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David A. Oakley, Eamonn Walsh, Ann-Mari Lillelokken, Peter W. Halligan, Mitul A. Mehta & Quinton Deeley (2020) UNITED KINGDOM NORMS FOR THE HARVARD GROUP SCALE OF HYPNOTIC SUSCEPTIBILITY, FORM A, *International Journal of Clinical and Experimental Hypnosis*, 68:1, 80-104,

[DOI: 10.1080/00207144.2020.1682257](https://doi.org/10.1080/00207144.2020.1682257)

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**United Kingdom norms for The Harvard Group Scale of Hypnotic Susceptibility:  
Form A**

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**Acknowledgements: This work was supported by The Panacea Society and Psychiatry  
Research Trust (PRT) grants. Thanks are also due to Vaughan Bell, Sara Di Simone,  
Jasmit Jheeta, Luke Sheridan Raines, and Stefanos Tsal for their involvement in the  
recruitment and testing of the participants included in this study.**

The topics of hypnosis and hypnotic suggestibility have been studied for their ‘intrinsic’ and clinical interest for over two centuries (Barnier & Nash, 2008) and more recently the ‘instrumental’ use of hypnotic suggestion as a research tool in cognitive and neuroscience research has been increasingly recognized (Cardeña, 2014; Halligan & Oakley, 2013; Dienes & Hutton, 2013; Kihlstrom, 2013; Jensen, Jamieson, Lutz et al 2017; Landry, Lifshitz & Raz 2017; Oakley & Halligan 2009a, 2013; Terhune, Cleeremans, Raz & Lynn, 2017). The phenomenon of hypnosis and the effects of hypnotic suggestion have also continued to influence ideas concerning the nature of consciousness from the early accounts offered by Charcot and Freud in the mid-19<sup>th</sup> century (Ellenberger, 1994; Oakley, 2012), through the subsequent development of cognitive psychology (Kihlstrom, 1987) to the present (Bargh & Morsella, 2008; Cardeña, 2014; Oakley & Halligan, 2017). Hypnotic suggestion has also been used to model clinical conditions such as conversion paralysis (Deeley, Oakley, Toone et al, 2013; Deeley 2016a), delusions of alien control of movement (Blakemore, Oakley & Frith, 2003), cultural phenomena such as possession and automatic writing (Deeley et al 2014; Walsh et al 2014); loss of awareness (Walsh et al 2017); religious experiences (Deeley, 2016b, 2018), and alterations in the sense of self as in mirrored-self misidentification (Barnier, Cox, O’Connor et al, 2008).

Since its inception in the early 1960s the Harvard Group Scale of Hypnotic Susceptibility, Form A (HGSHS:A; Shor & Orne, 1962) has become the most commonly used measure of responsiveness to hypnotic suggestion and continues to be used to select participants for instrumental hypnosis research studies (Barnier & McConkey, 2004). This is a particularly important role in neurocognitive research settings involving in-depth and expensive research procedures such as neuroimaging, to identify in advance the proportionately small number of potential participants who are highly hypnotically suggestible in order to maximize the

likelihood of their displaying the intended suggested effect. Testing commences with an introduction designed to reassure participants and to normalise hypnosis. The HGSHS:A itself consists of a hypnotic induction procedure followed by 12 test items, each of which includes a suggestion, resulting in an individual hypnotic suggestibility score that is derived from the number of these suggestions that produce the intended response in the participant. The suggestions themselves vary in form and are categorised as ‘ideomotor’, ‘challenge’ or ‘cognitive’. The HGSHS:A can be administered to relatively large groups using pre-recorded scripts making it a particularly efficient screening instrument.

Selecting participants using a standardized scale is also important in ensuring consistency across studies especially when individuals are recruited from different geographical locations and cultures. To this end, norms have been published for the HGSHS:A based on a number of national samples predominantly drawn from countries with a common Western history and culture. In chronological order, the countries represented in this Western sample are :- America (*Shor & Orne, 1963*); Australia (*Sheehan & McConkey, 1979*); Canada / Montréal (*Laurence & Perry, 1982*); Germany (*Bongartz, 1985*); Spain (*Lamas, de Valle-Inclan et al, 1989*); Denmark (*Zachariae, Sommerlund & Molay, 1996*); Finland (*Kallio & Ihamuotila, 1999*); Italy (*De Pascalis, Russo, & Marucci, 2000*); Romania (*David, Montgomery & Holdevici, 2003*); Sweden (*Bergman, Trenter & Kallio, 2003*); Israel (*Lichtenberg, 2008*); Poland (*Siuta, 2010*); Portugal (*Carvalho, 2013*); Germany/Adolescents (*Peter, Geiger et al, 2015*); Hungary (*Költó, Gósi-Greguss et al, 2015*) and France (*Anlló, Becchio & Sackur, 2017*).

As to the rest of the world there is to date one comparable HGSHS:A Norms Study, using an exact translation into Mandarin Chinese of the original English version and tested on the Mandarin-speaking population in Taiwan (Lin & Chang, 2019) and one, also administered in

Chinese, using a simplified version of the scale (Zhou and Wang, 2011). Lin & Chang (2019) noted that though there was a broad similarity in their results to the preceding Western (North American, Australian and European) normative studies, indicating the potential usefulness of the HGSH:A as a screening device for research purposes in Chinese-speaking populations they also note some discrepancies between their study and the Western reference norms. Whether these reflect consistent cultural differences remains to be determined via further normative studies on Chinese-speaking populations. Consequently, our report focuses on comparisons between the normative data we have collected for the United Kingdom and the Western normative studies as a whole.

The evidence to date is that administration of the scale and its translation into other languages within Western cultural settings has not substantially altered its psychometric properties. It is notable, however, that despite its involvement in both intrinsic and instrumental hypnosis research, the United Kingdom (UK) is not represented in the list of Western HGSH:A norms.. The present study remedies that omission using results drawn from samples with mixed cultural, educational and ethnic backgrounds in a central district of South London recruited using a research-subject database of students, university staff and members of the local population. At the more specific research level of replicability of research methods, the HGSH:A norms reported here are drawn from the same population as that used to select participants in a series of neuroimaging studies reported over the past 10 years at the Institute of Psychiatry, Psychology & Neuroscience (IoPPN), Kings College London, University of London, UK. This research includes studies on hypnotic depth and response to suggestion (Oakley et al 2007), the default mode network (Deeley et al, 2012), functional limb paralysis (Deeley, Oakley et al, 2013), control and awareness of movement (Deeley, Walsh et al, 2013), psychiatric and cultural possession phenomena (Deeley et al, 2014), automatic writing (Walsh

et al, 2014), rubber hand illusion (Walsh, Guilmette et al 2015), thought insertion and alien control of movement (Walsh, Oakley et al, 2015) and awareness of thought and movement (Walsh et al 2017).

In contrast to the hypnosis literature, the topic of suggestibility has been far less researched or discussed in cognitive psychology, though there is evidence that this is changing (Halligan & Oakley, 2014; Lynn, Laurence & Kirsch, 2015). In particular the fact that an individual's responsiveness to the suggestions that form the basis of the HGSHS:A correlates strongly with their responsiveness to the same scale administered without hypnosis, (Braffman & Kirsch, 1999; Kirsch & Braffman, 2001) indicates that both are potentially examples of a more broadly based trait of 'direct verbal suggestibility' (DVS) (Oakley & Halligan 2017; Terhune & Oakley, 2019).

Historically number of traits and cognitive abilities have been singled out as contributors to direct verbal suggestibility accompanied by a hypnosis induction procedure ('hypnotizability'). Early views, as adopted by Charcot and Freud, emphasised that hypnotic responsiveness had much in common with hysteria and depended on similar inherited neurological disturbances (Oakley, 2012). In his influential neo-dissociation theory, Hilgard emphasised the enhanced ability of high hypnotizable individuals to engage in processes underlying thought, action and experience outside conscious awareness – as exemplified in his description of the 'Hidden Observer' phenomenon (Hilgard, 1977). More recently Dienes & Perner (2007) proposed a 'cold-control theory' of hypnotic responsiveness that extended both the neo-dissociation view and more recent sociocognitive approaches (e.g. Kirsch & Lynn, 1997), that emphasised the role of expectations, belief and attributions by proposing that hypnotic ability depended on the individual's capacity for responding to suggestion in

the absence of higher-order-thoughts (HOTs). Absorption as a trait has been particularly implicated as a predictor of hypnotic responsiveness (Tellegen & Atkinson, 1974; Barnier & McConkey, 2004).

### **An Overview of the Western National Norms Studies.**

Key comparisons, procedural variations and data modifications involved in the 16 earlier Western national samples that are relevant to present study are shown in Table 1 and are summarized as follows:-.

*1. Gender comparisons.* With the exception of the original American sample all studies have compared overall HGSHS:A scores for male and female participants. Significant gender differences were reported in 6 of the 16 earlier studies. In all 6 cases female hypnotic suggestibility scores were higher than males though no geographical pattern is evident. There is also no consistent relationship between this gender difference and the marked imbalance discussed later between the percentage of female vs male participants recruited in the different studies.

*2. Correction for subjective experience/involuntariness of responding.* One drawback of the HGSHS:A from a theoretical perspective is that it depends on ‘objective’ (or ‘quasi-objective’) scoring and overlooks the subjective aspect of hypnotic responding (Kirsch, Council & Wickless, 1990), and in particular that to be considered a “classic suggestion effect” the participant’s response should be experienced as both effortless and involuntary (Weitzenhoffer, 1980). Recognising these concerns, the Italian study mentions that participants were ‘required to report a judgement of their subjective response in a response sheet at the end of the session’ (p 45 para 4) but these data are not reported. The most recent of the 16 studies (France), however, reported as an additional subjective measure, an

adapation of Kihlstrom' s Scale of Involuntariness (Kihlstrom, 2006). As a means of correcting the traditional 'objective' scale scores, the present study included a custom-made 'subjective' score that measured the participant's assessment of the strength of their experience in response to each test suggestion, rather than its involuntariness..

