Bem Sex-Role Inventory Performance in Students: Comparisons between New Zealand, Australian and American Samples

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The Bem Sex-Role Inventory was administered to a sample of first year psychology students at the University of Canterbury. Numbers of cases in sex-role classes determined by both the t-ratio and median split procedures were compared with samples from Macquarie University, Australia and Stanford University, U.S.A. No clear differences existed. However, Canterbury females obtained significantly lower mean ratings of items on the femininity and masculinity scales than females from the other two samples. Canterbury males on the other hand, were lower than Stanford but not Macquarie on masculinity. On the social desirability scale, all males were lower than females and all Canterbury students were lower than either their Macquarie or Stanford equivalents. For Canterbury females there was no relationship between choices of advancing subject and sex-role classification. This was contrary to males for whom individuals classified as "masculine" preferred subjects within the sciences and professions rather than the social sciences and arts. However, males who chose sciences and professions achieved lower femininity scores than those who chose social sciences and arts but the two groups did not differ on masculinity.

There has recently been increased awareness of the need for distinguishing between biological sex and sex-role identity in the study of human psychological processes. Traditionally this distinction is made through the use of masculinity-femininity scales on which a score represents one's position on a continuum extending between the two extreme positions. Consequently one can be feminine or masculine but not both. Recently Bem (1974) has attempted to depart from this sex-role dichotomy by incorporating a concept of "androgyny" into the Bem Sex-Role Inventory (BSRI) she has developed. In this, femininity and masculinity are treated as independent dimensions so that a score on each is obtained. Androgyny is viewed as the extent to which characteristics of both dimensions are endorsed and is measured by the size of the difference between femininity and masculinity self-ratings.

The BSRI comprises 60 personality characteristics of which 20 are defined as typically feminine and 20 typically masculine (according to the views of American college students). The remaining 20 items constitute a social desirability scale which is neutral with regard to sex-typing and is designed to measure any general tendency to merely endorse socially desirable traits. Subjects are required to indicate on a 7-point scale how well each characteristic describes themselves. The score for each scale is then calculated as the mean rating for all component items. The androgyny score becomes the difference between the masculinity and femininity scores converted to a t-ratio. Consequently the nearer to zero is this ratio, the more androgynous is the individual. A ratio of 2.025 indicates significant ($p < .05$) sex-typing. On the basis of these ratios Bem derived five sex-role classes, i.e., feminine ($t \geqslant 2.025$), near feminine ($1 < t$ 2.025), androgynous ($-1 \leqslant t \leqslant +1$), near masculine ($-2.025 \leqslant t < -1$), masculine ($t \leqslant -2.025$). However, as has been pointed out by Spence, Helmreich and Stapp (1975), Bem's method for determining androgyny ensures any small difference between feminity and masculinity scores will indicate androgyny irrespective of the magnitude of these scores. Therefore individuals who achieve low feminity and masculinity scores, and are therefore neither particularly feminine nor masculine will be classified as androgynous along with individuals obtaining high scores

on each scale. The present author has also noted that an individual who scores very highly on one scale but even higher on the other may be classified as sex-typed whereas an androgynous classification could be more appropriate in terms of Bem's (1974) conception of androgyny. Spence et al. (1975) therefore advocated an alternative median split procedure involving the determination of median femininity (F) and masculinity (M) scores and the subsequent assignment of each individual to one of four sex-role groups depending on whether or not these medians were exceeded, i.e., feminine ($>$F, $<$ M) androgynous ($>$F, $>$ M), undifferentiated ($<$F, $<$ M), masculine ($<$F, $>$ M). Bem (1977) now recommends the median split procedure in preference to her own t-ratio method.

As the BSRI has been developed entirely with American students, comparisons between other cultures are clearly desirable. Concern with this fact has led Rowland (1977) and Russell, Antill and Cunningham (1978) to investiate BSRI performance in samples of Australian university students. Rowland (1977) adopted Bem's t-ratio method and concluded that male psychology students at the University of Wollongong (New South Wales) were less sex-typed than their American equivalents in Bem's (1974) Stanford University sample (California). However, her finding was criticised by Russell et al. (1978) on the grounds that she surveyed first, second and third year students whereas Bem's sample was confined to first year students. Russell et al. (1978)

accordingly found that the distribution of sex-role classifications amongst first year psychology students at Macquarie University (New South Wales) did not markedly differ from that reported by Bem (1974, 1977) when either the t-ratio or median split procedure was used. As the BSRI is becoming increasingly popular in sex-roles research it seemed desirable to determine how a sample of New Zealand first year psychology students would compare with those investigated by Russell et al. (1978) in Australia and Bem (1974, 1977) in the U.S.A. In a modest attempt to relate sex-roles to academic choice it was also decided to see if there was any relationship between sex-role classification and selection of advancing university subjects.

