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ABSTRACT

This newsletter issue describes a programmatic line of research to develop and standardize a test battery of transition skills (employment and independent living skills) for adolescents and young adults (ages 14 to 25) who are deaf. The newsletter first discusses the importance of assessment data to the transition process for persons who are deaf. Three federally funded research projects are then summarized, including: (1) development and testing of the Transition Competence Battery (TCB), which involved specification of the content blueprint, generation of test items, pilot test of a written and signed (video) format, and analysis of test items and subtests; (2) examination of the small group administration mode and multiple-choice response format, through videodisc; and (3) development of a shorter instrument to use as a screening tool. The TCB comprises six subtests: job seeking skills, work adjustment skills, job-related social and interpersonal skills, money management skills, health and home skills, and community awareness skills. (Contains 28 references.) (JDD)

TEACHING RESEARCH

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Special Education Activities

The purpose of this newsletter is to share with you our activities and projects. Each issue features a different project or activity. This issue describes the development and standardization of a test battery for transition skills (employment and independent living skills).

A list of our demonstration sites and those who manage them follows:

Early Childhood/Special Education
- Teaching Research Child Development Center:
  - Director: Pam Deardorff
  - Associate Teachers: Cassie Kroeker, Claudia Austin-Prevost
  - Assistant Teachers: Doris Maruame, Cindy Brown
- Early Intervention Staff:
  - Coordinator: Patty Severns
  - Infant/Toddler Specialists: Margaret McCaffrey, Muriel Liggett

Services for Persons with Moderate and Severe Disabilities
- Training Staff: Torry Templeman, Carol Bunse, Joyce Peters, Gary Glasenapp, Kathy Haydon, Lisa Carlson, Tom Udell
- Supported Work Training for Adults: Kirk Hendrickson, Miriam Waintrup, John Gallagher, Kim Miller
- Residential Supervisor: Bud Fredericks
  - Group Home for Adolescents with Severe Handicaps, Polk County: Eric Karlinger
  - Group Home for Adults with Profound Handicaps, Clackamas County: Daphne Richardson
  - Adult Sex Offender Program: Trish Mark
- Marion County Children's Project: Evelyn Ferris

Services for Students with Severe Emotional Disturbances
- Supervisor: Vicki Evans
  - High School Resource Room, Salem Public Schools: TBA
  - Training in Classroom Services: Vicki Evans
  - Vocational Program for Adolescents, Marion County: Phillip Martinez
  - Group Home for Adolescents, Marion County: Kelly Knechtel
  - Apartments for Adolescents: Jacque Edinger
  - Foster Parent Training: Vicki Evans

ASSESSING THE TRANSITION SKILLS OF ADOLESCENTS AND YOUNG ADULTS WHO ARE DEAF THROUGH VIDEO TECHNOLOGY

This issue of the Teaching Research Newsletter describes a programmatic line of research directed by Dr. Michael Bullis to develop and standardize a test battery of transition skills (employment and independent living skills) for adolescents and young adults (ages 14 to 25) who are deaf. In the summer of 1986 Dr. Bullis was awarded a Field Initiated Research grant from the federal Office of Special Education Programs (OSEP) to begin the development process of the Transition Competence Battery (TCB) (Reiman & Bullis, 1990). More importantly, the notification of this award coincided to the day with the adoption of his son (Matt, or Grant as he is known to many). Shortly thereafter, Dr. John Reiman and Dr. Cheryl Davis were hired to coordinate various aspects of the work. In 1989 a second grant was awarded to Dr. Bullis by OSEP to explore the efficacy of different administration and response formats for the TCB, and to transfer the TCB to a videodisc format. In the summer of 1992 a third grant was awarded to Drs. Reiman and Bullis from the National Institute on Disability and Rehabilitation Research's Field Initiated Research competition in order to develop and standardize and shortened version of the TCB, the "Mini-TCB."

This newsletter first discusses the importance of assessment data to the transition process for persons who are deaf. Following that section, each of the three projects are summarized.

Background

Reliable and valid assessment data should be gathered to guide and structure focused and effective transition intervention programs for all persons with disabilities (DeStefano, 1987; Frey, 1984; Marut & Innes, 1986; Shiels, 1986; Sligar, 1983). Unfortunately, there are few instruments designed specifically to assess the transition skills of deaf adolescents and young adults (Reiman & Bullis, 1987). Typical practice is to administer traditional psychometric tests (e.g., IQ tests) or functional measures designed for other populations (e.g.,

vocational skill tests developed for learning disabled adolescents). Such measures are routinely presented by administrators (interpreters or clinicians) possessing varying levels of sign language competence (Levine, 1974; Stewart, 1986). Based on the lack of other assessment alternatives, this approach is logical, but the veracity of data gathered in this manner--and subsequent intervention decisions based on these results--are questionable for two primary reasons.

