis on the tasks included in the alternating treatment work periods. The procedure for assessing independence included the same steps as the initial assessments of independence:

1. The researcher demonstrated the task.
2. The participant completed the task given prompting as needed.
3. Data were recorded about each step as the participant completed the task including any prompting that was needed.

The third step was not performed if the participant performed the task without prompting in their first attempt.

### **Modality Preference**

After all other study activities were completed, the participants reported their preferred presentation method. The objects, an iPad with electronic pictures and an iPad with videos, were situated on the table and the participant was asked to select the modality they liked best.

### **Measures**

#### **Selection Response**

During the preference assessments, a selection response was observed when the participant chose a task. The researcher recorded the task selected and its position in the array. For the tangible stimulus assessments, the selection response is defined as touching or pointing to one of the objects or stating that they want to do the object or task. For the electronic picture-based and video-based assessment, the selection response is defined as touching or pointing to a picture or video on the iPad screen or stating that they want to do the task.

### **Task Engagement**

Task engagement was measured using momentary time sampling in 15-second intervals while the participant performed tasks during the assessments and treatment conditions. All assessment sessions and treatment conditions were video recorded. The researcher reviewed the video recordings and determined whether the participant was on task or off task at the end of the 15-second period. Similar to prior studies (Parsons et al., 1990; Verbeke et al., 2003), task engagement is defined as manipulating materials, asking for help, or receiving instructions. The participant was marked as on task when engaging in behaviors required to complete the task (Verbeke et al., 2003). Attempting to complete the task but making errors (e.g., stapling incomplete packets of paper in a stapling task), was still considered on task. Requesting assistance verbally or by using alternative or augmentative communication (AAC) was deemed on task. The participant was considered on task when responding to prompting or correction. Refusal to complete a task after prompting from the researcher was marked as off task. If the participant was not touching or using materials to complete the task, moved away from the task or task materials, or engaged in an activity other than the work task, the behavior was recorded as off task. Brief pauses of less than 3 seconds that were preceded by and followed by on-task behavior were counted as a on task (e.g., briefly scratching one's face).

### **Interobserver Agreement**

Interobserver agreement checks were conducted by a trained observer on at least 25% of all assessments and work periods. The coder was a graduate student with a master's degree in special education and experience teaching students with significant disabilities. Prior to conducting the checks, the coder was provided with a training manual and met with the researcher to review coding procedures. The observer practiced recording data on training

videos, and the data sheets were reviewed by the researcher for accuracy before beginning interobserver agreement and procedural fidelity checks.

Using the video recordings of the assessments of independence, the observer recorded task analysis data using the prompt hierarchy scale on 28% of the videos. Interobserver agreement was calculated by dividing the number of steps with ratings in agreement by the total number of steps. Average agreement for the assessments of independence was 94%, and the range for agreement on individual assessments was 57% to 100%. For the two assessments with agreement below 80%, the video was reviewed by both the coder and the researcher, and a consensus was reached. Interobserver agreement was checked on 27% of six-task and 26% of three-task preference assessments across participants. The observer recorded the task selected and its location based on videos of the assessments. This was compared to the data sheets used during the assessment, and interobserver agreement was calculated as the percentage of tasks and task positions in agreement. Agreement was 100% for the tasks selected and the position of the selected task in the six-task and three-task assessments. Interobserver reliability was also checked on 33% of the work periods and was determined by the percentage of intervals that the coding of “on task” or “off task” matched. Overall agreement was 97% for task engagement coding during work periods with a range of 90% to 100% for individual work periods.

### **Procedural Fidelity**

To measure procedural fidelity, the researcher and observer recorded the presence or absence of key procedural steps using a checklist during at least 25% of the preference assessments and work sessions. A percentage of steps present was calculated by dividing the number of steps observed to be present by the total number of steps. For any session in which procedural fidelity fell below 95%, specific errors were identified, procedures were reviewed,

and a determination was made as to whether the error was significant enough to disqualify the results and warrant repeating the assessment or work period. Procedural fidelity was calculated for 27% of six-task assessments with 99% of procedural steps observed to be present overall and a range of 94% to 100% on individual assessments. Twenty-six percent of three-task assessment videos were reviewed for procedural fidelity, and 100% of the steps were present in all reviewed videos. Additionally, procedural fidelity was checked on 33% of work periods, and no steps were marked as not present, although two videos had steps that were not observable from the video recording. Procedural errors were not significant enough to disqualify the results of any assessment or work period.

## **Data Analysis**

### **Rank Order of Tasks and Task Preference Hierarchies**

The order in which tasks were selected was used to establish a preference hierarchy for each type of preference assessment. An overall preference hierarchy was determined by totaling the numbers representing the rank from each individual assessment and ranking those totals to establish the hierarchy using a point-based scoring approach (Ciccone et al., 2005; Chazin & Ledford, 2016). For example, if a task was selected first, second, and third across three assessments, the rank numbers would be added (i.e.,  $1+2+3$ ) and that total (6) would be compared with the totals from the other tasks to determine the overall hierarchy. If a task was not chosen during an assessment, it was given the highest possible rank (i.e., 3 or 6). The overall hierarchies for each participant were calculated for the six-task assessments and for each presentation modality used in the three-task assessments. The preference hierarchies were graphed and visually compared. The overall hierarchies and the highest and lowest ranked work tasks were compared to determine matches between the results of the object-based three-task

assessments and the other presentation modalities. In addition, rank-correlation coefficients were calculated for the relationship between hierarchies for different assessment modalities for each participant and across all participants.

### **Consistency of Responses**

In addition to the comparison of overall results, the order in which tasks were selected during each administration of assessments with the same modality were used to generate rankings and hierarchies for each of the three modalities for each participant. The hierarchies were graphed and visually analyzed to compare the consistency of results for each presentation method across the three sessions conducted with each participant. The number of variations between the three administrations of each type of assessment was determined and used to analyze consistency.

### **Task Engagement**

The task engagement data were analyzed to assess the predictive validity of the assessments. The overall percentage of intervals during which each participant was engaged in the task was calculated for the 5-minute work periods. The percentage of intervals on task for each work session was graphed and visually inspected to determine differences and trends for each participant.

### **Modality Preference**

The percentage of participants expressing a preference for each modality was calculated by dividing the number of participants who selected a particular modality by the total number of participants. The preferred modality selected by each individual participant was compared to that participant's results for that modality to determine if the preferred modality accurately determined the participant's preferences.

### **Percent Independence**

The percent independence scores calculated between the initial and final assessments of independence were compared. The percent independence scores were used to determine if there was a change in independence over the course of the study activities.

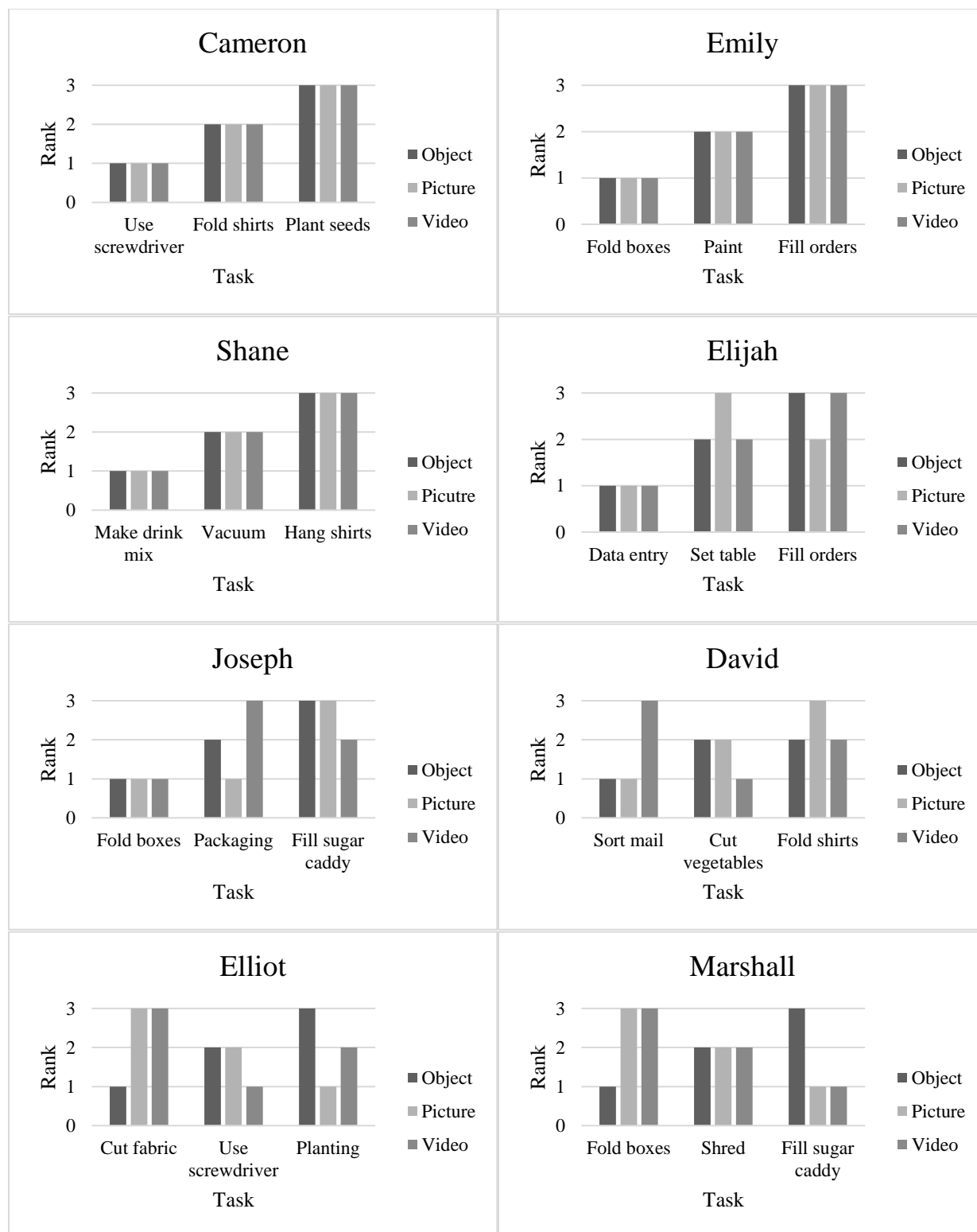
## CHAPTER IV: RESULTS

The aim of this study was to determine if MSWO job task preference assessments using electronic pictorial and video presentation modalities are as effective as assessments using the established object modality. Task preference hierarchies generated by the assessments and rank-order correlations as well as the consistency of participants' responses were compared among the object, electronic picture, and video modalities. Task engagement was measured while participants worked on the high and low preference job tasks identified in the assessments. Additionally, modality preference was assessed by asking participants their preferred modality, and participants' independence in performing high and low preference tasks was evaluated.

