Australian Journal of Clinical and Experimental Hypnosis
Vol. 24, No. 1, 1996, pp. 1–11

A NORMATIVE AND STRUCTURAL ANALYSIS OF THE HGSHS:A WITH A LARGE AUSTRALIAN SAMPLE

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Australian norms and structural analysis for the Harvard Group Scale of Hypnotic Susceptibility, Form A (HGSHS:A) are presented. Results relating to score distributions, item difficulty level, and reliability were considered for a large sample of Australian students (N = 4,752) obtained over eight years of testing at Macquarie University. The aggregated sample, which represents the largest normative study of the HGSHS:A undertaken to date, was compared to recent normative studies conducted in Australia, Canada, Germany, and Spain, using both English and non-English versions of the test. In general, the aggregated sample was consistent with other reference samples, and results indicated that the HGSHS:A continues to function well as an instrument for the initial screening of hypnotisability. Further, the emergence of a three-factor solution from the principal components analysis was also consistent with previous factor-analytic studies, and suggested that performance on this scale reflects three dimensions of hypnotic responding.

The Harvard Group Scale of Hypnotic Susceptibility, Form A (HGSHS:A), adapted by Shor and E. Orne (1962) from the individually administered Stanford Hypnotic Susceptibility Scale, Form A (SHSS:A; Weitzenhoffer & Hilgard, 1959) is the most widely used measure of hypnotisability (Sheehan & McConkey, 1982). The relative efficiency of administration and the psychometric properties of the scale have resulted in the HGSHS:A being the preferred instrument for the initial screening of high-, medium-, and low-hypnotisable subjects for further participation in hypnosis research. Normative studies of the HGSHS:A in the USA (Coe, 1964; Shor & Orne, 1963), Australia (Sheehan & McConkey, 1979), and Canada (Laurence & Perry, 1982) have

This research was conducted at Macquarie University. Its conduct was supported in part by a grant from the Australian Research Council. We are grateful to Bernadette Bibb, Sandra Hejtmanek, and Natalie Watson for research assistance.

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established the reliability and validity of the HGSHS:A, and more recent normative studies in Germany (Bongartz, 1985) and Spain (Lamas, del Valle-Inclan, Blanco, & Diaz, 1989) have established that transposing the HGSHS:A into other linguistic contexts does not result in either a loss of precision or a substantial change in the scale's psychometric properties. Thus, the HGSHS:A is comparable across different socio-cultural and linguistic contexts. Minor differences in the distributions of scores have generally been attributed to the nature of the different samples. For instance, subject selection procedures (e.g., whether participants were volunteers), participants' knowledge and expectations about hypnosis, and the presence of group pressure to participate may alter the composition of the sample in ways that affect the overall results.

Sheehan and McConkey (1979) reported Australian norms for the HGSHS:A on 1,944 participants who were tested over three years (1973–1975) at the University of Queensland. Those norms established the reliability and utility of the HGSHS:A as a predictor of hypnotic susceptibility in the Australian context. The present paper provides updated Australian norms for the HGSHS:A, and is based on a sample of 4,752 participants obtained over eight years (1985–1992) of testing at Macquarie University. In this paper we compare this large aggregated sample with previous Australian (Sheehan & McConkey, 1979), and subsequently reported overseas reference samples (viz., Bongartz, 1985; Lamas et al., 1989; Laurence & Perry, 1982). Although the HGSHS:A was designed to measure "hypnotisability," assuming that it taps a single trait or general ability factor labelled "hypnotisability," different types of performance have been observed (Sheehan & McConkey, 1982). Specifically, factor analytic studies of the structure of the HGSHS:A (e.g., McConkey, Sheehan, & Law, 1980; Peters, Dhanens, Lundy, & Landy, 1974) have generally supported the existence of three types of items or dimensions underlying the scale: direct or ideomotor (e.g., hand lowering, hands moving apart), challenge (e.g., arm rigidity, eye catalepsy), and cognitive/delusory (e.g., fly, post-hypnotic amnesia) (for a critical review see Balthazard & Woody, 1985). Since inconsistent or unstable findings from factor analyses of the HGSHS:A may be attributed to small sample sizes, the present analysis, which is based on the large aggregated sample, sought to clarify the dimensions of the HGSHS:A.

METHOD

Participants

Four thousand seven hundred and fifty-two first-year Psychology students enrolled at Macquarie University in the years 1985–1992 participated in the HGSHS:A testing program. Participants received research credit in return for their participation. Table 1 presents information about the age and sex of subjects in the aggregated sample.