3. *Self vs observer rating.* The standard scoring of the HGSHS:A is deliberately 'quasi-objective'(e.g. the participant is asked if an independent observer would have reported the suggested response). The original study on which the HGSHS:A was based (Shor & Orne, 1963) found a good correlation between self-reported and observer-reported scores and all subsequent studies, including the present one, have adopted self-reporting of responsiveness with two exceptions (German and Hungarian), which included both self and observer ratings. In common with the original American research, the German and Hungarian studies found no consistent differences between self and observer ratings.

4. *Recorded vs Spoken presentation of the HGSHS:A.* The method of delivery of the scale was not reported in two of the earlier Norms studies (American and Canadian). Of the 14 previous studies that reported the mode of delivery the majority (10) adopted a live presentation of the HGSHS:A, usually spoken by one of experimenters, though one (Swedish) employed an actor. Two of these 10 studies (German and Swedish) also used an audio-recorded presentation for some of their participants and found no significant differences between the two methods. The remaining (4) previous studies were based solely on a recorded presentation as was the present one, which used an audio-recording voiced by one of the authors (DO).

5. *The revised score.* As discussed later, the amnesia item is traditionally scored solely on the number of suggestions recalled by the participant immediately after testing is complete and hypnosis has been terminated. This form of scoring was used in 13 studies. The present study and the remaining 3 original studies (Swedish. Portuguese and French) applied a

revision based on data collected in a second recall test after the amnesia reversal cue has been given (which was included in the original questionnaires but not used for scoring). This second recall test serves to establish whether additional suggestions are recalled once the amnesia suggestion has been removed and that a failure to recall on the first test can be attributed to the amnesia suggestion itself rather than other factors such as inattention, sleep or misunderstanding of the task.

**Insert Table 1 about here**

Here we report on the psychometric qualities of the HGHS:A in the context of data derived from a large sample of participants recruited in London, UK. Specifically, we report on response distributions, gender differences, item pass rates for the scale as a whole and for the three subcategories of suggestion type (Ideomotor, Challenge and Cognitive – see table 3 in Methods). We comment on the relation of our findings to the 16 Western reference studies where appropriate, and consider potential for modifications of the scale in addressing the question of how best to characterise hypnotic suggestibility and to screen participants for research purposes. In particular, in addition to presenting results based on the traditional ‘objective’ scoring system we also present ‘corrected’ scores using a subjective scoring system to eliminate ‘objective’ responses that are not accompanied by at least a moderate sense of having ‘experienced’ the suggested effect. In common with 4 previous studies, we used a pre-recorded audiofile to deliver the hypnosis script and test suggestions in order to standardise the presentation. Also in the present study, as in 3 earlier ones the amnesia suggestion score was revised using recall data collected after the amnesia reversal cue was given (Kihlstrom & Register, 1984) to ensure that failure to recall on the first (pre-reversal) test was a product of the amnesia suggestion itself.

## **METHOD**

### **Participants**

Four hundred and seventeen volunteers (59.5% female) were recruited from both the university and the local community in the London (UK) area. The sample consisted predominantly of students, but also included university staff and members of the general public. Recruitment of participants in a university setting in a large city is common to the other national norms studies and also typical for research projects in similar institutions. Recruitment took place between November 2007 and September 2011 and was via Gumtree (a British online classified advertisement and community website), adverts in Metro (a free newspaper distributed across urban areas of the United Kingdom), and internal recruitment adverts at King's College London. All volunteers were screened for suggestibility using the Harvard Group Scale: Form A (HGSHS:A; Shor and Orne, 1962). Their mean age was 27.6 (SD = 9.2; range 16 – 67) years. Participants received STG£15 expenses. They were tested in groups of approximately 10 people in a quiet, dimly-lit room at the Institute of Psychiatry, Psychology & Neuroscience (IoPPN), King's College London. Each test session took approximately 90 minutes in total. All procedures were approved by the local university research ethics committee.

### **Measurement of Hypnotic Suggestibility**

Hypnotic suggestibility was measured using the script provided in the original HGSHS:A manual (Shor and Orne, 1962) pre-recorded as a 54 minute audiofile of the entire procedure. There was just one alteration to the original script in that, for safety and ease of execution in group-seating situations, the post-hypnotic suggestion (scale item number 11) was changed from the original which stated that when the prearranged post hypnotic cue (a tapping noise)

was presented “you will reach down and touch your left ankle” and became “you will reach up and touch your right ear”. Data collection was by means of copies of the original HGSHS:A response booklet with appropriate modification to the wording of item 11. Participants completed the response booklet in their own time immediately following termination of hypnosis and testing of the post-hypnotic suggestion. The scale items are listed below in order of presentation (see Table 2) and allocation to one of three suggestion sub-categories (ideomotor, challenge and cognitive – see Table 3).

The first section of the response booklet relates to scale item 12 (post-hypnotic amnesia). The participant is asked to “write down a list of things that happened since you first began looking at the target” (the hypnosis induction commences with the participant selecting a spot on either hand to focus on, thereafter referred to as ‘the target’). For each of the remaining 11 scale items participants recorded their responses using the ‘objective’ criterion specified in the original HGSHS:A response booklet, scoring each item (test suggestion) on a binary scale as Pass/Fail (1 or 0). For Scale item 3 for example (“hand and arm becoming heavier and heavier .... as though a weight were pulling the hand and arm down”) the original questionnaire asks for a quasi-objective response in which participants are required to estimate whether an onlooker would have seen their hand lowering by at least six inches by the end of the suggestion. They did this by circling either “A, My hand had lowered by at least six inches (15 cm) by then” or “B My hand had lowered by less than six inches (15cm) by then” [with A scoring 1 and B scoring 0].

Item 12 (post-hypnotic amnesia is traditionally counted as ‘passed’ (scoring 1) if fewer than 4 of the items 3-11 are recalled. However, after the amnesia reversed cue (“Now you can remember everything”) is given, the participant is also asked immediately to write down on a

separate page of the booklet “anything else that you now remember, that you did not remember previously”. This ‘reversal’ score was not used in the original (American) scoring of the amnesia item and, with the exception of Swedish, Portuguese and French, has not been used in the national norm studies since. However, the amnesia reversal score is helpful in distinguishing suggested amnesia from intrinsically poor memory, and possible confusion over what constitutes an item or simply falling asleep. Accordingly, in the present study we have used revised amnesia scores where the traditionally defined ‘objective’ pass score of 1 (4 or fewer items recalled on first testing) was counted only if the participant did not show recovery of memory by subsequently recall of 3 or more additional items following the reversal cue (slightly higher than the one selected by Kihlstrom & Register, 1984 – which was 2 or more items recalled post reversal) .

Finally, participants provided a second set of scores intended to reflect the subjectively experienced reality of their response (Kirsch, Council & Wickless, 1990) by completing a subjective rating scale in which they were asked “to rate the degree to which you *experienced* the effects that each item suggested” for each of the 12 HGSHS:A items on a 5-point (0 = not at all, 1 = slightly, 2 = to a moderate extent, 3 = fairly strongly and 4 = to a great extent). For example, for scale item 3 (hand lowering) this would be a rating of the extent to which they ‘experienced’ the suggested heaviness of their arm and the weight pulling it down. The subjective ratings were later used to create ‘corrected’ scores for all 12 test items so that items passed on the standard ‘objective’ scoring system were discounted if the accompanying subjective experience was rated as less than 2 on the subjective rating scale (the effects of applying stricter criteria - less than 3, or less than 4 - are also reported below for information). As discussed earlier, this correction is intended to ensure that the objectively passed items are also experienced as subjectively ‘real’ to the participant. See next section for an overview of

suggestions, recording and scoring of responses for the 12 test items. When delivered as an audio recording, presenting the introductory material ('establishing rapport') and main test procedures (introducing hypnosis, delivery of the 12 test items and terminating hypnosis) takes 54 minutes. Completing the response booklet for all 12 test items, and subjective experience measures takes the overall time for testing to approximately 90 minutes.

### **Overview of Test Items, Suggestions and Scoring.**

The following is a summary of all 12 test items in the HGSHS:A, the suggestions they contain and the statements provided in the post-hypnotically completed Response Booklet for suggestions 1-11 to be used by the participant as the basis for reporting responses as positive (scoring 1) or negative (scoring 0). [The second response option is not shown in this summary but is a negatively worded version of the same statement. For example, the second (negative response option) for test item 1 is worded "My head fell forward less than two inches (5cm)."]

For items 1- 11 the participant is asked to refer to what had happened by the end of each suggestion (S) and to respond in terms of what an *onlooker* would have observed (O)

Item 12, containing an amnesia suggestion, is scored differently as described below.

M = Motor suggestion, CH = Challenge COG = Cognitive. The time taken on the audio recording to present each test item is shown in square brackets.

1. M: Head Falling: (sitting upright – eyes closed\*) "your head is falling forward" (S) [3m 30sec] – "My head fell forward at least two inches (5cm)" (O).

2. M: Eye closure: “your eyelids are getting heavier and closing” (S) [\*\*] – “My eyelids had closed” (O).

3. M: Hand lowering: (arm extended) “your hand is getting heavier – a weight is forcing it down” (S) [5min 5sec – includes a short general introduction on ‘how it feels to respond to hypnotic suggestion’] - “My hand had lowered by at least six inches (15cm)” (O).

