THESIS

INSTRUMENT DEVELOPMENT OF THE VOCATIONAL FIT ASSESSMENT –

SELF-REPORT AND CONTENT VALIDITY STUDY PROCEDURES

Submitted by

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ABSTRACT

INSTRUMENT DEVELOPMENT OF THE VOCATIONAL FIT ASSESSMENT – SELF

REPORT AND CONTENT VALIDITY STUDY PROCEDURES

People with intellectual and developmental disabilities (PwIDD) are unemployed in the United States at rates much higher than that of the general population. Current job matching practices rely largely on proxy-report of worker abilities, resulting in decreased opportunity for self-determination. As Patient Reported Outcome Measures rise in popularity in other fields as a means of directing patient-centered care, job matching assessments should follow to support client-directed services.

The Vocational Fit Assessment (VFA) is an existing tool which compares proxy-reported worker abilities with job demands and creates job matching reports that guide and support job matching decisions. The aims of this thesis were to 1) adapt the existing Vocational Fit Assessment (VFA) into a format that is appropriate for self-report by people with intellectual and developmental disabilities and 2) develop content validity procedures to assess the adapted assessment, the Vocational Fit Assessment – Self-Report.

ACKNOWLEDGEMENTS

DEDICATION

For my brother –

you introduced me to occupational therapy,

back when it meant plastic slides, counting bears, and animal crackers,

and inspired my area of research.

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DEFINITION OF TERMS

Transition: In this context, transition refers to the process by which secondary students with disabilities move and adjust from school to adulthood.

Transition planning: The process of preparing for transition, including setting postsecondary goals and identifying necessary transition services and supports. The Individuals with Disabilities Education Act (IDEA) requires that this process for student must begin by age 16, but it may start earlier.

Transition team: The group of individuals who collaborate on transition planning. This includes the student, teachers, parents, and others who have knowledge or expertise regarding the student's needs.

Transition-aged: This refers to teens and young adults who are between the ages of 14 and 26.

Proxy-report assessments: Assessments which collect data not from the person being assessed, but from someone who knows them well. This could be a parent, caregiver, or teacher, for example. This method of report is contrasted with self-report wherein a person provides their own responses.

Job matching: The process of comparing worker interests and abilities with job demands in order to determine possible areas of employment.

List of Abbreviations:

PROMs: Patient-Reported Outcome Measures

ID: Intellectual disabilities

DD: Developmental disabilities

IDD: Intellectual and developmental disabilities

PwID: People with intellectual disabilities

PwDD: People with developmental disabilities

PwIDD: People with intellectual and developmental disabilities

VFA: Vocational Fit Assessment

VFA-SR: Vocational Fit Assessment – Self-Report

CHAPTER 1: INTRODUCTION

The purpose of this thesis was to develop an adapted version of the Vocational Fit Assessment (VFA) that is appropriate for self-report by people with intellectual and developmental disabilities (PwIDD), titled the Vocational Fit Assessment – Self-Report (VFA-SR), and to develop materials and methods for expert review of content validity.

This topic was born out of a need identified while working with young adults with intellectual and developmental disabilities who were enrolled in an employment-preparatory course. This course was offered through the Colorado State University Center for Community Partnerships and involved both an in-class component and an internship in the community. Students in this course completed the Vocational Fit Assessment (VFA) as a self-report assessment during one of their class periods. Since the VFA is intended for proxy-report on the worker's skills by someone who knows them well, such as a teacher or vocational rehabilitation counselor, several challenges arose.

First, the language used in the VFA resulted in limited comprehension for most students in the course. Second, the format of the VFA was overwhelming, including use of the rating scale. These barriers resulted in self-reported work-related abilities that were inconsistent with my observations and experiences working with these students over the course of two semesters. Seeing the issues that arose when using the VFA as a self-report tool alongside the benefits of promoting self-determination and self-assessment in this population, the benefits of an adapted self-report VFA became clear.

Chapter 1 of this thesis provides background information on PwIDD, employment for PwIDD, existing employment-related assessments including the VFA, and the COSMIN

guidelines which were used to direct research activities. Chapter 2 details the steps involved in the instrument development of the VFA-SR. Chapter 3 describes the methodological development of a preliminary assessment of content validity of the VFA-SR. Finally, Chapter 4 concludes this thesis with next steps and reflection.

Intellectual and Developmental Disabilities

The American Association on Intellectual and Developmental Disabilities (AAIDD) and the DSM-5 describe intellectual disabilities (ID) as neurodevelopmental disorders characterized by significant deficits in intellectual functioning and adaptive functioning skills, including conceptual, social, and practical areas of living, with onset before age 22 (AAIDD, 2022; American Psychiatric Association, 2013). Support needs are used by both the AAIDD and the DSM-5 to determine severity of impairment - mild, moderate, severe, and profound - with approximately 95% of ID cases classified as mild-moderate (Boat & Wu, 2015). According to the DSM-5, intellectual disabilities are associated with co-occurring conditions, including other neurodevelopmental disorders (APA, 2013).

More broadly, developmental disabilities (DD) are conditions that cause impairments in the area(s) of physical function, learning, language, and/or behavior beginning during childhood which typically last throughout the lifespan (Rubin & Crocker, 1989). Common diagnoses include Autism spectrum disorder, Fragile X syndrome, Down syndrome, and cerebral palsy. Many medical classification systems, including the ICD-11 (International Classification of Diseases 11th Revision), categorize intellectual disabilities as a type of developmental disability (World Health Organization, 2019). This indicates the interrelatedness of these two categories of conditions.

People with intellectual and developmental disabilities (PwIDD) often present with support needs in similar areas, especially during transitionary times like young adulthood. This transition often involves a significant increase in responsibility and expected independence in novel tasks as the young adult exits secondary school and pursues community living and participation, postsecondary education, and/or employment. Adaptive behavior is vital to navigating the expectations of adult life and is a significant determinant of quality of life for adults with IDD (Balboni et al., 2020). The loss of support and respite experienced as PwIDD transition out of school also results in increased stress for parents of PwIDD (McKenzie et al., 2017).

Employment for People with Intellectual and Developmental Disabilities

There are several employment options for PwIDD in the United States with various levels of support and community integration. Sheltered workshop employment occurs in a workplace separate from non-disabled workers and the public. This means the environment can be optimized to support work performance of PwIDD, but this comes at the cost of a restrictive environment and subminimum wage due to The Fair Labor Standards Act of 1938. Alternatively, competitive integrated employment ensures compensation matches or exceeds minimum wage but often occurs in an environment with less built-in supports. In these settings, PwIDD work alongside non-disabled co-workers in a community setting. Employment supports, including job coaching, visual schedules, and workplace accommodations, can be used to mitigate any discrepancies between worker ability and environmental supports. This approach is referred to as supported employment.

In spite of these support options, PwIDD in the United States are presently unemployed at rates much higher than that of the general population, with only 14.7% of PwIDD engaging in

community-based employment (Butterworth et al., 2015). Beyond creating occupational deprivation for PwIDD through inaccessibility to meaningful work, high unemployment rates in PwIDD also create societal costs. This includes the financial burden associated with unemployment and disability payments which are being distributed to a portion of the disability community who are largely willing and able to work. The Centers for Disease Control and Prevention (2006) estimate that the cost of supporting a PwIDD exceeds $1 million over the course of the individual's lifetime.

Job matching refers to the process of comparing worker interests and abilities with job demands in order to determine possible areas of employment. Despite the high unemployment rate of PwIDD, job matching practices for this population remain under-researched. Without sufficient tools and clear guidance on best practice, approaches to job matching remain inconsistent, creating variable outcomes that are difficult to define and measure (Persch et al., 2015a). These inconsistencies in the job matching process indicate necessity for an integrated, standardized tool to support transition teams and PwIDD as they make important job matching decisions.

Many existing assessments, including the Autism Work Skills Questionnaire (Gal et al., 2013; Gal et al., 2015), Job Match Pattern (Swenson, 2000), Self-Directed Search (Holland, 1997), and Your Employment Selections (Morgan, 2008; Morgan, 2011) address aspects of job matching but do not fully meet the needs of PwIDD in the job matching process. This area of need prompted the development of the Vocational Fit Assessment.

Vocational Fit Assessment

The Vocational Fit Assessment (VFA) was developed by the Transition, Employment, and Technology (TET) Lab at The Ohio State University with the goal of creating an accurate

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and person-centered tool that would measure both work-related interests and adaptive behavior in people with disabilities (Persch et al., 2015b). The VFA is a systematic job matching tool based in the person-environment-occupation (PEO) Occupational Therapy theoretical model which describes the interaction between these factors as transactional and dynamic (Gugiu et al., 2015; Law et al., 1996).

The VFA was developed through an iterative instrument development and refinement process. The job pool was determined through secondary analysis of the U.S. Department of Education's 2009 National Longitudinal Transition Study-2 which indicated that youth and young adults with disabilities most commonly work in the sectors of food service, retail, clerical, custodial, trade, and manufacturing (Persch et al., 2015b). Using data from the Occupational Information Network (ONET), TET lab staff identified the demands of 153 jobs (Persch et al., 2015b). These demands were transformed into a preliminary instrument item pool of 2,970 items (Persch et al., 2015b). Through a process of expert review, piloting, and refinement, winnowing of the item pool resulted in a total of 126 items (Persch et al., 2015b). This item pool has since been further refined, resulting in 133 total items.

The VFA items are divided across 11 subscales, each representing a domain of work abilities: physical, self-determination, work structure, cognitive, computer skills, higher task, lower task, communication, interpersonal, safety, and the Project SEARCH subscale. For each item, a proxy-reporter rates the PwIDD's work ability in that area as low ability, some ability, or high ability on a 3-point Likert scale. These VFA-Worker item and subscale scores are then compared with VFA-Job item and subscale scores using the Demands & Abilities Transforming Algorithm. The resulting Job Matching Reports can be used to support job matching decisions.

All subscales of the VFA have demonstrated reliability and validity, with the exception of the Project SEARCH subscale which has not been assessed. The VFA has demonstrated subscale internal consistencies of ≥.86 for VFA-Worker and ≥.85 for VFA-Job (Persch et al., 2015b). Test-retest reliability ranged from .49-.87 for VFA-Worker and from .72-.93 for VFA-Job (Persch et al., 2015b).

The VFA assesses the work abilities of an individual (VFA-Worker) and demands of a desired job (VFA-Job) and identifies areas of congruency and incongruency between the worker abilities and job demands using the Demands & Abilities Transforming Algorithm (Persch et al., 2015b). VFA-Worker data is collected via proxy-report by someone who knows the PwIDD well, including members of a transition team. This may include teachers, vocational rehabilitation counselors, occupational therapists, job coaches, and any other professionals who have experience with the PwIDD.

The algorithm compares the VFA-Worker scores with the VFA-Job scores to determine areas of congruency and incongruency (Table 1). For example, if the VFA-Worker score is 0, indicating low ability, and the VFA-Job score is 2, indicating the task is essential, an incongruency would be indicated. This data is then visualized in the Job Matching Reports (Figure 1) with pros (congruencies) displayed in green, areas for intervention (mild incongruencies) displayed in yellow, and cons (incongruencies) displayed in red (Persch et al., 2015b). VFA data and reports can be utilized to identify possible problems, monitor development of skills over time, and guide interventions including job training, accommodations, and modifications in the workplace. These reports also provide an easy visual representation of the results which can be shown and explained to the PwIDD.