First, deafness is a condition defined by its unique expressive and receptive communication modalities that differ significantly from those of our English-based hearing society. Many deaf people use a bona fide language (American Sign Language or ASL) with no structural relationship to English; which relies on visual rather than auditory encoding and decoding; and which has a rule-governed phonology, syntax, and morphology (Reiman & Bullis, 1989). These fundamental communicative differences warrant paramount consideration when conducting any assessment of deaf people's transition skills. Can the deaf person use an interpreter in an effective manner in a job interview? Does the individual know his or her legal rights when interacting with a policeman? Can the person formulate a strategy to communicate effectively with co-workers? Questions such as these are highly relevant to successful community adjustment. Review of published research on measurement procedures with this population, however, reveals that tests designed for other populations do not address these crucial skills in any systematic way, nor have investigations delineated the particular skills and content necessary for deaf people to succeed in work and living endeavors (Bullis & Reiman, 1989; Reiman & Bullis, 1987).

Second, any time the administration procedures of a standardized assessment tool are altered, the validity of the resulting assessment data must be questioned. Consider a measure of functional skill knowledge that was devised for use with and standardized on a group of adolescents other than those who are deaf (e.g., learning disabled). If that tool is administered using sign communication in place of verbal instructions, such substitution violates the standardization procedures of the measure and technically invalidates the tool (Gerweck & Ysseldyke, 1979; Standards, 1985; Yoshida & Friedman, 1986). Consequently, the resulting data are suspect due to the absence of psychometric standards of the measure for that type of application.

Accordingly, there was a clear need to develop language-appropriate and psychometrically sound measures of transition skills for deaf persons. Three fundamental assumptions guided the research and development process that we followed.

First, one of the major stumbling blocks in conducting research with or understanding investigations of this group, is that all too often deaf people are regarded as homogeneous. Quite the contrary, this population is highly heterogeneous, encompassing people with varying levels of auditory capabilities, linguistic skills, cognitive abilities, social skills, and emotional development. Consequently, the construction of an assessment battery, that is content relevant for a particular subgroup, requires the clear delineation of the segment of the population for which the instrument is to be used. Based on results of previous research (Bullis, 1985), the population for whom this instrument was constructed are described in the following way. This description parallels the "low functioning" term (or as we prefer, "low-achieving") that is often used to characterize a group of deaf people who do not attend 4-year colleges or succeed in work or living endeavors in the community, and for whom few services and little research is available (Bowe, 1988).

> Members of the subject population are devoid of a seriously complicating secondary disability, but some may present mild secondary conditions (e.g., wear glasses, heart murmur, etc.). Further, members of the subject population possess limited English reading skills (e.g., read at approximately the third grade level). The subject population does not include persons who go on to a 4-year college or university, but may include persons who attend community college or vocational/technical training centers. More than likely, members of the sample are those persons who either dropout of high school, seek employment immediately upon leaving high school, or go on to some type of rehabilitation or community-based training program. Finally, members of the subject population have little experience and/or training in employment and independent living skills.

Second, the assessment process should begin with an examination of the individual's knowledge of requisite transition skills to work and live successfully in the community. Knowledge of how to behave is a necessary foundation of behavior (Bandura 1977), and studies suggest that knowledge of functional skills is correlated to actual skill performance for persons with mild cognitive impairments (Bullis & Foss, 1986; Landman, Irvin, & Halpern, 1980).

Third, in order for assessment to be connected to transition instruction or training, it is critical that the measurement tools that are used represent the content of the particular domain of concern. Stated differently, measures of functional skills should be composed of items that adequately sample the knowledge and skills necessary for the deaf person to succeed in his or her transition from the school to the community. It follows that the parameters of transition, i.e., the work and independent living skills necessary for the target group of deaf persons to achieve success in community settings, must be clearly defined.

First Project: Development and Testing of the TCB

In line with the above assumptions, a domain sampling model of test construction (Nunnally, 1978) was adopted in the first project. In this approach, the content definitions of the employment and independent living domains for the target population were determined. These boundaries were then utilized as a blueprint for test construction, with test items generated within these parameters.

Specification of the Content Blueprint

A workshop was held with 18 professionals from the Northwest in the field of deafness to identify critical work and independent living skills for the target population. The workshop employed the Nominal Group Technique (NGT) (Delbecq, van de Ven, & Gustafson, 1975) to answer two questions.

1. What are the five most important employment-related skills for a member of the target population?

2. What are the five most important independent living-related skills for a member of the target population?

The lists of skills generated by workshop participants were grouped into three employment related subdomains (Job Seeking Skills, Work Adjustment Skills, Job Related Social/Interpersonal Skills) and three subdomains related to independent living (Money Management, Health and Home,

Community Awareness). These skill areas were then evaluated in a national survey of practitioners and leading "experts" in the field of deafness, a technique designed to insure broad geographical and social validity of the skills (Kazdin, 1977). Respondents were instructed to rate each skill on two 4-point Likert scales in terms of importance (its importance to the ultimate employment or independent living success of members of the target population) and on presence (the percentage of persons in the target population possessing the competency). The idea was to identify those skills that were most important but demonstrated by the lowest percentage of the target population.