Table 1 Age Distributions of the Eight Samples and the Aggregated Sample Separately for All Subjects, Males, and Females

		N	Mean	*SD*
1985	All	622	22.62	7.67
	Males	191	22.08	6.99
	Females	431	22.86	7.95
1986	All	518	23.57	8.48
	Males	133	22.29	7.23
	Females	385	24.02	8.83
1987	All	491	22.73	7.88
	Males	116	21.75	6.28
	Females	375	23.04	8.29
1988	All	570	22.20	7.69
	Males	168	21.45	6.02
	Females	402	22.51	8.27
1989	All	546	20.82	6.37
	Males	150	19.70	3.74
	Females	396	21.24	7.07
1990	All	818	21.51	7.27
	Males	249	20.57	5.42
	Females	569	21.93	7.91
1991	All	624	21.81	7.59
	Males	163	20.61	6.05
	Females	461	22.24	8.03
1992	All	563	23.08	8.98
	Males	140	22.94	8.88
	Females	423	23.52	9.02
Aggregated sample	All	4,752	22.24	7.78
	Males	1,310	21.40	6.46
	Females	3,442	22.55	8.20

Procedure

Subjects were tested in groups of 3–30. The testing procedure was described and participants were informed that they were free to withdraw their participation at any time. The standard tape-recorded version of the HGSHS:A

(Shor & Orne, 1962; see original test manual for details of the procedure) was administered. The 12 test items were head falling, eye closure, hand lowering, arm immobilisation, finger lock, arm rigidity, hands moving apart, communication inhibition, fly hallucination, eye catalepsy, post-hypnotic suggestion, and post-hypnotic amnesia. Following the hypnosis session, the participants completed the standard self-report response booklet that indexed their behavioural response to each of the test items. Finally, any questions were answered and the session was ended.

RESULTS AND DISCUSSION

Scoring of responses to the 12 test items followed the standard procedure described by Shor and Orne (1963). For Items 1 to 11, a score of "1" was awarded if subjects reported a response that met the behavioural criterion for the response in question. A score of "0" was awarded for responses not meeting the criteria. For Item 12 (amnesia), participants were awarded a score of "1" if they recalled fewer than four items before the experimenter gave the signal to remember. Participants were awarded a score of "0" if they remembered four or more items prior to the cancellation cue. The scores on the 12 items were summed to yield a scale score with a maximum of 12.

Age and Sex Differences

Product–moment correlations between age of subject and HGSHS:A scores were computed for each sample separately (range: r = -0.02 to -0.16) and for the aggregated sample (r = -0.11). Similarly, point-biserial correlations between sex and HGSHS:A scores were computed for each sample separately (range: r = -0.04 to -0.16) and for the aggregated sample (r = -0.09). There was no substantial relationship between either age or sex and HGSHS:A scores. These data are consistent with the general burden of evidence that suggests slight, but nonsignificant, differences in the direction of women being more responsive to hypnosis (as measured by the HGSHS:A) than men (e.g., Bongartz, 1985; Lamas et al., 1989). Due to the absence of demonstrable age or sex differences in the samples, the data for males and females of all ages were pooled for the remaining analyses of the aggregated sample.

