

**TABLE 7**  
**ITEMS WITH ITEM-TOTAL CORRELATIONS BELOW THE CUT-OFF LEVEL FOR MALE AND FEMALE SUBSAMPLES**

Factor	Males	Females
A		3,4,98,99
B	131	
C		
E	135	
F		
G	44	
H		
I		
L	17,18,50,113	
M	83,84	
N	55,86,117	21,148
O	89	
Q <sup>1</sup>		89
Q <sup>2</sup>		
Q <sup>3</sup>		97
Q <sup>4</sup>		
Motiv dist	31,64,160	31,64,160

## DISCUSSION

When investigating construct comparability by contrasting the factor score means and standard deviations across racial groups and gender, the results showed that a considerable number of statistically significant differences existed. The observed differences between racial groups were most notable. Significant differences between means, and large differences between the standard deviations, were found for the majority of the factors. If, for the sake of the argument, one were to accept the results of the investigation as an accurate reflection of the personality characteristics of the subsamples, one would be obliged to claim that black people tended to be more reserved, detached, stiff, sober, slow, serious, tough minded, affected by emotional instability, moralistic, jealous, dogmatic, tyrannical, apprehensive, and less intelligent than the other groups – particularly the whites. It is manifest that such claims are ludicrous and cannot be supported on rational grounds.

Differences in 16PF means and standard deviations were also found in cross-cultural studies conducted by De Andrade, De Godoy Alves, and Ford (1969), Cattell and Warburton (1961), Mcquaid (1967), Mehryar (1972), Meredith (1966), Thompson and Dayries (1975), and Vaughn and Cattell (1976). In a number of other studies in which a variety of personality inventories were used, cross-cultural differences were also found when the researchers compared means and standard deviations (Chui, 1990; Irfani, 1977; Iwawaki, Eysenck & Eysenck; Kline, 1967; Khatena, Bledsoe & Zetenyi, 1975; Loo & Schiomi, 1982; Nagelschmidt & Jacob, 1977; Niles, 1981; Parsons & Schneider, 1974; Ryckman, Posen & Kulberg, 1978; Reimanis, 1977; Stetson & Wagner, 1980; Wohl, Horowitz, Tapingkae & Pardthiason, 1970).

If the cut-off level for acceptability of the coefficients of internal consistency is set at 0,50, 14 of the first-order factors were unacceptably low for the black subsample. Only in the case of Factors H, Q2 and Q3 alpha coefficients greater than 0,5 were found. Factors C, F, M, N, O performed the worst as coefficients were estimate at lower than 0,3. Generally higher coefficients of internal consistency were found for the coloured, Indian and

white subsamples as none of the observed coefficients were lower than 0,30. The alpha coefficients which were computed for the white subsample were the highest, and also the closest, to the coefficients reported for the norm group. While these results are scientifically most interesting, they pose a major problem for the use of the 16PF in the legal and socio-political climate in present-day South Africa.

The results of the factor analyses showed that Cattell's factor structure could not be replicated when the data which had been collected for this investigation were used. The factor structure of the white group best matched Cattell's structure, whereas that of the black subsample least matched it. These findings are similar to those reported in a number of cross-cultural studies in which the factor structures of the 16PF were compared (Adcock, 1974; Cattell & Warburton, 1961; Golden, 1978; Phillip, 1972). In factor analytic studies in which other personality tests were used for making cross-cultural comparisons, similar results to those discussed above were found (Hosch & Marchioni, 1986; Iwawaki, Eysenck & Eysenck, 1977; Loo & Schiomi, 1982; Nagelschmidt & Jacob, 1977; Niles, 1981; Ryckman *et al.*, 1978). On the other hand, Abdel-Khalek, Ibrahim and Budek (1986), Tsijioka and Cattell (1965), and Zak (1976) reported that they had found factor patterns which were the same or similar to the model underpinning the 16PF when different cultural groups were compared. Prinsloo and Van Eeden (1995) also claimed to have found similar factor structures on the 16PF (SA02) in South Africa when they compared English and Afrikaans-speaking participants with African language participants. It should be noted, however, that their factor analysis only sought to explore the second-order factors. Four years earlier, Taylor and Boeyens (1991) had indicated a moderate or fair amount of similarity for their factor structure when they compared white and black South Africans on the South African Personality Questionnaire. Forbes, Dexter and Comrey (1974), Hanin, Eysenck, Eysenck and Barret, (1991) and Noller *et al.* (1987) also found similar factor structures when cross-cultural comparisons were made on other personality tests. They also reported similar cross-cultural findings for their item analyses.