A total of 307 deaf and hearing service providers (representing residential and mainstream schools, community colleges, and rehabilitation programs) completed the survey (Bullis & Reiman, 1989). Analyses were conducted with this data set to identify the most critical transition competencies, from the perspective of professional opinion. To complement and modify the content definition drawn from both the NGT and the national survey, a literature review in this subject area was used to clarify, expand, and/or condense this listing (Reiman & Bullis, 1987). The six subdomains and their associated content areas are presented in **Table 1** (Employment Domain) and in **Table 2** (Independent Living Domain). These six subdomains of transition for this part of the deaf population eventually became the six subtests of the TCB, and provided the framework used to structure the item generation activities.

Generation of Test Items

A second group of 20 professional service providers (hearing and deaf) were assembled for training on test item construction. These persons possessed direct experience with the target population in work and/or independent living programs, and a working knowledge of sign communication (ASL, Pidgin Sign English, and Manually Coded English). The goal of the workshop was to teach the requisite skills for writing test questions in each of the previously identified content areas.

Particular emphasis was placed on defining those categories in which TCB items would be written--the knowledge, comprehension and application categories (Bloom, 1956)--in the form of 3-option, multiple choice questions. The format was chosen to minimize correct answers due to guessing (Nunnally, 1978) and because 3-option multiple choice questions have been demonstrated to be valid for use with adolescents and young adults with mild cognitive disabilities (Bullis & Foss, 1986; Landman et al., 1980). Linguistic structures (i.e., conditionals, minimal information pronouns, comparative, negatives, etc.) of potential difficulty for the target population were next identified and their use cautioned. Lists of words commensurate with a third grade reading level (the TCB target level) were introduced and reviewed. Finally, highly structured practice time for item writing was included with all participants writing and critiquing practice sets of questions.

Six weeks after the workshop, participants submitted more than 900 test items that were subsequently edited for content, duplication, and adherence to item construction criteria. Editing involved eliminating or significantly modifying inappropriate or inaccurate items and/or distractors. At the conclusion of the editing process, slightly more than 200 items remained that were distributed across the six content subdomains and that addressed each of the content areas. **Figure 1** presents sample items.

Pilot Test of a Written and Signed (Video) Format

To truly measure the subject population's knowledge of TCB content--and not merely reflect their English language capabilities--a combined written and signed administration approach seemed appropriate. There are, though, few guidelines on which to base such a tool, so it was necessary to carefully examine the veracity of this administration approach. As a place to start, it was decided that a small group (n=4 to 8) procedure that employed videotaped, signed directions coupled with a simply worded and illustrated test booklet, would be most expedient and cost effective. That is, a group of deaf persons would be shown the questions and their respective responses on the monitor and read the question in the test manual. On an individual basis they would mark the correct answer on a separate answer sheet. After a prespecified length of time the entire group would then be administered the next question.

From the edited item pool, a subset of 30 test items was selected. These items were representative of multiple presentation styles (e.g. positioning and size of signer and character generation) and varying levels of reading complexity. (Note: Some items required students to read actual bus schedules or recipes as these are skills required in the "real world." In these instances the reading level of the items was not limited to the third grade level.) Correct answers and distractors for the 30 items were randomly positioned, and written materials including a test booklet and separate answer sheet were developed.

Next, a videotaped version of the 30 test items was developed in American Sign language (ASL), with a certified interpreter signing the question stem and the three possible responses. For many items, the salient information contained in the stem and/or the responses was reproduced using character generation which appeared simultaneously with, and just to the left of, the signer.

The pilot test was administered to 36 hearing impaired subjects located in three sites: mainstream high school juniors/seniors, n=8; residential high school seniors, n=16; community college deaf program students, n=12. A process evaluation was conducted following each administration of the pilot test in the various sites. Overall, these comments were positive regarding the relevance of the test content and the level at which it was presented, but two very important points were apparent. First, the number of subjects reporting difficulty in understanding ASL raised serious questions regarding the viability of this language as the choice for the TCB. Second, subjects reported annoyance with the videotape moving too slowly. Both the length of the countdown and the response time between items were distressing for some students who, having answered the question, were ready to move to the next question without a prolonged waiting period. Each of these issues were carefully considered in the development of the TCB.

Final Development

From the results of the pilot-test it was decided that the videotaped, signed version of the TCB should be presented in Pidgin Signed English (PSE) (sign communication using primarily English word order with ASL signs and ASL grammatical features). The reported difficulties with the videotape moving too slowly necessitated a re-examination of the timing patterns within and between test items. At issue

Table 1. Employment Skills and Content Areas

Employment Domain

Job Seeking Skills Subdomain

- E-1 The individual should be able to use an interpreter appropriately and effectively in a job interview.
- E-10 The individual should have knowledge of the pay and benefits that can be expected for the job.
- E-14 The individual should be aware of legal rights in getting a job and in terms of job advancement.
- E-16 The individual should display appropriate dress and hygiene when interviewing for a job.
- E-17 The individual should be aware of the language and terms that are used in the job application and in the interviewing process.
- E-18 The individual should be able to respond to and ask appropriate questions in the job interview.
- E-21 The individual should have knowledge of resources and agencies to use for help in finding a job.
- E-23 The individual should display appropriate assertiveness in searching for a job.
- E-24 The individual should be able to demonstrate appropriate resume writing skills and competence in completing job applications.
- E-25 The individual should demonstrate job-related reading skills

