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USE OF THE SIXTEEN PERSONALITY FACTOR QUESTIONNAIRE, FORM A, WITH DEAF UNIVERSITY STUDENTS

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Numerous investigations have been undertaken to discern which standardized paper-and-pencil personality inventories, if any, are appropriate for use with deaf individuals; (Bannowsky, 1983; Dwyer & Wincenciak, 1977; Jensema, 1975a, 1975b; Levine, 1978; Shafqat, 1986; Trybus, 1973; Vernon & Brown, 1964; Watson, 1979). One such instrument that has received considerable attention is the Sixteen Personality Factor Questionnaire (16PF). This instrument was developed by R. B. Cattell and subsequently refined by Cattell and his associates through numerous factor analytical studies (Cattell, Eber and Tatsuoka, 1982). This inventory purports to measure fifteen relatively orthogonal traits of personality and a sixteenth trait Cattell refers to as "fluid" and "crystallized" intelligence. These sixteen measures refer to the source traits, or innate personality characteristics that are described in Cattell's model of personality (Hall and Lindsey, 1978). The 16PF has been used extensively in studies of personality characteristics. From a face validity viewpoint, the 16PF would seem a reasonable choice because of the reported claims of factor orthogonality, thus yielding a detailed profile of the individual [Institute for Personality and Ability Testing (IPAT) 1986, 1970]. A score profile obtained from the 16PF yields a more global profile than a more unidimensional inventory such as the Tennessee Self Concept Scale. Another advantage of the 16PF over other paper-and-pencil inventories is that it is designed to describe attributes of normal personality in contrast to other instruments that discern and quantify the existence of pathological traits such as the Minnesota Multiphasic Personality Inventory (Anastasi, 1982).

Each of the 16 factors is normally distributed and expressed in "sten" scores. The factor identifications as well as descriptors of the end points of each of the 16 continua are shown in Figure 1. There are five forms of the 16 PF. Two equivalent

Figure 1

16 PF Factors and Descriptions of Endpoints of each Dimension

Factor	Low Score Meaning	High Score Meaning
A	Reserved	Outgoing
B	Less intelligent	More intelligent
C	Affected by feelings	Emotionally stable
E	Humble	Assertive
F	Sober	Happy-Go-Lucky
G	Expedient	Conscientious
H	Shy	Venturesome
I	Tough-minded	Tender-minded
L	Trusting	Suspicious
M	Practical	Imaginative
N	Forthright	Shrewd
O	Confident	Apprehensive
Q_1	Conservative	Experimenting
Q_2	Group dependent	Self-sufficient
Q_3	Impulsive	Self-controlled
Q_4	Calm	Tense

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forms, A and B, contain 187 items each and require a seventh grade reading level. Equivalent forms C and D contain 105 items each and require about a sixth grade reading level. Form E contains 128 items and requires a third grade reading level. Form E is intended for use with adults who have achieved a limited educational perspective (Cattell et al. 1982). Recent refinement of the 16PF has produced four dimensions or secondary source traits through second-order factor rotations. These second order factors are QI, Introversion vs. Extroversion; QII, Low Anxiety vs. High Anxiety; QIII, Tender Minded vs. Tough Poise; and QIV, Subduedness vs. Independence.

Reviews of the 16PF for its use with the general population have produced some favorable comments as well as some serious caveats (Bloxom, 1978; Bolton, 1978). While the 16PF is recognized as having a strong empirical basis for its development and refinement, questions are raised about the discrepancies across factor reliabilities reported by Cattell et al. (1982). These discrepancies further suggest questions about the content validities of factors with low reliabilities. One consistent criticism noted is that questionable reliability was obtained when only one form was administered as opposed to assessment with equivalent forms (Form A with Form B, or Form C with Form D). The most serious concerns were stated about the appropriateness of Form E. These concerns suggested that certain items required higher than a third grade reading level; the supplemental manual for Form E was inadequate; there was no equivalent form; and, the limited language level might adversely affect the precision of the item statement. Additionally, Form E differs from the other four forms in that Forms A through D allow for a three-option response to each item (except for factor B) while Form E requires a two-option response. Concerns of these reviewers appear to be substantiated by Cattell, et al. (1982) and IPAT (1986) who suggested the most reliable and valid score profiles would be obtained through an equivalent forms administration, and in cases of a single form administration, Form A would be the preferred choice over all other forms. A concept basic to psychometrics is that a good instrument is comprised of an accurate sample of items from a hypothetical item universe of infinite size. Following this concept of content validity, the larger the sample, the more likely content validity has been achieved (Nunnally, 1967). It then seems reasonable that Form A, with its 187 items would probably have higher content validity than Form E with its 128 items. Further, the items of Form A are stated in a richer language base with less restrictions on descriptive ability than Form E. Form E responses to each item are on a two-point continuum as opposed to a three-point continuum and therefore more restrictive in terms of ability to reflect a range of attitudes or values. These issues raise serious concerns about the use of Form E with the general population.