Table 1

Vocational Fit Assessment Rating Scales for VFA-Worker and VFA-Job

Workers' Abilities	Score	Jobs' Demands
The worker performs this task independently (with assistive technology if needed).	High = 2	The task is essential to the performance of the job.
The worker performs this task with support (assist with assistive technology, physical assistance, cues).	Some = 1	The task is relevant to the job but non-essential.
The worker is unable or otherwise dependent on others to complete the task.	Low = 0	The task is irrelevant and non-essential to this job.
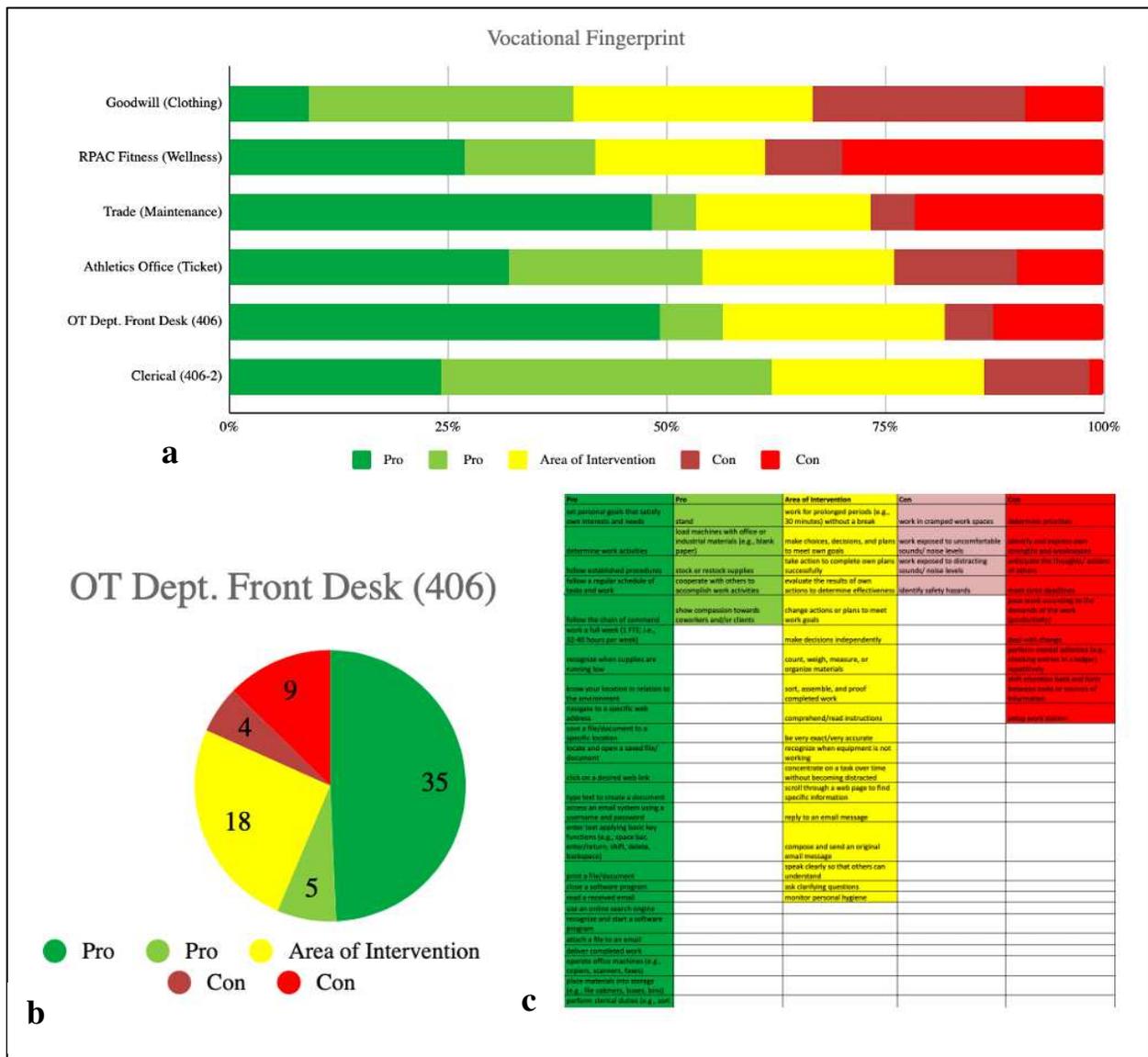
Figure 1. VFA Job Matching Reports

Note. Components of the job matching report visualize VFA data in multiple ways including (a) Vocational Fingerprint displaying all job matches, (b) Vocational Fit (pie) charts detailing a single job match, (c) job details that breakdown the pros, areas of intervention, and cons for each match.

Compared to other existing assessments, the VFA demonstrates better utility for guiding job matching decisions in PwIDD. First, the VFA is the only tool that combines worker abilities and job demands. Second, the VFA was designed specifically for the population of PwIDD.

Third, the VFA is available online, for free, at VocFit.com which makes it easily accessible to anyone with an internet connection.

COSMIN Reporting Guidelines

The EQUATOR (Enhancing the Quality and Transparency of Health Research) Network provides reporting guidelines for 527 different types of studies, including studies on measurement properties of patient-reported outcome measures (PROMs). The COSMIN (Consensus-Based Standards for the Selection of Health Measurement Instruments) initiative guides selection of outcome measure instruments based on the expertise of a team of international multidisciplinary researchers (COSMIN, 2022). Additionally, COSMIN provides multiple checklists and guidelines that provide structure for instrument development activities, including the risk of bias tool, reporting guidelines, and study design checklist for PROMs. These resources also provide guidance for activities of psychometric evaluation, beginning with content validity. The study design checklist was used to guide the research activities of this thesis, specifically the general recommendations and content validity guidelines.

CHAPTER 2: INSTRUMENT DEVELOPMENT OF THE VOCATIONAL FIT ASSESSMENT
– SELF-REPORT

Patient-reported outcome measures (PROMs) are standardized, validated questionnaires used to collect health outcomes directly from a patient. Benefits of using PROMs with individual patients include promotion of patient involvement, prioritization of the patient's needs, higher quality of care, standardized patient outcome monitoring, and enhancement of the patient-clinician relationship (Campbell et al., 2022). PROMs are also valuable outside of medical settings as they are not only patient-centered, but client-centered and person-centered as well. This allows patients and clients greater opportunity for self-determination in the service provision process.

The Patient-Centered Outcomes Research Institute (PCORI) was authorized for funding in the United States alongside the Affordable Care Act in 2010 with its funding reauthorized in 2019 (Patient-Centered Outcomes Research Institute, 2020). In 2020, intellectual and developmental disabilities were highlighted as a new area of funded research, particularly for studies addressing function and quality of life (Patient-Centered Outcomes Research Institute, 2020). This demonstrates the continued recognition of PROMs at the federal level in the United States and the importance of research focusing on intellectual and developmental disabilities, a population that is often overlooked during the development of PROMs (Kramer & Schwartz, 2018; Shogren et al., 2021) and in the administration of PROMs (Greenberg et al., 2021).

Limitations of Proxy-Report

The VFA is intended for proxy-report by professionals involved in the job matching process for young adults with IDD including teachers, occupational therapists, vocational rehabilitation specialists, and job coaches. This method of administration presents some

limitations. Although these individuals are familiar with the skills and needs of the individual they are reporting on, only seeing the individual in one setting may influence the scope of their experience with the individual. For example, if a teacher has only seen their student in a classroom setting where they complete desk work, it may be difficult to determine their capacity for physical tasks like lifting heavy objects or performing repetitive movements.

Proxy-report and self-report outcomes demonstrate incongruencies in other areas (Kramer & Schwartz, 2018; Irwin et al., 2012), including perspectives on family networks (Tournier et al., 2022) and social networks (Roll & Koehly, 2020), impact of mental health on quality of life (Koch et al., 2015), and some dimensions of quality of life (Berástequi et al., 2021). As a result, proxy-report, particularly of internal thoughts and feelings (Scott & Havercamp, 2018), can serve as a barrier to client-centered service provision.

Benefits of Self-Report

The limitations of proxy-report demonstrate a need for a self-report employment tool that is appropriate and accessible to PwIDD while providing the same data to the transition team that is needed to support job matching decisions. The development of an adapted self-report assessment, the Vocational Fit Assessment – Self-Report (VFA-SR) is an important next step for the VFA in prioritizing client-centeredness of the job matching process for PwIDD and their transition teams.

By modifying the language and structure of the existing VFA to make it appropriate for self-report, the research team can promote autonomy in PwIDD while also conserving time and resources associated with proxy-reporting by transition team members. Additionally, self-report by PwIDD could result in a more holistic view of the individual's skills as compared to proxy-report by a professional who has only observed the individual in one setting.

The VFA-SR can also serve as a web-based tool on VocFit.com for PwIDD to reflect on skills that may be important for employment success, particularly soft skills which are not typically included in a job description but are expected in most workplaces (e.g. proper hygiene, interpersonal skills with workers, self-monitoring). Additionally, self-report by PwIDD on their work abilities can also create an opportunity for transition team members to assess the individual's level of self-awareness and start the discussion around areas for intervention.

Instrument Development Activities

Ten subscales of the VFA, totaling 108 items, were adapted to create the VFA-SR. These subscales included physical, self-determination, work structure, cognitive, computer skills, higher task, lower task, communication, interpersonal, and safety domains. The subscale created for Project SEARCH was excluded since it has not undergone reliability and validity testing. The included subscales were adapted in numerous ways, including reduction in the number of items, language adaptations, structural adaptations, and other changes which support accessibility for the target population. These research activities were guided by the COSMIN study design checklist for PROMs (Mokkink et al., 2019).

VFA-SR Conceptualization

The first step in the VFA-SR development process was determining best practice for making assessments accessible and appropriate for self-report by PwIDD, particularly those with mild-moderate support needs. This was achieved through a combination of reviewing existing literature, established accessibility standards, and universal design for learning (UDL) principles, and by consulting with experts in the field. The principles outlined in Tables 2 and 3 were identified and integrated into the development process.

Table 2

Language Adaptation Principles

Principle	Description
Clarity	Each item should only address a single concept, except in cases where the tasks require similar demands (example: "I can bend and twist my body"). (Kramer & Schwartz, 2017; White-Koning et al., 2005)
Current Language	Items should be worded in present tense ("I can" instead of "In the past month, I have been able to"). (Eddy et al., 2011; Finlay & Lyons, 2001; Food and Drug Administration, 2009; Fujiura, 2012; Kramer & Schwartz, 2017; Sturgess et al., 2002)
Positive Language	Items should not include words like "can't" or "don't" and should instead be phrased with consistently positive language. (Abedi et al., 2011; Centers for Disease Control, 2009; Kramer & Schwartz, 2017; Mencap, 2000; White-Koning et al., 2005)
Personal Reference Language	Language should be in first person perspective. (Abedi et al., 2011; Centers for Disease Control, 2009; Kramer & Schwartz, 2017; Mencap, 2000; White-Koning et al., 2005)
Simple Language	Items should be formed using familiar, concrete, and concise vocabulary structured with grammatical simplicity. (Abedi et al., 2011; Beddow, 2010; Beddow, 2012; Beddow, 2013; Centers for Disease Control, 2009; Finlay & Lyons, 2001; Finlay & Lyons, 2002; Friedman & Bryen, 2007; Kramer & Schwartz, 2017; Mencap, 2000; Ng, 2017; Vanderheiden, 1994; White-Koning et al., 2005; Yalon-Chamovitz, 2009)

Table 3

Structural Adaptation Principles

Principle	Description
Account for Uncertainty	The assessment should include a "skip" or "not sure" button.
Clear Visuals	Images should represent the item concept clearly without presenting extraneous information which might be confusing or overwhelming. (Abedi et al., 2011; Beddow, 2010; Beddow, 2012; Beddow, 2013; Centers for Disease Control, 2009; Dolan et al., 2010; Kramer & Schwartz, 2017; Mencap, 2000)
Consistency	The assessment should feature consistent structure throughout, including layout, use of color, font, and text alignment. (Beddow, 2010; Beddow, 2012; Beddow, 2013; Dolan et al., 2010; Friedman & Bryen, 2007; Inclusive Learning Design, n.d.; Kramer & Schwartz, 2017; Mencap, 2000; Vanderheiden, 1994)
Item Reduction	Both within and across domains, items which are not clearly distinct should be combined.
Legible Text	Text should be presented in a large, readable sans serif font with high contrast and without italicization. (Abedi et al., 2011; Beddow, 2010; Beddow, 2012; Beddow, 2013; Centers for Disease Control, 2009; Dolan et al., 2010; Friedman & Bryen, 2007; Inclusive Learning Design, n.d.; Kramer & Schwartz, 2017; Mencap, 2000; White-Koning et al., 2005; Yalon-Chamovitz, 2009)
Multimodality	Information should be provided in several representational modes, including written text, visual components, and spoken word. (Inclusive Learning Design, n.d.; Ng, 2017; Rudd, n.d.)
Representative and Realistic Visuals	Images should be representative of the diversity of young adult PwIDD, including various skin tones, visible disabilities, and gender presentations. Images should depict realistic work scenarios that PwIDD can recognize.
Simplicity	The layout should have adequate white space with only essential items on the page. (Beddow, 2010; Beddow, 2012; Beddow, 2013; Centers for Disease Control, 2009; Friedman & Bryen, 2007; Kramer & Schwartz, 2017; Mencap, 2000; Rudd, n.d.)
Visual Integration	Visual and auditory components should be placed adjacent to item text. Rating scales and item stems should be integrated into each item. (Beddow, 2010; Beddow, 2012; Beddow, 2013; Dolan et al., 2010; Kramer & Schwartz, 2017)

Item Reduction and Language Adaptation

After identifying these principles of best practice, the VFA items were organized in a spreadsheet workbook with tabs for each subscale. Each VFA item was modified, combined, or eliminated in accordance with the principles identified above. Rationale and outcomes of this process were recorded via audit trail for personal reference and for review by colleagues. These colleagues included members of the research team that developed the VFA, other experts in the area of transition to employment for PwIDD from partner universities, and members of the Transitions, Employment, and Technology lab at Colorado State University. Each of these groups were provided continuous access to working documents which they were encouraged to review and provide comments on throughout the process. Additionally, specific items which required more extensive language adaptation were posited for specific feedback.

For items that were distinct and did not share similar demands with other items, the language was simplified and modified to reflect current tense, first-person language. Any items which were repetitive or could be more clearly described using one shared descriptor were combined. Conversely, VFA items which included more than one distinct concept were expanded in the VFA-SR so that each item represented one comprehensible concept. Any items whose construct(s) were already represented in another VFA-SR item, both within the subscale and across other subscales, were eliminated. This process of winnowing and expanding items sought to find an appropriate balance between clarity and assessment length. VFA items were not combined or eliminated until they received endorsement by the lead developer of the VFA and at least one other colleague.

The VFA item stem "To what degree does the student/intern/worker demonstrate the ability to…" was removed from all items and replaced with an integrated item stem of "I can…"

or "I feel…" in the VFA-SR items. This change was made in order to make items more concise and comprehensible through use of personal reference language.

Modifying the Rating Scale

The next step was determining the best format, language, and features of the modified rating scale. Existing evidence suggests the appropriateness of 3-point Likert scales for PwID (Fang et al., 2011), especially those with mild ID (Hartley & MacLean, 2006) who comprise a large majority of the target population of PwIDD who are seeking postsecondary employment. Therefore, the modified rating scale maintained the Likert scale structure of the VFA, but with modified language informed by the inclusive development of a measure response scale by Schwartz, Kramer, and the PEDI-PRO Youth Team (2020).