### **Task Preference Hierarchies**

The preference hierarchies depicting the rank order of tasks for each presentation type for each participant are shown in Figure 1. When comparing the hierarchies from the object-based assessments to those from the electronic picture-based assessments, Cameron, Emily, and Shane, had exact matches for their task rankings with both modalities. In addition to the three with exact matches, David, Elijah, and Joseph had the same top-ranking task; thus, 75% of participants had the same highest preference task between the object and picture modalities. However, Joseph had two tasks tied for the most preferred ranking. Five of eight participants, including David and Joseph, had the same least preferred task with the object and picture modalities, although David had two tasks tied for the least preferred ranking. Hierarchies between the object and video modalities matched exactly for half of the participants: Cameron, Emily, Shane, and Elijah. In addition to those exact matches, Joseph had the same most preferred task with both the object and video presentation method; five participants had the same preferred task between object and video modalities.



**FIGURE 1***Hierarchies of Task Preference*

Cameron, Emily, and Shane had the same rank order of tasks across object, electronic picture, and video presentation modalities. The most preferred task was consistent across all three modalities for 62.5% of participants, which included Elijah and Joseph. Although in Joseph's electronic picture assessment results, as mentioned previously, two tasks held the same rank as the number one task. David's results were similar between the object and electronic picture assessments but not between the object and video assessments. The highest and lowest preference tasks from their object-based preference assessments did not match the electronic picture or the video-based assessment results for Elliot and Marshall.

### **Rank-Order Correlation**

The overall rank-order correlation between modalities was calculated using the results for all participants. There was a moderate, positive correlation between the rank order of tasks selected in object and electronic picture modalities ( $r_s = .379, p = .068$ ) and a low, positive correlation between object and video modalities ( $r_s = .321, p = .126$ ). The correlation between the electronic picture and video presentation modalities ( $r_s = .544, p = .006$ ) was moderate and statistically significant.

Rank-order correlations were also calculated for each participant between object, electronic picture, and video assessment results. Hierarchies with exact matches were statistically significant and include the relationships between all modalities for Cameron, Emily, and Shane; the object and video hierarchies for Elijah; and the picture and video hierarchies for Marshall. Both Joseph and David had strong but not statistically significant correlations between their object and picture assessment results. There were moderate but not statistically significant correlations between Elijah's object-to-picture and picture-to-video comparisons, Joseph's object-to-video comparison, and Elliot's picture-to-video comparison. Elliot's object and picture

results and Marshall's object-to-picture and object-to-video comparisons all had perfect negative correlations. David's object and video results had a strong negative correlation, and his picture and video results had a moderate negative correlation. Elliot's object-to-video results were also moderately negatively correlated. Table V displays the rank-order correlations between modalities for individual participants.

**TABLE V**

*Rank-Order Correlations*

Participant	Object–Picture Correlation	Object–Video Correlation	Picture–Video Correlation
Cameron	1*	1*	1*
Emily	1*	1*	1*
Shane	1*	1*	1*
Elijah	0.5	1*	0.5
Joseph	0.866	0.5	0
David	0.866	-0.866	-0.5
Elliot	-1*	-0.5	0.5
Marshall	-1*	-1*	1*

*Note.* \* $p < .01$ .

**Consistency of Responses.**

Hierarchies were compared among the three repetitions of the three-task assessments conducted with each modality to assess the consistency of participants' responses. With the

object presentation modality, the order in which tasks were selected was exactly the same across all three assessments for Cameron and Joseph. For two other participants, Emily and Shane, results were similar for the object-based assessments with only one variation; on one assessment the rankings for two tasks were different. For Marshall the results were somewhat similar for the object-based assessments with two variations. For the other three participants, the results were inconsistent across assessments with the object modality.

When the assessment was repeated three times with the electronic picture modality, three participants, Cameron, Emily, and Elijah, had similar results with only one variation on one assessment. Shane's results were somewhat consistent across administrations of the electronic picture-based assessments with two variations. The other four participants had more variable results across electronic picture-based assessments.

When video choices were presented during assessments, one participant, Emily, had results that matched exactly across all three assessments. Cameron, Elliot, and Shane had similar results with one variation on the video-based assessments. Marshall had somewhat consistent results with two variations across the assessments using the video modality. The other three participants had more variation across assessments.

### **Task Engagement.**

Participants worked on their most and least preferred tasks for 5-minute work periods, and task engagement was recorded using momentary time sampling at the end of 15-second intervals. Joseph, David, and Elliot worked on three tasks because their task preferences differed across assessment modalities. For the other participants, two tasks were used in the work periods. Table VI shows the tasks included in the work periods for each participant as well as the average and range of intervals on task.

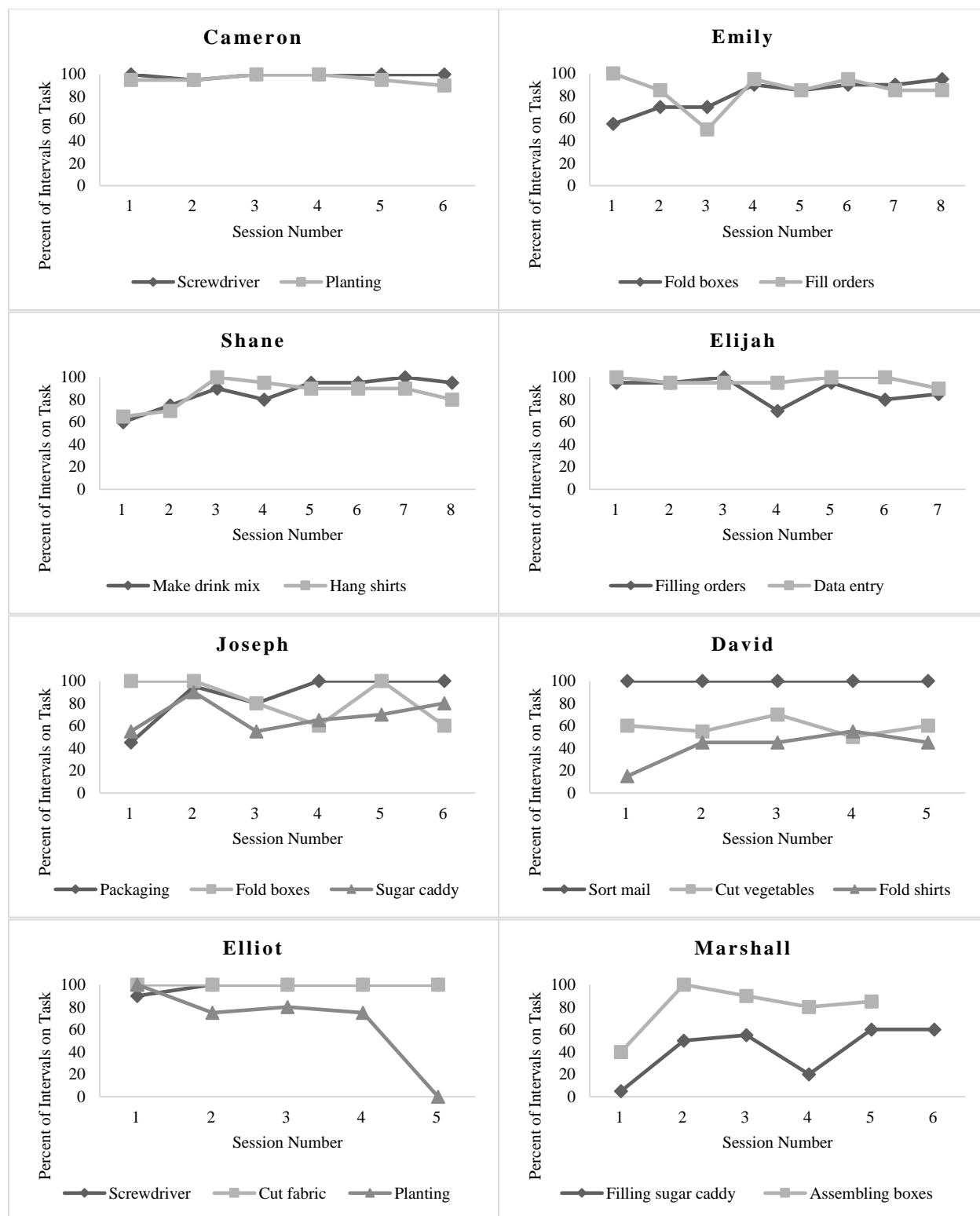
**TABLE VI***Percentage of Intervals on Task*

Participant	Task	Average percentage of on-task intervals	Range by percentage of on-task intervals
Cameron	Using a screwdriver	99	95–100
	Planting seeds	96	90–100
Emily	Folding boxes	81	55–95
	Filling orders	85	50–100
Shane	Making drink mix	86	60–100
	Hanging shirts	85	65–100
Elijah	Entering data	96	90–100
	Filling orders	88	70–100
Joseph	Packaging	87	45–100
	Assembling boxes	83	60–100
	Filling sugar caddy	69	55–90
David	Sorting mail	100	100%
	Cutting vegetables	59	50–70
	Folding shirts	41	15–55
Elliot	Cutting fabric	100	100
	Using a screwdriver	98	90–100
	Planting seeds	66	0–100
Marshall	Assembling boxes	79	40–100
	Filling sugar caddy	42	5–60

The trends for the percentage of intervals on task during the 5-minute work periods graphed by work period can be seen in Figure 2. Four participants, Cameron, Emily, Shane, and Elijah had high rates of on-task behavior during both of their tasks. Cameron and Elijah each had one task with a trend of slightly higher rates of on-task behavior. Emily and Shane each had a task that emerged with an upward trend and higher rate of on-task behavior in the final session. Of the participants with high rates of on-task behavior during both tasks, Emily and Elijah also demonstrated less variability with one task. Four participants, Joseph, David, Elliot, and Marshall showed clearer differences in their rates of on-task behavior between tasks. Joseph was 100% on task during his last three sessions of packaging. His performance was inconsistent across sessions while folding boxes, and he had more intervals off task while filling the sugar caddy. David was 100% on task during all sessions of sorting mail. He had lower rates of on-task behavior with both cutting vegetables and folding shirts. Elliot had high rates of on-task behavior with two tasks, using the screwdriver and cutting fabric, but was clearly more off task while planting and refused the task in the last session. Marshall's on-task behavior was consistently higher while assembling boxes as compared to filling the sugar caddy. Overall, four participants showed distinct differences in on-task behavior during work periods, while four demonstrated high rates on on-task behavior with all tasks and only small differences between tasks.