Having reviewed these concerns about the use of the 16PF-E with the general population, the following discussion will focus on the use of the 16PF-E with the deaf population. Trybus (1973) and Jensema (1975a, 1975b) explored the use of the 16PF-E with deaf students enrolled at Gallaudet University. Their investigations raised questions about the extreme mean response scores on some items, the low, and in some cases, negative reliability coefficients obtained for certain factors and the inappropriateness of generalizing findings based on this group of deaf individuals to the deaf population in general.

Dwyer and Wincenciak (1977) and Shafqat (1986) investigated the possibility of administering the 16PF to deaf subjects using Sign Language. Dwyer and Wincenciak (1977) focused their investigation upon factors C, E and H of Form E. They compared an American Sign Language administration of these three factors to the standard paper-and-pencil administration. They concluded that the two forms of administration were not interchangeable and that further research was needed to determine which form of administration, if either, would be most valid for this group. Shafqat (1986) focused her investigation on an administration of Form A in Pidgin Signed English. The conclusions made in this pilot study were that this type of administration of Form A may prove to be a more culture-fair assessment than a paper-and-pencil format for the subjects participating in this study. The computerized interpretation of score profiles also suggested opportunities to incorporate this data into career counseling, career training and career placement applications. Bannowsky (1983) investigated the relevance of Form E to assess vocational interest patterns among prelingually deaf adults. A serious concern he raised regarding Form E was that normative data provided by the publishers was

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generated primarily from rehabilitation populations. This raises questions about the appropriateness of using career interest factors measured by Form E with the non-client, post-secondary deaf student population. Jones (1983) conducted an investigation of the Form E with a visually impaired rehabilitation client group. He re-worded several items in an attempt to make the overall form more culture-fair for this particular group. In this sense, he was responding to the same concerns raised by Dwyer and Wincenciak (1977) and Shafqat (1986).

Having reviewed the concerns expressed by other investigators regarding the use of the 16PF-E with deaf college students, the following discussion will review the use of the 16PF, Form A with deaf college students.

Method

The students in this study represent volunteers from four institutions (California State University Northridge, Oregon College of Education, Oregon State University and San Diego State University). Their dates of attendance covered a period of time from 1977 through 1986. All students who participated in this study did so on a volunteer basis, not related to any course or program requirement. The academic environment in which these students participated would best be described as "mainstreamed." In no case did any of the 77 students, while attending any of the four above-named schools participate in a class where all of the other students were deaf and/or used sign language. In all four schools, there was opportunity to associate with other deaf students, and these 77 individuals typically did so. All 77 availed themselves of academic support services, requesting and receiving interpreters and notetakers for lecture and laboratory classes. This group was comprised of 40 males (52%) and 37 females (48%). The mean age for this group at the time of participation in this study was 24.84 years. Audiometric information on 95 percent of this group (n=73) indicated a "better ear average" (ISO) of 89.93 dB. The average age of onset loss was 1.51 years of age with 52 records (71%) indicating congenital loss. Regarding educational background, 45 students (58%) attended day schools and programs, 16 students (21%) attended residential school programs and another 16 students (21%) attended some combination of residential and day programs. All 77 students had satisfied the standard requirements for admission to these four state institutions. They were enrolled primarily in undergraduate liberal arts courses that were a part of each respective institution's regular offerings. At the time of participation, 23 students (30%) were enrolled in graduate level coursework, primarily in the areas of counseling, special education, and special education administration. Thirty-five students (45%) were upper division undergraduates and the remaining 19 students (25%) were lower division undergraduates. Four of these students (5%) were on academic probation as defined by their respective institutions of attendance at the time of participation. Twenty-one of these students (27%) had attended Gallaudet University or the National Technical Institute for the Deaf and fourteen of these students had earned their B.A. degrees from these two institutions. Score profiles on standardized tests such as the Scholastic Aptitude Test and the Graduate Record Examination indicated that while these students scored below the national norms on these measures, their competency level with written English was above the seventh grade requirement specified in the use of the 16PF Form A. Further evidence of this group's competency with written English was provided by the overall success of this group in English courses and scores from such measures as the Michigan Test of English Proficiency.