Identifying Supplementary Visuals for Items

Stock photographs that have been uploaded by photographers to websites www.pexel.com and www.unsplash.com for free use were acquired to represent most VFA-SR items. Images were selected based on their conceptual congruence with the written item. Special consideration was given to representing the diversity and variety of interests held by PwIDD. This included finding images representing facets of human diversity (skin tone, gender, disability, body size/shape, etc.) as well as a variety of work environments (office, factory, outdoors, etc.).

Images depicting young adults were selected over images of older adults, when possible, in order to best represent the transition-aged young adult population. Photographs were preferred over illustrations in order to maximize realism and recognizability of constructs as well as ensuring age appropriateness which would be jeopardized by juvenile clipart. Additional images

were created for items that were not well-represented by available stock photos, including images of schedules and items in the computer skills subscale.

Layout and Structure

Next, the adapted language, modified rating scale, and supporting images were combined using a custom PowerPoint template that included all components of each VFA-SR item on its own slide. This template allowed for performing layout changes throughout the item set which made it simple to try different layouts and perform further revisions based on colleague feedback. Specifically, this template was optimized to meet the structural adaptation principles identified in Table 3.

Accessibility Testing

Finally, the completed VFA-SR draft underwent preliminary accessibility testing to assess comprehensibility and usability for PwIDD. This included readability calculations (Flesch Reading Ease Score, the Flesch-Kincaid Grade Level, the Gunning Fog Score, the Coleman-Liau Index, the SMOG Index, and the Automated Readability Index) and assessment of the final structure for accessibility supports and barriers. Structural features that were assessed included structural adaptation principles identified in Table 3 and compatibility with assistive technologies. The VFA also underwent accessibility testing to provide a baseline comparison.

<div align="center">

Results

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Structure

Each subscale of the VFA is formatted in a simple embedded table underneath the subscale heading (Figure 2). The common item stem is written above the table with each row of the table including only the item itself along with 3 radio buttons used to indicate the level of

ability. These radio buttons are organized into a matrix with 3 columns labeled high, some, and low.

Cognitive Abilities

To what degree does the Student/Intern/Worker demonstrate the ability to:

	Highs	Some	Low
PERFORM MENTAL ACTIVITIES (E.G., CHECKING ENTRIES IN A LEDGER) REPETITIVELY?	○	○	○
COUNT, WEIGH, MEASURE, OR ORGANIZE MATERIALS?	○	○	○
SORT, ASSEMBLE, AND PROOF COMPLETED WORK?	○	○	○
COMPREHEND/READ INSTRUCTIONS?	○	○	○
BE VERY EXACT/VERY ACCURATE?	○	○	○
RECOGNIZE WHEN EQUIPMENT IS NOT WORKING?	○	○	○
RECOGNIZE WHEN SUPPLIES ARE RUNNING LOW?	○	○	○
ADD, SUBTRACT, MULTIPLY, AND DIVIDE?	○	○	○
CONCENTRATE ON A TASK OVER TIME WITHOUT BECOMING DISTRACTED?	○	○	○
SHIFT ATTENTION BACK AND FORTH BETWEEN TASKS OR SOURCES OF INFORMATION?	○	○	○
KNOW YOUR LOCATION IN RELATION TO THE ENVIRONMENT?	○	○	○

Figure 2. VFA Item Structure

The VFA-SR (Figure 3) features a supplementary image that supports understanding of the item, integrated items with item stems, a proposed read-aloud audio component, and a revised rating scale with each option individually labeled with color used to support meaning. The modified rating scale also includes a "not sure/skip question" button.

Figure 3. VFA-SR Item Structure

In accordance with the visual integration structural adaptation, the VFA-SR rearranges and combines several components of each item, including close proximity of the rating scale to the item and integrated item stems. The visual integration of the VFA-SR resulted in a greater percentage of white space which is less visually overwhelming for the user. Visual integration of the item stems and rating scale also resulted in improved accessibility for those who utilize a screen reader and/or keyboard navigation due to simplified tabbing order and inclusion of the rating options with each question rather than using columns of radio buttons without individual identifiers.

Simplified Language

The total word count of the VFA-SR (including item stems) is 866 words, a 48% reduction from the 1,665-word count of the VFA. Additionally, the VFA-SR items scored at a higher level of readability across all measures used, including the Flesch Reading Ease Score, the Flesch-Kincaid Grade Level, the Gunning Fog Score, the Coleman-Liau Index, the SMOG

Index, and the Automated Readability Index. Using the Flesch Reading Ease Score formula,

206.835 - 1.015 x (words/sentences) - 84.6 x (syllables/words), the average score of VFA items

was 28 while the average score of VFA-SR items was 89. These scores indicate that the VFA

items are on average written at a college reading level and are "very difficult to read" while the

VFA-SR items are on average written at a sixth grade reading level and are "easy to read." Table

4 contains examples of VFA-SR item language adaptations.

Table 4

Example Adaptations of VFA Item to VFA-SR Item

VFA Item	VFA-SR Item
To what degree does the student/intern/worker demonstrate the ability to perform work activities (e.g., working on an assembly line) repetitively?	I can do the same physical activity over and over again.
To what degree does the student/intern/worker demonstrate the ability to determine priorities?	I can decide what is most important to do first.
To what degree does the student/intern/worker demonstrate the ability to recognize when equipment is not working?	I can tell if something is not working right.
To what degree does the student/intern/worker demonstrate the ability to compose and send an original email message?	I can write and send an email.
To what degree does the student/intern/worker demonstrate the ability to select items from serving or storage areas and place them in dishes, on trays, or in bags?	I can take things and put them into the right place.
To what degree does the student/intern/worker demonstrate the ability to show compassion towards coworkers and/or clients?	I can show coworkers and customers that I care.
To what degree does the student/intern/worker demonstrate the ability to monitor personal hygiene?	I can keep my body clean.

Reduced Number of Items

The VFA-SR features 102 items compared to 108 items in the VFA (Table 5). Items remained within the same subscales, with the exception of VFA item 98 ("… listen actively") from the interpersonal subscale being combined with VFA item 90 ("… understand the speech of another person") to create a VFA-SR item in the communication subscale. Nearly all items addressed only one concept each, with the exception of actions which require similar demands and were not distinct enough to warrant two separate questions. For example, VFA items "bend" and "twist" were combined in the VFA-SR (Table 6) due to the similarity of their physical demands.

Table 5

VFA and VFA-SR Items Per Subscale

Subscale	VFA items	VFA-SR items
Physical	11 items	10 items
Self-Determination	11 items	11 items
Work Structure	13 items	12 items
Cognitive	11 items	11 items
Computer Skills	16 items	15 items
Higher Task	10 items	9 items
Lower Task	10 items	10 items
Communication	8 items	8 items
Interpersonal	9 items	7 items
Safety	9 items	9 items
Total Items	**108**	**102**

Table 6

Combined and Eliminated VFA Items with VFA-SR Equivalents

VFA Items (Excluding Item Stem)	VFA-SR Item
… twist the body. … bend the body.	I can bend and twist my body.
… meet strict deadlines. … pace work according to the demands of the job (productivity).	I can pace myself so that I get my work done on time.
… type text to create a document. … enter text applying basic key functions (e.g., space bar, enter/return, shift, delete, backspace).	I can use a keyboard to type.
… close a software program. … recognize and start a software program.	I can open and close a program on the computer.
… perform clerical duties (e.g., sort mail, run errands, send faxes, scan).	N/A; task demands addressed in other items
… understand the speech of another person. … listen actively.	I can listen and understand what people are saying.
… work with a co-worker in a group or team. … cooperate with others to accomplish work activities.	I can work together with a team to meet a goal.

Supplementary Images

Supplementary images in the VFA-SR are largely comprised of stock images of young adults with various gender presentations, skin tones, and disabilities. These images also included a variety of work settings that are represented in the VFA job bank, including factories, retail stores, food service, and offices. For more abstract items, stock images were supplemented with added text or images to provide a paraphrased example of the meaning of the question (Figures 4b-4e). Other items feature two images in a sequence to demonstrate progression of the task (Figure 4a). Remaining images were created by taking screenshots for the computer skills

subscale (Figure 4f). Special care was taken to choose age-appropriate images to avoid

infantilizing the young adult PwIDD target population.

a.

I can pick up heavy things.

b.

Did I do the right thing?

I can decide if my actions were the right choice.

c.

Priorities:
1. Help customers
2. Stock shelves
3. Mop floors

I can decide what is most important to do first.

d.

"I am good at cleaning. Organizing is hard for me."

I can tell others about my strengths and weaknesses.

e.

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RESCHEDULED

I feel okay when plans change.

f.

ago)   Reply

Sans Serif

Send

I can reply to an email.

Figure 4. VFA-SR Supplementary Image Examples

Modified Rating Scale

The VFA-SR rating scale (Figure 5) maintains the 3-point Likert scale format of the VFA rating scale (Figure 6), but features modified language, visual integration of the rating scale with each item, and visual color cues to support meaning. The rating scale also includes a button labeled "Not sure/skip question" to be used anytime a user is unsure of the meaning of the question or is unsure of their performance in that area. The modified rating scale features more white space and requires less precision and attention to respond compared to selecting the correct radio button in the VFA matrix. Despite the many changes, this modified rating scale is compatible with the current VFA job matching algorithm since it maintains the 3-point Likert scale format.
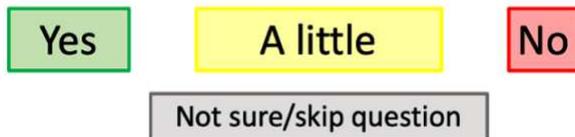
Figure 5. VFA-SR Rating Scale

Figure 6. VFA Rating Scale

Discussion

Structure

The VFA-SR demonstrates structural accessibility improvements for this population, including increased white space and visual integration. For the purpose of content validity testing, participants will be shown one VFA-SR item per survey page. However, the number of items per page for subsequent pilot testing with PwIDD may differ.

Simplified language

At an estimated sixth grade reading level compared to the estimated college reading level of the VFA, the VFA-SR demonstrates improved readability which makes it more accessible to people with lower levels of literacy. Additionally, the VFA-SR is nearly 50% shorter by word count than the VFA, resulting in a much shorter reading time. Although further simplifying the language of the VFA-SR would make it accessible to even more PwIDD, it may also result in loss of meaning for some constructs. In other words, increasing comprehensibility may negatively impact comprehensiveness. This trade-off should be closely monitored during future revisions to the VFA-SR.

Reduced number of items

As it currently stands, the VFA-SR has 102 items compared to 108 items in the VFA. Although this is an improvement, the VFA-SR will benefit from further revisions to further decrease number of items and, as a result, decrease cognitive load and length of time required to complete the assessment. Content validity survey data and focus groups will be integral in determining which items might be most appropriate to combine or remove, particularly in the computer skills subscale which currently contains the most items. As in the case of simplifying

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language, care should be taken not to eliminate or combine too many items at the cost of sacrificing comprehensiveness.

Multimodality

Stock images depicting people with visible disabilities performing work tasks were challenging to find during the development of the VFA-SR. This lack of available representation may be due to lasting stigmas surrounding disability in the workplace. Depicting disability in employment settings should be a continued priority for the VFA and VFA-SR.

Although it was not feasible to record functional audio components in preparation for the content validity survey, future integration of this feature would further improve accessibility of the VFA-SR. This addition would be consistent with Universal Design for Learning (UDL) principles and accessibility best practice by providing users with another way to interact with the content. In particular, auditory learners and people with limited written English literacy would benefit from a read-aloud option. After revising items based on preliminary content validity feedback and before pilot-testing with PwIDD, items should each be recorded being read aloud clearly with minimal background noise.

Modified Rating Scale

Since PwIDD were not involved in the development of the modified rating scale and it plays an important role throughout the VFA-SR, special attention should be paid to this component during pilot testing by PwIDD. A few possible areas for discussion include the language used in the Likert scale, the presence of/language used on the skip button, and the possible addition of an additional visual cue associated with each answer (examples: thumbs up/thumbs down, nodding head/shaking head/shrugging).

Limitations and Future Directions

The greatest limitation of this project is the lack of representation of PwIDD in the process of instrument development to this point in the process. The use of a youth team of people with developmental disabilities was not feasible within the scope of this project, but pilot testing and cognitive interviewing with PwIDD will be a high priority for assessing practicality and usability of the VFA-SR. After content validity assessment by experts in the field of transition, the VFA-SR should be further assessed and revised with the help of members of the target population who are experts on the lived experience of IDD. For example, we are interested in how PwIDD interpret items that include contractions or negative language.

Before being used in practice, the VFA-SR will need an introduction that will orient users to the assessment. The first section of this orientation should include general information on the VFA-SR, including the purpose of the assessment and what the PwIDD will be expected to do. The orientation should also include a brief teaching and learning module including examples and practice questions to ensure the PwIDD comprehends item language and understands how to answer the questions before they begin providing responses on their own work abilities. This module can also be used by practitioners to determine whether self-report or proxy-report would be more appropriate for an individual. For individuals with higher support needs, the VFA-SR could be completed alongside a support person who can paraphrase and give examples for items which are difficult for the PwIDD to comprehend.

Another aspect of the VFA-SR that will need to be considered before use in practice is accessibility of the tool for users of various assistive technologies and types of devices (mobile, tablets, desktop, etc.). Electronic accessibility components should include optical character recognition for all text, alternative text for every image, colorblind-friendly job matching report

options, proper tabbing order, and keyboard navigability. Additionally, the final format of the VFA-SR should be usable across device types and accessible by individuals using an internet connection with low bandwidth speed. The number of items per page and number of multimodal elements (images, audio, video, etc.) used to supplement item text should be added purposefully and carefully to maintain usability on mobile devices and with slow internet connections.