Score Distributions

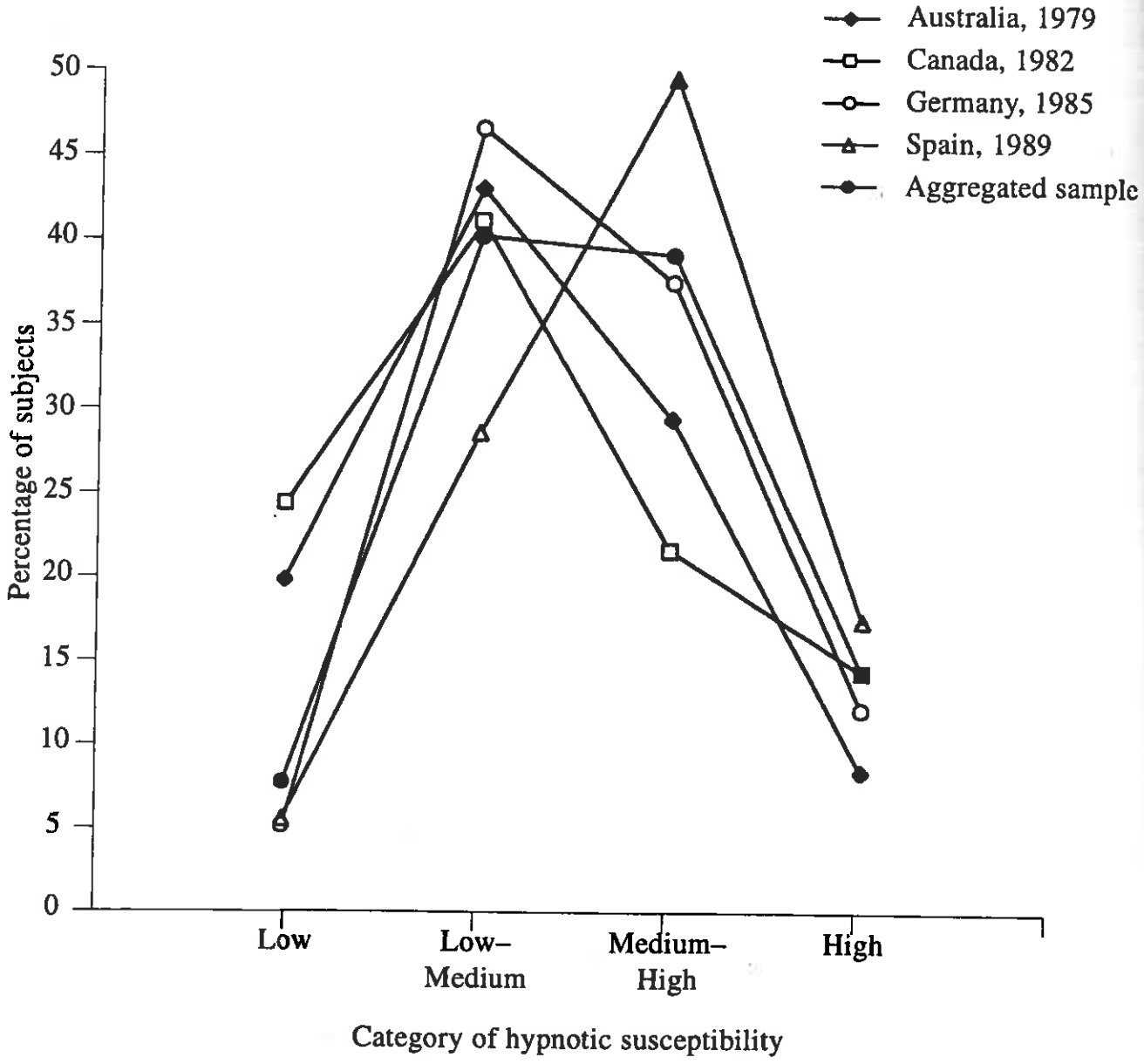
Table 2 presents the percentage distributions of scale scores and the overall mean scale scores for the aggregated sample and the Australian reference sample. The mean scale scores across the eight samples in the aggregated sample varied within acceptable limits, ranging from 5.90 to 6.91. The mean scale score for the aggregated sample (6.54) fell around the middle of the distribution of mean scores of the reference samples, was slightly higher than those reported in the Canadian (M = 5.38; Laurence & Perry, 1982), Australian

(M = 5.45; Sheehan & McConkey, 1979) and German (M = 6.51; Bongartz, 1985) reference samples, and was slightly lower than that reported in the Spanish reference sample (M = 7.13; Lamas et al., 1989). Examination of the samples in terms of the four categories of hypnotic susceptibility proposed by Laurence and Perry (1982) suggested that differences in means could be attributed to the composition of the samples. Figure 1 presents the distribution of participants in Low (0–2), Low–Medium (3–6), High–Medium (7–9), and High (10–12) categories of responsiveness for the aggregated sample and the reference samples. The percentage of High–Medium hypnotisable participants in the aggregated sample (39%) was similar to the percentage reported for the German reference sample (37%; Bongartz, 1985), was smaller than that reported for the Spanish reference sample (49%; Lamas et al., 1989), but was considerably larger than the percentage reported for both the Australian (29%; Sheehan & McConkey, 1979) and Canadian (21%; Laurence & Perry, 1982) reference samples. Conversely, the percentage of Low hypnotisable participants in the aggregated sample (7.5%), while similar to both the German (5%; Bongartz, 1985) and Spanish (5%; Lamas et al., 1989) reference samples, was smaller than the percentage reported for both the Australian (20%; Sheehan & McConkey, 1979) and Canadian (24%; Laurence & Perry, 1982) reference samples.