**FIGURE 2**

*Percentage of Intervals on Task During Work Periods*



### **Modality Preference**

Upon completion of the assessments and work periods, participants were asked which presentation method they preferred. David, Emily, and Marshall indicated they liked the object presentation modality best. Elijah, Shane, and Elliot selected the electronic picture modality as their preference. The video presentation modality was preferred by Joseph and Cameron. Overall, 3 of 8 or 37.5% participants preferred the object modality, 3 of 8 or 37.5% liked the electronic pictures, and 2 of 8 or 25% preferred the video presentation method.

### **Independence**

Assessments of independence were conducted on the two or three tasks that were included in the work periods at the start and end of the study. The pre- and postscores are shown in Table VII. Initial independence scores for the tasks included in work periods had an average score of 96% independence and a range of 82% to 100%. Final independence scores averaged 99% and ranged from 92% to 100%. Of the 19 final assessments of independence conducted across the eight participants, independence was maintained at 100% on five tasks, and independence increased on 13 tasks. Participants achieved 100% independence on 10 of the 13 tasks that showed an increase. Only one participant showed a slight decrease in independence on one task.



**Table VII***Percent Independence*

Participant	Task	Prescore percentage	Postscore percentage
Cameron	Using a screwdriver	98	100
	Planting seeds	100	100
Emily	Folding boxes	98	100
	Filling orders	97	100
Shane	Making drink mix	98	99
	Hanging shirts	91	100
Elijah	Entering data	98	100
	Filling orders	98	100
Joseph	Packaging	100	100
	Assembling boxes	82	92
	Filling sugar caddy	94	95
David	Sorting mail	100	100
	Cutting vegetables	98	100
	Folding shirts	94	100
Elliot	Cutting fabric	100	100
	Using a screwdriver	93	100
	Planting seeds	100	100
Marshall	Assembling boxes	80	100
	Filling sugar caddy	100	99

## CHAPTER V: DISCUSSION

Identifying the employment interests and preferences of students with ASD and ID is challenging, but it is essential in preparing individuals for paid employment in inclusive community settings. The major aim of this study was to determine if the electronic picture and video modalities were effective for presenting job task choices in MSWO preference assessments used with transition-age students with ASD and ID. The effectiveness of these modalities was evaluated by comparing results of electronic-pictorial and video-based assessments to results of object-based assessments and then using observations of task engagement to validate the assessment results. The key findings are described regarding comparison between stimulus modalities, validation of results through task engagement data, overall effectiveness of the assessments, consistency of results, and preferred modality.

### **Validation of Results Through Comparison To Object Based Assessment**

The first component of the research question addresses the correspondence between results of assessments using different modalities. The technology-based assessment results matched the object-based for some participants, but assessment results varied across modalities for some participants. The electronic picture-based assessment results were validated by closely or exactly matching hierarchies and strong or perfect correlations with object-based assessment results for five of the eight participants. Additionally, one participant had a matching highest preference task and moderate correlation between electronic picture and object results. However, nonmatching results and negative correlations failed to confirm the efficacy of the electronic picture modality for two individuals. Because of these mixed results, even though the overall correlation between object and electronic-picture assessments was positive, it was not statistically significant. To date, only one other study compared tangible and electronic-pictorial

MSWO preference assessment results of individuals with ASD (Brodhead et al., 2016a).

Brodhead et al. (2016a) found that four of five participants had highly correlated hierarchies and matching high preference tasks, and three had matching low preference tasks. Compared to the current study, Brodhead et al. (2016a) found a higher, statistically significant correlation between overall tangible and electronic-pictorial results. The electronic-picture assessment was successful for 80% of participants in the Brodhead et al. (2016a) study, compared to efficacy for 75% of participants in this study. Findings of the two studies are congruent in that the electronic-pictorial and object-based assessment results were similar for most but not all participants. However, in Brodhead et al. (2016a), five stimuli were used in assessments, and toy preferences were assessed but not work task preferences.

Video-based assessment results were validated by perfect correlations and matching hierarchies with object-based results for half of the participants. In addition, one participant had a moderate correlation and the same high preference task between the video and object-based results. Negative correlations between the object and video hierarchies failed to confirm the video assessment results of three participants. The overall weakly positive correlation between the object and video results reflects the inconsistent results across participants. Brodhead et al. (2016b) made a similar comparison between tangible and video-based MSWO assessments of toy preferences. In their study, three of four participants had the same high preference task and strongly correlated hierarchies: two of which were statistically significant between assessment modalities. Brodhead et al. (2016b) found a strong and statistically significant correlation between object and video results overall, differing from the present study that had a nonsignificant, low, positive correlation. Based on comparison between video and tangible assessments, the video-based assessment was effective for 75% of participants in Brodhead et

al.'s (2016b) study compared to 62.5% of participants in the present study. Efficacy of the video-based assessment is similar between the studies because the video-based assessment was effective for some but not all participants. However, there are key differences between the two studies because Brodhead et al. (2016b) evaluated toy preferences of children and included five rather than three stimuli in the assessments.

### **Validation of Assessment Results Through Task Engagement Data**

The second component of the research question addresses the validity of job task preference assessments by comparing task engagement between high and low preference tasks. Momentary time sampling was used to mark the participant as on or off task every 15 seconds during 5-min work periods. Half of the participants had high rates of on-task behavior for both high and low preference tasks. Even so, there were slight differences between tasks when trends and consistency were visually examined in the graphed data. These trends in the task engagement data were consistent with the results of the preference assessments for Cameron, Emily, and Shane--participants who had the same preference-assessment results with all modalities. In addition, the trends in Elijah's task engagement data match his object and video-assessment results. The task engagement data confirm the high preference task from Elijah's picture-based assessments in comparison to the moderate preference task, as the low preference task was not included in the work periods. While the similar rates of on-task behavior between tasks for four participants do not show large distinctions between tasks, the small differences in trends give some confirmation of assessment results.

Task engagement data showed more variations and distinct differences between tasks for 50% of the participants. For example, David had one task with clearly higher task engagement and two tasks with lower rates of on-task behavior. This matches his object and electronic-

picture assessment results but does not match his video results. Elliot was very engaged during two of his tasks and had lower engagement with one task. This is most consistent with his object-based assessment results and not consistent with his picture and video results. Marshall showed a clear difference in on-task performance between his two tasks, which matched his object-based assessments but not his picture or video results. For Joseph, packaging emerged as the task with the highest engagement, and filling the sugar caddy had the lowest average rate of on-task behavior. Performance of box assembly was inconsistent and without a clear trend, making it difficult to determine a precise ranking of tasks based on Joseph's task engagement. It is possible that his preferences shifted with increased exposure to the tasks over the longer work periods. His task engagement data corresponded best with his picture-based assessment results, matched his least preferred task from the object results, and contradicted his video-based assessment results. Overall, task engagement data confirm the object-based assessment results for seven participants and are inconclusive for the other participant. Electronic picture-based assessment results are confirmed by on-task behavior for four participants, and the high preference task is confirmed for one participant. Task engagement data were inconsistent for one participant, but most closely matched results from electronic-picture assessment. Task engagement data do not validate the electronic picture-based results of two participants. Rates of on-task behavior validate the video-based assessment results for half of the participants and do not match video assessment results for the other half.

Not all participants in the present study had distinct differences in their rates of on-task behavior between high and low preference tasks, which is similar to some participants in other recent studies that used task engagement to validate preferences. For example, St. Peter et al. (2021) also had a participant with high rates of task engagement on both high and low preference

tasks. LaRue et al. (2020) found that several participants had high rates of on-task behavior with both jobs that matched and did not match their preferences, and they note that despite participants being willing and able to perform both types of jobs, they still choose jobs that match their preferred task conditions. This highlights the importance of directly and systematically assessing work task preferences of individuals who may be compliant and willing to work on a variety of tasks, as their preferences may not be obvious based on their task engagement and their interests and preferences are important.

Observation of task engagement on high and low preference tasks did not show obvious differences for all participants, particularly several participants with high rates on-task behavior on more than one task. Task engagement has frequently been used to confirm work task preference assessment results (e.g., Cobigo et al., 2009; St. Peter et al., 2021; Worsdell et al., 2002). However, other measures such as work rate, affective behaviors showing like or dislike, or maladaptive behaviors may also be indicators of preference or nonpreference (e.g., Cole et al., 1997; Mulaire-Cloutier et al., 2000; Parsons et al., 2001). Affective behaviors were not specifically measured in this study, because prior research found that low rates of behavior made it challenging to use that measure to validate work task preference assessment results for all individuals (e.g., Cole et al., 1997; Parsons et al., 1990; Reid et al., 2007; Spevak et al., 2005; Verbeke et al., 2003). However, David and Marshall demonstrated behaviors signaling nonpreference while performing less preferred tasks in the present study. For example, David made loud vocalizations indicating his dislike of cutting vegetables and folding shirts, and Marshall got up and left the room during the sugar caddy task. Although it would be challenging with tasks that require different amounts of time to complete one trial or item, comparison of work rate could give a more nuanced perspective of task engagement beyond just “on task” or

“off task.” Anecdotally, some participants in the present study seemed to work more fluently or productively during some work periods, though work rate was not tracked. Measuring only task engagement to validate preferences did not show large differences between tasks for some participants in the present study, and other indicators may have shown larger distinctions for some individuals. Evaluation of multiple variables would allow the researcher to capture information from different indicators to validate preferred tasks for different individuals.

### **Overall Effectiveness of Video and Electronic Pictorial MSWO Assessment**

The overarching research question in this study focused on the effectiveness of an MSWO job task preference assessment using electronic-picture and video-presentation modalities. Considering the highly correlated hierarchies with the object modality and comparisons with task engagement data, the electronic picture-based assessment was highly effective for five of eight participants. The electronic pictorial assessment was somewhat effective with one additional participant, in that results were moderately correlated with the object-based assessment and the preferred task was accurately identified. Assessments using the video modality were effective for half of the participants who had perfectly matched results with object-based assessment and correspondence with task engagement data. One other participant had the same high preference task on object and video assessments, but task engagement was varied across sessions for this task and did not clearly confirm the preference. Of the three presentation methods used in this study, the object modality was the most effective of the three and was the most accurate in comparison to task engagement data. Both technology-based assessment types were effective with some but not all participants. The electronic-pictorial modality was effective for three fourths of the participants, showing greater effectiveness than the video modality, which was effective with half of the participants.

