THE DEVELOPMENT OF THE OPINIONS ABOUT DEAF PEOPLE SCALE: A SCALE TO MEASURE HEARING ADULTS' BELIEFS ABOUT THE CAPABILITIES OF DEAF ADULTS

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This report documents the development of a scale to measure hearing adults' beliefs about the capabilities of deaf adults. An item pool created from a list of misconceptions about deaf people was used to develop a 35-item Opinions About Deaf People scale, piloted with 38 university undergraduates. A revised 20-item version of the scale was piloted with 290 undergraduates. A coefficient alpha of .83 was obtained from the second pilot, with item-total correlations ranging from .22 to .58. Factor analysis demonstrated a General Deaf Capabilities factor (eigenvalue = 5.39). Some items also correlated moderately to strongly with an Intelligence factor (eigenvalue = 1.70). Construct validity was established through correlation with Cowen's Attitudes to Deafness scale ($r = .75$). Analysis supports that a reliable and valid scale has been developed that can be used to measure hearing adults' beliefs about the capabilities of deaf adults in education, employment, and other appropriate settings.

Although federal legislation mandates that equal employment and educational opportunities must be granted to deaf Americans (Americans with Disabilities Act of 1990; Nondiscrimination on the Basis of Handicap, 1991; Rehabilitation Act of 1973, Section 504), attitudinal barriers preventing such opportunities still exist (Beaudry & Hetu, 1990; Berkay, 1991; Strong & Shaver, 1991). Researchers have suggested that to remove effectively such barriers, the attitudes of hearing individuals toward hearing-impaired people

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should be measured in order to assess attitudes that are maladaptive or open to revision (Beaudry & Hetu, 1990; Berkay, Gardner, & Smith, 1994; Schroedel & Schiff, 1972; Strong & Shaver, 1991). The purpose of this report was to document the development of an instrument to assess hearing adults' beliefs about the capabilities of deaf adults. When diagnosing attitudinal barriers that might prevent opportunities for hearing-impaired individuals, we believe that a scale specifically measuring beliefs about the capabilities of deaf adults is more helpful than one measuring general attitudes toward deafness.

A review of the literature failed to uncover a published scale that specifically measures beliefs of hearing adults about the capabilities of deaf adults. In fact, we found that there was only one widely used scale developed to measure general attitudes toward deafness: the Attitudes to Deafness (ATD) scale (Cowen, Bobrove, Rockway, & Stevenson, 1967). One reason for the widespread use of the ATD scale has been its extensive and thorough development and validation process (Beaudry & Hetu, 1990; Strong & Shaver, 1991). The ATD scale has been criticized, however, for having items with low item-total correlations and for the developers' failure to conduct a factor analysis (Beaudry & Hetu, 1990). It has also been criticized because more than half of the items in the ATD's original item pool was adapted from the Attitude to Blindness scale (Cowen, Underberg, & Verrillo, 1958).

In addition to the ATD, researchers have developed two instruments to measure attitudes toward deafness that were adapted from instruments originally constructed to measure attitudes toward other disabilities. The original instruments were Siller, Ferguson, Holland, and Vann's (1967, 1968) Disability Factor Scales (DFS) and Yuker, Block, and Campbell's (1960) Attitudes Toward Disabled Persons (ATDP) scale. Through an extensive development process, a Deafness (DFS:D) scale was adapted from the original DFS scales (Beaudry & Hetu, 1990; Ferguson, 1970; Schroedel & Schiff, 1972). The ATDP scale also was adapted to measure attitudes toward deafness (Furnham & Lane, 1984; Furnham & Pendred, 1983).

For many items in both the DFS:D and the deaf version of the ATDP, those authors merely replaced the phrase "disabled person" in the original instruments (or a phrase for another disability, such as "blind person") with "deaf person." They also added new items that related directly to deaf people. Beaudry and Hetu (1990) discussed their concern that reliability and validity studies from scales developed for general attitudes toward disabled persons could not be generalized to studies that adapted these scales to measure attitudes toward deafness, especially when additional items were added to the original scales.

To avoid some of the problems with these three existing scales, the entire item pool for the scale in the current study was based upon a review of the literature on deafness rather than on items from any existing instruments

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developed to measure attitudes toward other disabilities. The previous development process used by past researchers was not used here because we were concerned that items developed for other disabilities might not focus on important attitudes regarding the unique characteristics of deaf people. Therefore, the substitution of the words "deaf" or "deafness" into existing items developed for general disabilities or other specific disabilities was not considered. We also avoided some of the limitations of the ATD scale by conducting a factor analysis and removing items with low item-total correlations.