Table 2 HGSHS:A Percentage Distributions, Mean Scores, and Standard Deviations

HGSHS:A Score	Sample	
	Aggregated sample %	Sheehan & McConkey (1979) %
0	1.2	4.0
1	2.2	6.0
2	4.2	9.5
3	6.5	9.8
4	9.6	10.3
5	10.7	10.4
6	12.8	12.0
7	13.8	10.1
8	13.5	10.5
9	11.2	8.4
10	9.0	4.5
11	4.0	3.3
12	1.3	0.7
Mean HGSHS:A Score	6.5	5.5
SD	2.65	2.95

Figure 1. Percentages of Participants in Each Category of Hypnotisability for the Aggregated Sample and the Australian (Sheehan & McConkey, 1979), Canadian (Laurence & Perry, 1982), German (Bongartz, 1985), and Spanish (Lamas et al., 1989) Reference Samples



Item Difficulty

Table 3 presents the percentages of subjects passing each item and the mean pass percentage for the aggregated sample and the Australian reference sample. In addition, the ranked difficulty level is shown for each item. Rank item difficulty levels were also calculated for each of the eight samples in the aggregated sample, and rank order correlations for each pair of samples were calculated. Correlations were high (range: $r = 0.91$ to 1.00), indicating a high degree of consistency in item difficulty across the eight samples. To evaluate the consistency of item difficulty across the aggregated sample and the reference samples, item difficulty ranks were calculated for each sample, and rank order

Table 3 Percentages of Subjects Passing Each Item for the Aggregated Sample and the Australian Reference Sample. Numbers in Parentheses Represent Rankings for Items from Least Difficult/Most Passed (1) to Most Difficult/Least Passed (12)

Item	Sample	
	Aggregated sample %	Sheehan & McConkey (1979) %
1 Head falling	70 (4)	61 (3)
2 Eye closure	73 (3)	57 (4)
3 Hand lowering	76 (2)	71 (1)
4 Arm immobilisation	48 (8)	36 (9)
5 Finger lock	63 (5)	53 (5)
6 Arm rigidity	52 (6)	41 (7)
7 Hands moving	79 (1)	71 (2)
8 Communication inhibition	52 (6)	42 (6)
9 Hallucination	25 (12)	25 (11)
10 Eye catalepsy	45 (10)	38 (8)
11 Posthypnotic suggestion	26 (11)	17 (12)
12 Posthypnotic amnesia	46 (9)	33 (10)
Mean	55	45

correlations for each pair of samples were calculated. High correlations between the aggregated sample and the Australian (r = 0.95; Sheehan & McConkey, 1979), Canadian (r = 0.88; Laurence & Perry, 1982), German (r = 0.91; Bongartz, 1985), and Spanish (r = 0.78; Lamas et al., 1989) reference samples supported the consistency of item difficulty across the various culturally and linguistically specific contexts.

Reliability

Point-biserial correlations between each item and the scale score omitting that item were calculated for each of the eight samples in the aggregated sample. High correlations between pairs of samples (range: r = 0.92 to 0.97) suggested that the HGSHS:A is a reliable instrument. The similarity of the relative magnitudes of the Kuder-Richardson coefficient for each of the groups (range: 0.66 to 0.69), as well as a high coefficient of concordance between the eight samples (W = 0.97), also indicated a high degree of consistency among the samples comprising the aggregated sample. Point-biserial correlations for each item and the Kuder-Richardson coefficient for the total scale were calculated for the aggregated sample and the reference samples; Table 4 presents these data for the aggregated sample and the Australian reference sample. Inspection of these data revealed that total scale reliability, as well as item reliability, was generally

lower for the aggregated sample. Similarly, the Kuder-Richardson coefficient for the aggregated sample (0.68) was smaller, but comparable to that of the Australian reference sample (0.76; Sheehan & McConkey, 1979) and the other reference samples (for comparison of previous samples, see Lamas et al., 1989). Despite the lower reliability of the HGSHS:A items and the mean scale score for the aggregated sample, the rank order of the point-biserial correlations of the aggregated sample was consistent with the rank order of the Australian (r = 0.94; Sheehan & McConkey, 1979), Canadian (r = 0.78; Laurence & Perry, 1982), German (r = 0.83; Bongartz, 1985), and Spanish (r = 0.95, Lamas et al., 1989) reference samples. These results indicated that the hierarchies of the items were comparable between the aggregated sample and the reference samples, highlighting the reliability of the scale.