Although the picture and video modalities were not compared with the purpose of validating the results, this comparison generated the only statistically significant correlation between overall results. These modalities are very similar in appearance as they were both presented on iPads and the electronic pictures were stills from the videos; so, it is logical that participants would respond in the same way. However, this correlation does not necessarily demonstrate the accuracy of the modalities in all cases since two participants had corresponding electronic picture and video results that were negatively correlated with the results of the established object modality and did not match their on-task behavior. It does suggest that the moving images of the video modality might not be necessary when still electronic images produced comparable results, and video-based assessments require more time and effort to create. In the present study, electronic-picture assessments were effective with more participants than the video assessments, but it is unclear if electronic-picture modality would produce the same results if participants had not been exposed to the video from which the stills were taken. Several prior studies have successfully used still images from videos to present video choices (Curiel et al., 2018; Curiel & Poling, 2019; Curiel et al., 2020) and one recent study used stills from video models of community job placements to present choices (Walsh et al., 2019). In these cases, participants watched the videos, but moving images were not used for choice making. In contrast, Morris and Vollmer's (2020) comparison between electronic pictures and GIFs found that the GIFs were more accurate in identifying preferred social interactions. While the present study shows that moving images might not provide a benefit in electronic choice presentations when the participant has experienced both the actual task being depicted and a video self-model of the task being performed, it is unclear if electronic images would be as accurate in circumstances without access to the video and experience with the task.



### **Consistency of Assessment Results**

Consistency of participants' responses across the three repetitions of each assessment type were compared as a measure of how well participants understood the options presented. The participants with matching results across presentation methods, Cameron, Emily, and Shane, also had consistent responses to repetitions of same assessments across all modalities. Additionally, Marshall's choices were somewhat consistent across object assessments, and those results were validated by his task engagement. Joseph's choices were the same on all administrations of the object-based assessment, which turned out to be somewhat accurate. In contrast, Elliot and Marshall had at least somewhat consistent responses on their three video-based assessments, but that assessment type was not validated by the object-based results or task engagement for either participant. All other comparisons showed more variability and less reliable responses across assessments with the same modality. Inconsistent responding could indicate random selection attributable to participants not understanding the presentation modality, undifferentiated preferences, or preferences that changed over the course of the multiple administrations as participants had more exposure to tasks. In at least one case, on Joseph's initial video assessment, the order of task selection appeared to be influenced by the desire to complete a task he started during the exposure trials. Consistent results can indicate participants' comprehension of task options and the reliability of the assessment method. Responses on assessments with the object and video modalities were consistent for more participants, than the electronic picture modality. However, comparison with task engagement during work periods suggests that two individuals' consistent responses on the video assessments were not accurate.

### **Modality Preference**

A component of social validity is the acceptability of procedures and interventions to the individuals experiencing them (Wolf, 1978). Modality preference was evaluated in the present study by asking participants to select the modality they liked best from an array that included task materials, an iPad with video choices, and an iPad with picture choices. The preferences seemed unique to the individuals as responses were evenly split between the three modalities. Five participants preferred a modality that was demonstrated to be effective through the study activities. Elijah chose the picture modality that accurately identified his most preferred task but was only moderately correlated with object-based results. Two other participants' preferred modalities were not shown to be effective for them--specifically Elliot's preference for pictures and Joseph's preference for videos. For Joseph in particular, this expressed preference is consistent with his behavior during the assessments. Joseph appeared confident and made choices more quickly with the iPad, but he required additional prompting and reordering of choice options when choosing between objects. In these cases, rather than avoid using a modality because of its ineffectiveness, it is important to find a way to improve the accuracy of this preferred procedure for the individual.

### **Limitations**

Although efforts were made to control study design and procedures, this study has several limitations. The range of tasks included in the preference assessments in this study was restricted by several factors. Constraints caused by the school sites' lack of available space and equipment, COVID precautions, and nonparticipating students' confidentiality limited the variety of tasks. The task list was generated based on the most common job families for individuals with ASD exiting VR services (Roux et al., 2016), which might have excluded potentially preferred tasks

from other career areas. Most tasks from the transportation and materials moving category and any other tasks that would require specialized or large equipment unique to that industry or that had to be performed in specific settings could not be easily replicated in a school. The inclusion of tasks with similar independence, minimized confounding effects of task difficulty, but might have eliminated high preference/low skill tasks even though recent research shows that individuals can readily increase their skills on preferred tasks (Walsh et al., 2019). Nonpreferred tasks were excluded for Emily and David because of maladaptive behaviors or refusal to participate during the assessments of independence. Additionally, some tasks were excluded for Marshall at his teacher's request because of his history of inappropriate use of materials. All of these factors could have prevented the inclusion of highly preferred or nonpreferred tasks and resulted in the use of tasks with a more restricted range of preference. Additionally, activities in the study were simulated in the school environment and did not exactly match the way they would be done at community sites, which could limit the generalization of identified preferences.

Other limitations include the inconsistency in the study procedures with Elijah, the first participant to complete activities, and insufficient procedures to link the presented stimuli with the associated tasks. After some challenges were identified with Elijah, changes were made for subsequent participants, specifically the elimination of pre-exposure trials after the initial assessment and the inclusion of nonmatching nonpreferred tasks in the work periods. The lack of pre-exposure trials is a limitation that could have contributed to some of the participants not understanding the choices that were presented with alternative modalities. Furthermore, the expectations for task performance were not always clear to participants when beginning a new study activity; students performed tasks for one trial, 1 min, and 5 min in different activities. Emily, Shane, Joseph, and Marshall all had lower rates of on-task behavior in earlier work

periods that increased when they became more familiar with the expectations of the longer work periods. Finally, use of multiple rooms at the first site and scheduling and time constraints at both sites because of school breaks, individual student schedules, or class schedules resulted in variations between participants.

## **Implications for Practice**

### **Increase Use and Awareness of Preference Assessments**

Preference assessments are underutilized in special education. While training in and use of stimulus preference assessments is common for board certified behavior analysts (BCBA), the majority of non-BCBA professionals working with individuals with ASD and developmental disabilities have not been trained to use stimulus preference assessments (Graff & Karsten, 2012). Less than half of non-BCBA professionals with a degree in special education have experience using direct preference assessment methods such as paired stimulus or MSWO procedures (Graff & Karsten, 2012). Furthermore, when they are utilized, stimulus preference assessments are commonly used to identify reinforcers, and the use of these methods to assess job task preferences in the school setting has been largely overlooked. Research shows that job coaches can be trained to use preference assessments with workers with disabilities (e.g., Cobigo et al., 2009). Teachers, school-based job coaches, VR counselors, and other professionals working with transition-age students with ASD and ID should also be trained to implement preference assessments to evaluate transition-related preferences systematically including preferences for job tasks.

### **Include Preference Assessments in Transition Planning**

Educators and school personnel should integrate preference assessments into transition planning for students with ASD and ID who have challenges communicating their preferences

and interests. Transition assessment is required under IDEA, and preference assessment is a way to include the student's voice in this process. A systematic approach to eliciting student input can be used to include students in making employment decisions rather than overreliance on staff or family input. In the present study, high preference tasks, as identified by assessments and task engagement, matched the parent report 67% of the time and the teacher report 56% of the time. Parent ratings matched 78% of low preference tasks, and teacher reports were accurate for 56% of low preference tasks. Likewise, Reid et al. (2007) and St. Peter et al. (2021) found that preference assessment results were more accurate than staff or teacher reports. While educators and caregivers are a valuable source of information about students, their opinions could be inaccurate, particularly if they have not directly observed the individual performing specific tasks directly.

When used with transition students, preference assessments could be particularly valuable in preparing for supported, customized employment that focuses on matching a worker's preferences and abilities with an employer's needs. Preference assessments can be a component of job exploration counseling during pre-employment transition services as students prepare to join the workforce. Along with skill assessment, considerations of environmental fit, and analysis of available jobs in the local community, work task preference assessments should be considered one useful tool among several means of gathering information when planning for employment. Preference assessment could have additional applications in transition planning. Tullis and Seaman-Tullis (2019) suggested utilizing preference assessments to explore employment variables beyond task preference as well as preferences for living arrangements and social and leisure aspects of adult life.

### **Use an Individualized Approach**

An individualized approach is necessary in selecting job task preference assessments. While multi-stimulus assessments using object, picture, and video presentation modalities were effective for some participants in this study, some students made accurate choices only with the object modality. Some participants demonstrated preferences during the assessments which would not have been clear from the work-period observations alone. The use of preference assessments is particularly important for those individuals who tend to be compliant and willing to do what is asked. More important, their preferences might not be evident from rates of on-task behavior or from other behavioral cues such as refusal or maladaptive behaviors. The results of the present study suggest that the approach to identifying preferences should be customized to the individual and drawn from methods supported by existing research.

A variety of preference assessments options are available including single stimulus, paired stimulus, and multiple stimulus with and without replacement. Behavioral observation can also be useful, but if used alone, it might not provide opportunity for student choice. Efficiency is important in a classroom setting because a teacher might not have much time allotted for one-on-one administration of assessments. The multiple-stimulus procedure has advantages of efficiency and the ability to produce a hierarchy, but it is not successful for all individuals. Similarly, the electronic picture and video presentation modalities offer advantages over object presentation but do not work for everyone. To meet the eligibility criteria of the present study, all participants were required to see and touch options on the iPad screen, but this type of technology-based assessment may not be appropriate for students without those abilities. For these reasons, teachers should tailor the method of determining preference to the individual student's abilities and characteristics. Also, teachers should observe whether preferences

identified by the assessments hold true in classroom or community-based vocational activities and try a different assessment approach if results do not seem accurate.

## **Recommendations for Further Research**

### **Evaluation of Assessment Variations**

Further research is needed to determine the best ways to assess job task preferences for students with ASD and ID. Additional research will continue to refine the technology-based stimulus preference assessment procedure and evaluate features for optimal use as a transition assessment. In the present study, MSWO assessments were conducted using only three tasks. However, MSWO assessments often include more than three options, with recent research of technology-based preference assessments using five choices presented simultaneously (Brodhead et al., 2016a; Brodhead et al., 2016b; Curiel et al., 2018). More work task options would be a useful feature of transition assessments., Future research could explore a preference assessment format with more than three work tasks presented electronically, which would be a useful feature of a transition assessment.

Additionally, different ways of presenting electronic-task choices should be explored. Electronic pictures were successful for many individuals in the present study, but they also experienced the actual task and viewed the videos from which the images were taken. Future research could evaluate the efficacy of electronic-pictorial assessments without access to corresponding videos, as this would save time in editing: an action similar to Brodhead et al.'s (2016a) study of toy preferences. As another alternative, videos could be used to introduce tasks, while still images are presented for selection as in the Walsh et al. (2019) study but with a MSWO procedure. To include tasks that do not occur in the same location, the use of videos

and/or electronic pictures without immediately performing tasks after selection could also be explored.

