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MAIN PAPER

HARVARD GROUP SCALE OF HYPNOTIC SUSCEPTIBILITY AND THE CREATIVE IMAGINATION SCALE: DEFINING TWO SEPARATE BUT CORRELATED ABILITIES

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ABSTRACT

Normative data for most psychological tests have been collected from student samples rather than clinical populations. So it was for the Harvard Group Scale of Hypnotic Susceptibility (HGSHS:A). This paper describes a comparative study, not a normative study, using an unselected adult, primarily non-student, cohort of volunteers (n=128) tested on the HGSHS:A. The purpose was to compare the results with those of normative studies performed in the USA, Australia, Germany and Canada. Results indicated strong similarities. Likewise, 49 of these subjects were tested with a taped form of the Creative Imagination Scale (CIS), published in 1978. Scores on neither the HGSHS:A nor the CIS were predicted by either age or sex. Although the CIS and HGSHS:A results were correlated, factor analysis on the two tests showed loadings on separate factors suggesting that these tests are measuring two related, but separate, abilities found in conjunction with each other. We concluded that these instruments can be used with confidence with clinical populations.

INTRODUCTION

The experimental situation involving hypnosis usually requires an assessment of hypnotizability that is either a quick individually administered test or, preferably, a test suitable for administration to many people at one time. The two most commonly used group administered tests are the Harvard Group Scale of Hypnotic Susceptibility: Form A (HGSHS:A, Shor & Orne, 1963), followed by the Creative Imagination Scale (CIS, Barber & Wilson, 1978). They both have the added advantage of being available in audio-tape format. The HGSHS:A, standardized in the United States of America, Canada, Australia and Germany (Bongartz, 1985; Laurence & Perry, 1982; Sheehan & McConkey, 1979; Shor & Orne, 1962), is widely utilized: in one survey over a 4-year period, it was used in 50% of published studies which assessed hypnosis (Sheehan & McConkey, 1979). The CIS is more rarely used, but when it is, it is as a measure of hypnotizability in spite of its name (Stewart & Marks, 1990; Wilson & Barber, 1978). The CIS meets the requirements of clinicians in being easy to use (especially the taped version) and it is quick (20 minutes to hear the tape and 5 minutes or so to fill out the questionnaire) (Gibson

& Heap, 1991). It has not been based on the Stanford Scales, and there is no induction. A criticism of the CIS is that it measures visualization abilities and ignores other sensory modalities that can be methods of inducing hypnosis like somatesthesia (Sacerdote, 1982). It was developed to counteract reactions to the authoritarian language of the standard scales (Hilgard, Sheehan, Monteiro & MacDonald, 1981).

A very real concern is the reported lack of correlation between these two measures (HGSHS:A and the CIS). McConkey, Sheehan and White (1979) in Australia used the two scales on the same subjects and found a low correlation, r = 0.28. These data were then compared to data collected in California which yielded a much higher correlation of r = 0.55.(Hilgard *et al.*, 1981). Spanos, Gabora, Jarrett and Gwynn (1989) opine that the discrepant correlations may be due to how the CIS was presented to the subjects. The higher Californian correlation may be due to the CIS being viewed as an alternative measure of hypnotizability, whilst the Australian study avoided this direct connection in the perceptions of the subjects. An important point in any hypnosis testing situation when two tests are being used, is whether the situations are presented as assessing the same or different dimensions. Spanos *et al.* (1989) found a variety of correlations between the CIS and another hypnotizability test, the Carleton University Responsiveness to Suggestion Scale (CURSS), which were dependent upon the expectations held by the subjects.

The normative data of both the HGSHS:A and the CIS were collected on student populations some years ago. Our research question is whether the usual mix of human characteristics in the general population today, will give results predicted by the older normative studies. The present study was designed to assess the means and standard deviations of an adult (i.e., non-student) New Zealand sample of 128 volunteers using the HGSHS:A. Forty-nine completed a CIS for comparison purposes. The Australian study with its low correlation has been cited at least twice (Lindsay, Kurtz & Stern, 1993; Siuta, 1987). The CIS is used to assess hypnotizability (Lindsay *et al.*, 1993; Stewart & Marks, 1990) but Lindsay *et al.* criticized their own decision to use the CIS because of the low Australian correlation with the HGSHS:A. This study set out to define the HGSHS:A as an assessment of hypnotic abilities and the CIS as a measure of 'imagery'.

METHODS

Subjects

Posters offering knowledge about hypnosis and personal hypnotizability were placed in lifts in a medical school and nearby general hospital producing 128 adult, working volunteer subjects. The age range was 19–68, with a mean of 37.6 years, (38 males (29.7%) and 90 females (70.3%)). No volunteer was excluded.