Work Adjustment Subdomain

- E-3 The individual should be able to obtain training opportunities that are available through the current job.
- E-5 The individual should be able to manage a work schedule to meet deadlines.
- E-7 The individual should demonstrate appropriate dress and hygiene in the work place.
- E-8 The individual should be able to understand and follow the work supervisor's instructions.
- E-9 The individual demonstrate job-related mathematics skills.
- E-12 The individual should have knowledge of work safety rules.
- E-13 The individual should be able to demonstrate appropriate procedures for quitting a job.
- E-20 The individual should be able to work without direct supervision when appropriate.
- E-25 The individual should to demonstrate job-related reading skills.

Job-Related Social/Interpersonal Skills Subdomain

- E-2 The individual should be able to accept criticism from work supervisors.
- E-11 The individual should be able to communicate effectively with the work supervisor.
- E-19 The individual should display appropriate assertiveness on the job toward co-workers.
- E-22 The individual should be able to keep personal concerns and worries under control in the work place.
- E-26 The individual should have an awareness of co-workers' and supervisors' lack of knowledge about deafness.
- E-27 The individual should demonstrate appropriate control and management of anger and frustration in the work place.

Table 2. Independent Living and Content Areas

Independent Living Domain

Money Management Subdomain

- IL-1 The individual should demonstrate independent-living related mathematical skills.
- IL-2 The individual should be able to demonstrate effective comparative shopping skills (i.e., auto, clothes).
- IL-3 The individual should demonstrate independent living reading skills.
- IL-8 The individual should be aware of appropriate skills in money management, budgeting, and bill paying.
- IL-21 The individual should be able to maintain accurate financial and personal records (i.e., taxes, warranties, medical).
- IL-25 The individual should have knowledge of how contractual agreements work (e.g., rental contracts).

Health & Home Subdomain

- IL-1 The individual should demonstrate independent-living mathematics skills.
- IL-3 The individual should demonstrate independent-living reading skills.
- IL-9 The individual should be able to search effectively for housing.
- IL-12 The individual should have knowledge of insurance needs (auto, health, life, home).
- IL-16 The individual should be able to maintain and care for personal belongings.
- IL-18 The individual should be able to access emergency services (e.g., ambulance) in the community.
- IL-20 The individual should have knowledge of family planning and sex education.
- IL-22 The individual should demonstrate appropriate cooking skills.
- IL-23 The individual should demonstrate appropriate health related skills (nutrition, exercise, hygiene).
- IL-28 The individual should have knowledge of drug and alcohol abuse.

Community Awareness Subdomain

- IL-6 The individual should have knowledge of leisure/recreational options in the community.
- IL-7 The individual should be able to communicate effectively with community workers (mail carriers, maintenance workers).
- IL-10 The individual should be able to use public transportation.
- IL-15 The individual should be able to use TDD and technical signaling devices that are available in the community.
- IL-17 The individual should demonstrate appropriate self advocacy skills with community service agencies (i.e., DVR).
- IL-24 The individual should be aware of legal rights in the community.

LEAVING	1	2
Court & High	Center & 13th	Center & 24th
WEEKDAYS		
6:15	6:20	6:26
6:45	6:50	6:56
7:15	7:20	7:26
7:45	7:50	7:56

3. Use the bus schedule above to answer this question. You live near Court and High. You work near Center and 24th. What time does the bus leave that will arrive at Center and 24th at 7:26?

   A. 7:15 a.m.
   B. 7:20 a.m.
   C. 7:45 a.m.

28. You are at a job interview with a boss and you are using an interpreter. Where should your interpreter sit during your job interview?

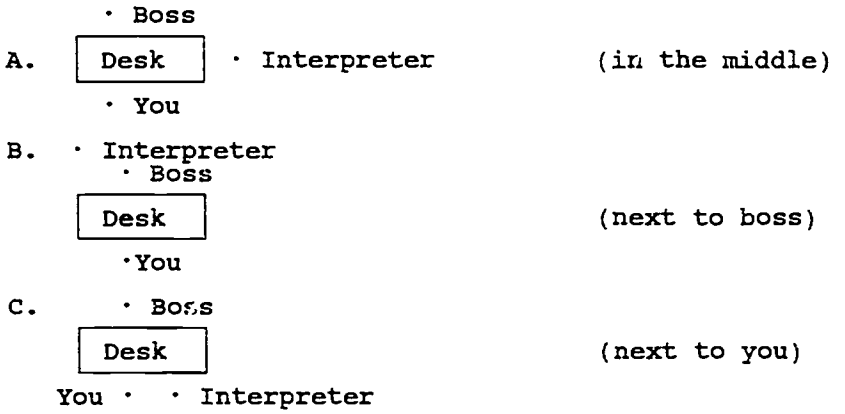

Figure 1. Sample Test Items

was the need to allot increments of response time that would be reasonable given the heterogenous abilities of the target population. Based on staff observations during the pilot testing of the actual time individuals used to respond to each item, the timing patterns of the videotaped form were adjusted downward and gauged to respond to the middle on a continuum of subjects' demonstrated needs. Finally, the group administered, 3-option multiple choice format for the test battery was maintained.