Structural Analysis of the HGSHS:A

Data for the aggregated sample were factor analysed by the principal components model. Factors extracted using the principal components method

Table 4 Point-Biserial Correlations Between Each Item and the Total Score Omitting That Item, and Kuder-Richardson Total Scale Reliability Index for the Aggregated Sample and the Australian Reference Sample

Individual HGSHS:A items	Sample	
	Aggregated sample %	Sheehan & McConkey (1979) %
1 Head falling	.27	.39
2 Eye closure	.27	.39
3 Hand lowering	.13	.25
4 Arm immobilisation	.37	.36
5 Finger lock	.48	.59
6 Arm rigidity	.46	.55
7 Hands moving	.31	.42
8 Communication inhibition	.47	.51
9 Hallucination	.25	.34
10 Eye catalepsy	.49	.53
11 Posthypnotic suggestion	.14	.18
12 Posthypnotic amnesia	.18	.18
Total scale (Kuder-Richardson coefficient)	.68	.76

represented both the common and unique, or error, variance of the test items. Using the phi coefficient, intercorrelations were calculated for each item on the scale. Correlations were low, suggesting orthogonal rotation should be used. A principal components analysis was then conducted and three factors with eigenvalues greater than 1 were extracted; a scree test was used to confirm the appropriateness of this solution. Table 5 presents the factor loading matrix, rotated orthogonally using the varimax criterion.

Using a stringent cut-off for factor loadings of 0.50, three factors emerged that represented the data reasonably well, accounting for 44.1% of the variance. The arm immobilisation, finger lock, arm rigidity, communication inhibition, and eye catalepsy items were most representative of Factor 1; the head falling, eye closure, hand lowering, and hands moving apart items were most representative of Factor 2; and the fly hallucination and post-hypnotic suggestion items were most representative of Factor 3. Posthypnotic amnesia appeared to be factorially complex, loading moderately on all three factors. With the exception of the amnesia item, this pattern suggested that a three-factor solution most appropriately defined the vector space shared by the 12 items. The emergence of these three factors, consisting of (what are typically labelled) Challenge items, Ideomotor (or Direct Suggestion) items, and Cognitive (or Complex Delusory) items, is consistent with previous factor analytic results (e.g., McConkey et al., 1980; Peters et al., 1974) and the theoretical distinctions between item types (Hilgard, 1965).

Table 5 Communalities and Rotated Factor Loading Matrix for Principal Components Analysis of Aggregated Sample

Item	Communality	Factor 1	Factor 2	Factor 3
1 Head falling	.349	.12	.56	.16
2 Eye closure	.294	.18	.50	.09
3 Hand lowering	.434	-.07	.65	-.08
4 Arm immobilisation	.487	.69	-.07	-.01
5 Finger lock	.459	.63	.24	.06
6 Arm rigidity	.489	.69	.07	.09
7 Hands moving	.369	.18	.57	.13
8 Communication inhibition	.492	.68	.18	.00
9 Hallucination	.498	.16	.09	.68
10 Eye catalepsy	.468	.63	.27	.06
11 Posthypnotic suggestion	.599	-.06	.12	.76
12 Posthypnotic amnesia	.351	.43	-.32	.26

CONCLUSION

These findings were based on a series of samples that were combined to create the largest sample of its kind in the literature. The properties of this aggregated sample were consistent with those demonstrated for previous normative samples, thus demonstrating a remarkable degree of consistency and stability in how the test functions across different cultures, samples, and times. The HGSHS:A has been shown to work equally well for samples of students tested in different countries, whether English or non-English versions of the test are used. These findings add further support to the notion that the HGSHS:A is both a reliable and efficient tool for securing preliminary assessments of hypnotic susceptibility, and for the process of screening large numbers of individuals to identify the most promising candidates for further hypnotic involvement. Although some minor discrepancies in score distributions were noted across the reference samples considered, we would argue that differences in sample composition, rather than any weakness in the scale, accounted for these differences. Overall, the current data indicate that, in the Australian context, the HGSHS:A is a viable tool for the measurement of individual differences in susceptibility in continuing research on hypnotic phenomena.

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