Procedure

The first testing was done with a taped version of the Harvard Group Scale of Hypnotic Susceptibility (HGSHS:A) re-recorded by the experimenter using the script provided. Testing for the HGSHS:A took place in a quiet seminar room in the medical school in groups of 5–16. There were no obstructions to arm movement. The testing session was completed in 1 hour with the tape taking 41 minutes of the time.

Some weeks or months later, a random 50 of the group were involved in another experiment which involved imagination and visualization with the same experimenter, but the term hypnosis was deliberately never mentioned so that the study and the subsequent testing with the CIS would not be associated with the original testing with the HGSHS:A. At the completion of the final session for that study, 49 of the subjects agreed to do the CIS; only one person dropped out due to time constraints. Their mean age was 38.94 years, (18 males, 31 females). On t-testing, there were no significant differences between the ages of the 49 subjects who completed the CIS and those 79 subjects who did not. Neither was there a significant difference in the male/female mix.

Some care was taken that the CIS should not be associated with testing for hypnotizability. No instructions were given to the subjects other than saying that this was an 'imagery test'. It was put to each person individually that he or she would be doing the investigator a small favour by participation. Instructions were kept low-key. The subject was invited just to sit back and enjoy the tape, and fill out a form afterwards about the experience. No hypnotic induction preceded the CIS and no 'think-with' instructions were given. They were admonished not to fall asleep. The CIS was administered by tape (21 minutes) and a form was provided for the results, all of which took place in the experimental room with no researcher present, although the session was monitored through a one-way glass from the next room.

Subjects were not paid, but, on completion of the HGSHS:A testing, were promised feedback of their own hypnotizability score and a brief explanation of what it meant. They were offered a 10-minute relaxation tape made by the experimenter as a thank you gift. All subjects requested the tape. The 49 subjects who participated in the further study and completed the CIS, were not given feedback about their HGSHS:A results or the relaxation tape until the end of the second study and the completion of the CIS testing. No subject asked for feedback from the 'imagery test' or seemed to expect it as part of the feedback about their own hypnotizability.

RESULTS

Comparison of CIS norms

Means and standard deviations are available for the CIS in three other countries: the United States of America (Wilson & Barber, 1978), Australia (Sheehan, McConkey & Law, 1978) and Poland (Siuta, 1987), as well as the present results from New Zealand (see Table 1). The means of the four countries are similar: 19.04 (10.68) in this study, 20.8 (8.6) in the American study, 20.69 (7.56) in the Polish study and 20.60 (6.9) in the Australian study.

Table 2 illustrates the statistics that are available from the literature so that they can be compared to those from the New Zealand study.

In the original American study (Wilson & Barber, 1978), all of the correlations between the items of the CIS, and each of the items correlated with the total score were significant. The Polish study reported that 12 of the items did not reach significance. The present study contains high correlations, as can be seen in Table 3 wherein all items but one reach significance with each other. All items also reach significance when correlated with the total score (all are $P < 0.0001$), and their correlations are somewhat higher than the Polish study.

Table l. CIS means

Item	NZ n = 38 mean	NZ SD	USA[a] n=217 mean	USA SD	Pol[b] n = 111 mean	Pol SD	Aust[c] n = 305 mean	Aust SD
1. Arm heaviness	2.76	1.30	2.2	1.1	2.38	1.17	2.18	1.09
2. Hand levitation	1.97	1.42	1.5	1.2	1.83	1.11	1.63	1.13
3. Finger anaesthesia	1.58	1.48	1.5	1.2	1.69	1.22	1.58	1.17
4. Water hallucination	1.55	1.48	2.0	1.3	1.93	1.28	2.02	1.22
5. Olfactory-gustatory hallucination	1.89	1.52	2.2	1.3	2.01	1.29	2.13	1.24
6. Music hallucination	2.32	1.51	2.7	1.3	2.35	1.31	2.34	1.29
7. Temperature hallucination	1.87	1.42	1.7	1.2	1.99	1.31	1.65	1.09
8. Time distortion	1.89	1.48	1.9	1.4	2.34	1.26	1.92	1.26
9. Age regression	2.61	1.39	2.3	1.3	2.08	1.28	2.35	1.16
l0. Mind-body relaxation	2.37	1.38	2.7	1.2	2.59	1.09	2.75	1.10
Total scale	20.81	10.7	20.8	8.6	20.69	7.56	20.60	6.90

[a] See Wilson and Barber (1978)
[b] See Siuta (1987)
[c] See Sheehan *et al*. (1978)

