

Job matching: Development and evaluation of a web-based instrument to assess degree of match among employment preferences

Robert L. Morgan*

Department of Special Education and Rehabilitation, Utah State University, Logan, UT, USA

Abstract. To increase the probabilities of successful employment, job seekers with disabilities require precision assessment of their skills in relation to the job's requirements. Assessment of job seeker characteristics in relation to job requirements has been referred to as job matching. Ideally, job matching should be predicated on identification of an individual's job preferences and yield a listing of preferred jobs in terms of degree of match. This article describes job preference assessment, one method for assessing degree of match across preferred jobs, and initial field evaluation. Results from 18 young adults with developmental disabilities indicate the web-based program may yield scores useful in assessing degree of job match. Results are discussed in terms of implications for job seekers with disabilities and the need for additional research.

Keywords: Job matching, job preference, self-determination, ecological assessment, Occupational Information Network (O*NET), job development, stimulus preference assessment, intellectual disabilities, web-based assessment

1. Introduction

Job matching has been defined as an assessment of job seeker characteristics in relation to job requirements [4,21]. Swenson [19] refers to job matching as how well an individual's cognitive abilities, interests, and personality traits match those required for success in a particular job. As described by Smith, Belcher, and Juhrs [18], the matching process involves identifying strengths of an individual that make success on a job likely, weaknesses that might jeopardize success, and methods for overcoming weaknesses. Some authors [9, 17] caution that job matching should not imply a unitary process of seeking a compatible, entry-level job in the short-term, but instead, a sequence of well-matched career opportunities based on long-term planning.

Given the models of vocational assessment [13], job matching is probably most consistent with the ecolog-

ical model emphasizing assessment of individual characteristics and its congruence with environmental factors. Specifically, Szymanski & Hanley-Maxwell [20] described ecological assessment as a measure of (a) an individual's preferences for employment, (b) current skill levels, and (c) the requirements for preferred jobs. Job matching is particularly important for job seekers with developmental disabilities, such as individuals with intellectual disabilities, because it plays an important role in successful placement and maintenance in supported employment [8].

Assessment of employment preferences may be an important component to job matching because it (a) increases the probabilities of successful employment, (b) establishes a job seeker's motivation to develop skills necessary to be successful in employment, (c) shows respect for the individual's choices, and (d) is consistent with the philosophy of self-determination [15]. Assessment with a focus on preferences and interests is required by federal legislation for youth with disabilities in transition from school to adulthood, i.e., the Individuals with Disabilities Education Improve-

*Address for correspondence: Robert L. Morgan, Department of Special Education and Rehabilitation, Utah State University, 2865 Old Main, Logan, UT, USA. Tel.: +1 797 3251; Fax: +1 435 797 3572; E-mail: bmorgan@cc.usu.edu.

ment Act, 2004. Additionally, the Rehabilitation Act Amendments of 1998 cite the importance of individual self-determination and opportunity to make choices. Self-determination refers to the right of an individual to exert control over his/her life [22]. Some advocates for individuals with disabilities assert that assessment of personal preferences should be the driving force for job placement and career planning [1,6,23].

Numerous job matching services exist for job seekers *without* disabilities, including some on the Internet (e.g., www.headhunter.com). Web-based services are attractive because of the general public's increasing access to the Internet and the web's capacity to link people to services. Most job matching services begin with assessment of interests and skills, resulting in a list of occupations that are best-matched. Although web-based job assistance is available for individuals with disabilities (e.g., www.careeronestop.org; www.peoplresources.org), no site was found by this author offering comprehensive assessment of preferences, skills, and job requirements. Instead, sites assessed competencies (e.g., www.careeronestop.org) or availability of specific employment (e.g., www.careeronestop.org; www.people-resources.org). Further, in the case of job seekers with developmental disabilities (e.g., intellectual disabilities, autism spectrum disorder), limitations in reading skills may limit comprehension of the assessment process (e.g., questions, rating scales, vocational language) and navigation of the sites.