Method

The sample comprised 123 female (mean age = 20.36 years, S.D. = 4.23) and 105 male (mean age = 19.80 years, S.D. = 3.04) first year psychology students enrolled at the University of Canterbury during 1978. They were requested to complete the BSRI and to state the university subjects they intended advancing to third year level in. No information was provided about the aims of the inventory until all completed forms had been collected.

Results

Sex Role Classification

Mean femininity, masculinity and social desirability ratings were calculated for each subject. Sex-role classifications were then determined by Bem's (1974) t-ratio method and the median split procedure advocated by Spence et al. (1975). Frequencies of cases in each class were subsequently compared with those reported by Bem (1974, 1977) for

Table 1

Sex-Role Classification via t-Ratios (percentages)

Student Sample	N	Feminine	Near Feminine	Androgynous	Near Masculine	Masculine
(a) Females						
Canterbury, N.Z.	123	29	24	36	7	5
Macquarie, Aust. (Russell et al., 1978)	633	35	17	32	9	7
Stanford, U.S.A. (Bem, 1974)	279	34	20	27	12	8
(b) Males						
Canterbury, N.Z.	105	8	8	39	19	27
Macquarie, Aust.	269	7	7	41	19	25
Stanford, U.S.A.	444	6	5	34	19	36

Table 2

Sex-Role Classification via Median Split Procedure
(percentages)

Student Sample	Feminine	Androgynous	Undifferentiated	Masculine
(a) Females				
Canterbury, N.Z.	38	19	26	17
Macquarie, Aust.	42	26	16	16
(Russell et al., 1978)				
Stanford, U.S.A.	34	29	20	16
(Bem, 1977)				
(b) Males				
Canterbury, N.Z.	11	24	23	42
Macquarie, Aust.	14	20	25	41
Stanford, U.S.A.	16	20	27	37

American students at Stanford University (California) and by Russell et al. (1978) for Australian students at Macquarie University (New South Wales).

The t-ratio method. Percentages of students which occurred in each sex-role class determined by this method are outlined in Table 1.

Chi-square tests revealed no significant differences between the numbers of students in the three samples appearing in the sex-role classes.

The median split method. Median femininity and masculinity scores for the Canterbury sample were 4.50 and 4.43 (Russell et al., 1978 = 4.75, 4.60; Bem, 1977 = 4.76, 4.89) respectively. Percentages in each class derived from whether or not each median was exceeded are outlined in Table 2. According to chi-square tests there were no significant between-sample differences in any of the four classes.

Correlations between the BSRI scales

By means of the Pearson product moment procedure Canterbury femininity, masculinity and social desirability scores were correlated with each other. The results can be seen in Table 3 along with those previously reported for Macquarie (Russell et al. 1978) and Stanford students (Bem, 1977).

In contrast to the non-New Zealand samples, only two Canterbury coefficients reached statistical significance, namely that between femininity and social desirability for females and that between masculinity and social desirability for males. Significance tests were

also applied to the differences between coefficients from the three samples (Garrett, 1958). The only significant difference noted was between the Canterbury and Stanford male masculinity-social desirability correlations ($t = 2.10$, $p < .05$)

Means and Standard Deviations

Means and standard deviations for each sex on the three BSRI scales were tabulated along with those reported by Russell et al. (1978) and Bem (1974) (see Table 4).