4. CH: Arm immobilization: (arm resting) “your hand and arm are feeling heavy, too heavy to lift” (S) (now try to lift it) [2 min 55 sec] - “I did not lift my hand and arm at least one inch (2.5 cm)” (O).

5. CH Finger lock: (fingers interlocked) “fingers becoming more and more tightly interlocked (S) (now try to unlock them)” [1min 40sec] – “My fingers were still incompletely separated” (O).

6. CH Arm rigidity: (arm extended) “arm becoming more and more stiff - like a bar of iron” (S) (“test how stiff and rigid it is now, try to bend it.”) [2min 25sec]– “My arm was bent by less than two inches (5cm)” (O)

7. M Hands moving together: (both arms extended straight forwards – hands 12 inches apart) “a force is pulling your hands closer and closer together” (S) [1min 45sec] – “My hands were not more than six inches (15cm) apart” (O).

8. CH Communication inhibition: “you are too deeply relaxed to shake your head to indicate ‘no’” (S) (“Try to shake your head now – just try”) [1min 25sec]– ‘I did not recognizably shake my head ‘no’” (O).

9. COG Hallucination: “A fly is buzzing around your head – annoying you – shoo it away if you want to” (S) [1min 30sec] – “I did make some outward acknowledgement [of the annoying fly]” (O).

10. CH Eye Catalepsy: “Eyes tightly shut – so tightly closed that you could not open them.” (S) (“Just try – try to open your eyes”). [2 min] – “My eyes remained closed.” (O)

11. COG Posthypnotic suggestion\*\*\*: (Suggestion given in hypnosis to be tested using a cue [tapping sound] presented after hypnosis is terminated.) “When you hear a tapping sound, you will reach up and touch your right ear – but forget that I told you to do so.” (S) [3min 35 sec] “I made at least an observable partial movement to touch my right ear.” (O)

12. COG (post-hypnotic) Amnesia\*\*\*: (The suggestion given in hypnosis but tested after termination of hypnosis before and after an amnesia reversal cue is presented.) “You will remember nothing of what has happened until you hear the words ‘Now you can remember everything’” (S). For this item, after hypnosis has been terminated, the participant is asked to write down in the response booklet “a list of the things that happened since you began looking at the target” then on a different page following the amnesia reversal cue [“Now you can remember everything”] to write down “a list of anything else that you now remember that you did not remember previously”.

\* This suggestion is presented before the hypnotic induction procedure.

\*\*This suggestion is embedded in the hypnosis induction procedure [15min 25sec].

\*\*\* This suggestion is embedded in the hypnosis termination procedure [3min 35sec].

## **RESULTS**

The mean HGSHS:A ‘objective’ response ratings (0-1) on the 0-12 point scale for all participants (N = 417) was 5.6 (range 0-12, SD = 2.7). Independent sample t-tests showed no significant difference between females (N = 248) and males ( N = 169) in age (mean female 27.5, SD=9.2; mean male = 27.8, SD=9.2 years;  $p=0.75$ ) or Harvard objective score (mean female 5.5, SD=2.7; mean male = 5.8, SD=2.7;  $p=0.27$ ). The overall objective HGSHS:A scores for the 417 participants were normally distributed (skewness=0.16 and standard error of skewness=0.12; kurtosis=-0.51 and standard error of kurtosis=0.24 ) (see Figure 1). Figure 1 also shows the subdivision of participants into low, medium and high hypnotic suggestibility categories based on criteria typically used for research purposes (Woody & Barnier, 2008, Woody, Barnier & McConkey, 2005).

**Insert Figure 1 about here**

In addition to the standard 'objective' scores, which reflect the participant's account of what an observer would have seen, subjective response ratings (0-4) of the degree to which the suggested effects were 'experienced' were collected from each of the participants separately for all 12 items of the HGSHS:A (0 = not at all to 4 = to a great extent). While the standard HGSHS:A score is the main index, the subjective response rating score is thought to provide a more complete assessment of hypnotic suggestibility (Kirsch, Council, & Wickless, 1990). The mean HGSHS:A 'subjective' score on the 0-48 point scale for all participants (N = 417) was 22.6 (range 0-48, SD = 10.8). In common with the objective scores, these overall subjective scores were normally distributed (skewness=-0.13 and standard error of skewness=0.12; kurtosis=-0.747 and standard error of kurtosis=0.24). The subjective score also correlated strongly with the objective score (Pearson's  $r = 0.865$ ,  $p < 0.0001$ ).

Chi-squared tests showed that there was no relationship between gender and overall score on the Harvard objective ( $\chi^2 = 13.28$ ;  $p=0.35$ ) or Harvard subjective ( $\chi^2 = 36.95$ ;  $p=0.85$ ) measures. This is consistent with the absence of male/female differences in the majority of national samples (Canadian, German, Spanish, Finnish, Romanian, Israeli, Portuguese, German A and French), though 6 of the samples (Australian, Danish, Italian, Swedish, Polish and Hungarian) found gender differences in favour of females. Gender comparisons were not included in the seminal American sample.

Mean subjective scores for each of the 12 HGSHS:A items and correlations between the subjective score and the objective score per item are shown in table 2. All correlations between the two types of score were significant (11 items at  $p < 0.01$ , and the remaining amnesia item at  $p < 0.05$ ).

### **Insert Table 2 about here**

Mean percentage pass rates for all 12 HGSHS:A scale items are shown in Table 3 for the participant group as whole (total) and by gender – again there are no significant gender related differences. This table also shows the ‘corrected’ total score for all participants where each item passed on the ‘objective’ rating scale (0 or 1) is counted only if the score on the subjective rating scale (0 to 4) is 2 or more, i.e. only those items which the participants rated as experienced to a moderate, fairly strong or a great extent. The mean changes due to this correction are 9.0% for ideomotor items, 23.2% for challenge items and 42% for cognitive items. The effect of applying this correction on total percentage pass rates to using subjective score ratings to a "moderate extent" or higher ( $\geq 2$ ); “fairly strongly” or higher ( $\geq 3$ ) or to a “great extent” (4) is shown in Figure 2. No other National Norms study has reported scores corrected for ‘subjectivity’. The French study included a related correction for ‘involuntariness’ of responding and found a significant reduction in overall scores and in scores for Finger Lock (item 5) and the Post-hypnotic Suggestion (item 11).

### **Insert Table 3 and Figure 2 about here**

Pearson correlations were performed on each of the suggestion types and the overall HGSHS:A scores. *Ideomotor* items ( $r=0.847$ ) showed a very strong correlation with the Harvard score, followed by strong ( $r=0.680$ ) and moderate ( $r=0.585$ ) correlations for the *Challenge* and *Cognitive* items respectively (Evans, 1996); all correlations were significant at the 0.01 level (2-tailed). Furthermore, Chi-squared tests showed that there was no effect of

gender for the Ideomotor ( $\chi^2 = 0.775$ ;  $p=0.942$ ), Challenge ( $\chi^2 = 6.434$ ;  $p=0.266$ ) and Cognitive ( $\chi^2 = 5.575$ ;  $p=0.134$ ) items.

Table 4 summarises percentage pass rates for HGSHS:A scale items for all participants in the present UK sample alongside the other sixteen national samples. The overall percentage pass rate for the present sample for the HGSHS:A is within the range of overall means for the 16 national samples [UK 47/ National range 45-67 / National mean 55 (*SD11*) ]. Similarly, all of the mean scores for individual items, with the exception of Item 8, fall within the range seen in the national samples (See Table 5). Reliability estimates (point-biserial coefficients of correlation between each suggestion and the sum of all other suggestions) were calculated for HGSHS:A and are presented in Table 6. The Kuder-Richardson total scale reliability index (Hoyt, 1941) was calculated as 0.77, the magnitude of which compares to previous (e.g. Australian = 0.76; Canadian = 0.84; American = 0.8; Spanish = 0.68 and German = 0.62) samples.

**Insert Tables 4, 5 & 6 about here**

Table 4 also shows that the percentage pass rates for the three suggestion types are as expected and are consistent with the categorization of them in terms of the number of participants passing each scale item as being ‘easy’ (Ideomotor) , ‘intermediate difficulty ’ (Challenge) and ‘most difficult’ (Cognitive) (Balthazard & Woody, 1985; Barnier & McConkey, 2004; Woody & Barnier, 2008; Woody, Barnier & McConkey, 2005). In the UK sample the mean pass rates are Ideomotor : 68 (SD 29), Challenge : 44 (SD 34) and Cognitive : 23 (SD 27) and in the 16 national samples Ideomotor : 71 (SD10), Challenge : 55 (SD 9) and Cognitive: 34 (SD 15).

It is notable from Table 5 that there is a wide range of scores within the individual items in the national samples, particularly for the amnesia item with the UK sample showing the second lowest percentage pass rate. The latter is partly explained by the use of ‘reversal’ revised scores in the present study for the amnesia item – though the lowest amnesia score is from the Israeli sample, which did not use the post-reversal revision.

#### **Insert Table 7 about here**

In every one of the 16 Norms studies that have reported gender, including the present study, (see Table 7) the number of females (mean percentage = 68.2; SD = 10.4%) outnumbered the number of males (mean percentage = 31.8; SD = 10.4%). This difference is significant - independent t test  $t(30)=9.884$ ;  $p<0.0001$ . However, the range of this percentage difference in favour of females is very wide from 2.7 (Germany) to 71.9 (Finland). Significantly higher overall Harvard scores in females compared to males has no clear relationship with the percentage of females recruited into the study. The percentage of females recruited into

studies showing significantly higher overall scores is 56.2- 82.5% compared to the range for studies showing no significant gender difference in overall scores, which is 51.3 - 86%.