For interested practitioners in rehabilitation and special education, an instrument assessing preferences, skill levels, and job requirements would be useful in assisting job seekers with developmental disabilities. Assessment would likely precede job development and provide information leading to development and placement in supported or competitive employment. Three existing instruments provide data on job matching. Although not specifically described as such, Holland's Self-Directed Search (SDS) [7] may be considered an assessment of preferences, skill levels, and job requirements. The SDS is based on Holland's theory that congruence between types of people and environments will lead to occupational satisfaction, stability of career path, and achievement [7]. Holland categorizes people and environments as Realistic, Investigative, Artistic, Social, Enterprising, or Conventional (commonly known as RIASEC). Using the SDS, the job seeker identifies occupational aspirations, preferred activities, self-estimates of competencies and traits, and specific occupations named as appealing or uninteresting. The

SDS yields a two or three-letter code (such as IRE: Investigative, Realistic, and Enterprising) identifying the job seeker's personality type and a list of corresponding occupations. Form E of the SDS, specially developed for individuals with limited reading skills ranging from the fourth to sixth grade level, features a reduced assessment protocol. Researchers have conducted validation research on Form E [16]. Although designed for fourth-to-sixth grade reading level, Form E may nevertheless exclude non-readers and second-language learners with developmental disabilities who can participate in supported or competitive employment.

A second job matching instrument is Swenson's [19] Job Match Pattern which assesses the extent to which a job seeker's cognitive abilities, interests, personality traits match with a particular job's requirements. The instrument lists categories consisting of abilities, interests, and personality, and then identifies characteristics within each category. For example, the Abilities Category consists of general ability and working with numbers, words, and shapes. The Interest Category consists of working with people, data, and things. The Personality Category lists 12 characteristics as polar opposites (e.g., cooperative – competitive, submissive – assertive, etc.). A job seeker is rated on each characteristic according to a 1-to-10 Likert Scale by the manager, interviewer, or human resource staff. The ratings are then compared to ratings of a job's requirements producing the job match pattern score. The manager informally analyzes the degree of congruence between rating scores and the job match pattern. Validation data were provided on groups of individuals hired based on job matching data and those without job matching. Dependent measures consisted of percentages of individuals who quit or were fired in high turnover ($N = 13, 102$) and low turnover ($N = 5, 941$) industries. Individuals hired based on job matching in both industries showed lower rates of quitting or having been fired compared to individuals without job matching. No information was provided on job seekers with disabilities or how the job match pattern profiling process had been developed. Additionally, beyond the Interest Category, job preference was not specifically assessed.

A third instrument, the Career Satisfaction Index, was developed by DiLeo and Langton [3] as a tool for assessing job match for individuals with disabilities. This instrument is divided into categories of Elements of work/setting/people/compensation, Opportunities for advancement, and Intangibles. The Elements of Work category included an item on "Match to (job seeker name's) Interests". Items within each of these

categories (e.g., elements of work: clear/realistic expectations) receive a weighted score based on importance from 1 to 3. Then, items are rated from 1 to 5 based on how well the potential job measures up to the person's hopes for a satisfying career. Weighted scores are multiplied by ratings and summed to produce a total career satisfaction index score for a job. Although DiLeo and Langton's inventory was structured similar to Swenson's Job Match Pattern, its purpose differed in that it was designed to predict career satisfaction of job seekers with disabilities. No published validation data were found on the Career Satisfaction Index.

Rehabilitation personnel and special education transition specialists need an instrument to assess the degree of match between preferences, skills of job seekers with disabilities, and job requirements. Consistent with tools described above, the instrument should assess job seeker characteristics and job requirements on the same dimensions (e.g., working with numbers) so that a comparative score is generated for each of several items.

2. Job preference assessment

In 2005, a web-based job preference program called Your Employment Selections (YES: www.yesjobsearch.com) was designed for individuals with significant developmental disabilities and/or job seekers at second grade or lower reading level [12]. Individuals with significant developmental disabilities include those with significant cognitive disabilities, such as severe intellectual disabilities involving IQ scores of 40 or below concurrent with limitations in adaptive behavior. The web-based program was retooled from a CD ROM instrument developed by a grant from the Office of Special Education and Rehabilitative Services. The YES website shows 2–4 min of motion video from as many as 120 jobs and allows the participant to select a list of about five most preferred ones to guide transition or rehabilitation planning [10]. An initial set of decisions reduces the length of the assessment to less than 60 min. Most of the assessment can be completed by a job seeker using a mouse at computer terminal, although a facilitator (i.e., rehabilitation counselor, special education transition specialist) is encouraged to assist. Facilitators work with individuals or small groups of job seekers by assisting with computer operations or answering questions. Although the majority of the assessment requires limited reading skill, a *More Info* section provides text-based descriptions on

job outlook, qualifications, training requirements, advancement opportunities, wages and benefits, related occupations, and links to web sites related to the job and employment services. A narrator's voice accompanies the videos (with closed captioning) and describes the critical tasks in each job analysis. After viewing video clips, job seekers make a sequence of decisions related to work conditions, tasks, and specific jobs. The selection process follows a research-based model called stimulus preference assessment [2] in which an individual with disabilities considers two stimuli (in this case, job videos) and selects one or neither as preferred. Jobs selected for inclusion in the YES program were entry-level positions, commonly identified placements of individuals with disabilities, and those representing emerging markets [11]. Table 1 presents the list of 120 jobs in the program.