Several components could be added to the VFA-SR in the future which would result in further reduction of items and associated cognitive load. First, by asking the PwIDD to select the jobs they are interested in, low-demand skills for those jobs could be removed from the item set. For example, if someone is only interested in janitorial work and food service, computer skills items may not be relevant. Additionally, computerized adaptive testing functionality in the VFA-SR could further reduce the number of items for an individual based on their answers. For example, if the PwIDD reports that they cannot stand, they would not be asked if they can run. However, this functionality should be used with caution since difficulty completing lower-level tasks does not always indicate difficulty with related higher-level tasks.

Compatibility between VFA and the VFA-SR results could allow for further assessment of self-awareness of the PwIDD and result in important discussions around demonstrating appropriate work behaviors and developing work skills. Observer-reported outcomes of a transition team member who observes the PwIDD in a work setting combined with self-reported performance of the PwIDD would add depth to the job matching decision support, particularly for PwIDD who are experiencing difficulty finding a successful job match.

Future studies should assess discrepancies between self- and proxy-reporting in worker abilities. Discrepancies have been documented in other areas including perspectives on family networks (Tournier et al., 2022) and social networks (Roll & Koehly, 2020), impact of mental

health on quality of life (Koch et al., 2015), and some dimensions of quality of life (Berástequi et al., 2021). However, Berástequi et al. (2021) and Schmidt et al. (2010) have both found that global quality of life scores demonstrate a high level of agreement between adults with ID and proxy-reporters. Research on congruence between self- and proxy-report for PwIDD in worker abilities will provide further guidance on best use of the VFA and VFA-SR.

Implications for Research and Practice

This project has several implications for members of transition teams who work with adolescents and young adults with IDD, particularly those who are involved in job matching decisions. PROMs are standardized, person-centered tools that can give PwIDD the opportunity to practice self-determination and guide job matching decisions. However, most PROMs are not designed with PwIDD in mind. The VFA-SR is a new decision-support tool that encourages self-determination in the job matching process for PwIDD. This adaptation of the proxy-report VFA introduces a self-report alternative for transition teams to support client-centered job matching decisions.

Case Example

Joshua is a 16-year-old high school student who has an Individualized Education Plan due to his diagnoses of autism spectrum disorder and mild intellectual disability. He would like to work in construction after he graduates, but his parents are unsure if this would be a good fit for Joshua. Joshua's transition team, including himself, his parents, his teacher, and his occupational therapist, decide to use the VFA and VFA-SR to determine if construction would be a good fit for Joshua.

Joshua begins the VFA-SR with the teaching and learning module. He demonstrates competence to self-report based on his ability to correctly respond to practice questions. Joshua

continues to the VFA-SR items. Each item features a simple statement, an image that supports the item's meaning, and a simple rating scale. Joshua encounters three items which he feels unsure about, so he uses the "Not sure/skip question" button and asks his teacher to help him with these questions at the end. Joshua's parents complete the VFA to identify any inconsistencies between self-report and proxy-report data.

Joshua's transition team meets to review the Job Matching Reports (JMRs) generated by the VFA and VFA-SR. Many of the scores are consistent between the JMRs, but Joshua's team notices that he self-reported low ability to work outside in different weather conditions. His parents are surprised since Joshua helps with yard work regardless of weather conditions. Joshua says, "I like to be helpful, and I try not to complain."

Joshua and his transition team decide that construction will not be the best fit for him since he does not want to work outside or with a team. Based on his JMRs, Joshua decides to learn more about plumbing with the support of his transition team. They use his JMRs to determine which of his skills match the job demands of plumbing and to identify areas for intervention, including Joshua's low ability to work in small spaces.

CHAPTER 3: CONTENT VALIDITY STUDY PROCEDURES

Content Validity

Content validity measures the extent to which the content in an instrument adequately reflects the construct it intends to measure (Mokkink et al., 2010) and is considered a highly important indicator of the quality of a PROM (Terwee et al., 2018; U.S. Food and Drug Administration [FDA], 2009; European Medicines Agency, 2005). As a result, it is a logical first step in evaluating the psychometric properties of a PROM, as is recommended by the FDA (2009).

Content validity consists of three constructs: relevance, comprehensiveness, and comprehensibility (Terwee et al., 2018; Portney & Watkins, 2000). Relevance refers to the degree to which items are relevant to the construct of interest (Terwee et al., 2018; Portney & Watkins, 2000). Comprehensiveness refers to the degree to which the items in an instrument are representative of all the constructs the instrument is intended to measure (Terwee et al., 2018; Portney & Watkins, 2000). Lastly, comprehensibility refers to the extent to which the items are easily understood by the target population (Terwee et al., 2018; Portney & Watkins, 2000). Face validity, which can be considered another component of content validity, indicates that the instrument *appears* to measure what it aims to measure (Portney & Watkins, 2000).

Content validity is important to the quality of an instrument, particularly a PROM intended for people with intellectual and developmental disabilities which should be as concise and comprehensible as possible to improve accessibility without sacrificing comprehensiveness. Content validity represents one component of the overall quality of an outcome measure, as shown in Figure 7.
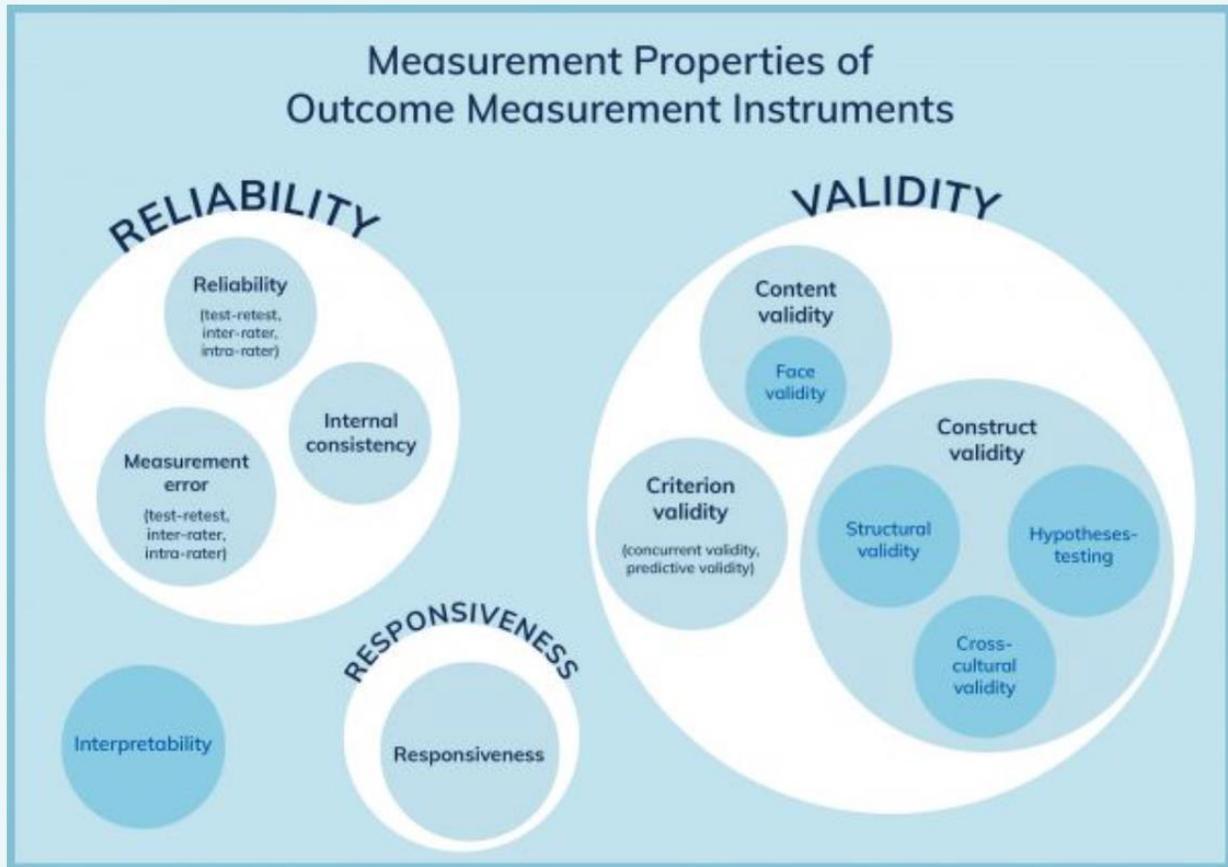
Figure 7. The COSMIN Taxonomy of Measurement Properties

Note. The COSMIN Taxonomy of Measurement Properties, used for educational purposes without special permission in accordance with copyright. (Mokkink et al., 2010)

Methods

Design

This phase of the project consisted of the methodological development of a mixed-methods content validity study comprised of a survey, collecting both quantitative and qualitative data, and focus groups/interviews for further depth of qualitative data. These research activities were guided by the COSMIN study design checklist for PROMs (Mokkink et al., 2019), specifically the design requirements for the perspective of professionals. It is important to note that this is a preliminary study of content validity of the VFA-SR that will utilize the opinions of experts in the field of transition for PwIDD. The findings of this study will guide further revisions to the VFA-SR and constitute one piece of evidence within a larger content validity and overall quality portfolio.

Content Validity Study Procedures

The content validity study design contains two components (survey and interviews/focus groups) that address the three constructs of content validity (relevance, comprehensiveness, and comprehensibility) for each VFA-SR item.

Purpose

The purpose of this study is to determine preliminary content validity of the VFA-SR, a new self-report version of the VFA that is intended to support greater self-determination for young adults with IDD in the job matching process.

Participants

This initial study of content validity will target experts in the field of transition who are familiar with the VFA. Potential participants (n=30) are past and present members of the research team and registered users of VocFit.com. These participants must be adults and must be

capable of providing informed consent. For recruitment, we will contact potential participants via email with information about the study and ask them to participate.

Procedures

The REDCap eConsent module will be used to obtain consent. Participants will complete the VFA-SR content validity survey on REDCap at a time and place of their choosing using a personal device. The survey is expected to take 60 minutes. The survey will contain a consistent series of question associated with each VFA-SR item, with at least one close-ended question addressing each construct for quantitative data analysis and open-ended questions to generate qualitative data. In addition to assessing the written item, the survey will also assess the relevance of the supplementary image associated with each item.

Data collected from the survey will then guide development of topics for discussion during interviews/focus groups. Interviews and focus groups will be scheduled for times when participants are able to engage via Zoom videoconferencing technology and will take 60 minutes or less. In total, participants can expect to commit up to 2 hours with this study.

Data Collection

Survey data will be collected electronically using REDCap. Interviews and focus groups will be recorded virtually via Zoom videoconferencing. Data will not be collected anonymously but privacy and confidentiality will be protected with secure data management.

Risks, Benefits, and Compensation

This study involves minimal risk for participants. Participants may not benefit directly, but people with IDD may indirectly benefit from their participation which will provide further direction for the VFA-SR. After completing the content validity survey and participating in an interview or focus group, the participants will be compensated with a $100 Amazon gift card.

Data Management

All data from surveys, participant lists, and downloads from the REDCap database will be stored on password-protected servers with only IRB-approved personnel having access to participant data. Recordings will be stored on these servers as well with the original recording being deleted. No identifiable information will be released. Information about participants will be stored in locked files and a password-protected computerized database which will be accessible only to IRB-approved personnel. Records will be maintained for 7 years with all personally identifiable information stripped from the files.

Institutional Review Board Application

Due to this project's minimal risk for participants, it was submitted to the Colorado State University Institutional Review Board (IRB) as an expedited application under categories 6 and 7. The application included an expanded version of the information provided above as well as the following attachments: VFA-SR items, participant consent form, recruitment email, and content validity survey questions.

Content Validity Survey Products

Following submission of the expedited application and accompanying materials, the content validity study was approved by the Colorado State University Institutional Review Board. The approved content validity survey items were then input into REDCap (Research Electronic Data Capture), a secure online survey building and management application.

Potential participants will be contacted using the approved email template that gives a brief description of the study and asks them to respond if they are interested in participating. Each potential participant who responds will be provided with a link to the survey and provided

with their group assignment. The group assignment determines which subscales of the VFA-SR the participant will review. Each participant will review approximately 55 VFA-SR items.

After indicating consent to participate in the survey by providing their name, email address, e-signature, and date, participants will be greeted with the following introductory language:

"Thank you for agreeing to participate in this Content Validity Study. This survey includes:

- Questions about your background and experience with the Vocational Fit Assessment (VFA)

- Review and content validity ratings of the Vocational Fit Assessment: Self-Report (VFA-SR)"

The first page of survey items focuses on demographic characteristics of participants. These questions include name, date of birth, race/ethnicity, gender, zip code, profession, years of transition-related experience, how the participant first encountered the VFA, if the participant is a registered user of VocFit.com, and how the participant uses the VFA. The second page of the survey asks for the participant's group assignment. Each subsequent page in the survey asks a series of questions about a VFA-SR item.

For use in the content validity survey, each VFA-SR adapted item was formatted side-by-side with the original VFA item(s), including the item stem but excluding the radio button matrix used in the VFA for the rating scale (Figure 8). These comparison images were then input into RedCAP along with the items in Table 7 (Figure 9).

To what degree does the student/intern/worker demonstrate the ability to work with a co-worker in a group or team?