A drawback of stimulus preference assessments, as they were implemented in the present study, is that they focus solely on job tasks and not on other conditions related to employment. Workers with ASD may have preferences for or sensitivity to environmental conditions and social expectations of a job that could be as important as or even outweigh task preference. Several prior studies have assessed preferred work conditions of adults with significant disabilities (Lancioni et al., 1995; Lancioni et al., 1998a; Lancioni et al., 1998b), and LaRue et al. (2020) used a concurrent operants design to assess preferences for the task features of interaction, complexity, and movement, as part of an assessment protocol to identify matched job tasks. The assessment of work or task conditions with paired or MSWO procedures or as a means of identifying tasks to include in a MSWO assessment warrants further investigation.

### **Determining Appropriate Modalities and Assessment Types**

While the assessments used in the current study were successful with several participants, the electronic pictorial and video presentation methods or the use of those presentations within the MSWO procedure were not effective for all. When making choices that affect employment goals, it is important that transition assessments obtain accurate information. Prior studies have evaluated participants' discrimination skills to determine prerequisite skills needed for different presentation methods (e.g., Lee et al., 2008; Reyer & Sturmey, 2006). Further research is needed to determine the prerequisite skills required to understand job task choices presented with technology-based modalities. Moreover, the MSWO procedure might have contributed to the lack of efficacy for some. While MSWO preference assessments have the advantages of efficiency and the ability to generate a hierarchy that includes all tasks or stimuli (DeLeon &



Iwata, 1996; St. Peter et al., 2021), some studies found that paired-task assessments were more effective than the MSWO for some participants (Reid et al., 2007; St. Peter et al., 2021).

Perhaps, as suggested by Heinicke et al. (2019), it might be possible to teach the association between the choice stimuli and the condition or task they represent to improve the efficacy of the procedure. Further inquiry is needed to determine why assessment types and presentation modalities are effective for some participants and not others and what type of work task preference assessment is most effective for specific people and situations.

Several models have been developed to identify the best preference assessment to use based on assessment-specific and participant-specific factors (Karsten et al., 2011; Lill et al., 2020; Virues-Ortega et al., 2014). However, these models focused on reinforcer preference assessments and did not include electronic presentation modalities. Further research into the development and testing of an assessment-selection process designed for job task preferences and one that include technology-based modalities would be helpful for practitioners.

## **Conclusion**

This study extends the research on job task preference assessments using technology-based presentation modalities with transition-age students with both ASD and ID, a population underrepresented in existing research. Results suggest that the electronic pictorial and video MSWO assessment of job task preferences are accurate and effective with some individuals and not as effective as the established object modality for others. The electronic picture-based MSWO assessment results matched results from assessments using objects with a moderate to strong correlation for six of eight participants, while the video results corresponded at least moderately to object results for five participants. Furthermore, observation of task engagement validated electronic-pictorial assessment results for four participants and confirmed the high

preference task for one. One participant had inconsistent task engagement, and task engagement data contradicted electronic-picture assessment results for two participants. Video-based assessment results were validated by task engagement for half of the participants. The object modality was accurate for nearly all participants. Overall, the electronic pictorial procedure was useful for 75% of participants, while the video-based assessment was effective for half. These results showing the efficacy of technology-based assessments of job- task preference for some individuals and offer opportunities for further research focused on refining electronic pictorial and video assessments to optimize accuracy and efficiency.

## **Appendices**

**APPENDIX A: INSTITUTIONAL REVIEW BOARD APPROVAL LETTER****Approval Notice****Initial Review (Response To Modifications)**

February 26, 2019

Lauren Mucha, MEd

Special Education

Phone: (XXX) XXX-XXXX/Fax: (773) XXX-XXXX

RE: **Protocol # 2019-0175**

**“Efficacy of Technology-Based Multi-Stimulus Work Task Preference Assessments”**

Dear Ms. Mucha:

**Please note that if Chicago Public Schools are involved in this research a copy of research approval from the Chicago Public Schools (CPS) Research Review Board (RB) is required prior to recruiting/enrolling subjects or collecting data from CPS records. CPS approval must be accompanied by an Amendment Form when submitted to the UIC IRB.**

**Please remember to submit a completed Appendix K and principal letters of support from each school site prior to accessing/analyzing identifiable information and/or recruiting/enrolling subjects at those sites. Letters and Appendix K must be accompanied by an Amendment form when submitted to the UIC IRB.**

**APPENDIX A (continued)**

**Please remember to add all key research personnel, via Appendix P. Appendix P must be accompanied by an Amendment form when submitted to the UIC IRB.**

*Please note that as per the revised Federal Regulations (2018 Common Rule) and OPRS policies your research does not require a Continuing Review; therefore, the approved documents are stamped only with an approval date. Although your research does not require a Continuing Review, you will receive annual reminder notices regarding your investigator responsibilities (i.e., submission of amendments, final reports, and prompt reports), and will be asked to complete an Institutional Status Report which will be sent to you via email every 3 years. If you fail to submit an Institutional Status Report, your research study will be administratively closed by the IRB. For more information regarding Continuing Review and Administrative Closure of Research visit: <http://research.uic.edu/node/735>.*

Your Initial Review (Response To Modifications) was reviewed and approved by the Expedited review process on February 25, 2019. You may now begin your research

Please note the following information about your approved research protocol:

**Protocol Approval Period:** February 26, 2019

**Approved Subject Enrollment #:** 15

**Additional Determinations for Research Involving Minors:** The Board determined that this research satisfies 45CFR46.404)', research not involving greater than minimal risk. Therefore, in accordance with 45CFR46.408 ', the IRB determined that only one parent's/legal guardian's permission/signature is needed. Wards of the State may not be enrolled unless the IRB grants

## **APPENDIX A (continued)**

specific approval and assures inclusion of additional protections in the research required under 45CFR46.409 '. If you wish to enroll Wards of the State contact OPRS and refer to the tip sheet.

**Performance Sites:** UIC

**Sponsor:** None

**PAF#:** - Not applicable

### **Research Protocol(s):**

- a) Efficacy of Technology-Based Multi-Stimulus Work Task Preference Assessments; Version 1; 02/07/2019
- b) Efficacy of Technology-Based Multi-Stimulus Work Task Preference Assessments (Initial Review Application)02/19/2019

### **Recruitment Material(s):**

- a) Cover Letter; Version 2; 02/19/2019
- b) Participant Eligibility Checklist (no footer)

### **Informed Consent(s):**

- a) The identification, recruitment, and screening procedures and materials are exceptions to informed consent for the purpose of screening, recruiting, or determining eligibility of prospective subjects under 45 CFR 46.116(g).

### **Assent(s):**

- a) Assent Script; Version 2; 02/19/2019
- b) A waiver of assent/consent has been granted under 45 CFR 46.116(f) for decisionally impaired children and adults who cannot communicate either verbally or in writing; minimal risk; written parent/guardian permission will be obtained.

### **Parental Permission(s):**

- a) Efficacy of Work Task Assessments; Version 2; 02/19/2019

**APPENDIX A (continued)**

Your research meets the criteria for expedited review as defined in 45 CFR 46.110(b)(1) under the following specific category(ies):

(5) Research involving materials (data, documents, records, or specimens) that have been collected, or will be collected solely for nonresearch purposes (such as medical treatment or diagnosis)., (6) Collection of data from voice, video, digital, or image recordings made for research purposes., (7) Research on individual or group characteristics or behavior (including but not limited to research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

**Please note the Review History of this submission:**

Receipt Date	Submission Type	Review Process	Review Date	Review Action
02/07/2019	Initial Review	Expedited	02/13/2019	Modifications Required
02/19/2019	Response To Modifications	Expedited	02/25/2019	Approved

Please remember to:

→ Use your **research protocol number** (2019-0175) on any documents or correspondence with the IRB concerning your research protocol.

→ Review and comply with all requirements on the OPRS website at,

**APPENDIX A (continued)****"UIC Investigator Responsibilities, Protection of Human Research Subjects"**

*(<http://tigger.uic.edu/depts/ovcr/research/protocolreview/irb/policies/0924.pdf>)*

**Please note that the UIC IRB has the prerogative and authority to ask further questions, seek additional information, require further modifications, or monitor the conduct of your research and the consent process.**

**Please be aware that if the scope of work in the grant/project changes, the protocol must be amended and approved by the UIC IRB before the initiation of the change.**

We wish you the best as you conduct your research. If you have any questions or need further help, please contact OPRS at (312) 996-1711 or me at (XXX) XXX-XXXX.

Sincerely,

Alison Santiago, MSW, MJ

Assistant Director, IRB # 2

Office for the Protection of Research Subjects

Enclosure(s) are accessible via OPRS Live:

- 1. Assent Document(s):**
  - a) Assent Script; Version 2; 02/19/2019
- 2. Parental Permission(s):**
  - a) Efficacy of Work Task Assessments; Version 2; 02/19/2019
- 3. Recruiting Material(s):**
  - a) Cover Letter; Version 2; 02/19/2019
  - b) Participant Eligibility Checklist (no footer)

cc: Norma Lopez-Reyna, Special Education, M/C 147  
Lisa Cushing (Faculty Advisor), Special Education, M/C 147



**APPENDIX B: PARTICIPANT ELIGIBILITY CHECKLIST**

**Participant Eligibility Checklist**

<b>Inclusion Criteria</b>		
<b>To be eligible for the study, all questions must be answered “yes” or “n/a.”</b>		
1. Does the student have an IEP and receive special education services?	<input type="checkbox"/> yes	<input type="checkbox"/> no
2. Is autism listed as the primary disability in the IEP?	<input type="checkbox"/> yes	<input type="checkbox"/> no
3. Does the student have documentation of intellectual disability (ID)?  Intellectual disability may be documented by one of the following: <ul style="list-style-type: none"> <li>• Intellectual disability listed as a disability in the IEP.</li> <li>• Psychological report that lists a diagnosis of intellectual disability.</li> <li>• Assessment report that lists a diagnosis of intellectual disability or IQ score below 70.</li> </ul>	<input type="checkbox"/> yes	<input type="checkbox"/> no
4. Is the student at least 15 years old?	<input type="checkbox"/> yes	<input type="checkbox"/> no
5. If the student is age 18 or older, does the student have documentation of having a legal guardian?  (Answer this question “n/a” for students ages 15-17.)	<input type="checkbox"/> yes  <input type="checkbox"/> n/a	<input type="checkbox"/> no
6. Can the student see objects placed on a table in front of them?	<input type="checkbox"/> yes	<input type="checkbox"/> no
7. Can the student see pictures and videos on an iPad screen?	<input type="checkbox"/> yes	<input type="checkbox"/> no
8. Can the student point to or touch objects spaced at least six inches apart on a table in front of them?	<input type="checkbox"/> yes	<input type="checkbox"/> no
9. Can the student point to or touch pictures and videos shown on an iPad screen?	<input type="checkbox"/> yes	<input type="checkbox"/> no
10. Does the student understand English?	<input type="checkbox"/> yes	<input type="checkbox"/> no
11. Does the parent/guardian understand English?	<input type="checkbox"/> yes	<input type="checkbox"/> no

**APPENDIX C: COVER LETTER AND PARENTAL CONSENT FORM****University of Illinois at Chicago  
Research Information Cover Letter for Participation in Social Behavioral Research**

Dear Parent or Guardian,

I am seeking your permission for your child to participate in a research study that aims to find out if assessments on an iPad can be used to determine the job task preferences of students with autism and intellectual disability. The study is titled “Efficacy of Technology-Based Multi-Stimulus Work Task Preference Assessments.” The attached consent form explains the study in more detail and its risks and potential benefits. Before you provide permission for your child to participate, it is important that you read the attached information to ensure that you understand what they will be asked to do. It is your responsibility to decide if participation in this study is in the best interest of your child.