As can be seen by the demographic characteristics and academic records of this group, they represent a very unusual group of individuals. Several of these people were employed in professional leadership roles in the areas of education, rehabilitation, and other social services. This group has been educated in a predominantly "mainstreamed" format, and has self-selected an opportunity to pursue a Bachelors or Masters degree in a "mainstreamed" setting. They are, in general, a severely to profoundly deaf group who lost their hearing congenitally or early in life. While this group unanimously expressed preference for sign language interpreting to facilitate their information reception in the learning situation, they demonstrated by their academic success the ability to process written English. While a significant percentage of this group attended Gallaudet University, caution must be taken about comparing this group with the samples studied by Jensema (1975a, 1975b) and Trybus (1973). For example, the mean age difference between the Jensema sample (X=19.8)

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and the sample of 77 in this study (X=24.84) is five years. Additionally, for reasons that have been discussed previously, it may be inappropriate to compare score profiles obtained by Form E to Form A, even if the populations were matched on demographic and other characteristics.

The method of administering the 16PF-A to this group varied from one-to-one testings to small group testing situations. In all cases, however, the students were instructed via Pidgin Signed English to read the test instructions, complete the practice items and proceed with the test in accordance with the published format for administration.

Results

The following discussion will focus on the aggregate score profiles obtained on this group of 77 students. The mean raw scores and standard deviations for each of the 16 factors are reported in Table 1. These scores are compared to the published norms for the combined male and female college student population for Form A as well as the combined male and female general population for Form A. The raw scores for this study group (N=77) were then converted to aggregate sten scores for each factor. Sten score conversions were computed two ways; by using published college student norm data and general popula-

Table 1

Raw Score Comparisons Between Study Group, (N=77), and the Published General Population Norms and College Student Norms

	Deaf Student Scores (N=77)		General Population Norm Group (N=2984)		College Student Norm Group (N=4272)	
	X	S.D.	X	S.D.	X	S.D.
A	7.27	1.74	10.75	3.25	10.93	3.45
B	10.61	2.58	7.04	2.17	8.83	1.89
C	13.81	3.00	16.07	4.07	15.23	3.90
E	13.16	2.70	12.08	4.30	12.93	4.36
F	13.48	2.82	13.86	4.25	16.63	4.42
G	11.00	3.66	13.08	3.39	11.88	3.72
H	12.45	3.07	13.85	5.50	13.58	5.79
I	11.10	2.81	11.18	4.05	11.67	4.20
L	8.94	2.65	6.80	3.42	8.38	3.38
M	11.75	2.97	13.08	3.79	12.81	3.60
N	10.89	3.02	9.80	2.94	8.75	2.80
O	11.84	3.12	10.09	4.12	10.70	3.89
Q_1	10.51	2.39	8.59	3.16	9.15	3.41
Q_2	11.68	2.37	10.23	3.55	10.08	3.68
Q_3	9.61	2.96	12.89	3.35	11.70	3.28
Q_4	12.30	3.00	11.82	4.85	13.43	4.81

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Table 2

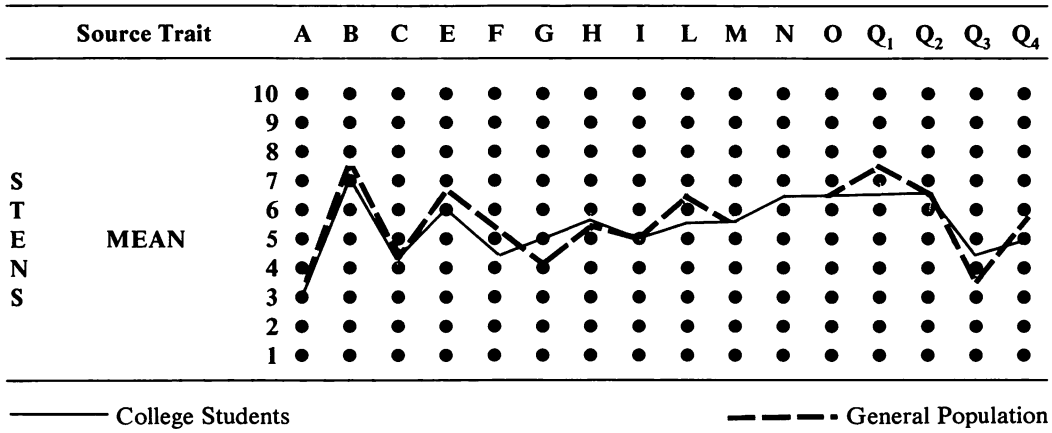
Aggregate Sten Score Profiles (N=77) Based Upon Published College Student and General Population Norms