3. Job matching assessment

Recently, a pilot version of a job matching assessment was added to the YES program. After a participant identifies preferences, the facilitator enters additional data to identify which of the preferred jobs is considered the best-matched one. The process is accomplished in six steps.

3.1. Reduce the list

The first task is to narrow the list of preferred jobs from about five to two or three. Reducing the list requires the facilitator, job seeker, or support team to consider the local job market, availability of jobs, training and qualifications, educational requirements and opportunities, advancement potential, transportation concerns, and other factors. These factors are not a part of the web-based job matching assessment, because they are considered better addressed by the stakeholders familiar with the job seeker and contextual issues. The reduced list of preferences are identified and entered into the assessment.

3.2. Access the O*NET importance dimensions

The job matching program takes advantage of data on dimensions of Knowledge (e.g., Deductive Reasoning), Skill (e.g., Mathematics), and Ability (e.g., Depth Perception) available from the list of descriptors at the Occupational Information Network (O*NET: <http://online.onetcenter.org/find/descriptor>). A total of

Table 1
List of jobs in the job preference program arranged according to work conditions

Mostly Outdoors
Able Seaman, Airport Utility Worker, Amusement Park Worker, Asphalt Paver, Boat Repair Worker, Brick Mason, Carpenter, Dock Worker, Equipment Operator
Farmer – Dairy, Farmer – Grain, Forest Worker, Garbage Collector, Gardener, House Painter, Logger, Mail Carrier, Messenger, Nursery Worker, Utility Cable Worker.
Indoor/Heavy Work/Mostly Alone
Auto Mechanic, Building Painter, Carpet Cleaner, Cutting Machine Operator, Domestic Housekeeper, Dry Cleaner, Electrician, Grocery Stocker, Hotel Housekeeper, Insulation Worker, Janitor, Laundry Worker, Plumber, Sewing Machine Operator, Sheet Metal Worker, Shop Painter, Slot Machine Repairer, Upholstery Worker, Welder, Woodshop Assistant.
Indoor/Heavy Work/Interact with Co-Workers
Auto Body Repairer, Auto Detailer, Butcher, Department Store Clerk, Farm Equipment Mechanic, Fast Food Cook, Fire Station Attendant, Food Preparation Worker, Furniture Mover, Hand Packer, Heating and Air Conditioning Worker, Machinery Maintenance Worker, Machinist, Print Press Operator, Restaurant Cook, Shipping/Receiving Worker, Tool and Die Maker, Veterinary Assistant,
Video Assistant, Warehouse Worker. Indoors/Heavy Work/Interact with Public
Arcade Worker, Baggage Porter, Baker, Child Care Worker, Copy Center Worker, Dining Room Attendant, Driver/Sales Worker, Fast Food Cashier, Grocery Cashier, Grocery Clerk, Home Health Aide, Licensed Practical Nurse, Locksmith, Occupational Therapy Assistant, Personal Care Aide, Physical Therapy Assistant, Radiological Technician, Recreation Assistant, Security Guard, Waiter/Waitress.
Indoors/Light Work/ Interact with Co-Workers
Bicycle Repairer, Chemical Plant Worker, Communications Equipment Mechanic, Computer Repairer, Data Entry Worker, Electronics Assembler, Floral Designer, Frame Shop Worker, Graphic Artist, Greenhouse Worker, Health Information Technician, Motor Vehicle Dispatcher, Order Clerk, Packing/Filling Operator, Pest Control Worker, Pet Care Worker, Plastics Machine Operator, Robotics Machine Operator, Secretary, Sign Shop Worker.
Indoors/Light Work/Interact with Public
Airport Passenger Assistant, Auto Parts Sales, Bank Teller, Barber, Customer Service Representative, Dental Assistant, Hair Stylist, Hotel Desk Clerk, Human Service Worker, Library Worker, Manicurist, Medical Assistant, Paraeducator, Pharmacist Technician, Receptionist, Rental Clerk, Retail Salesperson, Service Station Attendant, Telemarketer, Theater Worker.