## **DISCUSSION**

Norms studies For the HGSHS:A have a skewed geographical spread and 17 of the 19 currently identified have been confined to Western societies. There are also a number of biases within the data from the Western national samples, including UK, that are worth noting. First, the existing studies overall have involved significantly more female participants than males (females, mean number recruited across studies = 327.6, range 56 -1,324: males mean = 143.9, range 24-616) [data not available for the American sample]. Second, the age ranges in the studies are biased towards younger participants (mean lower age 17.5, range 15-20: mean higher age 49.5, range 31-85) [not included in these figures are Germany A, which recruited adolescents only, and four studies that did not report age ranges:- America, Australia, Germany & Spain]. The mean age of all participants per study as reported by the authors was 24.1; range 20.5- 35.4 [not included in these figures are America, Germany A and France where a mean age was not reported]. A third of all 17 studies were conducted in higher education/university settings (6 of them in national capital cities) and all relied heavily on recruitment of students from academic departments. In 10 cases all participants were university students (in 4 of these exclusively psychology students) and in one case, Germany A, secondary school students. (The French study did not specify the source of their participants but reported that they “recruited through official laboratory recruitment channels”.) In addition to students, four studies (Denmark, Sweden, Hungary & UK) also recruited some ‘professionals’ from within or outside their institutions and two of these also included members of the local population (Hungary & UK). The higher number of females included in these studies may reflect, at least in more recent years, the gender mix of students

in academic departments, psychology departments in particular. Equally it is possible that some of this difference may relate to gender biases in such factors as willingness to volunteer or in attitudes towards hypnosis. Future studies should investigate these possibilities and attempt if possible to balance numbers of male and female participants. For ‘instrumental’ hypnosis studies (Halligan & Oakley, 2013; Oakley & Halligan 2013), particularly where HGSH:A is used as a screening procedure and hypnotic suggestion is used as a tool to create phenomena of interest in their own right these biases are not a problem in as much as they typically reflect the populations from which the participants in the main study are also selected. As assays of the hypnotic suggestibility of national populations as a whole in recruitment for ‘intrinsic’ hypnosis studies (Halligan & Oakley, 2013; Oakley & Halligan, 2013) where the focus is on the nature of hypnotic processes themselves or related phenomena these biases may be seen as more problematic. However, in the case of gender and age it is worth noting that, as reviewed earlier, the evidence to date is that gender differences are not consistently found and are of small magnitude, though this may change when national norms are extended world-wide. Concerns about age-related differences are countered by evidence that the test-retest reliability of the hypnosis measure in individuals over time is good with a stability coefficient of 0.71 over the maximum 25 year period studied (Piccione, Hilgard & Zimbardo, 1989)

The present data are consistent with other studies in showing a normal distribution of scores with relatively few people falling within the lowest and highest levels of responsiveness (Barnier & Council, 2010; Barnier & McConkey, 2004; Woody, Barnier & McConkey, 2005). In particular it is worth noting that 15 % (64 participants) of our sample fell within the highest level of responsiveness (scale score of ‘9’ or above) typically used as a criterion for

selection of 'high suggestible' participants in research studies (Woody & Barnier, 2008; Woody, Barnier & McConkey, 2005). While this is a defensible strategy for these 'instrumental' studies where hypnotic suggestion is being used as a research tool a recently published set of guidelines outlining strategies for improving the quality of 'intrinsic' studies of hypnosis stresses the importance of including participants from the median and low ranges in exploring the nature of hypnotic responsiveness itself (Jensen, Jamieson, Lutz et al, 2017).

Our findings are also congruent with those reported in the 16 national reference samples in terms of scores for the HGSHS:A as a whole, and the relative differences in the scores for the three sub-categories (Ideomotor, Challenge and Cognitive), which have been classified on the basis of percentage pass rates respectively as 'easy', 'intermediate difficulty' and 'most difficult' (Balthazard & Woody, 1985; Barnier & McConkey, 2004; Woody & Barnier, 2008). Woody, Barnier & McConkey (2005), however, have argued for four subscales, which they labeled Direct Motor; Motor Challenge; Perceptual-Cognitive and Posthypnotic Amnesia, the latter reflecting their statistical evidence that the amnesia item does not fit well with the other items in the Cognitive scale, thereby presumably reflecting a different cognitive mechanism. Our data thus are consistent with the overall finding of cross-cultural stability for the HGSHS:A (Barnier & McConkey, 2004). No gender differences in hypnotic suggestibility were found in the present study for either objective or subjective overall HGSHS:A scores, subscale scores or individual test items. Again this is consistent with the majority of earlier national samples.

In our study, in common with 5 previous norm studies, we relied on an audiofile to deliver the hypnosis script and test suggestions. The remainder used live (spoken) presentations and two (German and Swedish) employed both. Consistent with previous work (Barber & Calverley, 1964), the German and Swedish studies reported no significant difference between

recorded and live presentations of suggestions. It is worth noting that these two norm studies are from northern Europe and the research paper is from North America and that potential compliance effects due to live presentation may be greater in more diverse cultural settings. Consistent with this possibility, the authors of the French Norms paper speculated that the use of a live spoken presentation might increase the possibility of compliance by the presence and presumed expectations of the presenter in their study. They also pointed to the popularity of hypnosis in French society, which may have made the participants “very motivated to pass as many suggestions as possible” (Anlló, Becchio & Sackur, 2017 p. 252). They also note that this ‘compliance’ effect can be mitigated (‘corrected’) by the use of a ‘voluntariness’ measure. The possibility remains, however, that motivation to respond and a favourable attitude to hypnosis increase true hypnotic responsiveness, rather than increasing compliance alone. Exploring such cultural differences is an interesting question for future research. On balance, for most practical purposes, as well as possibly reducing potential compliance effects, the use of a recorded presentation seems preferable especially as it simplifies the procedure. A further advantage of a recording is that it is always equally paced and perfectly consistent.

Irrespective of the method adopted for delivering the HGSHS:A, involuntariness and strength of subjective experience are seen as defining features of responsiveness to direct verbal suggestions both in and out of a hypnotic context (Kirsch, Council & Wickless, 1990; Weitzenhoffer, 1980). Correcting for voluntariness of responding, as in the French study, or for strength of the accompanying subjective experience, as in the present study, arguably increases the reliability of the ‘objective’ estimates participants are required to make of their responsiveness to suggestion. It is also worth noting, however, that the application of a ‘subjectiveness’ or ‘voluntariness’ correction to the traditional ‘objective’ HGSHS:A scores

excludes responses that are ‘objectively’ smaller than the traditional scoring criterion specifies, but are nevertheless very strongly experienced. Overall though, the addition of a measure of subjective experience or ‘involuntariness’ is arguably useful for practical research purposes. The choice of which of the two ‘corrections’ to use, ‘subjectiveness’ or ‘voluntariness’, may be driven in part by the aims of the research.

In common with three previous Norms studies (Swedish, Portuguese and French) the present study also applied a ‘reversal’ revision to the amnesia response scores, intended to remove false positives. While the original version of the HGSHS:A included recording of the number of additional scale items that were recalled after the amnesia release cue, the latter information was not used in the standard scoring to eliminate simple failures of memory, confusion over task instructions or inattention rather than the operation of suggested amnesia. The use of this revision should be considered in future as routine whenever the HGSHS:A is used and would be especially relevant if it is to be used for screening participants for studies involving suggested memory alteration as an experimental manipulation or as an analogue of psychogenic amnesia, for example.

Overall scores for amnesia also display the greatest variability in the national norms, with the present UK sample being one of the lowest scoring. A frequently cited reason for this variability is an inherent potential ambiguity in the wording of both the spoken instructions and the questions in the response booklet relating to this item in the standard version of the HGSHS:A. Specifically, it is possible that some participants may interpret these instructions and questions as referring to things that occurred in the induction rather than to the suggested events as intended (Carvalho et al, 2013: Portuguese Norms study). There is also potential confusion as to whether what is being referred to is things that ‘happened’ (suggested

responses) or things that they were ‘asked to do’ (general instructions as well as the suggestions themselves) (Lamas et al 1989 : Spanish Norms study; Kallio & Ihamuotila, 1999: Finnish Study). Future closer international collaboration could help resolve the current scoring variability for the amnesia item.

Our study employed the traditional ‘quasi-objective’ self scoring method for all scale items except item 12 (amnesia), intended to reflect the participants’ view of what an independent judge would have seen. In particular, it is possible that participants over- or underestimate their physical movement when their eyes are closed (Bongartz, 1985: German Norms). Shor & Orne (1963: American Norms) compared the scores obtained by this method with those of independent observers for the 7 most readily observable behavioral items on the scale. They reported good correlations between the two sets of scores with the traditional self-reported scores being slightly, but significantly, numerically higher. A recent normative study based on a Hungarian sample (Költő et al 2015) compared the traditional self-rating with that of a trained observer and found that mean scores produced by both methods were similar, but noted a lower level of correspondence at an individual level between participant and observer.