The specific purpose of this investigation was to examine the psychometric properties of a newly constructed scale to measure hearing adults' beliefs about the capabilities of deaf adults including (a) the reliability of the scale, (b) the factor structure, and (c) construct validity.

Method

The Construct

The instrument was developed to assess hearing adults' beliefs about the capabilities of deaf adults. Because subjects often use themselves as frames of reference when making judgments about others (Nunnally, 1978), beliefs about these capabilities were determined by comparing deaf people's capabilities to hearing people's capabilities. We conceptualized this construct as a continuum between two extreme types of hearing individuals: those who believe that deaf people are equally as capable as hearing people and those who believe that deaf people are less capable than hearing people. (We realize that many people's beliefs are not consistent across all contexts. Many individuals may believe that deaf people are capable in some areas and not in others.)

It is assumed that a hearing adult who believes that deaf adults have equal capabilities would also believe that deaf people possess the same intelligence and skill level as hearing people, with the exception of the ability to process verbal language and to hear. A hearing person who believes in equal capabilities would be aware that there are many low-functioning deaf people who possess low intelligence and abilities, but that there are also many low-functioning hearing people in the same situation. More specifically, aspects of the "equal capability" belief were identified from the literature as follows:

1. A belief that the normal distribution of intelligence within the deaf population is comparable to the distribution of intelligence within the hearing population (Nester, 1984).
2. A belief that deaf people possess the ability to (a) take care of themselves and live independently (Oklahoma Department of Human Services, 1993); (b) gain and maintain employment in either blue- or white-collar occupations, depending on their qualifications (Decaro, 1981); (c) drive safely on public

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roads (Baker & Cokely, 1980); (d) perform academically on a comparable level with their hearing peers (Culton, 1975; Murphy, 1976); and (e) find ways to communicate with hearing people, even when an interpreter is not present (Foster, 1987).

Development of the Opinions About Deaf People Scale

In order to determine the most common misconceptions that hearing people have about the capabilities of deaf adults, a review of the literature was conducted. In addition, six deaf professionals were interviewed to obtain anecdotal information about such misconceptions. The misconceptions that were mentioned fell within the following categories: (a) intelligence, (b) dealing with traffic, (c) job skills, (d) independent living, (e) communication skills, and (f) academic skills. The goal was to develop a univariate scale that adequately reflected as broad a range of misconceptions as possible. In order to achieve this, blueprints were designed so that all of these categories would be adequately represented in both a 35-item pilot scale and a 20-item revised scale. Using the blueprint as a guideline, the writers developed the 35-item Opinions About Deaf People (ODP) scale for an initial pilot study. A 4-point Likert scale was used with this instrument in order to avoid a neutral point, which might allow subjects to avoid committing to an attitude (Nunnally, 1978).

This 35-item scale was reviewed by measurement specialists, as well as by those in the field of deaf education. Minor revisions were then made prior to conducting the first pilot. The initial pilot study using the 35-item scale was conducted with 38 students enrolled in an undergraduate course in a teacher education program at a southwestern university. We revised the 35-item instrument to obtain a 20-item version by discarding 15 items based on low item-total score reliability estimates, low main factor correlations, and lack of conformity with blueprint requirements.

A second pilot investigation was conducted using the revised 20-item scale with 290 subjects from two sections of an upper-division, general education sociology course at a southwestern university. To perform construct validity analysis, each subject also responded to Cowen's 25-item ATD scale (Cowen et al., 1967) following the administration of the ODP scale. To avoid revealing that bias was being measured, subjects were simply informed that the ODP scale was asking for their opinions about deaf people. No mention was made about the examination of misconceptions about deaf adults' capabilities until a debriefing session that followed.

Sample

A total of 299 students (123 males, 173 females, and 3 gender unreported) agreed to participate in the second pilot study. Nine subjects' surveys were

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eliminated from the data analysis because of multiple responses on one or more scale items (n = 3) or failure to complete all scale items (n = 6). The remaining 290 subjects (120 males, 167 females, and 3 gender unreported; ages 18 to 50) became the sample. Demographics were reported on a background information sheet completed by each subject. A review of the descriptive statistics on the background data revealed that the majority of the subjects were college seniors (42%). The rest of the subjects consisted primarily of juniors (34%) and sophomores (21%). The remaining 3% consisted of either freshmen, master's students, or those who failed to report their class level. A total of 69% of the subjects were Caucasian, whereas the remainder reported membership in a number of other ethnic categories.