All subtests were produced in a professional recording studio using a certified sign language interpreter and extensive use of character generation on the monitor to highlight key aspects of the test questions and their responses. Before beginning the testing, a set of practice items were administered on videotape to orient the individuals to the demands of the testing process. Items in each subtest were randomly assigned a position, and each item's responses (the correct response and the two distractors) were randomly assigned to be either "a," "b," or "c." The six original subtests, with the amount of time required to administer each and their respective number of items, are listed below.

* Subtest 1: Job Seeking Skills for Employment (54 minutes:28 seconds; 38 items)
* Subtest 2: Work Adjustment Skills for Employment (40:45;32)
* Subtest 3: Job Related Social/Interpersonal Skills for Employment (34:38;27)
* Subtest 4: Money Management Skills for Independent Living (36:30;23)
* Subtest 5: Health and Home Skills for Independent Living (42:39;33)
* Subtest 6: Community Awareness Skills for Independent Living (37:34;28)

Field-testing of the TCB

Field-testing of the TCB was conducted in 14 sites from across the country representing urban and rural settings, as well as residential and mainstream programs. In all cases, project staff visited each site, trained program staff in the administration of the TCB, and then either administered the subtests to all subjects or closely monitored the testing by program personnel. Because of the amount of time necessary to administer the entire battery, some sites administered only the employment subtests or only the independent living subtests. Thus, between 181 to 230 subjects participated in the field-testing. The majority were male (56% to 58%), from residential schools (53% to 74%), were deafened prelingually (before age 3) (79% to 84%), were between 18 to 19 years of

age at the time of testing (means 18.69 to 19.07), and read at around the third grade level (mean of 3.1 grade level).

Item Statistics. Two different kinds of item statistics were computed for each subtest: item difficulty, or the percentage of subjects who answered each item correctly; and point-biserial or item-total correlations, that indicate the relationship of each subtest item to the total subtest. As a statistical guideline for retention in the TCB subtests, items were to possess a point-biserial correlation of at least .2 and a moderate level of difficulty (between .4 to .8). Also to be retained, each item was judged to be conceptually appropriate. Consideration of these standards resulted in the deletion of 18 items. These decisions reduced the number of items in each subtest and the time required to administer each.

* Subtest 1: Job Seeking Skills for Employment (48 minutes:13 seconds; 33 items)
* Subtest 2: Work Adjustment Skills for Employment (39:48; 31)
* Subtest 3: Job Related Social/Interpersonal Skills for Employment (33:35; 26)
* Subtest 4: Money Management Skills for Independent Living (32:27; 20)
* Subtest 5: Health and Home Skills for Independent Living (38:34; 29)
* Subtest 6: Community Awareness Skills for Independent Living (33:12; 24)

Subtest Characteristics. The average score of each subtest and its standard deviation, and the average percent of the questions answered correctly for each subtest are presented in the two right columns of **Table 3**.

Two types of reliability indices were computed for each of the TCB subtests. Coefficient alpha internal consistency reliability indices are presented in the left column of **Table 4**. We also conducted a study of each subtest's test-retest reliability. Sixteen deaf persons representing mainstream and community college programs (9 males and 7 females, 13 of whom were deafened pre-lingually, with an average age of 20.387) were involved in the test-retest study of the employment subtests. Twenty-eight students from residential school programs (15 male and 13 female, 25 of whom were deafened pre-lingually, with an average age of 17.283) participated in the test-retest of the independent living subtests. The right column of **Table 4** provides the test-retest reliability indices calculated for each subtest. In general, these indices are acceptable for a screening measure such as the TCB.

In contrast to reliability, validity is a test property that must be established over time through repeated studies and in various ways (Messick, 1989; Nunnally, 1978). In this first project we were able to address two types of test validity: content and construct validity.

Nunnally (1978) states that the content validity of a measure is demonstrated best through the procedures followed in its development. That is, the steps followed in identifying and sampling dictate in large part whether or not the test adequately samples content from the domain of concern. Given the extensive procedures followed to develop a content matrix across the employment and independent living domains, and to generate content-relevant test items, it can be judged that the TCB and its six subtests are content valid.