High Ability   Some Ability   Low Ability

To what degree does the student/intern/worker demonstrate the ability to cooperate with others to accomplish work activities?

High Ability   Some Ability   Low Ability

I can work together with a team to meet a goal.

Yes   A little   No

Not sure/skip question

Figure 8. Example VFA-SR Item Formatted for Content Validity Survey

Table 7

VFA-SR Content Validity Survey Items

Construct	Item	Item Type	Options
Relevance	Is the skill (or knowledge) measured by this item:	Likert scale	Essential Useful, but not essential Not necessary
Comprehensibility	The item is worded clearly and easy to understand.	Likert scale	Strongly agree Agree Disagree Strongly disagree
Comprehensiveness	VFA and VFA-SR items are equivalent.	Likert scale	Strongly agree Agree Disagree Strongly disagree
Comprehensibility	The image provided supports understanding.	Likert scale	Strongly agree Agree Disagree Strongly disagree
All	Item descriptors (select all as appropriate).	Multiple-answer multiple choice	This item is good This item is incomplete This item is unnecessary This item is repetitive
All	This question could be improved by:	Open-ended	N/A
All	This image could be improved by:	Open-ended	N/A

Original Item:

To what degree does the student/intern/worker demonstrate the ability to recognize when equipment is not working?

High Ability   Some Ability   Low Ability

Adapted Item:

ERROR 404

I can tell if something is not working right.

Yes   A little   No

Not sure/skip question

Is the skill (or knowledge) measured by this item: * must provide value	○ Essential ○ Useful, but not essential ○ Not necessary reset
The item is worded clearly and easy to understand * must provide value	○ Strongly Disagree ○ Disagree ○ Agree ○ Strongly Agree reset
VFA and VFA-SR items are equivalent * must provide value	○ Strongly Disagree ○ Disagree ○ Agree ○ Strongly Agree reset
The image provided supports understanding * must provide value	○ Strongly Disagree ○ Disagree ○ Agree ○ Strongly Agree reset
Item descriptors (select all as appropriate) * must provide value	☐ This item is good ☐ This item is incomplete ☐ This item is unnecessary ☐ This item is repetitive
This question could be improved by: * must provide value	
This image could be improved by: * must provide value	

Figure 9. Example of Content Validity Survey Formatting in REDCap

The VFA has already undergone psychometric evaluation to determine comprehensiveness of the items in each subscale, so less emphasis was placed on comprehensiveness of each subscale to allow for each participant to review a greater number of items for consistency with VFA item constructs. Comprehensiveness will also be discussed further during focus groups.

Discussion

With IRB approval and completion of the survey structure in REDCap, there are only a few steps remaining before beginning recruitment. First, in order to determine how many VFA-SR subscales to include in each survey, members of the research team will need to trial the items to determine approximately how long each item will take for participants to review. Then, using the approximate time per item, the team should consider which subscales to combine to create an appropriate survey length of approximately 60 minutes. Due to the varied number of items in each subscale, some groups may review more subscales than others. This survey time should also allow time for participants to fill out the e-consent form and demographic information.

Next, recruitment emails should be sent to potential participants. As potential participants respond indicating their interest, they should be given sequential group assignments (example: A, B, C, D, A, B, C, D) in order to distribute participants as evenly as possible between groups. Participants will then indicate consent and complete the content validity survey as described previously.

Participants will then indicate their availability for an interview/focus group. Focus groups should contain participants with the same survey group assignment. Interviews should be conducted with any participant whose schedule is not able to accommodate any selected times. Focus group/interview questions should include overall impressions of the VFA-SR and

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individual items, especially items which scored low in relevance, comprehensiveness, and/or comprehensibility.

Quantitative data analysis of close-ended survey item data should include descriptive statistics, content validity ratio, and content validity index. Qualitative data analysis of open-ended survey item data and interview/focus group transcripts should utilize a pragmatic approach with triangulation of methods (open-ended survey questions and interview/focus group transcripts), sources (different interview/focus group transcripts), and analysts to support credibility. Quantitative and qualitative findings should then be integrated using an explanatory sequential design.

This project constitutes a logical next step in the VFA research program in its mission to provide standardized job matching tools for PwIDD. Presently, the VFA research program is working under a National Institutes of Health (NIH) grant to quantify the reliability, validity, responsiveness, and clinical utility of the VFA with PwID in a variety of settings including special education and vocational rehabilitation settings. This project includes further mixed methods assessments of the VFA by disability and employment experts, PwID, and reliable reporters (people who know them well). Preliminary content validity assessment of the VFA-SR marks a new milestone in the VFA research program and future assessment of the VFA-SR should mirror that of the present VFA project.

CHAPTER 4: CONCLUSION

Young adults are faced with many decisions during the transition out of high school. "Which career paths am I interested in? Is college a good fit for me, or should I try to find a job? Do I want to continue living with my parents, or will I rent an apartment with roommates?" These decisions are daunting for all transition-aged teens and young adults, but they can be even more challenging for PwIDD who experience deficits in adaptive functioning. This challenge is compounded by the fact that PwIDD are often given less opportunities to practice autonomy and self-determination compared to their peers.

Limited opportunities for self-determination in the job matching process can result in poor job matches. These poor job matches can be discouraging for PwIDD and contribute to low self-esteem and self-efficacy. Limiting the PwIDD's autonomy in the job matching process also puts them at a disadvantage in the workplace where they will be expected to make decisions and complete tasks independently.

The job matching process should always center the interests and abilities of the PwIDD, but existing employment assessments fail to accomplish this due to proxy-report administration and language that is not accessible to PwIDD. By practicing self-determination in the job matching process, PwIDD will have the opportunity to further develop their independence. As such, it is vital that PwIDD play an active role in improving and refining the VFA-SR to make it as accessible as possible for PwIDD.

The next step in assessing the content validity and overall quality of the VFA-SR as a measurement tool will be involving PwIDD in the assessment process. Specifically, it will be

important to engage PwIDD in cognitive interviewing and pilot testing of the VFA-SR in order to further improve the usability of the tool for the target population.

Although all constructs of content validity should be assessed during this next step, comprehensibility will be particularly important to assess through the lens of the target population. The COSMIN reporting guidelines recommend that experts assess relevance and comprehensiveness. In addition to these constructs, COSMIN recommends that the target population of a PROM also assess comprehensibility. Ultimately, the true expert on comprehensibility for PwIDD are PwIDD themselves.

Content validity assessment with PwIDD will differ in several ways compared to the procedures described in Chapter 3. First, PwIDD will not be presented with VFA items alongside VFA-SR items. They will provide feedback on the VFA-SR as a standalone tool. Second, the process with PwIDD will involve a greater proportion of interviewing compared to the process with transition experts. PwIDD will work more closely alongside members of the research team to provide feedback on the VFA-SR rather than completing an hour-long online survey. The feedback provided by PwIDD will be integral in making further revisions to language and structure of the VFA-SR in order to maximize accessibility and usability.

Although the VFA-SR will require additional studies of reliability and validity assessment and revisions, I am proud of the contributions I have made. Compared to existing job matching methods, the VFA-SR offers a standardized approach that promotes self-determination for PwIDD. I think of the students I worked with who experienced barriers while using the VFA as a self-report tool and I am excited about the support the VFA-SR can provide similar individuals and their transition teams in the future.

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APPENDIX A: VFA ITEMS

VocFit.com

The Vocational Fit Assessment assesses the student/intern/worker and internship/job on 133 items
For the student/intern/worker, do they have: **High Ability, Some Ability, or Low Ability** for a particular skill?
For a particular internship/job, is the skill required: a **High Demand, Some Demand, or Low Demand?**

PHYSICAL ABILITIES

Stand	Run	Twist the body
Bend the body	Keep or regain balance	Work low to the ground (e.g. crouch, stoop, kneel)
Perform physical activities (e.g. working on an assembly line) repetitively	Lift heavy materials (i.e. 40 pounds)	Work in awkward positions
Work in cramped work spaces	Work for prolonged periods (e.g. 30 minutes) without a break	

SELF-DETERMINATION

Make choices, decisions, and plans to meet own goals	Take action to complete own plans successfully	Determine priorities
Set personal goals that satisfy own interests and needs	Evaluate the results of own actions to determine effectiveness	Change actions or plans to meet work goals
Make decisions independently	Determine customers' needs	Determine work activities
Identify and express own strengths and weaknesses	Anticipate the thoughts/actions of others	

GENERAL

Handle stress	Makes eye contact	Refrains from unnecessary social interactions (talking)
Admits mistakes	Accepts praise	Cooperative and courteous
Listens and pays attention	Expresses personal needs (restroom breaks, doctor visits)	Respects rights and privacy of others
Asks for help and clarification when needed	Communicates adequately (initiates conversation, does not interrupt)	Maintains clean appearance
Dresses appropriately for job	Body hygiene	Follows directions
Accepts constructive criticism/feedback	Follows rules and regulations	Maintains good attendance
Arrives on time for work and leaves on time	Attends to job tasks consistently	Completes tasks accurately
Works at an appropriate rate	Initiates new tasks	Works well with co-workers
Follows the proper chain of command		

SAFETY

Work exposed to hazardous equipment or conditions	Work exposed to contaminant (e.g. pollutants, gases, dust, odors)	Work exposed to minor burns, cuts, bites, or stings
Work exposed to potential disease or infection	Maintain sanitation, health, and safety standards	Wear common protective or safety equipment (e.g. safety glasses, gloves, hard hat)
Follow institutional hand-washing standards	Monitor personal hygiene	Identify safety hazards

WORK STRUCTURE

Meet strict deadlines	Pace work according to the demands of the work (productivity)	Follow established procedures
Follow a regular schedule of tasks and work	Follow the chain of command	Work a full week (1 FTE; i.e. 32-40 hours per week)
Deal with change	Work outdoors, exposed to all weather conditions	Work outdoors, under cover
Work in very hot (above 90 F degrees) temperatures	Work in very cold (below 32 F degrees) temperatures	Work exposed to uncomfortable sounds/noise levels
Work exposed to distracting sounds/noise levels		

COGNITIVE ABILITIES

Perform mental activities (e.g. checking entries in a ledger) repetitively	Count, weigh, measure, or organize materials	Sort, assemble, and proof completed work
Comprehend/read instructions	Be very exact/very accurate	Recognize when equipment is not working
Recognize when supplies are running low	Add, subtract, multiply, and divide	Concentrate on a task over time without becoming distracted
Shift attention back and forth between tasks or sources of information	Know your location in relation to the environment	

COMPUTER SKILLS

Navigate to a specific web address	Save a file/document to a specific location	Locate and open a saved file/document
Click on a desired web link	Type text to create a document	Scroll through a web page to find specific information
Access an email system using a username and password	Enter text applying basic key functions (e.g. Space bar, enter/return, shift, delete, backspace)	Print a file/document
Reply to an email message	Close a software program	Read a received email
Use an online search engine	Recognize and start a software program	Attach a file to an email
Compose and send an original email message		

HIGHER TASK-RELATED ABILITIES

Load machines with office or industrial materials (e.g. blank paper)	Deliver completed work	Stock or restock supplies
Operate office machines (e.g. copiers, scanners, faxes)	Place materials into storage (e.g. file cabinets, boxes, bins)	Perform clerical duties (e.g. sort mail, run errands, send faxes, scan)
Select materials needed to complete work tasks	Setup and adjust machines	Setup work station
Monitor system status		

LOWER TASK-RELATED ABILITIES

Start and stop machines using levers or buttons	Clean work surfaces (e.g. shelves, counters, tables)	Clean work tools (e.g. equipment, tools, dishes)
Select items from serving or storage areas and place them in dishes, on trays, or bags	Clean work areas (e.g. sweeping, mopping)	Prepare dining areas for meals and/or snacks
Move supplies (e.g. by hand, cart, dolly)	Serve food orders to customers	Gather and empty trash
Service, clean, and supply restrooms		

COMMUNICATION SKILLS

Communicate face-to-face with others	Work with external customers or the public	Deal with conflict
Deal with unpleasant, angry, or discourteous individuals	Communicate with others on the telephone	Answer questions about items available for public use or purchase
Speak clearly so that others can understand	Understand the speech of another person	

INTERPERSONAL SKILLS

Work with a co-worker in a group or team	Cooperate with others to accomplish work activities	Show compassion towards coworkers and/or clients
Work in close physical proximity to other people	Follow directions	Greet customers entering establishments
Monitor own body language	Listen actively	Ask clarifying questions

TRANSITION, EMPLOYMENT, AND TECHNOLOGY LAB

COLORADO STATE UNIVERSITY

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APPENDIX B: VFA-SR ITEMS

Original Item:

To what degree does the student/intern/worker demonstrate the ability to stand?

High Ability   Some Ability   Low Ability

Adapted Item:

I can stand.

Yes   A little   No

Not sure/skip question

1

Original Item:

To what degree does the student/intern/worker demonstrate the ability to run?

High Ability   Some Ability   Low Ability

Adapted Item:

I can run.

Yes   A little   No

Not sure/skip question

2

Original Item:

To what degree does the student/intern/worker demonstrate the ability to work low to the ground (e.g., crouch, stoop, kneel)?

High Ability   Some Ability   Low Ability

Adapted Item:

I can work low to the ground while crouching or kneeling.

Yes   A little   No

Not sure/skip question

3

Original Item:

To what degree does the student/intern/worker demonstrate the ability to work in awkward positions?

High Ability   Some Ability   Low Ability

Adapted Item:

I can work in awkward or uncomfortable positions.