It may be of interest to note that only a few of the subjects had deaf relatives or family members (9%). A larger portion of subjects, however, had had experience with deaf classmates (29%) and/or deaf coworkers (13%). Because these participants were in a course that is a general education requirement, the sample appeared to be representative of a typical undergraduate student population. Although most of the subjects were from the College of Arts and Sciences (53%), there were also students from most of the other colleges, including Allied Health (22%), Business Administration (9%), and Engineering (7%).

Data Analysis

A reliability analysis using a covariance matrix was employed to determine Cronbach's alpha, Guttman's split-half coefficient, and item-total score correlations for the ODP scale. A Pearson product-moment correlation with a one-tailed probability was calculated to determine the relationship between the ODP scale and Cowen's ATD scale (Cowen et al., 1967). A principal components analysis without iteration and a varimax rotation using Kaiser Normalization was used to extract factors with eigenvalues of 1.00 or more. Those factors with eigenvalues less than 1.00 were eliminated from the final analysis with this method.

Results

Descriptive Statistics

There are 20 items in this scale. Responses to each item were scored from one to four points, with a negative attitude receiving the highest score. Because this is a summative scale, each subject's score was calculated by adding up the points for all 20 items. The possible range of scores was from 20 to 80. A low score reflected a positive attitude about the capabilities of deaf adults, whereas a high score reflected a negative attitude. The mean total

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score for the second pilot investigation of the ODP scale was 30.31 with a standard deviation of 6.76. The range of scores was 20 to 53. The skewness was .85 and the kurtosis was .32. The standard error of measurement for this scale was 2.81 with a 95% confidence interval of ± 5.51.

Reliability and Validity

SPSS: Statistical Package for the Social Sciences (Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975) was used for all data analysis procedures in this study. For the second pilot study, the coefficient alpha was calculated to be .83, and a split-half reliability of .82 was obtained. Item-total score correlations ranged from .22 to .58. Only three item-total score correlations were below .30. To support statements of the presence of construct validity, Cowen's ATD scale (Cowen et al., 1967) was administered following the administration of our scale. The ODP scale was correlated with Cowen's scale at .75 ($p < .001$), which accounted for approximately 56% of the variance of scores on one scale by scores on the other. A higher correlation was not expected because the ODP scale was designed to measure beliefs about deaf capabilities, whereas the ATD scale measures general attitudes toward deafness.

Factor Analysis

A principal components analysis without iteration and a varimax rotation was employed to perform the factor analysis of the intercorrelations of items from the second pilot study of the ODP scale. Although six factors with eigenvalues greater than 1.00 (accounting for 58% of the variance) were revealed, only one had an eigenvalue over 2.00. Factor 1 was the most explanatory one with an eigenvalue of 5.39, which accounted for 26.9% of the variance of the scores in the scale. (The item-factor and item-total correlations for Factor 1 are shown in Table 1.) An examination of the factor matrix revealed that the majority of the items were correlated moderately to strongly with Factor 1, with item-factor correlations ranging from .25 to .67. Only Item 2 produced a correlation of less than .30 with this factor. Factors 2, 3, 4, 5, and 6 had eigenvalues of 1.7 (8.5% of the variance), 1.33 (6.6%), 1.10 (5.5%), 1.07 (5.4%), and 1.01 (5.1%), respectively.

We examined the six items that were correlated the highest with a factor other than Factor 1. These items were examined for different themes. The following results were notable:

1. Items 17 and 18 were correlated the highest with Factor 2 (with correlations of .72 and .68, respectively), but also were correlated with Factor 1 (.34 and .48). Both items were related to intelligence of deaf people. Although correlating higher with Factor 1 (.55), Item 5 also correlated

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Table 1
Items Scores Correlated With Total Score and Factor 1