Table 2. Comparisons of CIS statistics between three countries

Category	Raw Scores	NZ %	Pol %	USA %	Mean %
High	> 30 – 40	21.1	17.3	18.0	18.8
Medium high	> 21 – < 31	39.5	38.7	34.0	34.1
Medium low	> 10 – < 21	23.7	33.0	35.0	30.6
Low	0 – < 11	15.8	11.0	13.0	13.3

Table 3. Pearson correlations of the items in the CIS

CIS Item		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1.	Arm heaviness		0.54	0.52	0.45	0.36	0.28	0.47	0.31	0.55	0.57
2.	Hand levitation			0.37	0.51	0.46	0.31	0.45	0.50	0.47	0.65
3.	Finger anaesthesia				0.56	0.53	0.36	0.66	0.36	0.52	0.63
4.	Water hallucination					0.61	0.43	0.56	0.59	0.58	0.68
5.	Olfactory-gustatory hallucination						0.45	0.56	0.61	0.65	0.61
6.	Music hallucination							0.31	0.23	0.51	0.47
7.	Temperature hallucination								0.49	0.52	0.60
8.	Time distortion									0.57	0.56
9.	Age regression										0.70
10.	Mind-body relaxation										
	Total scale*										
	NZ	0.69	0.63	0.67	0.76	0.73	0.48	0.69	0.62	0.76	0.83
	Poland	0.59	0.53	0.51	0.61	0.53	0.34	0.47	0.44	0.43	0.52

A Pearson correlation coefficient < 0.31 is significant at the 0.05 level with n = 38.
* This correlation analysis was done with the item compared with the total score minus the item in each case.

A factor analysis was done on the New Zealand results, as both the American and Polish studies reported only one factor on analysis. Table 4 illustrates the weightings of each item, all of which load on only one factor, corroborating the overseas results (Siuta, 1987; Wilson & Barber, 1978). As no item loaded on any other factor, no rotation was done.

Table 4. Comparison of Polish and New Zealand factor loadings of the CIS items on one factor only

Item		New Zealand	Poland
1.	Arm heaviness	0.67	0.70
2.	Hand levitation	0.70	0.65
3.	Finger anaesthesia	0.74	0.62
4.	Water hallucination	0.81	0.72
5.	Olfactory-gustatory hallucination	0.79	0.65
6.	Music hallucination	0.56	0.44
7.	Temperature hallucination	0.76	0.59
8.	Time distortion	0.71	0.56
9.	Age regression	0.82	0.54
10.	Mind-body relaxation	0.88	0.62

Comparison of HGSHS.A norms

Scoring of the HGSHS:A was standard (Shor & Orne, 1962). Using the categorisation of scores used in the literature (Laurence & Perry, 1982), the distribution of

scores was entered into four categories as set out in Table 5. As can be seen, the New Zealand frequencies were somewhat more normally distributed than some of the overseas studies, but fall within the expected boundaries.

Table 5. Percentages of the HGSHS:A scores using the Montreal categories

HGSHS:A Score	NZ n = 117	Montreal n = 315[1]	Australian n = 1944[2]	German n = 374[3]
Low	15.4	22.54	19.5	5
Low–medium	38.4	41.59	42.5	46
High–medium	32.4	19.68	29.0	37
High	13.6	16.19	8.5	12

[1]Laurence and Perry, 1982
[2]Sheehan and McConkey, 1979
[3]Bongartz, 1985

The means of the sample are found in Table 6.

Table 6. Means of the HGSHS:A samples

	Means	SD	n
New Zealand	5.89	2.99	117
Germany[3]	6.51	2.43	374
Canada[1]*	5.52	3.43	137
Australia[2]	5.45	2.95	1944

* The last of the three Canadian samples was collected in 1978. No cumulative figures are available for all the Canadian subjects, but this sample was not different statistically from either of the other two samples.
[1]Laurence and Perry, 1982
[2]Sheehan and McConkey, 1979
[3]Bongartz, 1985

It is to be noted that the New Zealand sample is of adult volunteers while all the other studies noted for comparison (Bongartz, 1985; Laurence & Perry, 1982; Sheehan & McConkey, 1979) tested university students (see Table 7). The New Zealand sample is made up of a considerably older cohort (mean 37.6 years), with a wide age range (19–68 years). Age was not correlated with hypnotizability score on the HGSHS:A (r = -0.07, P = ns), and there were no significant differences in the scores of male and female subjects (2-tailed t-test, P = ns). The proportions of male to female volunteers approximates to both the Australian and the Canadian samples.