Yes   A little   No

Not sure/skip question

4

5

6

To what degree does the student/intern/worker demonstrate the ability to perform physical activities (e.g., working on an assembly line) repetitively?

High Ability   Some Ability   Low Ability

I can do the same physical activity over and over again.

Yes   A little   No

Not sure/skip question

7

To what degree does the student/intern/worker demonstrate the ability to lift heavy materials (i.e., 40 pounds)?

High Ability   Some Ability   Low Ability

I can pick up heavy things.

Yes   A little   No

Not sure/skip question

8

To what degree does the student/intern/worker demonstrate the ability to keep or regain balance?

High Ability   Some Ability   Low Ability

I can keep or regain my balance.

Yes   A little   No

Not sure/skip question

9

To what degree does the student/intern/worker demonstrate the ability to work for prolonged periods (e.g., 30 minutes) without a break?

High Ability   Some Ability   Low Ability

I can work for at least 30 minutes without taking a break.

Yes   A little   No

Not sure/skip question

10

Original Item:

To what degree does the student/intern/worker demonstrate the ability to set personal goals that satisfy own interests and needs?

High Ability   Some Ability   Low Ability

Adapted Item:

"I like animals, so I want to work at a pet store."

I can set goals that match my interests and needs.

Yes   A little   No

Not sure/skip question

11

Original Item:

To what degree does the student/intern/worker demonstrate the ability to make choices, decisions, and plans to meet own goals?

High Ability   Some Ability   Low Ability

Adapted Item:

Steps Toward My Employment Goals

☐ Email Lisa about internship opportunity
☐ Set up job site interviews
☐ Update my resume
+ List item

I can make plans to meet my goals.

Yes   A little   No

Not sure/skip question

12

To what degree does the student/intern/worker demonstrate the ability to make decisions independently?

High Ability   Some Ability   Low Ability

I can make my own decisions.

Yes   A little   No

Not sure/skip question

15

To what degree does the student/intern/worker demonstrate the ability to evaluate the results of own actions to determine effectiveness?

High Ability   Some Ability   Low Ability

Did I do the right thing?

I can decide if my actions were the right choice.

Yes   A little   No

Not sure/skip question

16

To what degree does the student/intern/worker demonstrate the ability to determine work activities?

High Ability   Some Ability   Low Ability

I can figure out what to do at work.

Yes   A little   No

Not sure/skip question

17

To what degree does the student/intern/worker demonstrate the ability to determine priorities?

High Ability   Some Ability   Low Ability

Priorities:
1. Help customers
2. Stock shelves
3. Mop floors

I can decide what is most important to do first.

Yes   A little   No

Not sure/skip question

18

To what degree does the student/intern/worker demonstrate the ability to determine customers' needs?

High Ability   Some Ability   Low Ability

I can figure out what a customer needs.

Yes   A little   No

Not sure/skip question

19

To what degree does the student/intern/worker demonstrate the ability to anticipant the thoughts/actions of others?

High Ability   Some Ability   Low Ability

He will start typing on his laptop

I can guess what someone will say or do before it happens.

Yes   A little   No

Not sure/skip question

20

Original Item:

To what degree does the student/intern/worker demonstrate the ability to identify and express own strengths and weaknesses?

High Ability   Some Ability   Low Ability

Adapted Item:

"I am good at cleaning. Organizing is hard for me."

I can tell others about my strengths and weaknesses.

Yes   A little   No

Not sure/skip question

21

Original Item:

To what degree does the student/intern/worker demonstrate the ability to meet strict deadlines?

High Ability   Some Ability   Low Ability

To what degree does the student/intern/worker demonstrate the ability to pace work according to the demands of the work (productivity)?

High Ability   Some Ability   Low Ability

Adapted Item:

I can pace myself so that I get my work done on time.

Yes   A little   No

Not sure/skip question

22

To what degree does the student/intern/worker demonstrate the ability to follow established protocols?

| High Ability | Some Ability | Low Ability |
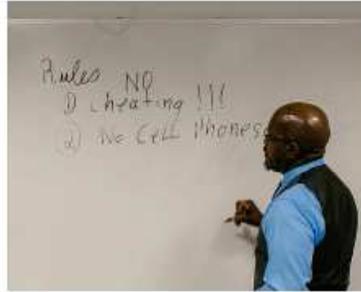
I can follow rules and plans at work.

Yes   A little   No

Not sure/skip question

23

Original Item: Adapted Item:

To what degree does the student/intern/worker demonstrate the ability to follow a regular schedule of tasks and work?

| High Ability | Some Ability | Low Ability |
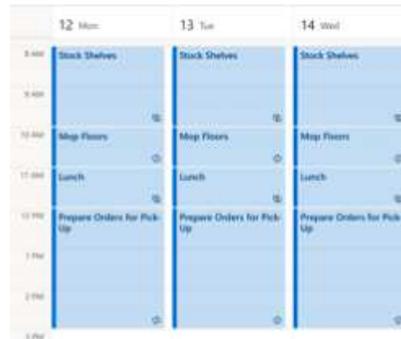
I can follow the same schedule every time I go to work.

Yes   A little   No

Not sure/skip question

24

Original Item:

To what degree does the student/intern/worker demonstrate the ability to follow the chain of command?

High Ability   Some Ability   Low Ability

Adapted Item:

I can listen to my boss's instructions.

Yes   A little   No

Not sure/skip question

25

Original Item:

To what degree does the student/intern/worker demonstrate the ability to work a full week (1 FTE; i.e., 32-40 hours per week)?

High Ability   Some Ability   Low Ability

Adapted Item:

I can work more than 30 hours per week.

Yes   A little   No

Not sure/skip question

26

Original Item:

To what degree does the student/intern/worker demonstrate the ability to deal with change?

High Ability   Some Ability   Low Ability

Adapted Item:

I feel okay when plans change.

Yes   A little   No

Not sure/skip question

27

Original Item:

To what degree does the student/intern/worker demonstrate the ability to work outdoors, exposed to all weather conditions?

High Ability   Some Ability   Low Ability

Adapted Item:

I can work outside in all types of weather.

Yes   A little   No

Not sure/skip question

28

Original Item:

To what degree does the student/intern/worker demonstrate the ability to work outdoors, under cover?

| High Ability | Some Ability | Low Ability |

Adapted Item:

I can work outside with shelter.

Yes   **A little**   **No**

Not sure/skip question

29

Original Item:

To what degree does the student/intern/worker demonstrate the ability to work in very hot (above 90 F degrees) temperatures?

| High Ability | Some Ability | Low Ability |

Adapted Item:

I can work in very hot temperatures.

Yes   **A little**   **No**

Not sure/skip question

30

To what degree does the student/intern/worker demonstrate the ability to work in very cold (below 32 F degrees) temperatures?

High Ability   Some Ability   Low Ability

I can work in very cold temperatures.

Yes   A little   No

Not sure/skip question

31

To what degree does the student/intern/worker demonstrate the ability to work exposed to uncomfortable sounds/noise levels?

High Ability   Some Ability   Low Ability

I can work in a place with very loud noises.

Yes   A little   No

Not sure/skip question

32

To what degree does the student/intern/worker demonstrate the ability to work exposed to distracting sounds/noise levels?

High Ability   Some Ability   Low Ability

I can work in a place with distracting noises.

Yes   A little   No

Not sure/skip question

33

To what degree does the student/intern/worker demonstrate the ability to perform mental activities (e.g., checking entries in a ledger) repetitively?

High Ability   Some Ability   Low Ability

I can do the same task in my head over and over again.

Yes   A little   No

Not sure/skip question

34

Original Item:

To what degree does the student/intern/worker demonstrate the ability to count, weigh, measure, or organize materials?

High Ability   Some Ability   Low Ability

Adapted Item:

I can count, weigh, and measure things

Yes   A little   No

Not sure/skip question

35

Original Item:

To what degree does the student/intern/worker demonstrate the ability to sort, assemble, and proof completed work?

High Ability   Some Ability   Low Ability

Adapted Item:

I can put things together the right way.

Yes   A little   No

Not sure/skip question

36

Original Item:

To what degree does the student/intern/worker demonstrate the ability to comprehend/read instructions?

| High Ability | Some Ability | Low Ability |

Adapted Item:

I can read and understand instructions.

| Yes | A little | No |

Not sure/skip question

37

Original Item:

To what degree does the student/intern/worker demonstrate the ability to be very exact/very accurate?

| High Ability | Some Ability | Low Ability |

Adapted Item:

Perfect! 100%!

I can do tasks exactly right.

| Yes | A little | No |

Not sure/skip question

38

Original Item:

To what degree does the student/intern/worker demonstrate the ability to recognize when equipment is not working?

High Ability   Some Ability   Low Ability

Adapted Item:

I can tell if something is not working right.

Yes   A little   No

Not sure/skip question

39

Original Item:

To what degree does the student/intern/worker demonstrate the ability to recognize when supplies are running low?

High Ability   Some Ability   Low Ability

Adapted Item:

I can tell if I am running out of work supplies.

Yes   A little   No

Not sure/skip question

40

Original Item:

To what degree does the student/intern/worker demonstrate the ability to add, subtract, multiply, and divide?

High Ability   Some Ability   Low Ability

Adapted Item:
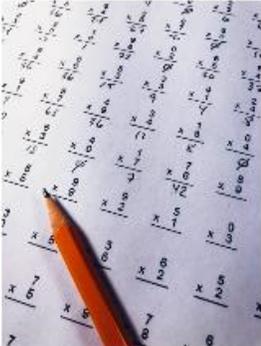
I can add, subtract, multiply, and divide.

Yes   A little   No

Not sure/skip question

41

Original Item:

To what degree does the student/intern/worker demonstrate the ability to concentrate on a task over time without becoming distracted?

High Ability   Some Ability   Low Ability

Adapted Item:

I can focus for a while without getting distracted.

Yes   A little   No

Not sure/skip question

42

Original Item:

To what degree does the student/intern/worker demonstrate the ability to shift attention back and forth between tasks or sources of information?

High Ability   Some Ability   Low Ability

Adapted Item:

I can switch my focus between 2 different things.

Yes   A little   No

Not sure/skip question

43

Original Item:

To what degree does the student/intern/worker demonstrate the ability to know your location in relation to the environment?

High Ability   Some Ability   Low Ability

Adapted Item:

I can tell where I am in my environment.

Yes   A little   No

Not sure/skip question

44

Original Item:

To what degree does the student/intern/worker demonstrate the ability to navigate to a specific web address?

High Ability   Some Ability   Low Ability

Adapted Item:

I can go to a website.

Yes   A little   No

Not sure/skip question

45

Original Item:

To what degree does the student/intern/worker demonstrate the ability to save a file/document to a specific location?

High Ability   Some Ability   Low Ability

Adapted Item:
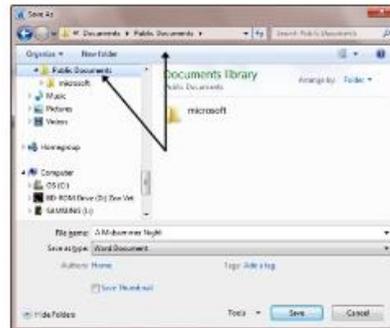
I can save a file in the right place on the computer.

Yes   A little   No

Not sure/skip question

46

Original Item:

To what degree does the student/intern/worker demonstrate the ability to locate and open a saved file/document?

High Ability   Some Ability   Low Ability
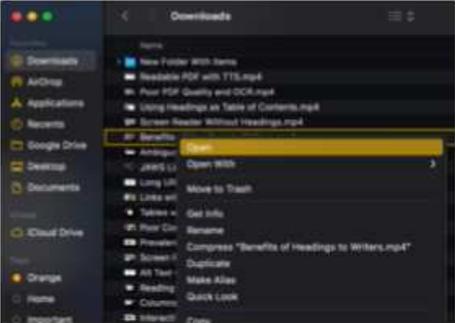
Adapted Item:

I can find and open a file on the computer.

Yes   A little   No

Not sure/skip question

47

Original Item:

To what degree does the student/intern/worker demonstrate the ability to click on a desired web link?

High Ability   Some Ability   Low Ability

Adapted Item:
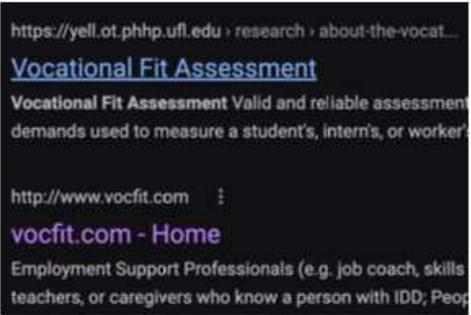
I can click on a link.

Yes   A little   No

Not sure/skip question

48

Original Item:

To what degree does the student/intern/worker demonstrate the ability to type text to create a document?

| High Ability | Some Ability | Low Ability |

To what degree does the student/intern/worker demonstrate the ability to enter text applying basic key functions (e.g., space bar, enter/return, shift, delete, backspace)?

| High Ability | Some Ability | Low Ability |

Adapted Item:

I can use a keyboard to type.

Yes | A little | No

Not sure/skip question

49

Original Item:

To what degree does the student/intern/worker demonstrate the ability to scroll through a web page to find a specific information?

| High Ability | Some Ability | Low Ability |

Adapted Item:
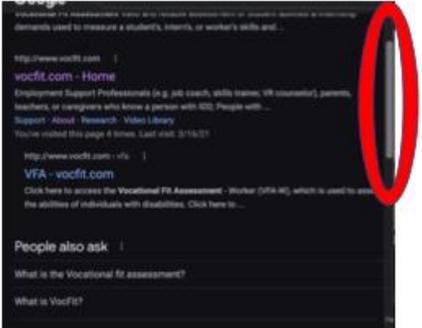
I can scroll on a webpage to find information.