The addition of item scores from independent observers is not only strategically difficult but does not appear to affect the overall outcome sufficiently to outweigh the convenience of group testing with self-scoring. Similarly, though there is no direct evidence of differences in responding due to live vs recorded presentations this might change in more culturally divergent samples. With this in mind, the use of an audio recording for the presentation of preliminary rapport establishing and the main procedures of the HGSHS:A is not only a further convenience but may avoid additional compliance pressures compared to a live

presentation and makes adherence to the recommended timing of the main procedures (suggestions) easier. However, the evidence reviewed indicates a number of refinements to the original form of the HGSHS:A that future researchers should consider, such as the addition of a self-report measure of subjective experience alongside the original quasi-objective scoring, and the use of the reversibility data for the amnesia item to form a more meaningful score rather than relying solely on the recall data. There is a good case also for revising the wording of the amnesia item to emphasise that it is directed at the test items rather than the overall experience of the induction procedure and the hypnotic experience generally. Perhaps more importantly there is evidence for seeing the amnesia item as distinct and for considering the HGSHS:A as consisting of four subscales (Ideomotor, Challenge, Cognitive and Amnesia) each measuring a different form of suggestibility, rather than simply item difficulty (Woody, Barnier & McConkey, 2005). As with 'intelligence' testing, this indicates a general trait of hypnotic suggestibility (reflected in overall scale scores) comprised of a number of constituent abilities that can be variably expressed on an individual basis. In particular, similar patterns of HGSHS:A scores across nationalities supports the view that there is as a trait/genetic component to suggestibility with 10-15% of individuals in these populations potentially able to experience complex cognitive suggestions.

We have proposed the term 'Direct Verbal Suggestibility' (DVS) for the form of suggestibility typically measured following a hypnotic induction procedure by the HGSHS:A but having a more general relevance and importance in non-hypnotic contexts (Oakley & Halligan 2017, Terhune & Oakley, 2019). While there is some evidence that a hypnosis induction procedure is associated with a small increase in responsiveness (Derbyshire et al, 2009; McGeown et al 2012; Oakley & Halligan 2013) there seems to be a good case for the

wider use of the HGSHS:A without the induction procedure in studies of suggestion and suggestibility and in cognitive psychology generally. Removing references to hypnosis throughout and eliminating the induction procedure itself (possibly with the eye-closure suggestions retained) would also have the advantage of saving 15- 20 minutes in administration time reducing the overall testing time to approximately 70-75 minutes.

In addition to research applications there has long been evidence that hypnosis procedures can facilitate outcomes in psychological therapies (Kirsch, Montgomery & Sapirstein, 1995; Lynn, Rhue & Kirsch, 2010). Despite that evidence, however, only a relatively small percentage of clinicians using hypnosis as an adjunct to their treatment of clients use a formal measure of hypnotic suggestibility (Barnier & McConkey, 2004; Lynn & Schindler, 2002) though there have been calls to remedy that situation (e.g. Barnier & Council, 2010).

There is also a case to be made that the inclusion of hypnosis in a therapeutic intervention may raise expectations of a positive outcome, especially where clients have had a prior positive response to hypnosis procedures and suggestions. A problem with formal hypnotic suggestibility scales for clinical practice is that they are time consuming, though recently developed more time efficient scales such as the Sussex-Waterloo Scale of Hypnotizability deriving from it might be considered (Lush, Moga McLatchie & Dienes, 2018). Also, formal scales contain standardised suggestions that are not necessarily relevant to the presenting problem of the individual. There is also the problem potential that as most formal scales contain 'difficult items' not passed by the majority of participants and this has the potential for creating negative expectations. In practice the use of more general suggestions within the induction procedure itself (such as involuntary eye-closure) and the introduction of suggestions tailored to the presenting problem in the process of therapy may be a more effective approach. Overall, though the HGSHS:A remains a valuable tool in research settings it does not recommend itself for use in clinical practice.

Our UK norms data are consistent with the existing national norms for the HGSH:A generally. They support the continued use of Harvard scale as an economical and effective measure in research studies where very large group sizes are involved or as a screening procedure for creating subgroups of participants who are high or low in hypnotic suggestibility in research settings. In particular, they also provide a reference point for methods used in selecting participants for instrumental research studies in the UK (London particularly). In their discussions the national normative studies have highlighted potential modifications to scripts and procedures in the wording and scoring of the amnesia item and the overall scoring for the scale as a whole to reflect the essential involuntariness and subjective dimension to suggested responses. Also there is a case for tailoring the content of the HGSH:A particularly when is used as a screening device for participants by selecting test items most closely related to the proposed research. The most significant shortcoming in the Norms data for future studies to address is their relatively restricted geographic spread. With the exception of two Chinese-languages studies, major geographical areas such as South America, Africa and Asia and regions within with them high population densities, such as India and China are not currently represented. Nevertheless, the HGSHS:A retains its importance as a reliable and robust measure of a particular type of suggestibility ('hypnotic suggestibility'), itself a special case of a more general human trait. In particular, it is relevant to studies of the same form of direct verbal suggestibility (DVS) seen in non-hypnotic contexts (Halligan and Oakley, 2014, Oakley & Halligan 2017 Terhune & Oakley, 2019). In addition to its intrinsic interest for psychology, the measurement of suggestibility via HGSHS:A is a powerful tool for conveniently selecting suitable participants for 'instrumental' studies where hypnotic suggestion is deployed

experimentally to create phenomena and conditions of interest to clinicians, psychologists, neurologists and cognitive neuroscientists, and to explore human consciousness.

## REFERENCES.

- Anlló, H., Becchio, J. & Sackur, J. (2017) French norms for the Harvard Group Scale of Hypnotic Susceptibility, Form A. *International Journal of Clinical and Experimental Hypnosis*, 65, 241-255.
- Balthazard, C.G. & Woody, E.Z. (1985) The 'stuff' of hypnotic performance: A review of psychometric approaches, *Psychological Bulletin*, 98; 283-296
- Barber, T.X. & Calverley, D.S. (1964) Comparative effects on 'hypnotic-like' suggestibility of recorded and spoken suggestions. *Journal of Consulting Psychology*, 28, 384, doi:10.1037/h0045217
- Bargh, J.A. & Morsella, (2008) The unconscious mind. *Perspectives on Psychological Science*. 3, 73-79, doi: 10.1111/j.1745-6916.2008.00064.x
- Barnier, A.J., Cox, R.E., O'Connor, A., Coltheart, M., Langdon, R., Breen, N., & Turner, M. (2008). Developing hypnotic analogues of clinical delusions: Mirrored-self misidentification. *Cognitive Neuropsychiatry*, 13, 406-430.
- Barnier, A.J. & Council, J.R. (2010) Hypnotizability matters: The what, why and how of measurement. In S.J. Lynn, J.W. Rhue & I. Kirsch (eds) *Handbook of Clinical Hypnosis: Second Edition*, Washington, DC: American Psychological Association, pp. 47-78.
- Barnier, A.J. & McConkey, K.M. (2004) Defining and identifying the highly hypnotizable person. In M.Heap, R.J. Brown & D.A. Oakley (eds) *The Highly Hypnotizable Person: Theoretical, Experimental and Clinical Issues*. Hove, UK: Brunner-Routledge, pp. 30-60.
- Barnier, A.J. & Nash, M.R. (2008) Introduction: A roadmap for explanation, a working definition. In M.R. Nash & A.J. Barnier (eds) *The Oxford Handbook of Hypnosis: Theory, Research and Practice*. New York: Oxford University Press, pp. 1-18
- Bergman, M., Trenter, E. & Kallio, S. (2003) Swedish norms for the Harvard Group Scale of Hypnotic Susceptibility: Form A. *International Journal of Clinical and Experimental Hypnosis*, 51, 348-356.

- Blakemore, S.-J., Oakley, D.A. & Frith, C.D. (2003) Delusions of alien control in the normal brain. *Neuropsychologia*, *41*, 1058-1067.
- Bongartz, W. (1985) German norms for the Harvard Group Scale of Hypnotic Susceptibility: Form A. *International Journal of Clinical and Experimental Hypnosis*, *33*, 131-139.
- Braffman, W. & Kirsch, I. (1999) Imaginative suggestibility and hypnotizability: An empirical analysis. *Journal of Personality and Social Psychology*, *77*, 578-587.
- Cardeña, E. (2014) Hypnos and psyche: How hypnosis has contributed to the study of consciousness. *Psychology of Consciousness: Theory, Research and Practice*, *1*, 123-138.
- Carvalho, C. (2013) Portuguese norms for the Harvard Group Scale of Hypnotic Susceptibility: Form A. *International Journal of Clinical and Experimental Hypnosis*, *61*, 219-231.
- David, D., Montgomery, G. & Holdevici, I. (2003) Romanian norms for the Harvard Group Scale of Hypnotic Susceptibility: Form A. *International Journal of Clinical and Experimental Hypnosis*, *51*, 66-76.
- De Pascalis, V., Russo, P. & Marucci, F.S. (2000) Italian norms for the Harvard Group Scale of Hypnotic Susceptibility: Form A. *International Journal of Clinical and Experimental Hypnosis*, *48*, 44-55.
- Deeley, Q. (2016a). Hypnosis as a model of functional neurologic disorders. *Handbook of Clinical Neurology*, *139*, 95– 103.
- Deeley, Q. (2016b). Transforming experience through the meditation and ritual of Chod: Insights from hypnosis research. In M. Lifshitz & A. Raz (Eds.), *Hypnosis and meditation: Toward an integrative science of conscious planes* (pp. 39–54). Oxford: Oxford University Press.