106 dimensions were identified for this job matching program. O*NET has assigned an importance weighting to each dimension as it relates to each of hundreds of occupations. In the database, each listed dimension includes a definition and a numeric rating (unimportant = 0 to important = 100). Importance weightings for the O*NET dimensions were assigned to the jobs in the YES program. Five skill dimensions were eliminated when judged by the author to be less relevant to entry-level positions for job seekers with developmental disabilities (e.g., Management of Financial Resources, Systems Analysis) and 13 pairs of knowledge dimensions were combined for parsimony (e.g, Biology and Chemistry). When pairs of dimensions were combined, an average importance weighting was computed for a job. Importance weightings vary across jobs; for example, Mathematic Skills were weighted 35, 66, and 87 for Airport Passenger Assistant, Auto Mechanic, and Locksmith, respectively. Table 2 presents the names of 106 dimensions transferred from the O*NET database to a database developed for the job matching website. The job matching database stores importance weightings for 106 dimensions for each of 120 jobs in the YES program.

Commissioned by the U.S. Department of Labor, the American Institutes for Research and its subcontractors

developed the O*NET database [14]. The database was compiled from survey research of employees holding certain jobs and occupational analysts. Data were generated from a mean of 19 employees and a minimum of six occupational analysts for each job in the O*NET database, and included reliability and validity data [14].

3.3. Enter data on job seeker skill ratings for each of 106 dimensions

The facilitator considers the job seeker's current skill levels in regard to the same 106 dimensions. The definition of each dimension is presented on the screen for the facilitator's reference. Using a button to the left of each dimension name, the facilitator clicks a mouse to rate the job seeker according to how well a match exists between the job seeker's current behavior or performance and the dimension. The facilitator rates the job seeker on each dimension by clicking either the *Good*, *Fair*, or *Poor* button. Figure 1 shows a facilitator's rating of one dimension.

3.4. Multiply importance by rating

A computer program assigns a number (*Good* = 2, *Fair* = 1, *Poor* = 0) to each skill rating. The skill rating

Table 2
Names of 106 knowledge, skill, and ability dimensions

(1) Active Learning/Active Listening, (2) Learning Strategies, (3) Mathematic Skills, (4) Money Skills, (5) Time-Telling Skills, (6) Reading Comprehension, (7) Written Comprehension and Expression, (8) Job-Related Reading Skills, (9) Speaking, (10) Speech Clarity, (11) Speech Recognition, (12) Oral Comprehension and Oral Expression, (13) Writing, (14) Time Management, (15) Time Sharing, (16) Social Coordination, (17) Personnel and Human Resources, (18) Customer and Personal Service, (19) Instruction, (20) Negotiation, (21) Persuasion, (22) Service Orientation, (23) Monitoring, (24) Judgment and Decision Making, (25) Deductive Reasoning, (26) Inductive Reasoning, (27) Critical Thinking, (28) Flexibility and Speed of Closure, (29) Fluency of Ideas, (30) Equipment Maintenance/Equipment Selection, (31) Installation, (32) Controlling, Monitoring, and Analyzing Operations, (33) Programming, (34) Quality Control Analysis, (35) Repairing, (36) Technology Design, (37) Troubleshooting, (38) Memorization, (39) Originality, (40) Visualization, (41) Problem Sensitivity, (42) Selective Attention, (43) Perceptual Speed, (44) Spatial Orientation, (45) Dynamic Flexibility, (46) Dynamic Strength, (47) Explosive Strength, (48) Gross Body Coordination, (49) Gross Body Equilibrium, (50) Stamina, (51) Static Strength and Trunk Strength, (52) Arm-Hand Steadiness, (53) Control Precision, (54) Finger Dexterity and Manual Dexterity, (55) Multi-limb Coordination, (56) Rate Control, (57) Reaction Time, (58) Response Orientation, (59) Speed of Limb Movement, (60) Wrist-Finger Speed, (61) Auditory Attention, (62) Hearing Sensitivity, (63) Sound Localization, (64) Depth Perception, (65) Far Vision, (66) Near Vision, (67) Near Vision, (68) Peripheral Vision, (69) Glare Sensitivity, (70) Visual Color Discrimination, (71) Administration and Management, (72) Economics and Accounting, (73) Biology and Chemistry, (74) Physics, (75) Medicine and Dentistry, (76) Science, (77) Building and Construction, (78) Engineering and Technology/Mechanical, (79) Design, (80) Clerical, (81) Communications and Media, (82) Computers and Electronics, (83) Telecommunications, (84) English Language, (85) Foreign Language, (86) Geography, (87) Law and Government, (88) Mathematics Knowledge, (89) Education and Training, (90) Psychology, Sociology, and Service, (91) Fine Arts, (92) Public Safety and Security, (93) Sales and Marketing, (94) Transportation, (95) Food Production, (96) Production and Processing, (97) Appearance and Hygiene, (98) Appropriate Communications to Co-Workers and Employer, (99) Appropriate Communications to Public, (100) Following Directions, (101) Responding Appropriately to Correction, (102) Recognizing and Reporting Potential Hazards/Emergencies, (103) Responding to Hazards/Emergencies, (104) Safety Awareness, (105) Punctuality, (106) Self-Initiative.