The results of the item analyses in the present investigation showed that, in the case of the black subsample, 18% of the total number of items failed to yield acceptable item-total correlations. The results for Factors B, M and N were the worst. In the case of the other subsamples (coloured, Indian and white), the observed item-total correlations were similar to those reported for the norm group. It is clear that cultural influences must exist which result in a situation in which black test takers fail to interpret the items of the 16PF in the same manner as research participants from the other three groups.

The findings suggested that gender did not have a great deal of influence on the results in this investigation. Significant differences between means and large differences between the standard deviations were not found on the majority of factors, which differs from the results reported by De Andrade *et al.* (1969), Mehryar (1972), Meredith (1966), and Vaughn & Cattell (1976), who found mean and standard deviation differences between males and females.

In the present study significant gender-related differences were found on Factors I, O, N Emotional Sensitivity and Tough Poise. If it were, for the moment, to be assumed that the test is valid and reliable, the findings would imply that women are more tender-minded, sensitive, dependent, overprotected, apprehensive, self-reproaching, insecure and troubled than males. Under the same assumptions, one would have to accept that men tend to be more polished, socially aware and insightful regarding others.

The coefficients of internal consistency for males and females were lower than those which had been reported for the South African norm group. Although the results for the two

subgroups were similar, those for the males were slightly lower than those for females on the majority of the factors. There is no obvious reason why this should have been the case, although one may speculate the findings are associated with results reported in earlier research which appears to support the notion that women are verbally more highly skilled than men.

The item analyses indicated that the items on Factors A, N and MD performed the worst in the female subgroup with 7,5% of the items not yielding acceptable item-total correlations. The values for males, as indicated earlier, were slightly worse with 11,9% of the item-total correlations lower than 0,3 of which the items on Factors L, M, N and MD were the least satisfactory. Some necessarily rather speculative light is cast on the reasons and nature of these differences in a companion article (Abrahams & Mauer, in preparation).

What is, however, abundantly clear is that the results of this investigation do not support the notion of comparability of the constructs of the 16PF across the four race groups included in this investigation. One must, therefore, accept that what is actually measured when the 16PF is applied to certain groups, does not necessarily agree with any of the postulated traits of the instrument. Furthermore, one cannot escape the impression that the differences must be associated with various sources of test score error, rather than with actual differences between the subsamples or the groups that they represent. The other popular versions of the 16PF (Form A & B) which are marketed in South Africa, should also be used with circumspection as there is a strong possibility of correspondingly problematic measurement characteristics associated with the similarity of the items in the various versions of the test (Prinsloo, 1992).

Bearing in mind the provisions of the *Constitution of the Republic of South Africa* (Act 108 of 1996), the *Labour relations act* (Act 66 of 1995), and the soon-to-be-promulgated *Employment equity bill* (Republic of South Africa, 1997), it is abundantly clear that it has become imperative that all instrumentation used for psychological assessment in South Africa be scientifically evaluated. This type of evaluation embraces well-known psychometric concepts such as validity, reliability, fairness and bias of all assessment devices. Simply carrying on using assessment instrumentation for which adequate empirical evidence of the issues referred to above does not exist, is bound to be interpreted, and treated, as unfair labour practice as defined in the previously-mentioned legislation. It is highly unlikely that employers and other users of psychological assessment instrumentation will be able to avoid the penalties associated with the unfair use of such instrumentation, and it is improbable that arguments in mitigation along the lines of satisfactory performance of such an instrument in other countries would have any chance of standing the test of a Labour Court hearing.

A factor which is particularly bothersome is that it is common knowledge that there are many psychological assessment instruments which are used on a regular basis, but which do not comply with the psychometric – and legal – requirements. The research that has to be conducted to meet the dictates of the legislation is arduous, and it requires a good deal of knowledge, skill and experience on the part of the researchers concerned. If employers, human resources practitioners and, obviously, psychologists do not take up the challenges which are now posed by the changes in the legislation, the country may well find itself in a situation where important decisions about the careers of individuals have to be taken on the basis of exceedingly unsatisfactory methods, merely because they do not infringe on the demands of the labour legislation in so blatant a fashion.

If we do not succeed in setting the situation right as far as psychological assessment instruments are concerned, we may be contributing to a situation in which the potential harm to

individual workers and work-seekers is even greater than that which may result from the use of assessment instruments which fail to comply with the present-day legal and standard psychometric criteria.

