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A brief 20-item measure of psychological distress, the GHQ20, was administered to three diverse ethnic groups, which included Chinese, Filipino, and Maori subjects. The FACTOREP method was employed to see if the previously reported four-factor structure of the GHQ20 could then be replicated. The four-factor structure was clearly replicated across the three groups. It is suggested that this measure may be useful for future cross-cultural studies in which a brief symptom measure yielding information on several different dimensions of distress is required.

DIMENSIONS OF DISTRESS A Cross-Cultural Factor Replication

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The application of exploratory factor analysis to the study of differences in the expression of psychopathology, particularly depression, across different cultures, has recently proved a productive strategy for researchers (e.g., Beiser, 1985; Binitie, 1975). Although such an approach may be enlightening in clarifying differences in the expression of psychopathology in different cultures, its weakness is that it does not necessarily permit a comparison between cultural groups along dimensions of distress that may be common to both.

The present article attempts to use factor analysis in a confirmatory rather than an exploratory sense with a well known symptom measure across three distinct English-speaking ethnic groups. The confirmatory method used is that of FACTOREP, devised by Walkey & McCormick (1985). The FACTOREP procedure uses the *s* index, a statistic similar in form to chi-square to generate matrices of interfactor similarity (Cattell, Balcar, Horn, & Nesselroade, 1969).

The FACTOREP procedure is now available as a computer program (Walkey & McCormick, 1983) that calculates what amounts to a three-dimensional matrix of *s* index values, with one dimension representing analyses across different numbers of factors, the second representing repli-

cations across groups, and the third representing different hyperplane cutoff points. It allows for the systematic study of any variation in s index values across the three dimensions and clearly identifies any replicable factor structures.

This approach has been successful in demonstrating stable replicable factor structures for a number of psychological measures including the Inventory of Socially Supportive Behaviors (Walkey, Siegert, McCormick, & Taylor, 1987), the General Health Questionnaire (Siegert, McCormick, Taylor, & Walkey, 1987) and the WAIS-R (Siegert, Patten, Taylor, & McCormick, 1988).

The symptom measure used in this study is the General Health Questionnaire (GHQ; Goldberg, 1972). The GHQ is a self-administered screening test for detecting nonpsychotic psychiatric disorders in community populations and can also be used for comparing mean levels of psychological disturbance found in different groups (e.g., Farmer & Harvey, 1975).

A major problem with the GHQ, previously described by Siegert et al. (1987), is that different attempts to describe its underlying factorial structure have consistently found different solutions. In an attempt to settle this question, Siegert et al. (1987) recently demonstrated a robust four-factor structure for the 60-item GHQ that they replicated across four independent subject groups from three different countries (Great Britain, Australia, and New Zealand). Based upon this work, they produced a new 20-item version of the GHQ with a robust, replicable and reliable four-factor structure. In addition to describing its development, Siegert et al. (1987) provided reliabilities for the GHQ20 and its four subscales, gave some preliminary norms, and reproduced the questionnaire in full. The four factors they identified were general illness, sleep disturbance, anxiety and dysphoria, and severe depression. The present article represents an attempt to further replicate the factor structure of the GHQ20 across three distinct ethnic groups. It will be argued that the confirmation of the factor structure of the GHQ across diverse ethnic groups will allow for much stronger and meaningful comparisons of symptomatology in future research.

METHOD

SUBJECTS

Chinese sample: This group comprised 108 New Zealand-born Chinese high school students in their third year of high school. It included 49 females and 59 males, all aged 15.

Maori sample: This group comprised 90 New Zealand-born Maoris. All of these subjects were unemployed at the time. The sample included 38 females and 52 males. Their ages ranged from 14 to 39 with a mean of 22.

Filipino sample: This group comprised 92 Filipino university students in their second year of study. It included 54 females and 38 males. Ages ranged from 18 to 24 with a mean of 20.

PROCEDURE

All three groups of subjects were administered the 20-item GHQ. All subjects were fluent English speakers and completed an English language version. All subjects completed the GHQ20 anonymously and on a voluntary basis. The completed responses of each group were entered on to an IBM 4351 computer and principal-components analyses were conducted using the SAS package (SAS Institute Inc., 1985). Based upon the four-factor solution previously identified by Siegert et al. (1987), the four factors were rotated using the varimax method, and their solutions were compared at the .35, .45, .50, and .55 hyperplane cutoff values.

RESULTS

The comparisons of the four factors across the three groups provided evidence of the presence of all four factors in each case at each hyperplane cutoff point. For economy's sake, only two cutoff levels will be presented. Table 1 shows the results of the factor comparisons at the .35 cutoff point. The s index values for comparable factors (i.e., leading diagonal values) are typically high, ranging from .71 to 1.00. Values for noncorresponding factors (i.e., off-diagonal values) are mostly low and frequently zero. The notable exception is the Maori sample's Factor 3, which shows some overlap with both Factor 1 ($s = .53$) and Factor 3 ($s = .75$) of the Chinese group. Even here the s index value is somewhat higher for the two "corresponding" factors.

This picture is even clearer at the more stringent cutoff level of .50, however. Inspection of Table 2 shows high s index values for corresponding factors across groups (.75-1.00) and zero or near-zero values for noncorresponding values (.00-.20). This indicates that the four factors were able to be clearly replicated across all three groups.

To illustrate precisely what these s index values mean, Table 3 provides the item-factor loadings for each group resulting from the four-factor solution.