Rate Job Seeker Skills For (Job Seeker s Name Here)

Using the buttons below, rate (the Job Seeker s name here) according to how well a match exists between the Job Seeker s current skill performance or behavior and the job dimension.

Sequence Number	Rating			Job Dimension	Description
	Good	Fair	Poor		
4 of 106				Money Skills	Ability to accurately add, subtract, multiply, and divide amounts of money. Also, ability to accurately compare sums of money, use basic banking facilities, and independently make informed, appropriate decisions regarding money.

Fig. 1. Drawing of one computer screen from the job matching assessment.

is multiplied by the importance weighting for a dimension and stored in the computer. For example, if the facilitator clicks the *Good* button for Mathematic Skills and this dimension has an importance weighting of 60 for a particular preferred job, the computer calculates two times 60 = 120. If the facilitator clicks *Poor*, the computer assigns 0. After 106 dimensions are rated based on the job seeker’s skill and multiplied by the individual importance weightings, the product scores are summed. In the job matching database, different jobs have varying total importance weightings. For example, if total importance weightings were summed for the jobs of Airport Passenger Assistant, Auto Mechanic, and Locksmith, the totals are 8,000, 11,558, and 10,680, respectively. Therefore, the summed product

score must be divided by the total importance weighting to produce a proportion score. The proportion score, which varies from 0.00 to 1.00, is produced by dividing the summed product score by the maximum possible score for a job.

Table 3 illustrates the computation of a proportion score for a preferred job. For example, if a job seeker’s summed product score (all facilitator ratings of the job seeker’s skills and behaviors times all importance weightings for 106 dimensions) equals 4,000 and the maximum possible score (all *Good* ratings) is 8,000, the proportion score would be 0.50. The proportion scores for preferred jobs are ranked and presented to the facilitator and job seeker as a measure of relative

Table 3
Illustration of the computation of a proportion score for one preferred job

Step 1. The facilitator rates the job seeker's skill levels as <i>Good</i> , <i>Fair</i> , or <i>Poor</i> on 106 job dimensions.	Example: Mathematics Skills = <i>Fair</i> , Money skills = <i>Poor</i> , Time-Telling Skills = <i>Good</i> , etc.
Step 2. For each preferred job, the computer program multiplies each rating by the importance weighting to create a product score.	Example: For Airport Passenger Assistant, Mathematics Skills (<i>Fair</i> = 1 point) times importance of Mathematics Skills (20) = 20. Money Skills (<i>Poor</i> , 0 point) times importance of Money Skills (14) = 0. Time-Telling Skills (<i>Good</i> , 2 points) times importance of Time Telling Skills (87) = 174.
Step 3. For each preferred job, the computer program sums all product scores.	Example: Sum (20, 0, 174, etc.) = 4,000.
Step 4. Divide the product score by the maximum possible score (<i>Good</i> ratings for all 106 dimensions times the total importance weighting).	Example: For Airport Passenger Assistant, the summed product score = 4,000. The maximum possible score was 8,000.
Step 5. Report the proportion score to the job seeker and facilitator.	Example: Airport Passenger Assistant = 0.50.

job match. From high to low, rated jobs are identified as Jobs 1, 2, and 3.

3.5. Review strengths and weaknesses associated with best-matched job

In addition to reviewing the job matching scores, the facilitator and job seeker can examine a list of strengths and weaknesses associated with the best-matched job. The computer program recognizes strengths as dimensions weighted 70 or higher in importance and rated *Good*, and weaknesses as dimensions weighted 70 or higher in importance and rated *Poor*. Strengths may be important to emphasize in the job marketing process, while weaknesses may represent targeted areas for training or accommodation.