- Deeley, Q. (2018) Revelatory experiences: Meanings, motives and causes. *Religion, Brain and Behaviour*. doi: 10.1080/2153599X.2018.1429012
- Deeley, Q., Oakley, D.A., Toone, B., Bell, V., Walsh, E., Marquand, A.F., Giampietro, V., Brammer, M. J., Williams, S.C.R., Mehta, M. A. & Halligan, P.W. (2013) The functional anatomy of suggested limb paralysis. *Cortex*, 49, 411-422.
- Deeley, Q., Oakley, D. A., Toone, B., Giampietro, V., Brammer, M. J., Williams, S. C. R. and Halligan, P. (2012). Modulating the default mode network using hypnosis. *International Journal of Clinical and Experimental Hypnosis*, 60(2), 206-228.
- Deeley, Q., Walsh, E., Oakley, D.A., Bell, V., Koppel, C., Metha, M.A. & Halligan, P.W. (2013) Using hypnotic suggestion to model loss of control and awareness of movements: An exploratory fMRI study. *PLoS ONE* 8 (10):e78324.doi:10.1371/journal.pone.0078324
- Deeley, Q., Oakley, D.A., Walsh, E., Bell, V., Mehta, M.A. & Halligan, P.W. (2014) Modelling psychiatric and cultural possession phenomena with suggestion and fMRI. *Cortex*, 53, 107-119.
- Derbyshire, S.W.G., Whalley, M.G. & Oakley, D.A. (2009) Fibromyalgia pain and its modulation by hypnotic and non-hypnotic suggestion: An fMRI analysis. *European Journal of Pain* 13, 542-550.
- Dienes, Z. & Hutton, S., (2013) Understanding hypnosis metacognitively: rTMS applied to left DLPFC increases hypnotic susceptibility. *Cortex*, 49, 286-292.
- Dienes, Z. & Perner, J. (2007) Executive control without conscious awareness: The cold control theory of hypnosis. In Jamieson, G. A. (ed) *Hypnosis and conscious states: The cognitive neuroscience perspective*. Oxford, UK: Oxford University Press. Pp. 293-314.

- Ellenberger, H.F. (1994) *The Discovery of the Unconscious. The History and Evolution of Dynamic Psychiatry*. London, UK: Fontana Press.
- Halligan, P.W. & Oakley, D.A. (2013) Hypnosis and cognitive neuroscience: Bridging the gap. *Cortex*, 49, 359-364.
- Halligan, P.W. & Oakley, D.A. (2014) Hypnosis and beyond: Exploring the broader domain of suggestion, *Psychology of Consciousness: Theory, Research and Practice*, 1, 105-122.
- Hilgard, E.R. (1977) *Divided consciousness: Multiple controls in human thought and action*. New York, NY: John Wiley & Sons.
- Jensen, M.P., Jamieson, G.A., Lutz, A., Mazzoni, G., McGeown, W.J., Santarcangelo, E.L., Demertzi, A., De Pascalis, V., Bányai, É.I., Rominger, C., Vuilleumier, P., Faymonville, M-E. & Terhune, D.B. (2017) New directions in hypnosis research: Strategies for advancing the cognitive and clinical neuroscience of hypnosis. *Neuroscience of Consciousness*. 1-14. Doi: 10.1093/nc/nix004
- Kallio, S.P. & Ihamuotila, M.J. (1999) Finnish norms for the Harvard Group Scale of Hypnotic Susceptibility: Form A. *International Journal of Clinical and Experimental Hypnosis*, 47, 227-235.
- Kihlstrom, J. F. (1987). The cognitive unconscious. *Science*, 237, 1445-1452. doi: 10.1126/science.3629249
- Kihlstrom, J.F. (2006) Measurement of involuntariness in hypnotic response. Retrieved from [http://socrates.berkeley.edu/~kihlstrm/hypnosis\\_involuntariness.htm](http://socrates.berkeley.edu/~kihlstrm/hypnosis_involuntariness.htm)
- Kihlstrom, J.F. (2013) Neuro-hypnotism: Prospects for hypnosis and neuroscience. *Cortex*, 49, 365-374.

- Kihlstrom, J.K. & Register, P.A. (1984) Optimal scoring of amnesia on the Harvard Group Scale of Hypnotic Susceptibility, Form A. . *International Journal of Clinical and Experimental Hypnosis*, 32, 51-57.
- Kirsch, I. & Braffman, W. (2001) Imaginative suggestibility and hypnotizability. *Current Directions in Psychological Science*, 10: 57-61
- Kirsch, I., Council, J. R., & Wickless, C. (1990). Subjective scoring for the Harvard group scale of hypnotic susceptibility, form A. *International Journal of Clinical and Experimental Hypnosis*, 38(2), 112-124.
- Kirsch, I. & Lynn, S.J. (1997) Hypnotic involuntariness and the automaticity of everyday life. *American Journal of Clinical Hypnosis*, 40, 329-348.
- Kirsch, I., Montgomery, G. & Sapirstein, G. (1995) Hypnosis as an adjunct to cognitive-behavioural psychotherapy: A meta-analysis. *Journal of Consulting and Clinical Psychology*, 63, 214-220.
- Költő, A., Gösi-Greguss, A.C., Varga, K. & Bányai, É. I. (2015) Hungarian norms for the Harvard Group Scale of Hypnotic Susceptibility, Form A. *International Journal of Clinical and Experimental Hypnosis*, 63, 309-334.
- Lamas, J.R., del Valle-Inclan, F., Blanco, M.J. & Diaz, A.A. (1989) Spanish norms for the Harvard Group Scale of Hypnotic Susceptibility: Form A. *International Journal of Clinical and Experimental Hypnosis*, 37, 264-273.
- Landry, M., Lifshitz, M. & Raz, A., (2017) Brain correlates of hypnosis: A systematic review and meta-analytic exploration.
- Laurence J.-R. & Perry, C. (1982) Montréal norms for the Harvard Group Scale of Hypnotic Susceptibility: Form A. . *International Journal of Clinical and Experimental Hypnosis*, 30, 167-176.
- Lin, M-J & Chang, E.C. (2019) Taiwanese norms for the Harvard Group Scale of Hypnotic

Susceptibility: Form A, *International Journal of Clinical and Experimental Hypnosis*, 67:2, 136-156, DOI: 10.1080/00207144.2019.1580959

Lichtenberg, I. (2008) Israeli norms for the Harvard Group Scale of Hypnotic Susceptibility: Form A. *International Journal of Clinical and Experimental Hypnosis*, 56, 384-393.

Lush, P., Moga, G., McLatchie, N. & Dienes, Z. (2018) The Sussex-Waterloo Scale of Hypnotizability (SWASH): Measuring capacity for altering conscious experience *Neuroscience of Consciousness*, 4, 1, 1-7 doi: 10.1093/nc/niy006

Lynn, S.J., Kirsch, I. & Rhue, J.W. (2010) An introduction to clinical hypnosis. In S.J. Lynn, J.W. Rhue & I. Kirsch (eds) *Handbook of Clinical Hypnosis: Second Edition*, Washington, DC: American Psychological Association. Pp. 3-18.

Lynn, S.J. & Schindler, K. (2002) The role of hypnotizability assessment in treatment. *American Journal of Clinical Hypnosis*, 44, 185-197

Lynn, S.J., Laurence, J-R & Kirsch, I. (2015) Hypnosis, Suggestion and Suggestibility: An integrative model. *American Journal of Clinical Hypnosis*, 57, 314-329.

McGeown, W.J., Venneri, A., Kirsch, I., Nocetti, L., Roberts, K., Foan, L & Mazzoni, G. (2012) Suggested visual hallucination without hypnosis enhances activity in visual areas of the brain. *Consciousness and Cognition*, 21, 100-116.

Oakley, D.A. (2012) From Freud to neuroimaging: Hypnosis as a common thread. In A. Fotopoulou, D. Pfaff & M.A. Conway (eds), *From the Couch to the Lab. Trends in Psychodynamic Neuroscience*. Oxford: Oxford University Press. Pp 356-372.

Oakley, D.A., Deeley, Q. & Halligan, P.W. (2007) Hypnotic depth and response to suggestion under standardized conditions and during fMRI scanning. *International Journal of Clinical and Experimental Hypnosis*, 55, 1-27

Oakley, D.A. & Halligan, P.W. (2009) Hypnotic suggestion and cognitive neuroscience. *Trends in Cognitive Sciences*, 13, 264-270

- Oakley, D.A. & Halligan, P.W. (2013) Hypnotic suggestion: Opportunities for cognitive neuroscience. *Nature Reviews: Neuroscience*. 14, 565-576.
- Oakley, D.A. & Halligan, P.W. (2017) Chasing the rainbow: The non-conscious nature of being. *Frontiers in Psychology: Cognitive Science*. 8:1924. doi: 10.3389/fpsyg.2017.01924
- Peter, B., Geiger, E., Prade, T., Vogel, S., & Piesbergen, C. (2015) Norms of German adolescents for the Harvard Group Scale of Hypnotic Susceptibility, Form A. *International Journal of Clinical and Experimental Hypnosis*, 63, 92-109.
- Piccione, C., Hilgard, E.R. & Zimbardo, P.G. (1989) On the degree of stability of measured hypnotizability over a 25-year period. *Journal of Personality and Social Psychology*, 56, 289-295
- Sheehan, P.W. & McConkey, K.M. (1979) Australian norms for the Harvard Group Scale of Hypnotic Susceptibility: Form A. *International Journal of Clinical and Experimental Hypnosis*. 27, 294-304.
- Shor, R.E. & Orne, E.C. (1962) *Harvard Group Scale of Hypnotic Susceptibility: Form A*. Palo Alto, CA: Consulting Psychologists Press.
- Shor, R.E. & Orne, E.C. (1963) Norms on the Harvard Group Scale of Hypnotic Susceptibility: Form A. *International Journal of Clinical and Experimental Hypnosis*. 11, 39-47.
- Siuta, J. (2010) Polish norms for the Harvard Group Scale of Hypnotic Susceptibility: Form A. *International Journal of Clinical and Experimental Hypnosis*, 58, 433-443.
- Tellegen, A. & Atkinson, G. (1974) Openness to absorbing and self-altering experiences ('absorption'), a trait related to hypnotic suggestibility. *Journal of Abnormal Psychology*, 83: 268-277.