Items	Item-total correlation	Item-factor correlation
1 Smarter deaf people have better speech than deaf people who are less intelligent. (–)	.31	.39
2 Deaf people drive just as safely as hearing people. (+)	.22	.25
3 A deaf person can have the leadership abilities needed to run an organization. (+)	.52	.61
4 It is unfair to limit deaf people to low-paying, unskilled jobs. (+)	.42	.52
5 A deaf person could get a Ph.D. or a Masters degree. (+)	.44	.55
6 If a boss has a problem with a deaf employee, the boss should talk with the interpreter, rather than the deaf person. (-)	.34	.41
7 A deaf person could be promoted to a management position. (+)	.54	.66
8 An 18-year-old deaf adult is capable of living alone and taking care of him- or herself. (+)	.40	.49
9 It is nearly impossible for a deaf person to keep up with a hearing person in school. (-)	.40	.48
10 It can be frustrating to pay a visit to deaf people because they can't hear you knock at the front door. (-)	.42	.47
11 Deaf people cost tax payers lots of money because they can't keep their jobs. (-)	.44	.52
12 Deaf people should only work in jobs where they don't need to communicate with anyone. (-)	.58	.67
13 It is a mistake to leave a baby alone with a deaf person, because he/she can't hear the baby cry. (-)	.48	.52
14 Deaf adults must depend on their parents to make important decisions. (-)	.53	.61
15 Signing is not really a language because only simple thoughts can be communicated. (-)	.43	.52
16 A deaf person could not go to a restaurant without a hearing person, because he/she could not order food without assistance. (-)	.55	.65
17 A deaf person can be an excellent writer. (+)	.24	.34
18 Deaf people are as intelligent as hearing people. (+)	.38	.48
19 If there was a fire, a deaf person could get out of a building safely without help just as easily as a hearing person could. (+)	.29	.36
20 Deaf adults are able to communicate with their hearing children. (+)	.57	.64

Note. (-) indicates a negative item; (+) indicates a positive item.

moderately with Factor 2 (.38). This item was also related to intelligence of deaf people.

2. Item 2 was correlated with Factor 3 (.46) and with Factor 1 (.25). Item 19 was correlated with Factor 4 (.52) and with Factor 1 (.36). Both of these items were related to perceived danger for deaf people, based on their inability to hear. It is possible that those who believe deaf people are highly capable are concerned about placing them in what is perceived to be a potentially dangerous situation.

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3. Item 9 was correlated the highest with Factor 5 (.57), but also was correlated with Factor 1 (.48). This item was related to the ability of deaf people to keep up in school. It might be possible that those hearing people who believe that deaf people are capable may have considered potential educational barriers unrelated to capabilities (e.g., lack of accommodations).

4. Item 1 was correlated the highest with Factor 6 (.50), but also was correlated with Factor 1 (.39). This item examined the relationship between good speech and the intelligence of the deaf person. Possibly, people who believe that deaf people are capable are uncertain about this relationship. Factors other than intelligence that affect speech, such as pre- versus postlingual deafness (being deafened before or after language exposure), might be unknown to these subjects. This item might measure ignorance in this area, rather than a negative attitude toward the capabilities of deaf people.

Overall, there appeared to be one General Deaf Capabilities factor (Factor 1), although a few items do also correlate strongly with a second factor, Intelligence (Factor 2). Because most of the items were correlated relatively high with Factor 1, the scale developers decided to retain that factor for this scale. The other factors were not retained.

Discussion

A reliable and valid scale has been produced for the purposes of measuring hearing adults' beliefs about the capabilities of deaf adults. Few adjustments to the original scale blueprint were needed to reduce the 35-item instrument used in the first pilot study to the desired 20-item instrument, which contained reliable and/or factor-related items. For the second pilot study, the reliability, as measured by a coefficient alpha of .83, and the concurrent validity of the scale, as measured by correlation with Cowen's scale, were judged acceptable.

One limitation to the immediate application of this instrument is related to the sample that was used for validation. The reliability and validity of this instrument can currently be generalized only to other university undergraduates. It is unclear whether the responses of this sample are representative of those of the general adult hearing population in the United States. A future validation with a more diverse sample is planned to determine the reliability and validity of the instrument for a more general population.

Several uses are suggested for this scale. In practice, the scale could be useful for analyzing the attitudes of an audience of hearing individuals. For example, the scale can be administered to a group of employees in a large corporation or in an educational setting prior to a deaf awareness workshop in order to assess general attitudes and misconceptions that need to be addressed. In such an application, the scale could also be readministered to evaluate the effectiveness of a workshop in changing beliefs about the capabilities of deaf adults.

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In research, the scale could be used to investigate the relationship between attitudes toward the capabilities of deaf people and other variables. For example, the scale could be administered to graduate program admissions personnel and correlated with the percentage of deaf applicants accepted. This might determine whether a relationship existed between the beliefs of graduate admissions personnel about the capabilities of deaf adults and the admission of deaf applicants to graduate programs.

References

Americans with Disabilities Act of 1990, §101-102, 42 U.S.C.A. 12111-12112 (West Pamph. 1991).

Baker, C., & Cokely, D. (1980). *American Sign Language: A teacher's resource text on grammar and culture*. Silver Spring, MD: T. J. Publications.