If you choose to provide permission for your child to participate, you will complete a Parent Questionnaire (included in this packet), which should take no more than 10 minutes. Your child’s teacher will complete a similar questionnaire that also asks for information about their disability and diagnoses. Responses from these questionnaires will be used to select the job tasks your child will perform during the study. I will assess your child’s independence in performing different job tasks. I will then assess your child’s preferences by presenting choices between tasks and having your child briefly perform the selected task. Choices will be provided using objects, pictures on an iPad, and videos on an iPad. Next, your child will work on the most and least preferred tasks for longer five-minute work periods, and their work engagement will be measured. Finally, their independence will be assessed on their most and least preferred tasks. These activities will be carried out in 10 to 13 sessions, lasting 15 to 45 minutes each. All session will be video recorded.

The research project is being conducted by Lauren Mucha, a doctoral student in Special Education from the University of Illinois Chicago, under the supervision of Dr. Lisa Cushing, Associate Professor of Special Education. If you have any questions regarding the study, please contact Ms. Mucha or Dr. Cushing. You can contact Ms. Mucha at XXX-XXX-XXXX or via email at [lmucha1@uic.edu](mailto:lmucha1@uic.edu). You can contact Dr. Cushing at (312) XXX-XXXX or via email at [lcushing@uic.edu](mailto:lcushing@uic.edu). You can contact the Office for the Protection of Research Subjects (OPRS) at (312) 996-4995 or via email at [ovcrweb@uic.edu](mailto:ovcrweb@uic.edu).

If you are interested in having your child participate in the study, I have attached several documents. Please complete the permission form and Parent Questionnaire and return them to school in the enclosed envelope. You may keep this letter.

Thank you for your time and consideration. The information gained from this study will support efforts to improve assessment methods to prepare individuals with autism and intellectual disability for employment.

Sincerely,  
Lauren Much

**APPENDIX C (continued)**

**University of Illinois at Chicago**  
**Research Information and Parental Permission for Participation in Social, Behavioral, or**  
**Educational Research**  
**Efficacy of Technology-Based Multi-Stimulus Work Task Preference Assessments**

**Principal Investigator/Researcher Name and Title:** Lauren Mucha, Doctoral Student

**Faculty Advisor Name and Title:** Dr. Lisa Cushing, Associate Professor

**Department and Institution:** Special Education, University of Illinois at Chicago

**Address and Contact Information:** [LMucha1@uic.edu](mailto:LMucha1@uic.edu); (XXX) XXX-XXXX

1040 W Harrison M/C 147 Chicago IL 60607

**About this research study**

You are being asked to participate in a research study. Research studies answer important questions that might help change or improve the way we do things in the future.

**Taking part in this study is voluntary**

Your participation in this research study is voluntary. You may choose to say “no” to this research or may choose to stop participating in the research at any time. Deciding not to participate, or deciding to stop participating later, will not result in the loss of any services, class standing, and/or professional status to which you are entitled, and will not affect your relationship with the University of Illinois at Chicago (UIC) and/or University of Illinois Hospital and Health Sciences System (UI Health), or any of the agencies or organizations collaborating in this research.

This consent form will give you information about the research study to help you decide whether you want to participate. Please read this form and ask any questions you have before agreeing to be in the study.

You are being asked to participate in this research study because you are a 15 to 25-year-old student with autism and intellectual disability. No more than 15 subjects will be enrolled in this research study.

Note: This research includes subjects who are minors or are adults who are not able to consent for themselves. If you are a parent, guardian, or legal representative, the terms “you” or “your” refer to the research subject for whom you are responsible.

### APPENDIX C (continued)

#### Important Information

This information gives you an overview of the research. More information about these topics may be found in the pages that follow.

<p><b>WHY IS THIS STUDY BEING DONE?</b></p>	<p>We want to find out if assessments on an iPad can be used to determine the job task preferences of students with autism and intellectual disability.</p>
<p><b>WHAT WILL I BE ASKED TO DO DURING THE STUDY?</b></p>	<p>You will try different job tasks to see how well you can do them. Then you will make choices between tasks using objects, pictures on an iPad, and videos on an iPad and work on the task you selected. You will work on some tasks for longer 5-minute periods. You will be video recorded, so we can measure how engaged you are while doing the tasks.</p> <p>For more information, please see the “What Procedures Are Involved?” section below.</p>
<p><b>HOW MUCH TIME WILL I SPEND ON THE STUDY?</b></p>	<p>Sessions with the researcher will last 15 to 45 minutes, with one session per day. You will participate in 10 to 13 sessions over the course of the study.</p> <p>For more information, please see the “What Procedures are Involved?” section below.</p>
<p><b>ARE THERE ANY BENEFITS TO TAKING PART IN THE STUDY?</b></p>	<p>By participating in this study, you will learn more about what kinds of jobs tasks you like and don’t like. I will share this information with your parent (or guardian) in an assessment report that can be used in planning for employment.</p> <p>We hope that participating in this research study will benefit other students and teachers in the future by identifying effective ways to assess employment preferences.</p>

**APPENDIX C (continued)**

<b>WHAT ARE THE MAIN RISKS OF THE STUDY?</b>	<p>The primary risks presented by this research study are breaches of privacy (others outside of the study may find out you are a subject) and/or confidentiality (others outside of the study may find out what you did, said, or information that was collected about you during the study).</p> <p>During the study you will be asked to perform different job tasks. You might find some of these activities challenging or stressful. You may be asked to engage in less preferred tasks. These risks are minimal and of short duration.</p>
<b>DO I HAVE OTHER OPTIONS BESIDES TAKING PART IN THE STUDY?</b>	<p>This research study is not designed to provide treatment or therapy, and you have the option to decide not to take part at all or end your participation at any time without any consequences.</p>
<b>QUESTIONS ABOUT THE STUDY?</b>	<p>For questions, concerns, or complaints about the study, please contact Lauren Mucha at (XXX)XXX-XXXX or email at <a href="mailto:LMucha1@uic.edu">LMucha1@uic.edu</a> or Dr. Lisa Cushing, faculty advisor at (XXX) XXX-XXXX or email at <a href="mailto:LCushing@uic.edu">LCushing@uic.edu</a> .</p> <p>If you have questions about your rights as a study subject; including questions, concerns, complaints, or if you feel you have not been treated according to the description in this form; or to offer input you may call the UIC Office for the Protection of Research Subjects (OPRS) at 312-XXX-1XX1 or 1-866-XXX-XXXX (toll-free) or e-mail OPRS at <a href="mailto:uicirb@uic.edu">uicirb@uic.edu</a>.</p>

**Please review the rest of this document for details about these topics and additional things you should know before making a decision about whether to participate in this research. Please also feel free to ask the researchers questions at any time.**

**What procedures are involved?**

Your parent or guardian and your teacher will complete questionnaires that will be used to decide which job tasks you will do. All activities that you do will take place at your school, XXXX, in a room away from other students. All sessions will be video recorded.

## APPENDIX C (continued)

The study procedures are:

- **Parent Questionnaire** – Your parent or guardian will provide information about you, including your age and whether you are able see materials and do some of the actions required in the study. This information will be used to verify that you are eligible for the research study. They will be asked to provide your race/ethnicity, so that we can report the characteristics of people who participate in the study. They will also list job tasks that you like and do not like, which will be used to decide which job tasks you will do.
- **Teacher Questionnaire** – Your teacher will provide information about you, including your disability and whether you are able see materials and do some of the actions required in the study. This information will be used to verify that you are eligible for the research study. They will also list job tasks that you like and do not like, which will be used to decide which job tasks you will do.
- **Initial assessment of independence** – You will try at least 12 job tasks, and the researcher will assess how independently you perform each task. Each assessment should take less than 5 minutes per task. Additional tasks may be added if needed.
  - **2 – 3 assessment sessions of 30 – 45 minutes each**
- **Preference assessments** – We will assess your preference for job tasks by having you make choices between job tasks followed by briefly work on the chosen tasks. We will conduct twelve assessments, including three different ways of presenting the choices (object, electronic picture, video). The first three assessments will include six job tasks and should take less than 15 minutes each. One or two of these assessments will be conducted per day. Then, nine assessments will be conducted with three tasks, which should take eight minutes each. Three of these assessments will be conducted per day over three days. After you have completed all twelve assessments, we will ask you which way of making choices you liked best, which should take less than one minute.
  - **5 assessment sessions of 15 – 45 minutes each**
- **Alternating treatments** – We will ask you to work on your most and least preferred job tasks to see how engaged you are. You will work on each of these tasks for at least five short work periods. Additional work periods will be added if there is not a clear pattern of work engagement. Work periods will last up to six minutes each. Up to six work periods will be conducted per day.
  - **2 – 4 work sessions of up to 45 minutes each**
- **Final assessment of independence** – We will assess how independently you perform the most and least preferred work tasks. This should take about five minutes per task.
  - **1 session of 10 – 15 minutes**

During this study, Lauren Mucha and her research team will collect information about you for the purposes of this research. We will ask your parent/guardian and teacher to report your age, race/ethnicity, disability information, and what job tasks you like and do not like. We will record

## APPENDIX C (continued)

video of you performing job tasks during your sessions with the researcher. We will use these videos and still pictures taken from the videos to present choices during the study. We will collect data on how independently you perform job tasks, which tasks you select when given choices, and how engaged you are in the work. The videos will also be used to make sure that the researcher completes all of the steps of the procedure and records the data correctly.