Separate unequal groups sex x sample analyses of variance were performed on each scale. Both main effects were significant for the three measures, i.e., *femininity*: F sex (1, 1847) = 299.70, $p < .001$, F sample (2,1847) = 24.36, $p < .001$; *masculinity*: F sex = 208.65, $p < .001$, F sample = 28.11, $p < .001$; *social desirability*: F sex = 59.26, p

Table 3

Correlations Between Femininity (F),
Masculinity (M) and Social Desirability (S)

	F & M	F & S	M & S
(a) Females			
Canterbury, N.Z.	– .03	.24**	.08
Macquarie, Aust.	– .11*	.23**	.16**
(Russell et al., 1978)			
Stanford, U.S.A.	– .14*	.26**	.19**
(b) Males			
Canterbury, N.Z.	.12	.16	.22*
Macquarie, Aust.	.15*	.21**	.37**
Stanford, U.S.A.	.11*	.28**	.42**

* $p < .05$ ** $p < .01$

Table 4

Means and Standard Deviations for Femininity Masculinity and Social Desirability

Student Sample	Females Mean	S.D.	Males Mean	S.D.
(a) Femininity				
Canterbury, N.Z.	4.66	.56	4.40	.58
Macquarie, Aust.	4.93	.54	4.47	.51
(Russell et al., 1978)				
Stanford, U.S.A.	5.01	.52	4.44	.55
(Bem, 1974)				
(b) Masculinity				
Canterbury, N.Z.	4.16	.61	4.79	.72
Macquarie, Aust.	4.41	.73	4.78	.72
Stanford, U.S.A.	4.57	.69	4.97	.67
(c)Social Desirability				
Canterbury, N.Z.	4.64	.52	4.50	.50
Macquarie, Aust.	5.04	.46	4.83	.50
Stanford, U.S.A.	5.08	.50	4.91	.50

$< .001$, F sample $= 139.22$, $p < .001$. Females scored higher than males on femininity and social desirability and lower on masculinity.

As sex x sample interactions were also significant for femininity ($F (2,1847) = 13.29$, $p < .001$) and masculinity ($F (2,1847) = 6.48$, $p < .01$), individual t-tests were performed between the three samples within each sex using *MS error* as estimates of variance ($d.f. = 1847$). The results can be seen in Table 5.

In both cases Canterbury females scored significantly lower than Macquarie females who in turn scored lower than Stanford

Table 5

Results of t-Test Comparisons Between Canterbury, Macquarie and Stanford Students for Femininity and Masculinity

	Canterbury F	M	Macquarie F	M	Stanford F	M
(a) Females						
Canterbury			5.08	3.62	5.99	5.40
Macquarie	1.13	0.12			2.06	3.17
Stanford	0.68	2.36	1.17	3.50		
(b) Males						

p crit. (.05) = 1.96

females. There were no significant differences between males for femininity. However, Stanford males were higher on masculinity than either of the other two groups which did not differ significantly from each other.

The significant sex effect on social desirability was due to higher scores for all females (mean = 5.00) than for males (mean = 4.83). Individual t-tests revealed that the sample effect was due to lower scores for Canterbury students (mean = 4.58) than for either their Macquarie (mean = 4.98, $t = 3.32$, $p < .001$) or Stanford equivalents (mean = 4.98, $t = 3.28$, $p < .01$).

Choice of Advancing Subject

Chi-square comparisons. To enable statistical comparisons the variety of advancing subjects selected by Canterbury students was reduced to two general categories, namely (1) *social sciences and arts* (comprising psychology, education, sociology, economics, languages, philosophy, political science, history, religious studies, American studies), and (2) *sciences and professions* (comprising chemistry, physics, mathematics, zoology, botany, biology, geography, geology, operations research, computer science, law accountancy, business administration, medicine, optometry, architecture). The numbers of individuals in each sex-role group (median split method) were then compared by means of chi-square tests (see Table 6). Eight females and 9 males did not specify an advancing subject and were therefore excluded from these analyses.

Although significantly more females chose the social sciences and arts than males (Chi square = 9.96, $d.f. = 1$, $p < .01$) and vice versa for the sciences and professions, their choices were not related to their BSRI classification. However, significantly fewer masculine males chose the social sciences or arts than the other three sex-role groups. This of course meant that correspondingly more masculine males chose the sciences or professions.

Differences in mean femininity and masculinity. Separate unequal groups sex x subject category analyses of variance were performed on the femininity and masculinity scores of all students who specified an advancing subject. In both cases the sex

Table 6.