Inspection of Table 3 shows that four factors were replicated across all three groups. The first factor identified in Table 2 comprises items 1-5 of the

TABLE 1
S Index Values for Four Factor Solutions Across Chinese, Maori, and Filipino Groups at the .35 Cutoff Point for the GHQ20

Factor	Chinese				Maori			
	1	2	3	4	1	2	3	4
Filipino								
1	.83	.00	.17	.40	1.00	.00	.43	.00
2	.00	.92	.00	.14	.00	.80	.27	.00
3	.00	.00	1.00	.31	.17	.29	.71	.18
4	.00	.31	.18	.86	.00	.31	.00	1.00
Maori								
1	.92	.00	.14	.00				
2	.13	.77	.50	.31				
3	.53	.15	.75	.00				
4	.00	.00	.31	1.00				

TABLE 2
S Index Values for Four Factor Solutions Across Chinese, Maori, and Filipino Groups at the .50 Cutoff Point for the GHQ20

Factor	Chinese				Maori			
	1	2	3	4	1	2	3	4
Filipino								
1	.89	.00	.00	.00	1.00	.00	.00	.00
2	.00	1.00	.00	.00	.00	.89	.18	.00
3	.00	.00	.89	.20	.00	.00	.80	.00
4	.00	.00	.00	.89	.00	.00	.00	1.00
Maori								
1	1.00	.00	.00	.00				
2	.00	.75	.00	.00				
3	.00	.20	.83	.00				
4	.00	.00	.20	.89				

GHQ20 and is known as general illness. Factor loadings here are typically high for all items on Factor 1 and low on the remaining nonsalient factors. The next factor, sleep disturbance, comprising items 6-10, shows a similar pattern. Items load highly on the appropriate factor and are generally small on the other three factors. In some instances items do load highly on another factor. In only one case, however, are the loadings higher on the nonsalient factor than for the salient factor (that is, item 7 of the Maori sample). For the

TABLE 3
Four-Factor Varimax Loadings for Three Independent Groups Using GHQ^a

Subjects	Chinese Factor				Maori Factor				Filipino Factor			
	1	2	3	4	1	2	3	4	1	2	3	4
GHQ20 Item												
1	.81	.22	.17	.04	.73	.22	.11	.12	.65	.17	.28	.08
2	.72	.19	.03	.16	.72	.07	.02	.09	.75	.26	-.08	.23
3	.52	.29	.43	.19	.45	.03	.65	.22	.75	-.03	.23	.16
4	.61	.09	.25	.17	.75	.09	.19	.03	.72	.21	.23	.05
5	.42	.25	.34	.04	.68	.26	.12	.19	.70	.13	.24	.08
6	.03	.67	.01	.21	.05	.77	.20	.08	.06	.74	.17	.06
7	.12	.55	.43	.17	.47	.39	.32	.03	.47	.47	.24	.03
8	.11	.75	.03	.14	.01	.70	.15	.10	.19	.78	.09	.22
9	.04	.78	.11	.01	.26	.70	.12	.08	.16	.80	.04	.02
10	.06	.57	.54	.13	.58	.61	.10	.13	.26	.58	.43	.02
11	.18	.22	.67	.24	.05	.28	.67	.12	.22	.10	.62	.11
12	.35	.04	.68	.29	.23	.27	.65	.11	.16	.10	.73	.12
13	.33	.10	.70	.35	.35	.04	.67	.25	.13	.22	.74	.26
14	.25	.10	.67	.41	.06	.10	.54	.49	.20	.21	.48	.38
15	.06	.07	.81	.20	.09	.17	.62	.28	.48	.09	.56	.14
16	.23	.20	.28	.73	.12	.08	.51	.61	.13	.32	.09	.73
17	.31	.11	.18	.73	.12	.08	.51	.61	.13	.32	.09	.73
18	.13	.13	.19	.78	.13	.12	.04	.88	.07	-.07	.16	.70
19	.01	.10	.33	.75	.14	.09	.14	.84	.24	-.10	.13	.73
20	.09	.15	.18	.82	.00	.15	.00	.88	.07	-.09	.22	.60

NOTE: Underlined numbers represent the salient item-factor loading for each item on the four factors identified previously by Siebert et al. (1987).
a. Decimal points have been removed and factors reordered to increase clarity.

remaining two factors, anxiety and dysphoria (items 11-15) and severe depression (items 16-20) a similar pattern is repeated. In summary, four robust factors are replicated across the three groups.

DISCUSSION

The present study used the FACTOREP program (Walkey & McCormick, 1985) to test the replicability of the structure of the GHQ20 across three diverse ethnic groups. The four-factor solution previously reported by Siebert et al. (1987) was clearly replicated for the Chinese, Maori, and Filipino groups. This provides further support for the robustness of the factor structure of this measure. In their initial paper, Siebert et al. (1987) replicated the four-factor solution across four separate groups. However, even though these

groups were from different countries, they could all be described as predominantly European or Caucasian subjects. The present study goes one step further in employing groups that are clearly ethnically and culturally distinct.

It is important to stress here, however, that identifying the four factors across the three groups does not suggest that the groups will not differ in their absolute mean levels of the different symptoms tapped by each subscale and its underlying factor. The factors merely represent groups of items that are highly intercorrelated. Different cultural groups will likely display markedly different mean raw scores upon the subscales representing the underlying factors.

Such a finding supports the use of the GHQ20 as a brief measure of psychological distress in studies involving cross-cultural comparisons. It means that differences between groups on the same symptom dimensions can be readily compared. The GHQ20, in this regard, has four specific subscales and provides an overall index of disturbance.

The present study was confirmatory in nature. Its purpose was not to determine unique expressions of symptoms that could only be observed in one group, as has previously been attempted, but rather to determine the generalizability of certain specific symptom subscales to allow for their comparison across culturally separate groups. It appears that the GHQ20 is highly appropriate for this purpose, at least amongst English-speaking subjects. The four factors, namely general illness, sleep disturbance, anxiety and dysphoria, and severe depression, were all replicated across each of the three different cultural groups.

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