## REFERENCES

- Abdel-Khalek, A., Ibrahim, A., & Budek, M.A. (1986). The factorial structure of the 16PF and EPQ in Egyptian samples: A preliminary study. *Personality and Individual Differences*, 7, 65–72.
- Abrahams, F. (1994). The cross-cultural comparability of personality tests in South Africa. Is it possible? *Proceedings of the Congress on Psychometrics for Psychologists and Personnel Practitioners*. Pretoria, South Africa.
- Abrahams, F. (1996). *The cross-cultural comparability of the Sixteen Personality Factor Inventory (16PF)*. Unpublished Doctoral Thesis. Pretoria: University of South Africa.
- Adcock, N.V. (1974). Testing the test: How adequate is the 16PF with a New Zealand student sample? *New Zealand Psychologist*, 3, 2–10.
- Adcock, N.V. & Adcock, C.J. (1977). The validity of the 16PF personality structure: A large New Zealand sample. Item Analysis. *Journal of Behavioural Sciences*, 2, 227–237.
- Barret, P. & Kline, P. (1982). An item and radial parcel factor analysis of the 16PF questionnaire. *Personality and Individual Differences*, 3, 259–270.
- Bouchard, T.J. (1972). Review of Sixteen Personality Factor Questionnaire. In O.K. Buros (Ed.), *The seventh mental measurements yearbook*. Highland Park: Gryphon.
- Browne, M.W. (1972a). Orthogonal rotation to a partially specified target. *British Journal of Mathematical and Statistical Psychology*, 25, 115–120.
- Browne, M.W. (1972b). Oblique rotation to a partially specified target. *British Journal of Mathematical and Statistical Psychology*, 25, 207–212.
- Cattell, R.B., Eber, H.W. & Tatsuoka M.M. (1992). *Handbook for the Sixteen Personality Factor Questionnaire*. Champaign, Institute for Personality and Ability Testing.
- Cattell, R.B., & Warburton, F.W. (1961). A cross-cultural comparison of patterns of extraversion and anxiety. *British Journal of Psychology*, 52, 3–15.
- Chui, L.H. (1990). Comparison of responses to the Edwards Personal Preference Schedule by Chinese and American college students. *Psychological Reports*, 67, 1296–1298.
- De Andrade, E.M., De Godoy Alves, D., & Ford, J.J. (1969). A comparison of North American and Brazilian college students' profiles on the 16PF Questionnaire. *International Journal of Psychology*, 4, 55–58.
- Forbes, R.L., Dexter, W.R., & Comrey, A.L. (1974). A cross-cultural comparison of certain personality factors. *Multivariate Behavioural Research*, 5, 383–393.
- Golden, C.H. (1978). Cross-Cultural second-order factor structures of the 16PF. *Journal of Personality Assessment*, 42, 167–170.
- Hanin, Y., Eysenck, S.B.G., Eysenck, H.J. & Barret, P. (1991). A cross-cultural study of personality in Russia and England. *Personality and Individual Differences*, 12, 265–271.
- Hosch, H.M. & Marchioni, P.M. (1986). The Self-monitoring Scale: A factorial comparison among Mexicans, Mexican Americans and Anglo Americans. *Journal of Behavioural Sciences*, 5, 225–242.
- Irfani, S. (1977). Eysenck's Extraversion, Neuroticism, Psychoticism Inventory in Turkey. *Psychological Reports*, 41, 123–124.
- Iwawaki, S., Eysenck, S.B.G. & Eysenck H.J. (1977). Differences in personality between Japanese and English. *Journal of Social Psychology*, 102, 27–53.
- Jöreskog, K.G. (1963). *Statistical estimation in factor analysis: A new technique and its foundation*. Stockholm: Almqvist & Wiksell.
- Khatena, J., Bledsoe, J.C. & Zetenyi, T., (1975). Creative perceptions of Hungarian and American students. *Perceptual and Motor Skills*, 45, 901–902.