Construct validity, on the other hand, is demonstrated by the way the assessment instrument relates to a theoretical model of the construct being measured (Kerlinger, 1986; Messick, 1989; Nunnally, 1978). One method to establish construct validity is the discriminant group or social comparison approach (Bellack & Hersen, 1988; Bolton, 1987; Kerlinger, 1986; Nunnally, 1978; Wiggins, 1973). In this technique, the researcher theorizes that a subject group for whom the particular measure was not constructed will perform in a very different way on the test than a subject group for whom the measure was designed. Results confirming the hypothesis provides evidence supporting the measure's construct validity. To establish such a criterion group, 13 deaf undergraduate students were recruited to participate in this investigation who were administered all of the TCB subtests. It was hypothesized that this group would score differently, i.e., higher, on each of the six TCB subtests than would members of the target population. To compare the college group's performance on the TCB with that of the target population's, two groups of residential subjects and two groups of mainstream subjects (each consisting of 13 subjects) were randomly selected from the standardization pool of subjects. Statistical comparisons were conducted on each of the subtests and these groups. These analyses resulted in highly statistically significant differences favoring the college student's performance on each of the subtests. Calculation of the effect size yielded results that would be considered as "large" differences (i.e., effect size greater than .80 between pairs of groups on a particular measure, Cohen [1988]).

As a further test of the construct validity of the TCB, inter-correlations of the TCB subtests and pertinent demographic variables for the group of subjects (n= 158) that took the entire test battery were calculated. Statistically significant, but weak correlations (in the .20 range) were exhibited among gender, type of school program (mainstream vs. residential), age, and subtest performance. A pattern of low, negative correlations were found describing the relationship between pre- and postlingual hearing loss (hearing loss before age 3 as compared to hearing loss after age 3) and subtest performance. These results suggest that these demographic variables were not strongly related to test performance, providing additional evidence for this test property.

Project 2: Examination of Administration Modes and Response Formats through Videodisc

While the results of the first project were strong, there was an aspect of the TCB that demanded further investigation. That is, the administration mode (small group, n=4 to 8) and response format (3-option multiple choice) chosen of the battery were based on "educated guesses," without benefit of any empirical guidance. In the fall of 1989, then, a second grant to study to address this issue was initiated. In this study the use of group, individual (a proctor administered the subtests to a single deaf person at a time), and self administration (the deaf person independently answered the test questions on his or her own by responding on a computer keyboard) combined with multiple choice and true/false response formats was examined. The videotape version of the TCB was transposed to videodisc, because of this technology's great advantages of flexibility and clarity, through the facilities at Utah State University under the direction of Dr. Ron Thorkildsen.

Design/Production

Different forms of two subtests of the TCB (one from the vocational domain and one from the independent living domain) were developed and transferred to interactive videodisc. The two subtests were Subtest 3- Job-Related Social Skills and Subtest 4- Money Management Skills.

Table 3. Subtest Characteristics

	Mean Item Difficulty (mean, sd)	Item-Total Correlation (mean, sd)	Mean Score (mean, sd)	Mean Percent Correct	Number of Items
Subtest 1: Job Seeking Skills for Employment (n = 230)	.677 .101	.374 .122	22.348 6.504	.677	33
Subtest 2: Work Adjustment Skills for Employment (n = 181)	.714 .121	.373 .143	22.144 5.824	.714	31
Subtest 3: Job Related Social and Interpersonal Skills for Employment (n = 230)	.725 .122	.404 .114	18.843 5.222	.725	26
Subtest 4: Money Management Skills for Independent Living (n = 190)	.507 .155	.247 .119	10.132 3.527	.507	20
Subtest 5: Health and Home Skills for Independent Living (n = 189)	.548 .170	.288 .092	15.884 5.036	.548	29
Subtest 6: Community Awareness Skills for Independent Living (n = 188)	.661 .140	.338 .126	15.851 4.560	.661	24

Table 4. Subtest Reliabilities

	Internal Consistency	Test-Retest
Subtest 1: Job Seeking Skills for Employment	.864	.896
Subtest 2: Work Adjustment Skills for Employment	.857	.828
Subtest 3: Job Related Social and Interpersonal Skills for Employment	.860	.849
Subtest 4: Money Management Skills for Independent Living	.668	.613
Subtest 5: Health and Home Skills for Independent Living	.777	.766
Subtest 6: Community Awareness Skills for Independent Living	.801	.844

The adaptation of the subtest forms conformed to the following sequence. First, the original administration instructions for the TCB were rewritten to reflect the individually administered, self-administered, and true-false formats. The instructions for each form were essentially the same, with the exception of slight modifications related to content, response format, or administration mode. Second, for the appropriate form, test items were rewritten in the true/false response format. Each item was randomly designated as being either true or false. If designated as true, the item was rewritten to embody the correct response alternative of the item. If designated as false, the incorrect distractor that drew the highest percentage of respondents in the first project was chosen and the item rewritten to reflect this response. Each administration mode utilized the same practice items, structured according to administration and response requirements of the particular experimental condition.

The true/false forms were videotaped at facilities at Oregon State University in which the original TCB was produced. The tapes were edited and a master tape (1" master) was be sent to Utah State for transfer to videodisc. Each videodisc was restructured to contain a "clock bank." The clock bank contained the maximum amount of time that would ever be needed and through the branching nature of videodisc, only that portion of the total time per question would be utilized. The clock bank or timing screen included both the representation of a clock with hands and a digital clock to show remaining time, with a visual "flash" near the end of the count down to get the attention of the user that another question was about to be presented. It was proposed that this flash occur at the seconds 5, 4, 3, 2, 1, and 0.