Comparison of the two tests of hypnotizability

Several related studies (Sheehan *et al.*, 1978; McConkey *et al.*, 1979 and Hilgard *et al.*, 1981) subjected their CIS and HGSHS:A scores to a factor analysis that was performed on all subtest results — the 10 CIS items and the 12 HGSHS:A items. Their rationale for this procedure was to investigate the claim that the CIS tested only one factor, as illustrated by the results found in the present sample, and based upon those of Wilson and Barber (1978), and corroborated later by Siuta (1987). They felt that an anchoring test, with known factors independent to the CIS, was necessary for a true picture to emerge. They went on to identify that there were two factors involved, one they labelled as the Hypnotic Responsiveness Factor and the other, the Imagery/Absorption Factor.

Table 7. HGSHS:A age and sex statistics

	Age		Sex Frequency	
NZ	Mean	37.5	Males	28.2
n = 117	SD	11.7	Females	71.8
Australian[2]	Mean	20.5	Males	31.7
n = 1944	SD	6.1	Females	68.3
Canadian[1]	Mean	24.6	Males	33.3
n = 535	(SD not available)		Females	66.7
German[3]	Mean	22.77	Males	*
n = 226	SD	3.98	Females	

*The German sample was approximately equally divided between male and female subjects (no precise numbers) who used the taped version of the HGSHS:A.
[1]Laurence and Perry, 1982
[2]Sheehan and McConkey, 1979
[3]Bongartz, 1985

The data from the present study were entered into a factor analysis procedure (Proc Factor in SAS) which produces an initial analysis then, if secondary factors are present, automatically goes onto perform a varimax rotational procedure to determine the factors orthogonally. The three HGSHS:A categories, ideomotor, cognitive and challenge, identified by McConkey, Sheehan and Law (1980), were entered into the factor analysis along with the 10 CIS items. The varimax rotations loaded all items on only two factors: the three HGSHS:A items loaded on one and the 10 CIS items on the other factor (see Table 8).

When the two tests used to assess hypnotizability (HGSHS:A and CIS) were submitted to a Pearson correlational analysis, they emerged highly correlated with each other ($n = 49$, $r = 0.57$, $P < 0.0001$). They are significant predictors for each other as well ($f = 20.53$, $P = 0.0001$). The CIS score accounts for 41% of the variance of the HGSHS:A score in a stepwise analysis of variance.

Table 8. Factor analysis loadings from the varimax rotation

		Factor 1: CIS	Factor 2: HGSHS A
1.	HGSHS:A — cognitive		0.69
2.	HGSHS:A — ideomotor		0.84
3.	*HGSHS:A — challenge		0.87
1.	CIS Arm heaviness	0.67	
2.	CIS Hand levitation	0.54	
3.	CIS Finger anaesthesia	0.56	
4.	CIS Water hallucination	0.71	
5.	CIS Olfactory-gustatory hallucination	0.77	
6.	CIS Music hallucination	0.70	
7.	CIS Temperature hallucination	0.69	
8.	CIS Time distortion	0.68	
9.	CIS Age regression	0.73	
10.	CIS Mind-body relaxation	0.78	

DISCUSSION

The correlation between the HGSHS:A and the CIS (r = 0.57) was higher than that found in the Australian sample of McConkey *et al.*,(1979, and reported again in Hilgard *et al.*, 1981) of r = 0.28, and comparable to the California sample (r = 0.55) in the Hilgard *et al.* (1981) study. Our study was carefully crafted to avoid any connection between the CIS and hypnotizability measurement. This brings into focus the question of expectancy when the same subjects have already participated in a hypnotizability testing session. It could be argued that having performed (but not received feedback from) the HGSHS:A, subjects could be influenced by their performance on it as Spanos *et al.* (1989) argued must have happened with the Californian CIS data of the Hilgard *et al.* (1981) study. However, in the present study, the CIS was not presented as a hypnotizability test and hypnosis was not mentioned. Both time and interceding events had occurred between testing sessions.

Stewart and Marks (1990) used the CIS in an expectancy experiment because it was an indirect method of assessing hypnotizability which did not cue the subjects to their hypnotizability. In the present study, it was an 'imagery test'. Johnston, Chajkowski, DuBreuil and Spanos (1989) gave false feedback to certain subjects, with the suggestion that their responses were consistent with being good at hypnosis. All subjects were tested with the Barber Suggestibility Scale and three days or so later with the CURSS and for expectancy. On subsequent testing three weeks later, the subjects were retested with the Stanford Hypnotic Susceptibility Scale (C). High correlations were found between all hypnotizability tests. The objective behavioural experiences in hypnosis were temporarily increased, but the subjective experience of hypnosis remained constant. The enhanced behavioural ratings decreased with time. The authors suggest that compliance could be the operative feature in the outward manifestations of hypnotic suggestion that was measured soon after the initial session. Their next study (Spanos *et al.*, 1989) specifically considered situational variables and their effects upon correlations between the CIS and the CURSS. They found high correlations between the two tests when both were defined as tests of hypnotizability, but much lower correlations when they

were separately defined as a test of imagination (CIS) and a test of hypnotizability (CURSS).