- Terhune, D.B. & Oakley, D. A. (forthcoming) Hypnosis and imagination. In A. Abraham, (Ed)., *The Cambridge Handbook of the Imagination*. Cambridge University Press.
- Walsh, E., Guilmette, D. N., Longo, M. R., Moore, J. W., Oakley, D. A., Halligan, P. W., Mehta, M.A. & Deeley, Q. (2015). Are you suggesting that's my hand? The relation between hypnotic suggestibility and the rubber hand illusion. *Perception*, 44(6), 709-723. Doi: 10.1177/0301006615594266
- Walsh, E., Mehta, M.A., Oakley, D.A., Guilmette, D.N. , Gabay, A., Halligan, P.W. & Deeley, Q. (2014) Using suggestion to model different types of automatic writing. *Consciousness and Cognition*, 26, 24-36.
- Walsh, E., Oakley, D.A., Halligan, P.W., Mehta, M.A. & Deeley, Q. (2015) The functional anatomy and connectivity of thought insertion and alien control of movement. *Cortex*, 64, 380-393. <https://doi.org/10.1016/j.cortex.2014.09.012>
- Walsh, E., Oakley, D.A., Halligan, P.W., Mehta, M.A. & Deeley, Q. (2017) Brain mechanisms for loss of awareness of thought and movement. *Social Cognitive and Affective Neuroscience*, 12 (5), 793-801. <https://doi.org/10.1093/scan/nsw185>
- Weitzenhoffer, A.M. (1980) Hypnotic susceptibility revisited. *American Journal of Clinical Hypnosis*, 22, 130-146
- Woody, E.Z. & Barnier, A.J. (2008) Hypnosis scales for the twenty-first century: What do we need and how should we use them? In M.R. Nash and A.J. Barnier (eds) *The Oxford Handbook of Hypnosis: Theory Research and Practice*. Oxford, UK: Oxford University Press. Pp. 255-281.
- Woody, E.Z., Barnier, A.J. & McConkey, K.M. (2005) Multiple hypnotizabilities: Differentiating the building blocks of hypnotic response. *Psychological Assessment*, 17, 200-211

Zachariae, A., Sommerlund, B. & Molay, F. (1996) Danish norms for the Harvard Group Scale of Hypnotic Susceptibility: Form A. *International Journal of Clinical and Experimental Hypnosis*, 44, 140-152.

Zhou, A. B., & Wang, Z. D. (2011). The reliability and validity of Harvard group scale of hypnotic susceptibility, form A (HGSHS-A) Chinese version in college students. *Chinese Mental Health Journal*, 25(3), 223–227.

Table 1

*Key comparisons and data modifications applied in all 16 of the previous national samples plus the present one – shown in chronological order (America 1963 – UK 2019).*

*\*Adolescents. \*\* Significant gender difference in overall score (female scores higher in all cases). See text for discussion.*

Country	N	Male vs Female	Involuntary/ Subjective	Self vs Observer	Recorded vs spoken	Amnesia Revision
1 America	132	No	No	Yes	?	No
2 Australia	1944	Yes**	No	No	Recorded	No
3 Canada	535	Yes	No	No	?	No
4 Germany	374	Yes	No	Yes	Recorded & Spoken	No
5 Spain	220	Yes	No	No	Recorded	No
6 Denmark	376	Yes**	No	No	Spoken	No
7 Finland	285	Yes	No	No	Spoken	No
8 Italy	376	Yes**	Yes - data not reported	No	Spoken	No
9 Romania	340	Yes	No	No	Spoken	No
10 Sweden	291	Yes**	No	No	Recorded & Spoken	Yes
11 Israel	253	Yes	No	No	Spoken	No
12 Poland	1174	Yes**	No	No	Spoken	No
13 Portugal	313	Yes	No	No	Recorded	Yes
14 Germany A*	99	Yes	No	No	Recorded	No
15 Hungary	434	Yes**	No	Yes	Spoken	No
16 France	115	Yes	Yes	No	Spoken	Yes
17 UK	417	Yes	Involuntariness Yes Subjective	No	Recorded	Yes

Table 2

*Mean subjective and objective scores (standard deviation) and their Pearson correlations (r) for all test items shown in order of presentation. The range of scores for the subjective response scale is 0-4 and 0-1 for the objective score scale.*

	Harvard Test Item	Subjective	Objective	Pearson's <i>r</i>
1	Head falling	2.4 (1.3)	0.6 (0.5)	0.628**
2	Eye Closure	2.7 (1.2)	0.7 (0.5)	0.545**
3	Hand lowering	2.7 (1.4)	0.7 (0.5)	0.602**
4	Arm immobilisation	2.0 (1.4)	0.4 (0.5)	0.211**
5	Finger lock	2.0 (1.4)	0.5 (0.5)	0.495**
6	Arm rigidity	2.0 (1.4)	0.5 (0.5)	0.358**
7	Moving hands together	2.5 (1.4)	0.7 (0.5)	0.495**
8	Communication inhibition	1.6 (1.4)	0.4 (0.5)	0.474**
9	Experiencing of fly	0.9 (1.2)	0.2 (0.5)	0.540**
10	Eye catalepsy	1.8 (1.5)	0.4 (0.5)	0.560**
11	Post-hypnotic suggestion	0.9 (1.4)	0.3 (0.5)	0.573**
12	Post-hypnotic amnesia	1.2 (1.3)	0.1 (0.4)	0.113*

\* Correlation significant at the 0.05 level (2-tailed)

\*\* Correlation significant at the 0.01 level (2-tailed)

Table 3

Mean percentage (and standard deviation of the group mean) of HGSHS:A item pass rates for all participants (total) and by gender (all numbers rounded to the nearest integer). Items are listed in the same order as presented during the testing session and are identified by sub-category (Ideomotor, Challenge or Cognitive). Also shown are total ('objective') scores corrected for subjective experience – each scale item is counted as a pass only if it has an 'objective' score of 1 and a score of 2 or more on the five point subjective experience scale. The percentage change produced by this correction is shown in bold.

	Scale item	Suggestion Category	Total N=417 (%)	Total Corrected N=417 (%)	Change from Total (%)	Female N=248	Male N=169
1	Head falling	<b>Ideomotor</b>	64 (48)	58 (49)	<b>9</b>	63 (48)	64 (48)
2	Eye Closure	<b>Ideomotor</b>	68 (47)	64 (48)	<b>6</b>	69 (47)	67 (47)
3	Hand lowering	<b>Ideomotor</b>	68 (47)	63 (48)	<b>6</b>	67 (47)	70 (46)
4	Arm immobilisation	<b>Challenge</b>	41 (49)	29 (46)	<b>29</b>	40 (49)	44 (50)
5	Finger lock	<b>Challenge</b>	51 (50)	42 (49)	<b>18</b>	49 (50)	54 (50)
6	Arm rigidity	<b>Challenge</b>	46 (50)	34 (47)	<b>26</b>	44 (50)	48 (50)
7	Moving hands together	<b>Ideomotor</b>	72 (45)	61 (49)	<b>15</b>	73 (45)	71 (46)
8	Communication inhibition	<b>Challenge</b>	38 (49)	28 (45)	<b>25</b>	36 (48)	40 (49)
9	Experiencing of fly	<b>Cognitive</b>	22 (42)	14 (35)	<b>37</b>	23 (43)	22 (41)
10	Eye catalepsy	<b>Challenge</b>	43 (50)	35 (48)	<b>18</b>	42 (49)	45 (50)
11	Post-hypnotic suggestion	<b>Cognitive</b>	33 (47)	20 (40)	<b>39</b>	31 (46)	38 (49)
12	Post-hypnotic amnesia	<b>Cognitive</b>	14 (35)	7 (26)	<b>50</b>	14 (35)	15 (36)

Table 4

Percentage pass rates of items in each of the ideomotor, challenge and cognitive subscales of HGSHS:A for the current sample (UK)\* and for 16 national samples (USA = American; AUS = Australian; CAN = Canadian (Montreal) ; GER = German; SPA = Spanish; DAN = Danish; FIN = Finnish; ITA = Italian; ROM = Romanian; SWE = Swedish; ISR = Israeli; POL = Polish; PRT = Portuguese; GER:A = German Adolescents; HUNs = Hungarian self-ratings\*\*; FRA = France uncorrected scores\*. Across sample means and SD are shown excluding UK.

The suggestions are numbered according to the order of presentation.