Percentages of Canterbury Students in Each Sex-Role Class (Median Split)
Intending to Advance in the Social Sciences or Professions

	Feminine	Androgynous	Undifferentiated	Masculine
(a) Females				
Social Sciences or Arts	76	76	67	76 ⎤
Sciences or Professions	24	24	33	24 ⎦ a
N	46	21	27	21
(b) Males				
Social Sciences or Arts	67	70	55	37 ⎤
Sciences or Professions	33	30	45	63 ⎦ b
N	12	23	20	41

[a] Chi-Square (3 d.f.) = 1.01, $p > .05$
[b] Chi-Square (3 d.f.) = 7.91, $p < .05$

effect was significant, *i.e., femininity*: female mean = 4.67, male = 4.39, $F (1,207)$ = 12.44, $p < .001$; *masculinity* female = 4.17, male = 4.79, $F = 40.65$, $p < .001$. There was also a significant sex x subject category interaction for femininity only ($F (1,207) = 3.85, p < .05$). Subsequent t tests ($d.f. = 207$) showed this to be due to significantly lower scores for males who chose sciences or professions (mean = 4.23) than for males who chose social sciences or arts (mean = 4.54, $t = 2.72, p < .01$). Females in the two subject categories did not differ, i.e., 4.68, 4.67 respectively, $t = 0.08$.

Discussion

The proportions of subjects occurring in the sex-role groups determined by the t-ratio method did not differ between Australian (Russell et al., 1978), American (Bem, 1974) and New Zealand samples. Likewise, between-sample similarities characterized the distribution obtained by the currently more acceptable median split method. Although correlations between the three BSRI scales were of the same sign for all groups, Canterbury coefficients tended to be smaller. However, in view of the large numbers of cases involved, such small coefficients are of negligible psychological importance even though most were statistically significant. As the proportion of variance in one scale that could be attributed

to some linear relation with another (r^2) ranged from 1.21% (lowest significant coefficient) to 17.65% (highest significant coefficient) it is clear that, in research of this sort, there is little value in attempting meaningful interpretations of small correlations and why they differ (or not) between samples. All that can really be concluded in the present study is that the same general pattern of minor relationships between the BSRI scales characterized all three samples.

When comparing BSRI performance between cultures, Russell et al. (1978) have stressed the desirability of considering mean scores on each scale rather than proportions of cases in each sex-role class. This recommendation seems fully justified in the light of the present findings. Although no differences in femininity existed between males from the three samples, Canterbury males were significantly lower than Stanford but not Macquarie males on masculinity. Whereas Canterbury and Macquarie male patterns looked similar, Canterbury females differed extensively from those in the Australian and American samples. Their significantly lower scores on both femininity and masculinity suggested a greater inclination to avoid high ratings of test items. Whether this reflects a sex-related cultural difference in sex-role identification or merely in rating behaviour remains to be

determined. Irrespective of sex it was apparent that any differences between Canterbury and Macquarie students were in the same direction as those between Macquarie and Stanford students. The sample differences on the social desirability scale suggest that Canterbury students may have less of a tendency to merely endorse socially desirable traits than the other two samples.

Even though the three samples did not differ in proportions of cases within each sex-role class, differences in mean scores on the three BSRI scales support the use of this latter procedure in sex-roles research. As Russell et al. (1978) point out, the generally preferred median-split procedure is based on medians for the particular sample under investigation. It might then be possible to obtain similar distributions of sex-role classifications regardless of the absolute values of femininity and masculinity scores. Therefore, unless mean scores are also compared, variations in sex-role behaviour may not be detected.

Although the majority of Canterbury females selected advancing subjects in the social sciences and arts, in contrast to males their choices and sex-role classifications were in no way related. This suggests that, regardless of how they perceived themselves (at least in terms of the BSRI items), social influences had still been powerful enough to discourage them from "traditional" male pursuits in the sciences and professions. In line with popular views concerning what are "masculine" academic prerogatives, significantly fewer males chose the social

sciences and arts than females. Males also achieved higher masculinity and lower femininity scores than females. The possible socially acceptable relationship between masculinity and academic choice for males only was further supported by the finding that masculine males chose the sciences and professions more often than other male sex-role groups to the extent that they were preferred to the social sciences and arts. However, as males in the two advancing subject categories differed on femininity but not on masculinity scores, it would seem that any relationship between their sex-role identity and academic choice was based on a comparative lack of femininity rather than an abundance of masculinity. This example illustrates the value in comparing absolute scores as well as proportions of cases in sex-role classes derived from the BSRI.

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