3.6. Interpret the job matching scores and their impact on job development

The facilitator, job seeker, or support team may want to re-examine the list of strengths and weaknesses, revisit individual dimensions, and brainstorm factors that may change the interpretation of scores. There may be factors that impact the scores, such as diminished functioning due to an injury or a change in medication. Skill ratings may vary across facilitators and prompt the support team to seek multiple raters. These and other considerations may affect job matching scores and change direction of the job development efforts.

4. Initial field evaluation of the job matching assessment

In 2007, the author conducted initial field evaluation on the job matching assessment. Although small in scale, the evaluation sought to determine the capacity of

the assessment to discriminate among preferred jobs for individuals with developmental disabilities. Specific questions included the following:

1. To what extent do proportion scores discriminate among preferred jobs?
2. Can proportion scores rank degree of match from high to low?
3. Can proportion scores be divided into qualitative categories, such as Excellent, Good, Fair, and Poor matches to ease interpretation by facilitators and job seekers?
4. Are differences in proportion scores associated with differences in numbers of identified strengths and weaknesses?

4.1. Participants, facilitators, and supervising classroom teachers

Job preference and matching assessments were conducted for 18 youth (17 diagnosed with Severe Intellectual Disabilities, one diagnosed with Autism Spectrum Disorder) including 10 males and eight females. Ages of participants ranged from 17 years, 1 month to 21 years, 9 months (*mean* = 18 years, 2 months). Given available records on intellectual assessments for 16 of the 18 participants, *Full Scale IQ* scores ranged from 45 to 61 (*mean* = 56.1). Records were unavailable for two participants. All participants were involved in high school or post-high school (for 18 to 21 year old students in special education) classrooms for youth classified as severely intellectually disabled according to the State's standards. Each participant's Individual Education Program (IEP) included vocational or employment-training goals in preparation for transition to adult roles. In addition, 16 of 18 participants had received some degree of on-the-job employment training in community job settings (*range in duration*

= one to 15 months, *mean* = 2.6 months). Fourteen of 16 participants with on-the-job employment training had participated on only one job site; two participants had received training on two sites. Two participants had not received on-the-job training because their IEPs focused on improvements in academic skills pending future employment training.

Facilitators were 18 undergraduate students working towards bachelor's degrees and licensure as special education teachers, including 17 females and one male. Facilitators ranged in age from 20 to 52 years (*mean* = 25.4 years). Facilitators were enrolled in their second semester of teacher education courses and were involved in a course on transition from school to adult roles. Each facilitator was placed in a 6-hour-per-week, school-based internship working with students with severe intellectual disabilities. All facilitators were required to complete an assignment by administering the web-based job preference and job matching assessment to youth in a high school or post-high school special education program. Facilitators were responsible for contacting classroom teachers and identifying a participant for whom job preference/matching assessment was appropriate. Signed consent was received by all parents/guardians prior to assessment.

Three classroom teachers supervised activities of individual facilitators and assisted with job matching assessment. Each teacher was a licensed special education teacher with specialization in severe disabilities. Classroom teachers answered questions of facilitators about individual participants in regards to their goals, objectives, work experience, and skill levels.

4.2. Settings and materials

Assessments were conducted at computer terminals in the participant's classroom at one of three locations. The products of assessments were printouts listing job matching proportion scores for two or three preferred jobs and lists of strengths and weaknesses for the best-matched job. Facilitators used a wristwatch or other timing device to determine the duration of the job preference and matching assessment.

4.3. Procedures

Prior to the assessment, facilitators received a demonstration from the author in administration and scoring. Procedures for administering the job preference assessment are described elsewhere [11]. Facilitators reviewed the 106 job matching dimensions

and practiced procedures of rating participant skills and behaviors on dimensions. Because most facilitators worked with participants in school-based practicum settings, they had some notion of knowledge, skills, and abilities. However, some facilitators were unfamiliar with participants. Therefore, to standardize procedures, all participants were required to defer to their supervising classroom teachers who assigned the *Good*, *Fair*, or *Poor* ratings for each dimension. Facilitators and the author communicated scoring procedures to the classroom teachers. However, supervising teachers were not directly involved in the demonstration or practice of the job matching assessment. The author remained available to teachers to answer questions. Although no data were collected on inter-scorer agreement, facilitators and teachers appeared clear on the assessment purpose and procedures.