	Sample N	UK	USA	AUS	CAN	GER	SPA	DAN	FIN	ITA	ROM	SWE	ISR	POL	PRT	GER:A	HUNs	FRAu		
	Date	2017	1963	1944	1979	1982	1985	1989	1996	1999	2000	2003	2008	2010	2013	2015	2015	2017		
Ideomotor																				
1. Head falling		64	86	61	65	73	73	86	84	70	68	70	48	54	58	70	68	89	70	12
2. Eye closure		68	74	57	63	73	64	48	86	62	60	76	78	66	60	62	67	77	67	10
3. Hand lowering		68	89	71	66	83	60	75	89	56	59	66	75	78	68	76	72	91	73	11
7. Hands moving		72	86	71	64	74	79	78	78	64	61	64	76	71	67	69	71	91	73	8
SUBSCALE MEAN		68	84	65	65	76	69	72	84	63	62	69	69	67	63	69	70	87	71	10
Challenge																				
4. Arm immobilisation		41	48	36	47	52	58	72	43	55	56	61	37	48	57	47	41	60	51	10
5. Finger lock		51	67	53	50	57	67	76	66	60	58	74	50	59	75	62	71	71	64	9
6. Arm rigidity		46	57	41	47	52	69	75	53	63	59	65	51	58	65	49	55	63	58	9
8. Communication inhibition		38	50	42	43	49	74	73	56	48	52	56	51	61	51	50	44	75	55	11
10 Eye catalepsy		43	56	38	36	47	59	61	52	40	52	51	37	46	46	46	53	69	49	9
SUBSCALE MEAN		44	56	42	45	51	65	71	54	53	55	61	45	54	59	51	53	68	55	9
Cognitive																				
9. Hallucination		22	56	25	36	47	29	38	28	28	34	14	15	12	12	18	18	18	27	13
11. Posthypnotic suggestion		33	36	17	15	31	29	11	37	35	35	15	30	55	44	36	38	42	32	12
12. Amnesia		14	48	33	19	36	52	71	53	56	30	65	13	16	72	29	40	52	43	19
SUBSCALE MEAN		23	47	25	23	38	37	40	39	40	33	31	19	28	43	28	32	37	34	15
OVERALL MEAN		47	63	45	46	56	59	64	60	53	52	56	47	52	56	51	53	67	55	11

\* Also reported ratings adjusted for voluntariness and used the post-reversal cue data in calculating the amnesia scores.

\*\*Also reported observer ratings

Table 5

*Summarises the percentage pass rates for each of the 12 scale items for the present (UK) study compared to the ranges and means of pass rates for the 16 multi-national samples (SD = standard deviation).*

<b>Scale Item</b>		<b>UK</b>	<b>Multi-National Range</b>	<b>Multi-National Mean (SD)</b>
1	Head falling	64	48-89	70 (12)
2	Eye closure	68	48-86	67 (10)
3	Hand lowering	68	56-91	73 (10)
4	Arm immobilization	41	36-72	51 (10)
5	Finger lock	51	50-76	64 (10)
6	Arm rigidity	46	41-75	58 (10)
7	Hands moving	72	61-91	73 (10)
8	Communication inhibition	38	42-75	55 (10)
9	Hallucination	22	12-56	27 (10)
10	Eye catalepsy	43	36-69	49 (10)
11	Post-hypnotic suggestion	33	11-55	32 (10)
12	Amnesia	14	13-72	43 (10)

Table 6

*Item-Scale Correlation for the corrected United Kingdom sample.*

Item	Pearson's <i>r</i>
Head falling	0.494
Eye Closure	0.483
Hand lowering	0.498
Arm immobilisation	0.591
Finger lock	0.651
Arm rigidity	0.632
Moving hands together	0.524
Communication inhibition	0.629
Experiencing of fly	0.389
Eye catalepsy	0.671
Post-hypnotic suggestion	0.387
Post-hypnotic amnesia	0.436

Table 7

*Showing number of males and females and total number of participants included in the earlier Norms studies including the present study with the exception of the American study, which did not classify participants by gender. These data are also shown as a percentage of males and females in each group along with the difference in the two percentages. \* Studies finding a gender difference in Harvard scores - Females scoring higher than males in all cases.*

	Females N	Males N	Total N	Females %	Males %	Diff %
Australia*	1328	616	1944	68.3	31.7	36.6
Canada	357	178	535	66.7	33.3	33.5
Germany	192	182	374	51.3	48.7	2.7
Spain	153	67	220	69.5	30.5	39.1
Denmark*	253	123	376	67.3	32.7	34.6
Finland	245	40	285	86.0	14.0	71.9
Italy*	297	79	376	79.0	21.0	58.0
Romania	218	122	340	64.1	35.9	28.2
Sweden*	199	92	291	68.4	31.6	36.8
Israel	148	104	252	58.7	41.3	17.5
Poland*	968	206	1174	82.5	17.5	64.9
Portugal	247	66	313	78.9	21.1	57.8
Germany A	56	43	99	56.6	43.4	13.1
Hungary*	244	190	434	56.2	43.8	12.4
France	91	24	115	79.1	20.9	58.3
UK	246	171	417	59.0	41.0	18.0
<b>Mean</b>	<b>327.6</b>	<b>143.9</b>	<b>471.6</b>	<b>68.2</b>	<b>31.8</b>	<b>36.5</b>
<b>SDEV</b>	<b>335.1</b>	<b>138.8</b>	<b>460.8</b>	<b>10.4</b>	<b>10.4</b>	<b>20.8</b>

**Figure 1**

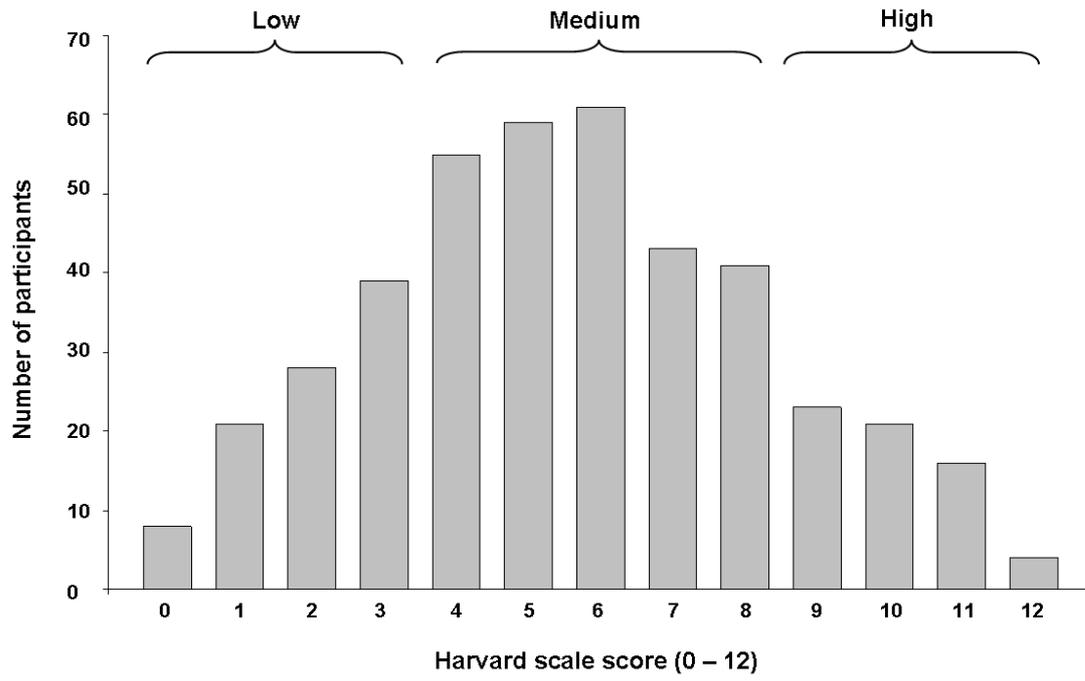
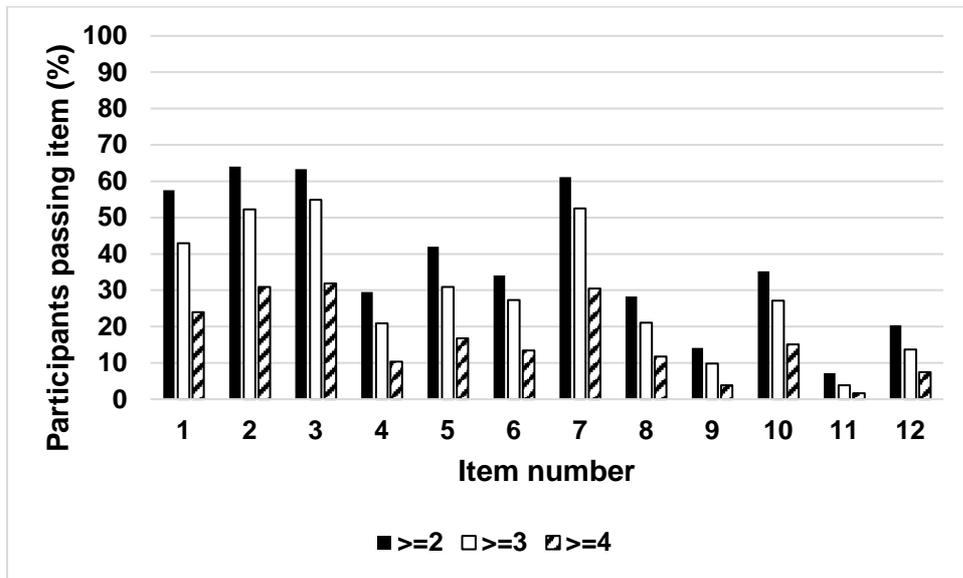


Figure 2



**Figure 1.**

**Hypnotic suggestibility scores for the 417 UK participants, as measured by the classic Harvard Group Scale of Hypnotic Susceptibility: Form A (Shor and Orne, 1962). Scale scores: 0–3 = lowest level of responsiveness; 4–8 = medium level of responsiveness; 9–12 = highest level of responsiveness. Scores were normally distributed.**

**Figure 2.**

**Showing the percentage of items passed using the corrected ‘objective’ scoring method which were found to be subjectively convincing to a "moderate extent" ( $\geq 2$ ); “fairly strongly” ( $\geq 3$ ) or to a “great extent” (4).**