Production for the first test disc was completed in the spring of 1990. After initial testing in Oregon, several minor problems were evident. These issues were addressed by staff at both institutions and resolved. The final versions of the subtests were produced in the fall of 1990, and prepared for field-testing.

Method

The purpose of this project was to examine the effect of different administration modes and response formats in the assessment of deaf adolescents and young adults. While it makes sense that different approaches and methods of assessment would produce different results, these differences must be judged in relation to some standard, or standards, of "correctness." For example, just because a particular administration mode and response format produced higher test performance than another, did not mean that these results were necessarily "better." Accordingly, the psychometric characteristics of the subtest and item characteristics were examined, as well as to study the relationship of test performance to an external standard. These criteria included third party ratings of actual skill and, in some cases, comparison of subtest performance to data from the preliminary standardization sample.

Research Design. The design adopted for this project included two independent variables: administration mode (group, individual, and self) and item response format (multiple choice and true/false). It was not possible to randomly assign all subjects to experimental conditions, so sites were assigned to administration mode based on three pragmatic variables: entry into the project, number of subjects, and stated preference. Once the site was assigned to an administration condition, subjects within the site were assigned to a response format condition. That is, subjects were administered either Subtest 3- Job-related Social Skills in the multiple choice response format and Subtest 4- Money Management Skills in the true/false response format, or Subtest 3- Job-related Social Skills in the true/false response format and Subtest 4- Money Management Skills in the multiple choice response format. This research approach is best characterized as a two-way--3 (administration mode) x 2 (response format)--quasi-experimental design (Cook & Campbell, 1979) (**Figure 2**).

Response Format	Administration Mode		
	GROUP	INDIVIDUAL	SELF
MC			
T/F			

Key
MC - Multiple Choice
T/F - True/False

Figure 2. Research Design

Procedures. A total of 309 deaf persons participated in this study. These persons represented 18 mainstream, residential, and rehabilitation sites from across the country. At some sites Teaching Research staff administered the subtests, while at others program staff conducted the testing. In all cases, the administration procedures described previously were strictly followed. Third party rating scales were completed on most subjects at each site by third party raters who were judged as being sufficiently aware of each individual's work and independent living skills.

Results. At this writing the final report for this project is being completed. Given space constraints it is not possible to present all of the findings, so key results are summarized below.

* Item-total (Point-biserial) correlations for the total sample for Subtest 3- Job-related Social Skills and Subtest 4- Money Management Skills favor the group and individual administration modes and the multiple choice response format. In fact, the low point biserial correlations for the true/false response format indicate a more random test performance profile in that condition as compared to the multiple choice response condition.

* For both of the subtests, higher scores were associated with the true/false format and the individual and self administration modes.

* Internal consistency reliability indexes were higher for the multiple choice response condition than for the true/false response condition. However, the individual administration mode tended to result in a higher index than did the group administration mode.

* For the entire sample, on both subtests, higher correlations were found between the multiple choice response condition and third party ratings, than between the true/false response condition and third party ratings.

* Performance on the practice items (i.e., those who did not miss any practice items vs. those who did miss practice items) clearly was associated with varying performance levels

(those who did not miss practice items tended to score higher on both subtests).

* The subgroup of subjects who did not miss any practice items exhibited higher internal consistency reliability indexes than those subjects who miss practice items.

* The subgroup of subjects who did not miss any practice items exhibited higher correlation between test scores and third party ratings across subtests than did other subjects. Within this group, the multiple choice response format demonstrated higher correlations than the true/false response condition.

Taken together. these data suggest that the multiple choice response format was superior to the true/false response format. exhibiting higher item statistics, internal consistency reliabilities, and correlations to outside criteria. Therefore, we believe it is safe to conclude that the multiple choice response format for the TCB is preferred.

The issue of which administration mode optimum is not as clear. Overall, it appears that the group administration mode is appropriate for most deaf adolescents and young adults (approximately 80% of those tested in this study) the group administration mode is appropriate and should be used, especially in light of its cost efficiency (e.g., being able to test a group of 4 to 8 subjects in the same time it takes to test one). However, this recommendation must be tempered by two points: (a) persons who missed practice items performed differently (i.e., poorer) than those who do not and (b) there is an indication that when the subtests were administered individually scores and psychometric characteristics were higher. Accordingly, it makes the most sense that to identify those subjects who miss any practice items and to assess them through an individual administration. There is an intuitive appeal to this recommendation, as well, as the one-to-one interaction provides the most control and direct information and impressions to the examiner.

Two other points should be noted. First, the self administration mode was not fully tested in this study. From the subjects we did test, it appeared a viable approach. The subjects who were administered the subtests in this manner, though, were older and in community college placements; thus, it may be that this impression would not hold for high school age, non-postsecondary bound deaf persons. Still, the self administration approach deserves further investigation. Second, Subtest 4- Money Management Skills remains an enigma, as performance on this subtest was variable and low. This finding, though, was consistent with the results of the initial project. so this result may not be indicative of any shortcoming in the subtest. That is, it may mean that this is an area that is inherently difficult and intensive instruction may be necessary for the majority of deaf adolescents and young adults to be proficient in these skills.