### **What about privacy and confidentiality?**

Efforts will be made to keep your personal information confidential; however, we cannot guarantee absolute confidentiality. In general, information about you, or provided by you, during the research study, will not be disclosed to others without your written permission. However, laws and state university rules might require us to tell certain people about you. For example, study information which identifies you and the consent form signed by you may be looked at and/or copied for quality assurance and data analysis by:

- Representatives of the university committee and office that reviews and approves research studies, the Institutional Review Board (IRB) and Office for the Protection of Research Subjects.
- Other representatives of the State and University responsible for ethical, regulatory, or financial oversight of research.
- Government Regulatory Agencies, such as the Office for Human Research Protections (OHRP).

A possible risk of the study is that your participation in the study or information about you might become known to individuals outside the study. Measures will be taken to prevent access by unauthorized personnel. Documents that include your personal information, disability information, and age will be stored in a locked file cabinet when not in use. Data collection forms with information about your performance on job tasks and choices made during assessments will use a code rather than your name. The key that matches the code to your name will be stored in a locked file cabinet. Video recordings and still pictures taken from the video recordings will be stored on an SD camera memory card, on iPads used during the study activities, and online in Box secure, cloud-based storage. The SD memory card and iPads will be stored in a locked cabinet when not in use. The iPad will be password protected. The videos collected during the study will only be viewed by the researchers working on the study. You will view videos of yourself and still pictures taken from the videos during some of the study activities.

The video files will be deleted from the memory card and iPads when they are no longer needed for study activities. The key that links your name to the code used on data collection forms and video file names will be destroyed upon completion of the study activities. The video recordings, which may show your face, will be deleted upon completion of data analysis. All other files and documents that include identifying information will be destroyed upon completion of data analysis, publication of findings, and dissertation defense. When the results of the study are published or discussed in conferences, no one will know that you were in the study.

## APPENDIX C (continued)

### **What are the costs for participating in this research?**

There are no costs to you for participating in this research.

### **Will I be reimbursed for any of my expenses or paid for my participation in this research?**

You will receive a \$10 Amazon gift card for each phase of the study that you complete. This compensation is for the activities completed by you, the student. You will receive a \$10 gift card for completing the initial assessments of independence, a \$10 gift card for completing the preference assessments, and a \$10 gift card for completing the alternating treatments work periods and final assessment of independence. If you do not finish the study, you will be compensated for the parts you have completed. If you complete the study, you will receive a total of \$30 in gift cards. You will receive your payment in person within approximately 30 days.

### **Can I withdraw or be removed from the study?**

If you decide to participate, you have the right to withdraw your consent and leave the study at any time without penalty. If you choose to withdraw from the study, inform the researcher Lauren Mucha and research activities will stop.

The researchers also have the right to stop your participation in this study without your consent if:

- They believe it is in your best interests;
- You were to object to any future changes that may be made in the study plan.

If you choose to no longer be in the study and you do not want any of your future information to be used, you must inform the researcher Lauren Mucha in writing at the address on the first page. The researcher Lauren Mucha may still use your information that was collected prior to your written notice.

### **What other things should I know?**

Parents/Guardians, please be aware that under the Protection of Pupil Rights Act, 20 USC 1232(c)(1)(A), you have the right to review a copy of the questions asked of or materials that will be used with your child. If you would like to do so, you should contact Lauren Mucha at (XXX) XXX-XXXX or email at [LMucha1@uic.edu](mailto:LMucha1@uic.edu) to obtain a copy of the questions or materials.

Parents/Guardians, you are being asked to give permission for your child's teacher to complete a questionnaire about your child. On the Teacher Questionnaire, your child's teacher will provide information about your child's disability and diagnoses, their ability to see materials and perform actions required for this research study, and the job tasks that your child likes and does not like. If you would like a copy of the Teacher Questionnaire, contact Lauren Mucha at (XXX) XXX-XXXX or email at [LMucha1@uic.edu](mailto:LMucha1@uic.edu).



### **APPENDIX C (continued)**

**Remember:**

Your participation in this research is voluntary. Your decision whether or not to participate will not affect your current or future relations with the University. If you decide to participate, you are free to withdraw at any time without affecting that relationship.

**Signature of Parent/Guardian/Legal Representative**

I have read the above information. I have been given an opportunity to ask questions and my questions have been answered to my satisfaction. I agree to participate in this research. I will be given a copy of this signed and dated form.

\_\_\_\_\_  
Printed Name of Minor

\_\_\_\_\_  
Signature of Parent, Guardian, Legal Representative

\_\_\_\_\_  
Date of Signature

\_\_\_\_\_  
Printed Name of Parent, Guardian, Legal Representative

*[Required]*

\_\_\_\_\_  
Signature of Person Obtaining Consent

\_\_\_\_\_  
Date (must be same as subject's)

\_\_\_\_\_  
Printed Name of Person Obtaining Consent

**Permission of Parent/Guardian/Legal Representative**

I have read the above information. I have been given an opportunity to contact the researchers and ask questions, and my questions have been answered to my satisfaction. I agree to participate in this research.

**PLEASE KEEP A COPY OF THIS DOCUMENT FOR YOUR RECORDS.**

## APPENDIX D: PARTICIPANT ASSENT FORM

### Efficacy of Technology-Based Multi-Stimulus Work Task Preference Assessments

1. My name is Lauren Mucha.
2. We are asking you to take part in a research study because we are trying to learn more about how to figure out what kinds of jobs students like and don't like. We want to see if students can use pictures and videos on an iPad to pick jobs that they like.
3. If you agree to be in this study, you will try different job tasks to see how well you can do them. Then you will make choices between tasks using objects, pictures on an iPad, and videos on an iPad and work on the task you selected. You will work on some tasks for longer 5-minute periods. You will be video recorded so we can measure how engaged you are while doing the tasks. You will do activities with me over 10 to 13 days, and work for 15 to 45 minutes each time.
4. You might be asked to try jobs that you don't like.
5. You will learn more about what kinds of jobs you like and don't like. I will share this with your parent (or guardian), so they can help you find a job that you like. You will also get gift cards if you decide to participate.
6. You can talk this over with your parents (or guardian) before you decide whether or not to participate. We have asked your parent (or guardian) to give their permission for you to take part in this study. But even though your parent (or guardian) said "yes" you can still decide not to do this.
7. If you don't want to be in this study, you don't have to participate. Remember, being in this study is up to you and no one will be upset if you don't want to participate or even if you change your mind later and want to stop.
8. You can ask any questions that you have about the study. If you have a question later that you didn't think of now, you can call me at (XXX) XXX-XXXX, email me at [LMucha1@uic.edu](mailto:LMucha1@uic.edu), or ask me next time.
9. Signing your name at the bottom means that you agree to be in this study. You and your parents will be given a copy of this form after you have signed it.

---

Name of Subject

---

Date

## APPENDIX E: PARENT/GUARDIAN QUESTIONNAIRE

Participant's name: \_\_\_\_\_ Questionnaire completed by: \_\_\_\_\_

### **Participant Information**

Please complete the following information about your child to confirm that they are eligible for the research study. This information will also be used to describe the characteristics of students who participate in the study.

Age: \_\_\_\_\_ years \_\_\_\_\_ months Race/ethnicity: \_\_\_\_\_

Can the student see objects placed on a table in front of them? Yes  No

Can the student see pictures and videos on an iPad screen? Yes  No

Can the student point to or touch objects spaced at least six inches apart on a table in front of them? Yes  No

Can the student point to or touch pictures and videos shown on an iPad screen? Yes  No

### **Preferred and Nonpreferred Work Tasks**

This section lists possible work tasks organized by career category. Please indicate if you think the participant would really dislike, dislike, like, or really like each task by marking an "X" in the box. Do not consider their ability to do the tasks, but instead focus on what they would like or not like.

<b>Office and Administrative Support</b>	Really dislike	Dislike	Like	Really like
Entering data in a spreadsheet				
Shredding paper				
Collating and stapling packets of paper				
Stuffing envelopes				
Putting stamps and labels on envelopes				
Hole punching papers				
Making photocopies				
Scanning documents				
Filing documents				
Sorting mail				
Weighing mail				

<b>Sales/Retail</b>	Really dislike	Dislike	Like	Really like
Bagging groceries				
Stocking shelves				
Stocking items on a rack or display				
Using a price gun to put stickers on products				
Folding clothes				
Putting clothes on hangers				
Filling orders (using a list to package items)				

**APPENDIX E (continued)**

<b>Food Preparation and Serving</b>	Really dislike	Dislike	Like	Really like
Rolling silverware				
Sorting silverware				
Setting tables				
Washing dishes				
Wiping menus				
Chopping food (using plastic knife)				
Preparing drink mix				
Pouring water into glasses				
Filling saltshakers				
Filling sugar caddies with sugar packets				
Filling napkin dispensers				

<b>Building, Grounds, Cleaning, and Maintenance</b>	Really dislike	Dislike	Like	Really like
Vacuuming				
Sweeping				
Mopping				
Filling soap dispensers				
Taking out trash and replacing bag				
Cleaning windows or mirrors				
Cleaning desks or tables				
Planting seeds in dirt				
Watering plants				
Weeding				

<b>Production</b>	Really dislike	Dislike	Like	Really like
Assembling parts with a screwdriver				
Sorting parts				
Painting products				
Sanding wooden items				
Cutting fabric following a pattern				
Inspecting products for defects				
Assembling (folding) cardboard boxes				
Sealing boxes with tape				
Packaging products (putting items in a bag)				
Affixing labels to packages				

## APPENDIX F: TEACHER QUESTIONNAIRE

Participant's name: \_\_\_\_\_

Questionnaire completed by: \_\_\_\_\_

### Participant Information

Please complete the following information about the student to confirm that they are eligible for the research study. This information will also be used to describe the characteristics of students who participate in the study.

Does the participant have a primary disability of autism listed on the IEP?      Yes       No

Does the participant have documentation of intellectual disability (ID)?      Yes       No

Intellectual disability may be documented by one of the following:

- Intellectual disability listed as a disability in the IEP.
- Psychological report that lists a diagnosis of intellectual disability.
- Assessment report that lists a diagnosis of intellectual disability or IQ score below 70.