The present study kept the two testing situations as separate as possible: different rooms, different times (weeks or months apart); the CIS was administered individually, the HGSHS:A as a group; the CIS was defined as an 'imagery test', the HGSHS:A as a test of hypnotizability; and finally, the CIS testing session was at the conclusion of another experiment which involved imagination, not hypnosis.

It seems unlikely in the present study that expectancy would be operative given the circumstances. No subject asked for the CIS results when the results of the HGSHS:A testing were provided as their hypnotizability score; this behaviour appears to negate a CIS/hypnotizability association. It appears as if these results can be considered to be as uninfluenced as any two tests could be which purport to assess the same dimension.

Most other published accounts of the CIS (Barber & Wilson, 1978; Hilgard *et al.*, 1981; McConkey *et al.*, 1979; Myers, 1983; Sheehan *et al.*, 1978) use the 'think-with' instructions (Barber & Wilson, 1978) that take place before administering the CIS, for the purpose of maximising the effect of the suggestions. The 'think-with' instructions ask subjects to use their imagination actively and creatively and to think along the same lines as the experimenter (or voice on the tape). One study (Siuta, 1987) administered the CIS without the 'think-with' instructions. The American sample of the Hilgard *et al.* (1981) study administered the CIS live and individually but included the 'think-with' preamble (their mean was higher than the means for the taped version of the CIS: mean = 25.29, SD = 6.95, perhaps due to some experimenter expectancy effects). No 'think-with' statements preceded administration of the CIS in the present study, and it was a taped presentation with no experimenter in the room. There is an impressive similarity of results in all the taped-format results, with or without 'think with' instructions. Given the similarity of results, the present study should be used as an indicator that the 'think-with' instructions might be superfluous. A study with a larger sample size is recommended to properly assess this finding.

It appears as if the CIS, as administered by tape, measures a remarkably consistent trait that is constant in the various cultures, European, American and Australasian, used as samples in the studies in the literature. The means are virtually identical, the items load on only one factor, and the intercorrelations between the items are consistently high. The loading on only one factor could reflect the correlation found between each item and the total scores as set out in Table 3 (Hilgard *et al.*, 1981), although the combining of both HGSHS:A and CIS in the one factor analysis still leaves the CIS loading on one separate factor.

It is interesting to note that the Music Hallucination item had the lowest loadings in the factor analysis done on the CIS alone, both in the New Zealand and in the Polish results. Siuta (1987) notes that the Pearson correlation between this item and the whole scale in the Polish results, is the lowest of items, as it is with the New Zealand results.

The entering of the items from two scales, the CIS and the HGSHS:A, into one factor analysis, illustrates an interesting division between the two. The CIS items fall into a factor on its own with no overlap from items in the HGSHS:A. The Hilgard *et al.* (1981) study included four tests in their analysis — the CIS and the HGSHS:A, plus the Absorption Scale of Telegen and Atkinson (1974), and the Queensland adaptation of the Betts imagery scale (QMI). Their results indicate that the CIS loaded not only on an 'imagery' factor (as did the QMI and the Absorption Scale), but also on the factor containing the HGSHS:A items. Our results separate the two

tests completely, in spite of the correlation between the two scales (r = 0.57). This suggests that the two tests are accessing different abilities in the individual that are found in conjunction with each other. It will be interesting to compare these abilities to experimental and/or clinical results.

The age range of the New Zealand study was different from all other studies in that the subjects were all working adults. All others have either used university students (Sheehan *et al.*, 1978; Siuta, 1987; Wilson & Barber, 1978) or children (Myers, 1983). This study illustrates the suitability of both the HGSHS:A and the CIS across age ranges.

In summary, it appears from the evidence in this study that both the CIS and the HGSHS:A measure characteristics that are consistent over the years since the tests were first published. Reassuringly, they both can be used throughout the adult age group, with neither age nor gender testing differentially. The means and standard deviations in this adult sample are similar to those of university aged students from various countries and cultures around the world. The tests are correlated with each other, but on a factor analysis each loads separately giving evidence that the two tests are assessing different but related abilities.

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