In summary, these results support the multiple choice response format and, for the majority of deaf individuals, the group administration format. The subgroup analyses revealed that persons who miss practice items tend to score lower than those who do not, and there was higher subtest performance when the measures were administered individually. Accordingly, we recommend that those persons who miss practice items should be identified and tested individually. Accordingly, all six of the TCB's subtests have been transposed to videodisc and the administration directions are being rewritten to reflect these findings.

Project 3: Development of the Mini-TCB

The response we have received to the TCB has been overwhelming positive. However, nearly all professionals who have participated in our projects state that they would prefer an instrument that is shorter to use as a screening tool. If the key items in the TCB reflecting overall performance could be identified. it would be possible to construct a shorter instrument for this purpose. Performance on this measure could be used to identify gross skill deficits, and to develop a preliminary profile of the deaf subject's skill level across the six subtests. Areas identified as potentially weak, in need of further examination. could be identified and assessed further with the appropriate subtest.

The purpose of this project, then, will be to construct a screening instrument that could be used in just such a manner: The Mini-TCB. During this past year (1991-1992) we established a contract with Northern Illinois University and its Research and Training Center on Deafness, to conduct sophisticated item-parameter analyses. These procedures were conducted by Drs. Greg Long and Nisha Mittal and Ms. Chris Reid, to identify those items from the TCB that are the "best" predictors of subtest performance. At this point, a pool of 50 to 60 items have been identified and will be considered for inclusion in the Mini-TCB. In Year 1 of this project the initial version of the Mini-TCB will be produced on videodisc through the facilities at Utah State University, pilot-tested, and then finalized. In Year 2 the Mini-TCB will be field-tested in residential and mainstream schools across the country. In Year 3, we will conduct two validation studies of the instrument.

Conclusion

This issue concludes with two final thoughts. First, It would be naive to believe that only one measure should be used in the appraisal of transition skills. Comprehensive assessment of deaf persons should include traditional psychometric measures, work evaluation samples, direct situational assessments, as well as the TCB. To identify such a battery, it will be necessary to conduct research to identify the most effective instruments to include such assessments.

Second, in a very real sense, in the development of the TCB, we content-analyzed the specific type of work and living skills a deaf person in the target group must exhibit to succeed in transition. This information is critical for the development of an assessment battery, but also for training. Our next goal is to submit proposals that will allow us to develop curriculum packages in each of the six content areas of the TCB. In this way, professionals would be offered an interlocking assessment and training program geared directly to this population. We are hopeful that at some point we will be able to write a newsletter detailing those future projects.

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MATERIALS LIST

In the transition area the following materials are available from Teaching Research Publications.

Associated work skills: A manual. The Teaching Research Special Education Department Staff. Teaching Research Publications, Monmouth, Oregon 97361. $10.00

Functional Living Skills for Adolescents and Adults with Mild and Moderate Disabilities: Budgeting Skills. Nishioka-Evans, V., Kraus, D., Ferguson, C., & Fredericks, B. Teaching Research Publications, Monmouth, Oregon, 97361. 1990.

The Teaching Research curriculum for handicapped adolescents and adults: Personal hygiene. Fredericks, H. D., Makohon, L., Bunse, C., Heyer, M., Buckley, J., Alrick, G., & Samples, B. Teaching Research Publications, Monmouth, Oregon 97361. $10.00

The Teaching Research curriculum for handicapped adolescents and adults: Dressing, clothing care and selection. Fredericks, H. D., Heyer, M., Makohon, L., Bunse, C., Buckley, J., Trecker, N., Egan, I., Johnson-Dorn, N., Miller-Case, V., Fay, M. L., Paeth, M. A., Alrick, G., & Samples, B. Teaching Research Publications. Monmouth, Oregon 97361. $20.00

The Teaching Research curriculum for handicapped adolescents and adults: Assessment procedures. Petersen, J., Trecker, N., Egan, I., Fredericks, H. D., & Bunse, C. Teaching Research Publications, Monmouth, Oregon 97361. $10.00

The Teaching Research curriculum for mildly and moderately handicapped adolescents and adults: Taxonomy and assessment. Nishioka-Evans, V., Hadden, C., Kraus, D., Johnson, J., Fredericks, H., & Toews, J. Teaching Research publications, Monmouth, Oregon. $10.00

The Teaching Research curriculum for mildly and moderately handicapped adolescents and adults: Telephone skills. Nishioka-Evans, Fredericks, H., Toews, J., Hadden, C., Moore, W., and Dooley, M. Teaching Research Publications, Monmouth, Oregon. $10.00

Transition for Persons with Deaf-Blindness and other Profound Handicaps. Fredericks, H. D., Covert, A. Teaching Research Publications, Monmouth, Oregon 97361. $10.00

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