IQ score (if known): \_\_\_\_\_

Source: \_\_\_\_\_

Can the participant see objects placed on a table in front of them?      Yes       No

Can the student see pictures and videos on an iPad screen?      Yes       No

Can the student point to or touch objects spaced at least six inches apart on a table in front of them?      Yes       No

Can the student point to or touch pictures and videos shown on an iPad screen?      Yes       No

**APPENDIX F (continued)****Preferred and Nonpreferred Work Tasks**

This section lists possible work tasks organized by career category. Please indicate if you think the participant would really dislike, dislike, like, or really like each task by marking an “X” in the box. Do not consider their ability to do the tasks, but instead focus on what they would like or not like.

<b>Office and Administrative Support</b>	Really dislike	Dislike	Like	Really like
Entering data in a spreadsheet				
Shredding paper				
Collating and stapling packets of paper				
Stuffing envelopes				
Putting stamps and labels on envelopes				
Hole punching papers				
Making photocopies				
Scanning documents				
Filing documents				
Sorting mail				
Weighing mail				

<b>Sales/Retail</b>	Really dislike	Dislike	Like	Really like
Bagging groceries				
Stocking shelves				
Stocking items on a rack or display				
Using a price gun to put stickers on products				
Folding clothes				
Putting clothes on hangers				
Filling orders (using a list to package items)				

**APPENDIX F (continued)**

<b>Food Preparation and Serving</b>	Really dislike	Dislike	Like	Really like
Rolling silverware				
Sorting silverware				
Setting tables				
Washing dishes				
Wiping menus				
Chopping food (using plastic knife)				
Preparing drink mix				
Pouring water into glasses				
Filling saltshakers				
Filling sugar caddies with sugar packets				
Filling napkin dispensers				

<b>Building, Grounds, Cleaning, and Maintenance</b>	Really dislike	Dislike	Like	Really like
Vacuuming				
Sweeping				
Mopping				
Filling soap dispensers				
Taking out trash and replacing bag				
Cleaning windows or mirrors				
Cleaning desks or tables				
Planting seeds in dirt				
Watering plants				
Weeding				

**APPENDIX F (continued)**

<b>Production</b>	<b>Really dislike</b>	<b>Dislike</b>	<b>Like</b>	<b>Really like</b>
Assembling parts with a screwdriver				
Sorting parts				
Painting products				
Sanding wooden items				
Cutting fabric following a pattern				
Inspecting products for defects				
Assembling (folding) cardboard boxes				
Sealing boxes with tape				
Packaging products (putting items in a bag)				
Affixing labels to packages				



### APPENDIX G: TASK ANALYSIS DATA FORM

Participant number:	Task:
---------------------	-------

Rating scale:

- 0 - independent
- 1 - gestural prompt
- 2 - verbal prompt
- 3 - model
- 4 - partial physical
- 5 - full physical

Steps	Date/Trial			
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

Notes:
--------

### APPENDIX H: 6-TASK PREFERENCE ASSESSMENT DATA FORM

Participant #:	Date:
Task presentation method:    object	

Tasks:			
A		D	
B		E	
C		F	

Trial	Task selected	Placement of selected task (circle)	Notes
1.		x    x    x    x    x    x	
2.		x    x    x    x    x	
3.		x    x    x    x	
4.		x    x    x	
5.		x    x	
6.		x	

Notes:
--------

**APPENDIX I: 3-TASK PREFERENCE ASSESSMENT DATA FORM**

Participant #:	Date:
Task presentation method (circle):    object            electronic picture            video	

Tasks:

A	
B	
C	

Trial	Task selected	Placement of selected task (circle)	Notes
1.		x    x    x	
2.		x    x	
3.		x	

Notes:
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**APPENDIX J: WORK PERIOD CODING FORM**

Coder:		Date of coding:		Start time:
Participant:	Date:	Work period #:	Task:	

0:15	0:30	0:45	1:00
On    Off	On    Off	On    Off	On    Off
1:15	1:30	1:45	2:00
On    Off	On    Off	On    Off	On    Off
2:15	2:30	2:45	3:00
On    Off	On    Off	On    Off	On    Off
3:15	3:30	3:45	4:00
On    Off	On    Off	On    Off	On    Off
4:15	4:30	4:45	5:00
On    Off	On    Off	On    Off	On    Off

Notes:

Total # on task:

Total # off task:

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## **CURRICULUM VITAE**

LAUREN E. MUCHA

### **EDUCATION**

- Doctor of Philosophy in Special Education, University of Illinois at Chicago, in progress
- Project SET (Seamless Effective Transition) - Transition Specialist licensure program, University of Illinois at Chicago, May 2013
- Master of Education in Special Education, University of Illinois at Chicago, May 2005
- Bachelor of Science in Psychology, Minor in Women's Studies, Loyola University Chicago, December 2002

### **LICENSURE**

- Illinois Professional Educator License (PEL)
  - Learning Behavior Specialist I (LBS 1)
  - Learning Behavior Specialist II (LBS 2) Transition Specialist
  - Endorsements in General Science and Psychology

### **RELEVANT WORK EXPERIENCE**

#### **PACTT LEARNING CENTER, CHICAGO, IL, January 2003 – Current**

Transition Specialist, August 2013- Current

- Mentors and supports teachers in the areas of transition, IEP preparation, curriculum development, classroom management, and behavior intervention
- Coordinates with parents, students, teachers, and outside service providers to transition secondary students to adult services and employment
- Conducts transition assessments and writes transition plans
- Develops community contacts for student volunteer and work experiences
- Promotes agency programs and services through local networking, website content development, and participation in professional conferences
- Designs and leads professional development opportunities at the school and agency level

Assistant Principal, August 2011- July 2013

- Trained and supervised paraprofessionals, program interns, and volunteers
- Led staff professional development, including new hire training and ongoing staff enrichment on agency-wide and school team levels
- Developed and implemented systems of program-wide data collection, record keeping, and reporting
- Interviewed job candidates and participated in hiring decisions

Lead Transition Teacher, August 2010- July 2013

- Developed and implemented curriculum in the areas of self-determination, vocational skills, independent living skills, socialization, communication skills, and community participation
- Coordinated student placements at community job sites
- Collaborated with speech language pathologist and occupational therapist
- Administered curriculum-based and state-mandated assessments

Mentor Teacher, August 2007- July 2008

- Planned and implemented regular new teacher meetings to foster team building and acclimate staff to the school and agency
- Met weekly with new teachers to plan instruction, prepare for IEP meetings, and discuss individual concerns
- Modeled teaching methods, student interactions, classroom management, behavior interventions, and job coaching to staff
- Organized community outreach and social networking for students, including job site visits and opportunities for socialization with peers
- Participated in leadership of school-wide curriculum development
- Wrote teacher handbook explaining classroom procedures and agency philosophy

Special Education Teacher, August 2005 – July 2010

Substitute Special Education Teacher, July– December 2004

Paraprofessional/ Job Coach, January 2003 – June 2004

**CENTRO ROMERO, CHICAGO, IL, July 2005- May 2008**

Volunteer Adult ESL Teacher

**RESEARCH INTERESTS**

- Secondary transition
- Transition assessment
- Self-determination
- Customized employment
- Autism spectrum disorder and intellectual disability

## **PUBLICATIONS**

Mucha, L. (2019). Therapist, role in activities of daily living (ADLs). In Heller, T., Harris, S. P., Gill, C. J., & Gould, R. P. (Eds.), *Disability in American Life: An Encyclopedia of Concepts, Policies, and Controversies* (pp. 658-660). Santa Barbara, California: ABC-CLIO.

## **PRESENTATIONS**

- Mucha, L. & Jablonski, P. (2020, November) *Using a Community Skills Rubric for Student Assessment & Planning*. Presented at Proficio Consulting Group's 2020 Conference: Envisioning Success, Oak Lawn, IL.
- Mucha, L. (2020, January) *Comparison of Job Task Preference Assessment Presentation Methods for Transition-Age Students with Autism and Intellectual Disability*. Presented at the Council for Exceptional Children Division on Autism & Developmental Disabilities (DADD) 21st International Conference on Autism, Intellectual Disability & Developmental Disabilities, Sarasota, FL.
- Mucha, L. & Jablonski, P. (2020, January). *Beyond the Invitation: Promoting IEP Participation and Self-Determination for Students with Autism and Intellectual Disability*. Presented at the Council for Exceptional Children Division on Autism & Developmental Disabilities (DADD) 21st International Conference on Autism, Intellectual Disability & Developmental Disabilities, Sarasota, FL.
- Mucha, L. & Jablonski, P. (2019, October) *Using a Community Skills Rubric for Student Assessment & Planning*. Presented at the 15<sup>th</sup> Annual Illinois Statewide Transition Conference, Collinsville, IL.
- Mucha, L. (2019, October) *Job Task Preference Assessment for Students with ASD and ID*. Presented at the 15<sup>th</sup> Annual Illinois Statewide Transition Conference, Collinsville, IL.
- Mucha, L. & Jablonski, P. (2017, October). *Promoting IEP Participation and Self-Determination for Students with Autism and ID*. Presented at the 13<sup>th</sup> Annual Illinois Statewide Transition Conference, Springfield, IL.
- Mucha, L. & Jablonski, P. (2017, July). *Beyond the Invitation: A School-Wide Plan to Promote Self-Determination and Increase IEP Participation for Students with Autism and Intellectual Disabilities*. Presented at the 49<sup>th</sup> Annual Autism Society of America's (ASA) National Conference, Milwaukee, WI.
- Jablonski, P. & Mucha, L. (2016, November). *Beyond the Invitation: A School-Wide Plan to Promote Self-Determination and Increase IEP Participation for Students with Autism and Intellectual Disabilities*. Presented at Proficio Consulting Group's Nonpublic Schools C conference, Oak Lawn, IL.

- Boheme, P., Paske, C., Mucha, L., Fegert, L., Schwartz, M., & Fencl, E. (2014, November). *Autism-Specific Transitions*. Panel Presentation at the Illinois Association of Rehabilitation Facilities' (IARF) Dialogue to Decision – Transitions: Children to Adult Services Conference, Springfield, IL.
- Mucha, L. & Jablonski, P. (2013, November). *Take the Tough Kids Too! Using Evidence-Based Strategies to Implement Community Experiences for Students with Severe Autism and Intellectual Disabilities*. Presented at the Illinois State Board of Education's (ISBE) Seventh Annual Conference on Best Practices in Nonpublic Special Education Programs, Oak Lawn, IL.
- Mucha, L. & Aldrich, S. (2010, April). *Community Employment for Students with Severe Autism*. Poster presentation at the National Council for Exceptional Children's (CEC) Annual Convention, Nashville, TN.

### **AWARDS**

William E. Albin & Charlotte C. Young Doctoral Fellowship Award, 2019

### **MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS**

Council for Exceptional Children and the following Divisions:

Division on Autism and Developmental Disabilities

Division of Career Development and Transition