Factor	College Students	General Population
A	3.12	3.12
B	7.43	8.54
C	4.25	4.25
E	6.07	6.58
F	4.49	5.18
G	5.00	4.00
H	5.66	5.19
I	5.05	5.05
L	5.59	6.71
M	5.34	5.34
N	6.54	6.54
O	6.46	6.46
Q_1	6.31	7.36
Q_2	6.37	6.37
Q_3	4.27	3.20
Q_4	5.59	6.15

tion norm data. These aggregate sten scores are shown in Table 2. Since sten scores are standardized with a mean of 5.5, it can be seen by inspecting Table 2 that there is a better "fit" between the sample (N=77) and the college student norm group than there is between the sample and the general population norm group. This better fit (lying closer to the mean of 5.5) is observed in factors B, E, G, H, L, Q_1, Q_3, and Q_2. There was no difference in the average sten scores between the college and general population norms on factors A, C, I M, N, O, and Q_2. On only one factor, Factor F, was the sample mean score closer to the norm of the general population than the college student norm. Another "goodness-of-fit" indication for this group is that only the sten scores for Factors A and B are considered "extreme" for a group profile using general population norms, and when using college norms only the score for Factor A is extreme. An "extreme"

Figure 2

A Comparison of Sten Score Profiles (N=77) With Published College Student and General Population Norms



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score for a group profile is a sten score of three or below or eight or above (IPAT, 1986). Sten score profiles for both groups are compared in Figure 2. A third goodness-of-fit assessment was conducted by determining the probability that the raw factor score profile of this group (N=77) was a representative sample of the published college student norm group. By using this procedure it was determined that sample mean Factor scores for Factors E, I and L were not significantly different from the college student norms. For all other factors, a significant difference was observed ($t(77) > 1.71$, $p < .05$). This finding may be a reflection of the small sample size. It does nonetheless indicate, by a more stringent measure than the two previously described goodness-of-fit procedures, that there is evidence to indicate that this profile of scores obtained from 77 deaf college students may not be truly representative of college students in general.

Reliability data from this administration was obtained by using Kuder-Richardson estimates. Bearing in mind the cautions previously stated about comparing this sample to the 818 students assessed by Jensema (1975b) and the fact that the two different forms may not be congruent enough to warrant a comparison of factor scores, the reliability coefficients obtained raise similar concerns to those expressed by Jensema (1975a, b). The reliability coefficients appear in Table 3.

While no reliability coefficients reached zero or negative values as was found by Jensema (1975b), a coefficient as low as .045 (for Factor F) suggests a measure so laden with error variance that its utility as a descriptive tool cannot be trusted without additional substantiating evidence. Further, the discrepancy among reliability coefficients, from a low of .045 for Factor F to a high of .721 for Factor G suggests the possibility that the content validity for this administration of Form A is questionable as suggested by Bloxom (1978).

In comparing the internal consistency estimates obtained from this study with reliability figures reported by Cattell, et al. (1982), it is significant to note that even when larger samples and multiple equivalent forms are used, some of the coefficients are still as low as the .7 range. Cattell, et al. (1978) reported profile scores on a sample of deaf subjects (N=37) that differed considerably from the sample studied in this investigation. The discrepancy between the score profiles of Cattell's group (N=37) and the current study group (N=77) may be accounted for by small sample size, and the Cattell subjects who were included in the norming data possessed a variety of illnesses and disabilities in addition to deafness. Also, Cattell's scores (N=37) were derived from Form E of the instrument. In this context, deaf subjects' score profiles are reported by Cattell, et al. (1978) with an orientation toward physical disability and accompanying psychological problems. It would therefore seem more appropriate to look at the group of deaf individuals in the current study who chose to participate and who demonstrated success in competitive, post-secondary academic problems, from a non-pathological, "cultural" perspective.

Discussion

This study explored the use of the 16PF, Form A with a group of successful deaf college students

Table 3

Kuder-Richardson Reliability Estimates for Factor Scores (N=77)

Factor	Coefficient	Factor	Coefficient
A	.301	L	.175
B	.301	M	.130
C	.344	N	.506
E	.147	O	.280
F	.045	Q_1	.084
G	.721	Q_2	.110
H	.391	Q_3	.499
I	.375	Q_4	.222

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who evidenced the capability to read and understand the instrument. Given the psychometric properties of Form A as compared to Form E that has been used in other investigations with deaf subjects, Form A would appear to be the form of choice over Form E, if it can be shown that examinees meet the seventh grade reading requirements. While reliability coefficients obtained from administration to the current sample were slightly higher on some factors than those obtained by Jensema (1975b) they were lower than those reported by Cattell, et al. (1978). Content validity appears to be questionable also.