Yes | A little | No

Not sure/skip question

50

Original Item:

To what degree does the student/intern/worker demonstrate the ability to access an email system using a username and password?

High Ability   Some Ability   Low Ability

Adapted Item:

Sign in to Yahoo Mail
using your Yahoo account

Username, email, or mobile

Next

I can log into an email account using a username and password.

Yes   A little   No

Not sure/skip question

51

Original Item:

To what degree does the student/intern/worker demonstrate the ability to print a file/document?

High Ability   Some Ability   Low Ability

Adapted Item:

Always Open Read-Only
Restrict Permissions   >
Passwords...

Compress Pictures...

Page Setup...
Print...   ⌘ P

Properties

I can print from the computer.

Yes   A little   No

Not sure/skip question

52

Original Item:

To what degree does the student/intern/worker demonstrate the ability to reply to an email message?

High Ability   Some Ability   Low Ability
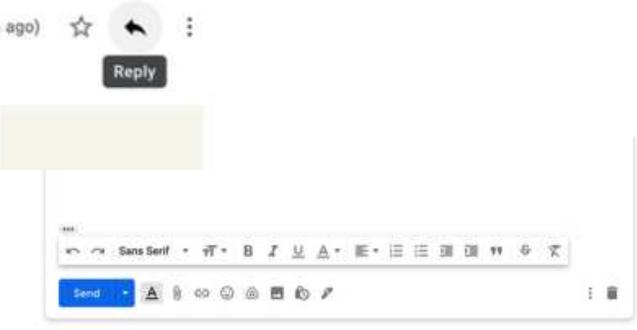
Adapted Item:

I can reply to an email.

Yes   A little   No

Not sure/skip question

53

Original Item:

To what degree does the student/intern/worker demonstrate the ability to recognize and start a software program?

High Ability   Some Ability   Low Ability

Adapted Item:

I can find a program on the computer.

Yes   A little   No

Not sure/skip question

54

Original Item:

To what degree does the student/intern/worker demonstrate the ability to close a software program?

High Ability   Some Ability   Low Ability

To what degree does the student/intern/worker demonstrate the ability to recognize and start a software program?

High Ability   Some Ability   Low Ability

Adapted Item:

I can open and close a program on the computer.

Yes   A little   No

Not sure/skip question

55

Original Item:

To what degree does the student/intern/worker demonstrate the ability to read a received email?

High Ability   Some Ability   Low Ability

Adapted Item:

I can read an email.

Yes   A little   No

Not sure/skip question

56

Original Item:

To what degree does the student/intern/worker demonstrate the ability to use an online search engine?

High Ability   Some Ability   Low Ability

Adapted Item:

I can search online.

Yes   A little   No

Not sure/skip question

57

Original Item:

To what degree does the student/intern/worker demonstrate the ability to attach a file to an email?

High Ability   Some Ability   Low Ability

Adapted Item:

I can attach a file to an email.

Yes   A little   No

Not sure/skip question

58

Original Item:

To what degree does the student/intern/worker demonstrate the ability to compose and send an original email message?

High Ability   Some Ability   Low Ability

Adapted Item:

To:
Subject

I can write and send an email.

Yes   A little   No

Not sure/skip question

59

Original Item:

To what degree does the student/intern/worker demonstrate the ability to load machines with office or industrial materials (e.g., blank paper)?

High Ability   Some Ability   Low Ability

Adapted Item:

I can load machines with materials.

Yes   A little   No

Not sure/skip question

60

Original Item:

To what degree does the student/intern/worker demonstrate the ability to deliver completed work?

High Ability   Some Ability   Low Ability

Adapted Item:

I can deliver work that I have finished.

Yes   A little   No

Not sure/skip question

61

Original Item:

To what degree does the student/intern/worker demonstrate the ability to stock or restock supplies?

High Ability   Some Ability   Low Ability

Adapted Item:

I can stock or restock things.

Yes   A little   No

Not sure/skip question

62

To what degree does the student/intern/worker demonstrate the ability to operate office materials (e.g., copies, scanners, faxes)?

High Ability   Some Ability   Low Ability

I can use office machines like a copier and a scanner.

Yes   A little   No

Not sure/skip question

63

To what degree does the student/intern/worker demonstrate the ability to place materials into storage (e.g., file cabinets, boxes, bins)?

High Ability   Some Ability   Low Ability

I can organize things in file cabinets, boxes, and bins.

Yes   A little   No

Not sure/skip question

64

65

66

To what degree does the student/intern/worker demonstrate the ability to setup work station?

High Ability   Some Ability   Low Ability

I can set up my workstation.

Yes   A little   No

Not sure/skip question

67

To what degree does the student/intern/worker demonstrate the ability to monitor system status?

High Ability   Some Ability   Low Ability

I can keep track of levels or numbers on a screen.

Yes   A little   No

Not sure/skip question

68

To what degree does the student/intern/worker demonstrate the ability to start and stop machines using levers or buttons?

High Ability   Some Ability   Low Ability
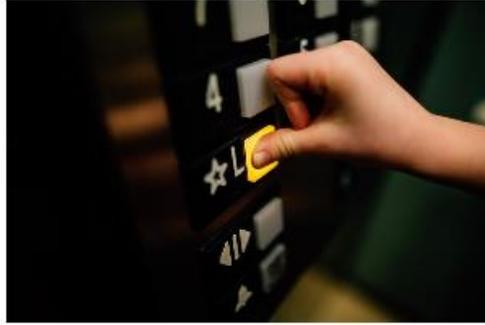
I can use levers and buttons.

Yes   A little   No

Not sure/skip question

69

Original Item:

Adapted Item:

To what degree does the student/intern/worker demonstrate the ability to clean work surfaces (e.g., shelves, counters, tables)?

High Ability   Some Ability   Low Ability

I can clean work surfaces like shelves and tables.

Yes   A little   No

Not sure/skip question

70

Original Item:

To what degree does the student/intern/worker demonstrate the ability to clean work tools (e.g., equipment, tools, dishes)?

High Ability   Some Ability   Low Ability

Adapted Item:

I can clean work tools like equipment and dishes.

Yes   A little   No

Not sure/skip question

71

Original Item:

To what degree does the student/intern/worker demonstrate the ability to select items from serving or storage areas and place them in dishes, on trays, or bags?

High Ability   Some Ability   Low Ability

Adapted Item:

I can take things and put them into the right place.

Yes   A little   No

Not sure/skip question

72

Original Item:

To what degree does the student/intern/worker demonstrate the ability to clean work areas (e.g., sweeping, mopping)?

High Ability   Some Ability   Low Ability

Adapted Item:

I can clean the floor by sweeping or mopping.

Yes   A little   No

Not sure/skip question

73

Original Item:

To what degree does the student/intern/worker demonstrate the ability to prepare dining areas for meals and/or snacks?

High Ability   Some Ability   Low Ability

Adapted Item:

I can get a table ready for a meal.

Yes   A little   No

Not sure/skip question

74

To what degree does the student/intern/worker demonstrate the ability to move supplies (e.g., by hand, cart, dolly)?

High Ability   Some Ability   Low Ability

I can move things by hand or by using a cart.

Yes   A little   No

Not sure/skip question

75

To what degree does the student/intern/worker demonstrate the ability to serve food orders to customers?

High Ability   Some Ability   Low Ability

I can serve food to customers.

Yes   A little   No

Not sure/skip question

76

To what degree does the student/intern/worker demonstrate the ability to gather and empty trash?

High Ability   Some Ability   Low Ability

I can gather and empty the trash.

Yes   A little   No

Not sure/skip question

77

Original Item:

Adapted Item:

To what degree does the student/intern/worker demonstrate the ability to service, clean, and supply restrooms?

High Ability   Some Ability   Low Ability

I can clean and prepare restrooms for customers.

Yes   A little   No

Not sure/skip question

78

Original Item:

To what degree does the student/intern/worker demonstrate the ability to communicate face-to-face with others?

High Ability   Some Ability   Low Ability

Adapted Item:

I can talk to people face-to-face.

Yes   A little   No

Not sure/skip question

79

Original Item:

To what degree does the student/intern/worker demonstrate the ability to work with external customers or the public?

High Ability   Some Ability   Low Ability

Adapted Item:

I can work with strangers.

Yes   A little   No

Not sure/skip question

80

Original Item:

To what degree does the student/intern/worker demonstrate the ability to deal with conflict?

High Ability   Some Ability   Low Ability

Adapted Item:

I can handle conflicts like disagreements or complaints.

Yes   A little   No

Not sure/skip question

81

Original Item:

To what degree does the student/intern/worker demonstrate the ability to deal with unpleasant, angry, or discourteous individuals?

High Ability   Some Ability   Low Ability

Adapted Item:

I can handle people who are mean.

Yes   A little   No

Not sure/skip question

82

Original Item:

To what degree does the student/intern/worker demonstrate the ability to communicate with others on the telephone?

High Ability   Some Ability   Low Ability

Adapted Item:

I can talk to people on the phone.

Yes   A little   No

Not sure/skip question

83

Original Item:

To what degree does the student/intern/worker demonstrate the ability to answer questions about items available for public use or purchase?

High Ability   Some Ability   Low Ability

Adapted Item:

I can answer questions about items at work.

Yes   A little   No

Not sure/skip question

84

To what degree does the student/intern/worker demonstrate the ability to speak clearly so that others can understand?

High Ability   Some Ability   Low Ability

I can speak clearly so other people can understand me.

Yes   A little   No

Not sure/skip question

85

To what degree does the student/intern/worker demonstrate the ability to listen actively?

High Ability   Some Ability   Low Ability

To what degree does the student/intern/worker demonstrate the ability to understand the speech of another person?

High Ability   Some Ability   Low Ability

I can listen and understand what people are saying.

Yes   A little   No

Not sure/skip question

86

To what degree does the student/intern/worker demonstrate the ability to work with a co-worker in a group or team?

High Ability   Some Ability   Low Ability

To what degree does the student/intern/worker demonstrate the ability to cooperate with others to accomplish work activities?

High Ability   Some Ability   Low Ability

I can work together with a team to meet a goal.

Yes   A little   No

Not sure/skip question

87

To what degree does the student/intern/worker demonstrate the ability to show compassion towards coworkers and/or clients?

High Ability   Some Ability   Low Ability

I can show coworkers and customers that I care.

Yes   A little   No

Not sure/skip question

88

Original Item:

To what degree does the student/intern/worker demonstrate the ability to work in close physical proximity to other people?

High Ability   Some Ability   Low Ability

Adapted Item:

I can work close to other people.

Yes   A little   No

Not sure/skip question

89

Original Item:

To what degree does the student/intern/worker demonstrate the ability to follow directions?

High Ability   Some Ability   Low Ability

Adapted Item:

I can follow directions.

Yes   A little   No

Not sure/skip question

90

Original Item:

To what degree does the student/intern/worker demonstrate the ability to greet customers entering establishments?

High Ability   Some Ability   Low Ability

Adapted Item:

I can greet customers when they come in to work.

Yes   A little   No

Not sure/skip question

91

Original Item:

To what degree does the student/intern/worker demonstrate the ability to monitor own body language?

High Ability   Some Ability   Low Ability

Adapted Item:

I can pay attention to how my body is positioned (body language).

Yes   A little   No

Not sure/skip question

92

To what degree does the student/intern/worker demonstrate the ability to ask clarifying questions?

High Ability   Some Ability   Low Ability

I can ask questions when I don't understand something.

Yes   A little   No

Not sure/skip question

93

To what degree does the student/intern/worker demonstrate the ability to work exposed to hazardous equipment or conditions?

High Ability   Some Ability   Low Ability

I can work in a place with dangerous equipment.

Yes   A little   No

Not sure/skip question

94

Original Item:

To what degree does the student/intern/worker demonstrate the ability to work exposed to contaminants (e.g., pollutants, gases, dust, odors)?

High Ability   Some Ability   Low Ability

Adapted Item:

I can work in a place with dust, gases, and smells in the air.

Yes   A little   No

Not sure/skip question

95

Original Item:

To what degree does the student/intern/worker demonstrate the ability to work exposed to minor burns, cuts, bites, or stings?

High Ability   Some Ability   Low Ability

Adapted Item:

I can work in a place where I could get an injury like a burn or a cut.

Yes   A little   No

Not sure/skip question

96

Original Item:

To what degree does the student/intern/worker demonstrate the ability to work exposed to potential disease or infection?

High Ability   Some Ability   Low Ability

Adapted Item:

I can work in a place that could make me get sick.

Yes   A little   No

Not sure/skip question

97

Original Item:

To what degree does the student/intern/worker demonstrate the ability to maintain sanitation, health, and safety standards?

High Ability   Some Ability   Low Ability

Adapted Item:

I can follow rules for safety, health, and cleaning.

Yes   A little   No

Not sure/skip question

98

Original Item:

To what degree does the student/intern/worker demonstrate the ability to follow institutional hand-washing standards?

High Ability   Some Ability   Low Ability

Adapted Item:

I can follow rules for handwashing.

| Yes | A little | No |

Not sure/skip question

101

Original Item:

To what degree does the student/intern/worker demonstrate the ability to monitor personal hygiene?