Each facilitator and teacher completed the job matching assessment for an individual participant. The facilitator described to the teacher that the purpose of the assessment was to "determine which preferred job is best matched to (the participant's) current skill levels." The facilitator explained that for each preferred job, importance weightings on 106 dimensions had already been loaded into a database. The task of the teacher was to "rate the participant on how well a match exists between the participant's current skill and the dimension." The program was constructed in such a way that no dimension could be skipped, i.e., each dimension had to receive a rating. When all dimensions had been rated, the program prompted the facilitator to print out a two-page summary. On the first page of the summary, text read:

"Based on your ratings, the best-matched job was (name of Job 1). The rating score was (score here). The score can range from 0.00 to 1.00. A high score indicates that the best-matched job is within the participant's current knowledge, skills, and abilities to perform, although training may still be necessary to meet standards and formal requirements of the job. A low score indicates that the best-matched job may still require considerable training or accommodation for the participant. The other jobs received lower matching score. The score for Job 2 (name of job here) was (score shown here). The score for Job 3 (name of job here) was (score shown here)."

On the second page of the summary, text read: "Strengths for the best-matched job, (name of Job 1), included (names of dimensions listed here). Weaknesses for the best-matched job (name of Job 1) included (names of dimensions listed here)." For purposes of

the course assignment, the facilitator turned in print-outs and a two-page summary report describing the job matching results.

4.4. Data compilation

The author compiled participant data to identify (a) individual proportion scores, (b) mean, standard deviation, range, and rank of proportion scores for the best-matched job (i.e., Job 1); (c) mean, standard deviation, and range of proportion scores for Jobs 2–3; (d) whether differences existed in a participant's proportion scores for Jobs 1–3 (as opposed to tied scores); (e) numbers of strengths and weaknesses for each participant's best-matched job; and (f) names of best-matched jobs. Differences in proportion scores were important if the job matching assessment were to discriminate among jobs. Additionally, the author compared the rank order of Job 1 proportion scores to ranks of numbers of strengths and numbers of weaknesses. The author computed Spearman rank-order correlations [5], a non-parametric statistic for small samples, comparing proportion score ranks to ranks of numbers of strengths and weaknesses.

5. Results and discussion

Proportion scores for two or three jobs were obtained for 18 participants. Job 1 scores ranged from 0.37 to 0.93 (*mean* = 0.63, *SD* = 0.19). Job 2 scores ranged from 0.30 to 0.87 (*mean* = 0.60, *SD* = 0.16). Job 3 scores ranged from 0.33 to 0.84 (*mean* = 0.59, *SD* = 0.15). For Job 1, proportion scores were equally distributed above ($n = 9$) and below ($n = 9$) the mean. Differences were found in most proportion scores as 16 of 18 participants' scores for Job 1 were higher than scores for Job 2. The remaining two participants had tied scores. The mean difference score between Job 1 and Job 2 was 0.03. Fourteen of 16 participants' scores for Job 2 were higher than scores for Job 3. The mean difference score between Job 2 and Job 3 was 0.03. Two participants did not select a preference for Job 3.

Relatively small difference scores across participants may indicate that preferred jobs were already restricted in range as participants, facilitators, and teachers reduced the list. That is, preferred jobs less compatible with participant skills and behaviors may have been eliminated before the job matching assessment. Yet, participants with the widest range between Job 1 and Job 3 scores were not those with higher job

Table 4
Participants' Job 1 Scores in Descending Order with
Frequencies of Identified Strengths and Weaknesses

Participant	Job 1 score	Number of strengths	Number of weaknesses
1	0.93	14	0
2	0.90	12	0
3	0.86	15	0
4	0.83	16	0
5	0.80	9	0
6	0.79	10	0
7	0.69	14	1
8	0.66	9	2
9	0.65	9	0
10	0.56	8	1
11	0.55	2	0
12	0.51	9	3
13	0.51	7	2
14	0.45	7	4
15	0.43	1	5
16	0.42	2	10
17	0.40	2	10
18	0.37	3	10

matching scores nor were participants with narrowest range between Job 1 and Job 3 scores those with lower job matching scores. Additional research is necessary on distributions and differences among job matching scores.