A comparison of the score profile for this group to the Gallaudet University sample, rehabilitation client norms and other disability group norms reported by Cattell, et al. (1978) would appear questionable because of discrepancies in the two forms (A and E) and discrepancies in sample size as well as demographic characteristics. An additional issue that suggests the inappropriateness of such a comparison is the "disability" and "pathology" orientation described by Cattell, et al. (1978) and the "cultural" orientation of the group investigated in this study.

In spite of the fact that reliability and validity data for this sample were below the published figures for the 16PF (Cattell et al., 1978), the data did reveal impressive internal consistency coefficients for a single administration of one form (Form A) to a relatively small sample (N=77). In addition, the score profile obtained on this group indicated that they are best described as a group of college students. In considering the demographic characteristics of this group, their impressive academic accomplishments, their voluntary status as subjects, and the fact that they selected a post-secondary academic experience, the score profile yielded in this study suggests acceptable construct validity.

Given the relatively impressive internal consistency coefficients obtained in this small sample and the fact that the most reliabile administrations of this instrument with other groups have been obtained through the combined use of forms A and B, it is recommended that more deaf individuals who possess the necessary academic ability be assessed with Forms A and B of the 16PF to ascertain the consistency of the findings in the current study. It is further recommended that alternate forms of administration, such as American Sign Language, be validated with similar groups of deaf subjects and subsequently tested for application with other deaf subjects whose academic backgrounds differ.

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REFERENCES

Anastasi, A. (1982). **Psychological testing** (5th Ed.). New York: MacMillan.

Bannowsky, A.W. (1983). Issues in assessing vocationally relevant personality factors of prelingually deaf adults using the 16PF-E. **Journal of Rehabilitation of the Deaf, 17**(3), 21-24.

Bloxom, B.M. (1978). Critical review of the 16PF. In O.K. Buros (Ed.), **The eighth mental measurements yearbook** (Vol. 1) (pp. 1077-1078). Highland Park, N.J.: Gryphin Press.

Bolton, B.F. (1978). Critical review of the 16PF. In O.K. Buros (Ed.). **The eighth mental measurements yearbook** (Vol. 1) (pp. 1078-1080). Highland Park, N.J.: Gryphin Press.

Cattell, R.B., Eber, H.W. and Tatsuoka, M.M. (1982). **Handbook for the 16PF.** Champaign, IL: Institute for Personality and Ability Testing.

Dwyer, C. and Wincenciak, S. (1977). A pilot investigation of three factors of the 16PF, Form E comparing the standard written form with an ameslan videotape revision. **Journal of Rehabilitation of the Deaf, 10**(4), 17-23.

Hall, C.S. and Lindsey, G. (1978). **Theories of personality** (3rd Ed.), (pp. 523-561). New York: Wiley.

Institute for Personality and Ability Testing, (1986). **Administrator's manual for the 16 personality factor questionnaire.** Champaign, IL: Institute for Personality and Ability Testing.

Institute for Personality and Ability Testing, (1970). **16PF handbook: Tabular supplemental no. 1.** Champaign, IL: Institute for Personality and Ability Testing.

Jensema, C. (1975). A statistical investigation of the 16PF Form E as applied to hearing-impaired college students. **Journal of Rehabilitation of the Deaf, 9**(1), 21-29.

Jensema, C. (1975). Reliability of the 16PF Form E for hearing-impaired college students. **Journal of Rehabilitation of the Deaf, 8**(3), 14-17.

Jones, W.P. (1983). Measurement of personality traits of the visually limited. **Education of the Visually Handicapped, 15**(3), 12-19.

Levine, E.S. (1978). Psychological evaluation of the deaf client. In B.F. Bolton (Ed.), **Handbook of measurement and evaluation in rehabilitation** (pp. 269-291). Baltimore, MD: University Park Press.

Nunnally, J.C. (1967). **Psychometric theory.** New York: McGraw-Hill.

Shafqat, L. (1986). Innovations in assessment strategies: one approach. In L.G. Stewart (Ed.), **Clinical rehabilitation assessment and hearing impairment: A guide to quality assurance** (pp. 119-130). Silver Springs, MD: National Association of the Deaf.

Trybus, R. (1973). Personality assessment of hearing-impaired college students using the 16PF, Form E. **Journal of Rehabilitation of the Deaf, 6**(3), 34-46.

Vernon, M. and Brown, D.W. (1964). A guide to psychological tests and testing procedures in the evaluation of deaf and hard of hearing children. **Journal of Speech and Hearing Disorders. 29:** 414-423.

Watson, D. (1979). Guidelines for the psychological and vocational assessment of deaf rehabilitation clients. **Journal of Rehabilitation of the Deaf, 13**(1), 29-57.