High Ability   Some Ability   Low Ability

Adapted Item:

I can keep my body clean.

| Yes | A little | No |

Not sure/skip question

102

APPENDIX C: RECRUITMENT EMAIL

ANDREW PERSCH
226 Occupational Therapy Building
1573 Campus Delivery
Fort Collins, Colorado 80523-1573
Andrew.Persch@colostate.edu

OCCUPATIONAL THERAPY
COLORADO STATE UNIVERSITY

COLLEGE OF HEALTH AND HUMAN SCIENCES

1 **Version Control Summary**
2
3 **Study Title:** Vocational Fit Assessment and Employment Status in People with Intellectual
4 Disabilities.
5
6 **Protocol Number:** 1675
7
8 **Document Title:** Recruitment email
9
10 **Version Number:** 1.0
11
12 **Version Date:** 1/11/22
13
14 **Person Responsible for Last Edits:** Andrew Persch
15
16 **Tool Revision History:**

Version Number	Version Date	Summary of Revisions Made:
1.0	11JAN22	Original

17

Study Name: Vocational Fit Assessment and Employment Status in People with Intellectual Disabilities
Version Date: 1.11.22

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Study of Vocational Fit Assessment: Self-Report (VFA-SR) Content Validity

Recruitment Email

Dear [CUSTOM],

You are a [Current or Past Member of the VocFit Research Team OR registered user of VocFit.com]. The VFA & VocFit.com have experienced impressive growth and we are focused on completing our NIH grant to demonstrate its reliability, validity, responsiveness, and clinical utility.

To make VocFit more useful, we are developing the **Vocational Fit Assessment: Self-Report (VFA-SR).** The first steps are a series of content validity studies. I am writing to request your participation.

If you choose to participate, we will send you a link to complete REDCap eConsent and survey questions about your background, experience with the VFA, and VFA-SR content validity ratings. This will take 60 minutes or less.

We will schedule a follow-up interview or focus group to explore content validity with you in greater depth. These meetings will take place using Zoom video-conferencing and will take 60 minutes or less.

You will receive $100 following your participation in the study (survey and interview or focus group). Payment is in the form of an Amazon gift card.

Please let me know if you have any questions

Study Name: Vocational Fit Assessment and Employment Status in People with Intellectual Disabilities
Version Date: 1.11.22

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APPENDIX D: INFORMED CONSENT FORM

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1 **Version Control Summary**
2
3 **Formal Study Title:** Vocational Fit Assessment and Employment Status in People with
4 Intellectual and Developmental Disabilities.
5
6 **Protocol Number:** 1675
7
8 **Document Title:** ADULT PARTICIPANT INFORMED CONSENT FORM
9
10 **Participant Study Title:** Content Validity of the Vocational Fit Assessment: Self-Report (VFA-
11 SR)
12
13 **Version Number:** 1.0
14
15 **Version Date:** 1/11/2022
16
17 **Person Responsible for Last Edits:** Andrew Persch
18
19 **Tool Revision History:**
20 •

Version Number	Version Date	Summary of Revisions Made:
1.0	11JAN22	Original document is the Informed Consent Form for Aim 3 Content Validity of VFA-SR.

21

Study Name: Vocational Fit Assessment and Employment Status in People with Intellectual Disabilities
Version Date: 1.11.22

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ADULT PARTICIPANT INFORMED CONSENT

Department of Occupational Therapy

PARTICIPANT STUDY TITLE: Content Validity of the Vocational Fit Assessment: Self-Report (VFA-SR)

FORMAL STUDY TITLE: Vocational Fit Assessment and Employment Status in People with Intellectual and Developmental Disabilities

PRINCIPAL INVESTIGATOR(S):   Andrew Persch, PhD, Colorado State University

STUDENT INVESTIGATOR(S):   Cristina Parsons, Colorado State University
Marisa Thum, Colorado State University

SPONSOR: National Institute of Child Health and Human Development

WHAT IF I HAVE QUESTIONS?
For questions or concerns about the study, you may contact **Andrew Persch** at:
andrew.persch@colostate.edu 970-491-3914 For questions regarding the rights of research subjects, any complaints or comments regarding the manner in which the study is being conducted, contact the CSU Institutional Review Board at: RICRO_IRB@mail.colostate.edu; 970-491-1553.

CONCISE STATEMENT OF STUDY
This research study will assess the content validity of the Vocational Fit Assessment: Self-Report (VFA-SR) using survey, interview, and/or focus group. As an expert user of the VFA, you are eligible to participate in this minimal risk study. We hope this research will be the first step towards development and validation of a Self-Report VFA. You can find more details in the body of this consent form.

WHAT IS THE PURPOSE OF THIS STUDY?
The purpose of this study is to develop a self-reported version of the Vocational Fit Assessment (VFA) for use with people with intellectual and developmental disabilities and assess its content validity.

WHY AM I BEING INVITED TO BE IN THIS STUDY?
You are an expert that is familiar with the Vocational Fit Assessment through research and/or practice.

WHERE IS THE STUDY GOING TO TAKE PLACE AND HOW LONG WILL IT LAST?
All study activities are completed electronically or virtually, from home or work. The Survey of VFA-SR Content Validity is completed electronically using REDCap and is expected to require 60 minutes. Participants will select a day, time, and private location to complete the survey. Interview/Focus Groups will be conducted using Zoom video-conferencing and will be scheduled at a mutually agreeable time. These will last 60 minutes or less.

Study Name: Vocational Fit Assessment and Employment Status in People with Intellectual Disabilities
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71 **WHAT WILL I BE ASKED TO DO?**
72 If you agree to participate in the study, we will ask you complete a survey and participate in an
73 interview or focus group. The survey includes questions about your background and experience
74 with the Vocational Fit Assessment (VFA). We will also ask you to review and provide content
75 validity ratings for the Vocational Fit Assessment: Self-Report (VFA-SR). After the survey, you
76 will be asked to complete an interview or focus group where we ask you follow-up questions
77 about the survey and your thoughts on the VFA.
78
79 **ARE THERE ANY BENEFITS FROM TAKING PART IN THIS STUDY?**
80 Being a part of this study may not help you directly, but you could feel good knowing that
81 you contributed ideas that will help improve the Vocational Fit Assessment. The thoughts
82 and opinions you share will help us to improve employment outcomes for people with
83 intellectual and developmental disabilities.
84
85 **WHAT ARE THE POSSIBLE RISKS AND DISCOMFORTS?**
86 There are few risks to participating in a focus group. It is not possible to know all risks in
87 research, but we've done our best to reduce them as much as possible. During the focus group,
88 you will be asked to share your thoughts and ideas. It is possible that you might feel
89 uncomfortable sharing your ideas in a group especially if your ideas are different from other
90 people in the group. The group leaders will remind the group that all ideas are important, and no
91 one is right or wrong. Other people might find out that you were in a research study about work
92 and disability.
93
94 **WILL I RECEIVE ANY COMPENSATION FOR TAKING PART IN THIS FOCUS GROUP?**
95 You will receive $100 following your participation in the study (survey and interview or focus
96 group). Payment is in the form of an Amazon gift card.
97
98 **WHO WILL SEE THE INFORMATION THAT I GIVE?**
99 Your privacy is very important to us and the researchers will be sure to protect it. No reference
100 will be made in written or verbal materials that could link you to this study. The only exceptions
101 to this are:
102 • If required by law but the researchers will do their best to make sure that any information
103 that is released will not say who you are.
104 • If we are asked to share the research files for audit purposes with CSU's Institutional
105 Review Board ethics committee.
106 For this study, you will be given a number so that the only place your name will appear in our
107 records is on the consent and in our data spreadsheet. (Only the researchers will have access
108 to the number for you, your code, and the data). All digital records will be stored using a
109 password protected folder. All hard copies will be stored in locked file cabinets in a locked office
110 at Colorado State University for seven years after completion of the study or until the data have
111 been analyzed and published. (After the storage time, the information gathered will be
112 destroyed.)
113
114 There are organizations that may inspect research records that may include yours. These
115 organizations are required to make sure your information is kept private, unless required by law
116 to provide information. Some of these organizations are:
117 • The study sponsor, National Institutes of Health
118 • The Institutional Review Board, IRB, is a group of people who review the research with
119 the goal of protecting the people who take part in the study.

Study Name: Vocational Fit Assessment and Employment Status in People with Intellectual Disabilities
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120 Your identity/record of receiving compensation (NOT your data) may be made available to CSU
121 officials for financial audits. Your identity/record of receiving compensation (NOT your data) may
122 be made available to CSU officials for financial audits.
123
124 National Institutes of Health (NIH) has additional protections for research they fund. Namely,
125 they consider your data to be protected under a "Certificate of Confidentiality." This Certificate
126 gives added protection for your privacy even if the records are subpoenaed. We will not give
127 information to anyone unless you provide a signed release telling us to do so, or unless we have
128 reason to suspect: 1) abuse, neglect, or endangerment of a child or elder; 2) or that anyone is in
129 immediate danger of seriously hurting himself/herself or someone else. In these situations, we
130 may have to make a report to the appropriate authorities.
131
132 If the U. S. Department of Health and Human Services (DHHS) audits our research project, they
133 can have access to information about you. However, they cannot report it to the police or use it
134 for any reason besides the audit. Even though a Confidentiality Certificate was issued, it does
135 not mean that the Secretary of DHHS supports this research project.
136
137 Participation in a focus group involves some loss of privacy. The researchers will make every
138 effort to ensure that information about you remains confidential, but cannot guarantee total
139 confidentiality. Your identity will not be revealed in any publications, presentations, or reports
140 resulting from this research study. While we will ask all group members to keep the
141 information they hear in this group confidential, we cannot guarantee that everyone will do so.
142
143 The research team works to ensure confidentiality to the degree permitted by technology. It is
144 possible, although unlikely, that unauthorized individuals could gain access to your responses
145 because you are responding online. However, your participation in this online survey involves
146 risks similar to a person's everyday use of the internet.
147
148 If you choose to take part in this study, your private information will be collected. Any identifiers
149 linking you to your private information will be removed. After we remove those identifiers, the
150 information could be used for future studies or distributed to another research for future
151 research studies without your permission.
152
153 **DO I HAVE TO TAKE PART IN THE STUDY?**
154 Research is voluntary and up to you. You do not have to participate if you do not want to. No
155 one will be upset if you do not want to participate. During the focus group, you do not have to
156 answer questions that you do not want to. It is ok to change your mind. You can STOP at any
157 time.

Study Name: Vocational Fit Assessment and Employment Status in People with Intellectual Disabilities   4
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158 **PARTICIPANT CONSENT:**
159 Your signature acknowledges that you have read the information stated and voluntarily wish to
160 participate in this **focus group**. Your signature also acknowledges that you have received, on
161 the date signed, a copy of this document
162
163
164
165 _____   _____
166 Signature of person agreeing to take part in the study   Date
167
168
169 _____
170 Printed name of person agreeing to take part in the study
171
172
173
174
175
176
177 _____   _____
178 Name of person providing information to participant   Date
179
180
181 _____
182 Signature of Research Staff

Study Name: Vocational Fit Assessment and Employment Status in People with Intellectual Disabilities
Version Date: 1.11.22

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APPENDIX E: CONTENT VALIDITY SURVEY

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OCCUPATIONAL THERAPY
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1 **Version Control Summary**
2
3 **Study Title:** Vocational Fit Assessment and Employment Status in People with Intellectual
4 Disabilities.
5
6 **Protocol Number:** 1675
7
8 **Document Title:** Survey of VFA-SR Content Validity
9
10 **Version Number:** 1.0
11
12 **Version Date:** 1/11/22
13
14 **Person Responsible for Last Edits:** Andrew Persch
15
16 **Tool Revision History:**

Version Number	Version Date	Summary of Revisions Made:
1.0	11JAN22	Original. Content for administration via REDCap

17

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18   **The Survey of Vocational Fit Assessment: Self-Report (VFA-SR) Content Validity**
19
20   ***This survey will be administered electronically using REDCap following e-Consent***
21
22   Thank you for agreeing to participate in this Content Validity Study. This survey includes:
23   •   Questions about your background and experience with the Vocational Fit Assessment
24   (VFA)
25   •   Review and content validity ratings of the Vocational Fit Assessment: Self-Report (VFA-
26   SR)
27
28   **Background**
29   1.   Name
30   2.   DOB
31   3.   Race
32   4.   Gender
33   5.   Zip Code
34   6.   Profession
35   7.   Years of transition-related experience
36
37   **Experience with the VFA**
38   1.   How did you first encounter the VFA?
39   2.   Are you a registered user of VocFit.com?
40   3.   How do you use the VFA?
41
42   ***The REDCap survey will integrate multiple components to facilitate review and rating for*
43   *content validity***
44
45   **Example Content Validity Item**
46

47
48
49   3. Is the skill (or knowledge) measured by this item:
50   a.   Essential
51   b.   Useful, but not essential
52   c.   Not necessary
53   4. The item is worded clearly and easy to understand
54   a.   Strongly Disagree
55   b.   Disagree
56   c.   Agree
57   d.   Strongly Disagree
58   5. VFA and VFA-SR items are equivalent
59   a.   Strongly Disagree

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60          b.  Disagree
61          c.  Agree
62          d.  Strongly Disagree
63    6.  The image provided supports understanding
64          a.  Strongly Disagree
65          b.  Disagree
66          c.  Agree
67          d.  Strongly Disagree
68    7.  Item Descriptors (select all as appropriate)
69          a.  This item is good
70          b.  This item is incomplete
71          c.  This item is unnecessary
72          d.  This item is repetitive
73    8.  This question could be improved by:_____
74    9.  This image could be improved by:_____
75
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