- Kline, P. (1967). The use of Cattell's 16PF test and Eysenck's EPI with a literate population in Ghana. *British Journal of Social and Clinical Psychology*, 6, 97-107.
- Levonian, E. (1961). Personality measurement with items selected from the 16PF Questionnaire. *Educational and Psychological Measurement*, 21, 559-596.
- Loo, R. & Schiomi, K. (1982). The Eysenck Personality scores of Japanese and Canadian undergraduates. *Journal of Social Psychology*, 118, 3-9.
- Mcquaid, J. (1967). A note on trends in answers to Cattell's personality questionnaires for Scottish subjects. *British Journal of Psychology*, 58, 455-458.
- Mehryar, A.H. (1972). Personality patterns of Iranian boys and girls on Cattell's 16PF. *British Journal of Social and Clinical Psychology*, 11, 257-264.
- Meredith, G.M. (1966). Amai and acculturation among Japanese-American college students in Hawaii. *Journal of Social Psychology*, 70, 171-180.
- Nagelschmidt, A.M. & Jacob, R. (1977). Dimensionality of Rotter's I-E scale in a society in the process of modernization. *Journal of Cross-Cultural Psychology*, 8, 101-112.
- Niles, F.S. (1981). Dimensionality of Rotter's I-E scale in Sri-Lanka. *Journal of Cross-Cultural Psychology*, 12, 473-479.
- Nzimande, B.Z. (1995). Culture fair testing? To test or not to test. *Proceedings of the Congress of Psychometrics for Psychologists and Personnel Practitioners*. Pretoria.
- Parsons, O.A. & Schneider, J.M. (1974). Locus of control in university students from eastern and western societies. *Journal of Consulting and Clinical Psychology*, 2, 456-461.
- Phillip, A.E. (1972). Cross-cultural stability of second-order factors in the 16PF. *British Journal of Social & Clinical Psychology*, 11, 276-283.
- Poortinga, Y.H. & Van der Vijver, F.J.R. (1987). Explaining cross-cultural differences: Bias analysis and beyond. *Journal of Cross-Cultural Psychology*, 18, 259-282.
- Prinsloo, C.H. (1992). *Manual for the use of the Sixteen Personality Factor Questionnaire: South African 1992 Version (16PF, SA92)*. Pretoria: Human Sciences Research Council.
- Prinsloo, C.H. & Van Eeden, R. (1995). The validity of the 16PF, SA92 for personality assessment in a multicultural context. *Proceedings of the Congress on Psychometrics for Psychologists and Personnel Practitioners*. Pretoria.
- Reimanis, G. (1977). Locus of control in American and Northeastern Nigerian students. *Journal of Social Psychology*, 103, 309-310.
- Republic of South Africa. (1950). *Population Registration Act (Act 30 of 1950)*. Government Gazette: Pretoria.
- Republic of South Africa. (1995). *Labour Relations Act (Act 66 of 1995)*. Government Gazette: Pretoria.
- Republic of South Africa. (1996). *Constitution of the Republic of South Africa (Act 108 of 1996)*. Government Gazette: Pretoria.
- Republic of South Africa. (1997). *Employment Equity Bill*. Government Gazette: Pretoria.
- Rogers, T.B. (1972). Some thoughts on the culture-fairness of personality inventories. *Canadian Psychologist*, 13, 116-120.
- Ryckman, R.M., Posen, C.F. & Kulberg, G.E. (1978). Locus of control among American and Rhodesian students. *Journal of Social Psychology*, 104, 165-173.
- Spence, B.A. (1982). A psychological investigation into the characteristics of black guidance teachers. Unpublished masters dissertation, University of South Africa, Pretoria.
- Stetson, C. \* Wagner, E.E. (1980). A note on the use of the Hand Test in cross-cultural research: Comparison of Iranian, Chinese and American students. *Journal of Personality Assessment*, 4, 6.
- Taylor, T.R. & Boeyens, J.C.A. (1991). The comparability of the scores of blacks and whites on the South African Personality Questionnaire: An exploratory study. *South African Journal of Psychology*, 21, 1-10.
- Thompson, R.W. & Dayries, J.L. (1975). Cross-cultural comparisons of physical education majors. *Perceptual and Motor Skills*, 40, 637-638.
- Tsijioka, B. & Cattell, R.B. (1965). Constancy and difference in personality structure and mean profile in the questionnaire medium from applying the 16PF test in America and Japan. *British Journal of Social and Clinical Psychology*, 4, 287-297.
- Vaughan, G.M. & Cattell, R.B. (1976). Personality differences between young New Zealanders and Americans. *Journal of Social Psychology*, 99, 3-12.
- White, D.H. (1982). *The effects of job stress in the South African mining industry*. Unpublished Doctoral dissertation, University of Africa, Pretoria.
- Wohl, J., Horowitz, I.A., Tapingkae, A. & Pardthiasong, T. (1970). Some personality characteristics of Thai and American university students. *Psychological Reports*, 27, 45-46.
- Zak, I. (1976). Structure of the 16PF. *Multivariate Experimental Clinical Research*, 2, 123-127.