Beaudry, J., & Hetu, R. (1990). Measurement of attitudes of those with unimpaired hearing towards the hearing impaired: A critical examination of the available scales. *Journal of Speech Language Pathology and Audiology/Revue d'Orthophonie et d'Audiologie*, *14*(2), 23-32.

Berkay, P. J. (1991). The establishment of a deaf employment task force in a major corporation. *Journal of the American Deafness and Rehabilitation Association*, *24*(3 & 4), 81-85.

Berkay, P. J., Gardner, J. E., & Smith, P. L. (1994). *Documentation of the development and validation of the Opinions About Deaf People scale: A scale to measure hearing adults' beliefs about the capabilities of deaf adults*. Norman: University of Oklahoma, Department of Educational Psychology. (ERIC Document Reproduction Service No. ED 366 129)

Cowen, E. L., Bobrove, P. H., Rockway, A. M., & Stevenson, J. (1967). Development and evaluation of an attitudes to deafness scale. *Journal of Personality and Social Psychology*, *6*(2), 183-191.

Cowen, E. L., Underberg, R. P., & Verrillo, R. T. (1958). The development and testing of an attitude to blindness scale. *Journal of Social Psychology*, *48*, 297-304.

Culton, P. M. (1975). Deaf students in community colleges. *Community College Social Science Quarterly*, *5*(1), 42-44.

Decaro, J. J. (1981). *An instrument and research design for assessing the attitudes of parents and teachers toward occupational opportunities for deaf people*. Rochester, NY: Rochester Institute of Technology, National Technical Institute for the Deaf. (ERIC Document Reproduction Service No. ED 204 393)

Ferguson, L. T. (1970). Components of attitudes toward the deaf. *Proceedings of the 78th Annual Convention of the American Psychological Association*, *5*, 693-694.

Foster, S. (1987). *Social alienation and peer identification: A dialectical model of the development of deaf community*. Rochester, NY: Rochester Institute of Technology, National Technical Institute for the Deaf. (ERIC Document Reproduction Service No. ED 296 518)

Furnham, A., & Lane, S. (1984). Actual and perceived attitudes towards deafness. *Psychological Medicine*, *14*, 417-423.

Furnham, A., & Pendred, J. (1983). Attitudes towards the mentally and physically disabled. *British Journal of Medical Psychology*, *56*, 179-187.

Murphy, H. J. (1976). Comparative studies of academic achievement between hearing-impaired and non-hearing-impaired students at California State University, Northridge. In H. J. Murphy (Ed.), *Selected readings in the integration of deaf students at CSUN. Center on Deafness Publication Series No. 1* (pp. 53-55). Northridge: California State University, Northridge, National Center on Deafness. (ERIC Document Reproduction Service No. ED 123 812)

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Nester, M. A. (1984). Employment testing for handicapped persons. *Public Personnel Management Journal, 13*(4), 417-434.

Nie, N. H., Hull, C. H., Jenkins, J. G., Steinbrenner, K., & Bent, D. H. (1975). *SPSS: Statistical package for the social sciences* (2nd ed.). New York: McGraw-Hill.

Nondiscrimination on the basis of handicap in programs and activities receiving federal financial assistance, 45 C.F.R. §84.44(d) (1991).

Nunnally, J. C. (1978). *Psychometric theory* (3rd ed.). New York: McGraw-Hill.

Oklahoma Department of Human Services. (1993). *Knowledge of deafness pre-test.* Unpublished manuscript. Oklahoma City, OK: Author.

Rehabilitation Act of 1973, §504, 29 U.S.C. §794 (1988).

Schroedel, J. G., & Schiff, W. (1972). Attitudes towards deafness among several deaf and hearing populations. *Rehabilitation Psychology, 19*(2), 59-70.

Siller, J., Ferguson, L., Holland, B., & Vann, D. (1967). *Studies in reactions to disability. XII: Structure of attitudes toward the physically disabled; Disability Factor Scales: Amputation, Blindness, Cosmetic Conditions.* New York: New York University, School of Education. (ERIC Document Reproduction Service No. ED 034 327)

Siller, J., Ferguson, L., Holland, B., & Vann, D. (1968). *Manual on the Disability Factor Scales.* Unpublished manuscript, New York University, New York.

Strong, C. J., & Shaver, J. P. (1991). Modifying attitudes toward persons with hearing impairments: A comprehensive review of the research. *American Annals of the Deaf, 136*(3), 252-260.

Yuker, H. E., Block, J. R., & Campbell, W. (1960). *A scale to measure attitudes towards disabled persons.* Albertson, NY: Human Resources Center, Ina Mend Institute.

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