Table 4 presents participants' Job 1 scores in descending order along with frequencies of identified strengths and weaknesses. As shown, higher job matching scores were associated with more strengths and less weaknesses. Lower scores were associated with less strengths and more weaknesses. The decision rule (i.e., strengths = dimensions with importance weighting of 70 or higher and rated *Good*; weaknesses = dimensions with importance ratings of 70 or higher and rated *Poor*) appears to correspond relatively well with the value of the Job 1 matching score. The correlation between score rank and number of strengths was 0.88, and the correlation between score rank and number of weaknesses was 0.89. Although some degree of correlation would be expected given the decision rule was dependent on job matching score, the calibration of the rule appears to discriminate relatively well between high and low scores. Weaknesses must be interpreted with caution, because they provide no information about a participant's skill level in the context of performing a particular job. However, they may help identify general areas to be targeted for training or accommodation. Future research should compare strengths and weaknesses from the job matching assessment with those identified through other means, such as skill assessment instruments or facilitator interviews.

In most cases, degree of job match could be judged based on how closely the proportion scores approximated 1.00. Although additional data from a larger sample are needed, job matching scores more than one standard deviation above the mean (i.e., 0.82 and higher), along with numerous strengths and few weaknesses, likely predict high compatibility between current skill levels and preferred jobs. Conversely, scores more than one standard deviation below the mean (i.e., 0.43 and lower) with several weaknesses likely predict low compatibility. Given the relatively wide range of proportion scores across participants, qualitative categories representing degree of job match can be explored. However, assigning specific categories with cut-off scores awaits additional data from a larger sample of participants and facilitators.

Across 18 participants, 52 preferred jobs from the preference program were subjected to the matching process (three jobs for 16 participants; two for two participants). Three jobs were identified as the best matched for multiple participants. For three participants, the best-matched job was Pet Care Worker, followed by Library Assistant and Fast Food Cashier for two participants. For remaining participants, the best matched job was Copy Center Assistant, House Painter, Child Care Worker, Arcade Worker, Food Preparation Worker, Greenhouse Assistant, Carpet Cleaner, Cutting Machine Operator, Baker, Dining Room Attendant, or Dairy Farmer.

Facilitators and teachers commented that job match scores provided useful data leading to additional training and job development. For example, one facilitator commented "Cindy's teacher can now design and focus IEP goals on the strengths and skills Cindy may need in the specific field of work she has chosen for her career path." A teacher indicated "The job matching assessment will show parents and other team members what the student wants to do and the weaknesses that need to be addressed."

The job preference assessment required an average of 45 min to complete (*range* = 20–70 min) and the job matching assessment required an average of 20 min (*range* = 10–25 min). In most cases, the two assessments were completed in 60 to 90 min across multiple sessions.

5.1. Limitations of the research

The initial field evaluation of the job matching assessment involved inherent limitations that compromised interpretation and generalization of the data.

Chief among them was the limited number of participants and facilitators. Also, these individuals represented a convenience sample. The initial evaluation served its purpose to generate data to determine whether the job matching assessment was functional and would yield information useful to job seekers and facilitators. However, additional research must be carried out with larger samples representing individuals with developmental disabilities and facilitators. Second, future research should clarify and standardize roles of the facilitators. The use of undergraduate students as facilitators and teachers as consultants may have altered ratings and confounded the job matching data. Future research should clearly define facilitator roles, arrange for multiple raters so that inter-rater reliability can be assessed. Third, job matching assessment must be extended to its most socially valid criterion, i.e., whether high job matching scores predict improved work performance, rapid skill acquisition, and satisfaction with employment. Finally, the job matching assessment in its current form provides the job seeker and facilitator with a list of strengths and weaknesses regarding the best-matched job but without guidance on what to do with them. At minimum, users need information on how to reduce the impact of weaknesses by arranging training or accommodations through rehabilitation counseling, skills development, or other resources.

6. Conclusions

Findings from this initial field evaluation indicate the potential for generating an assessment that yields a metric for gauging degree of match among preferences, skills, and job requirements. With additional research and development, the job matching assessment may become one important component that will assist job seekers with developmental disabilities in gaining supported or competitive employment. As a web-based program, it may take its place among job matching services readily available to job seekers in the general public and assist job seekers, transition specialists, and rehabilitation professionals in the job placement process. As a program for job seekers with significant developmental disabilities, it may represent a method for assessing degree of match for those individuals often excluded from community employment.

On a cautionary note, job preference and matching assessment should not be interpreted as a way to expedite an individual's job placement in such a way as to delimit or diminish the ongoing process of achieving

greater career capacity or aspiring to different occupations. Michaels [9] and Trach [21] emphasize that individuals with disabilities have the right to participate in or determine their long-term career planning with expectations far exceeding their current skill or job. Career planners should not use job preference and matching assessments as a “quick fix” but as a way to establish a job seeker’s motivation towards a career plan maximizing aspiration and achievement.

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