Portuguese adaptation of the Gudjonsson Suggestibility Scales (GSS1 and GSS2): empirical findings

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Abstract

In study 1 (n = 51, M_{age} = 21.4 years, SD = 5.7), the validity of the Portuguese adaptation of the Gudjonsson Suggestibility Scales (Pires, 2011) was shown through the comparison of means of the original (Gudjonsson, 1997) and the translated scales and the analysis of the correlations between the GSS1 and GSS2 scores. The relationships between interrogative suggestibility and the big five were also addressed and the results point to independence between suggestibility and personality, which is in line with Polczyk's findings (2005). Study 2 (n = 87, M_{age} = 48.9 years, SD = 20.7) explored the relationships among interrogative suggestibility, the state-trait anxiety and demographic variables (i.e., age and gender). There were no significant relationships between anxiety and suggestibility. These results are in line with other studies that point to a lack of relationship between suggestibility and anxiety in normal samples (Polczyk, 2005; Wolfradt & Meyer, 1998). As for the relationships between age and interrogative suggestibility, ANCOVA confirmed that the increased suggestibility in old age was not due to age differences but rather to the limited memory capacity of the older adults group. There were no significant gender differences in the GSS1 subscales.

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1. Introduction

The Gudjonsson Suggestibility Scales (Gudjonsson, 1984, 1987, 1997) operationalize the Gudjonsson-Clark theoretical model of interrogative suggestibility (Gudjonsson, 2003). The scales were developed with a clinical/forensic purpose, to identify people susceptible to giving erroneous accounts of events when questioned, and with research purposes, in order to understand the interrogative suggestibility process and to validate its theoretical model.

The suggestibility scales are composed of a story which is read out to the interviewee or played from a tape recorder, an immediate recall task, a delayed recall task and a formal questioning. The delay between the immediate and the delayed recall task is approximately 50 minutes. The formal questioning, consisting of 20 questions, 15 of which are subtly misleading, is given twice: after the delayed recall task and after the negative feedback, in which the individual is told that he/she has made a number of errors (even if no errors have been made) and that it is necessary to answer all the questions again. The individual is asked to be more accurate than before.

Although structurally similar in terms of the scales' format, administration and scoring, the suggestibility scales differ in the content of the stories and questions. The GSS1 story describes a robbery and the GSS2 describes a couple preventing a boy from having a bicycle accident.

In addition to measures that describe memory functioning, the suggestibility scales provide four measures of suggestibility: Yield 1 (the number of leading questions accepted by the individual in the first questioning); Yield 2 (the number of leading

questions accepted by the individual in the second questioning, after negative feedback); Shift (the number of answers altered from first to second questioning); and Total Suggestibility (which is the sum of Yield 1 and Shift which also provides information about the individual's overall level of suggestibility). Total Suggestibility characterizes the two types of interrogative suggestibility described in the Gudjonsson-Clark theoretical model (Gudjonsson, 2003): vulnerability to misinformation (Yield 1) and vulnerability to interrogative pressure (Shift).

The theoretical model of interrogative suggestibility conceives suggestibility as a dynamic and situational process. The situational nature of suggestibility is particularly evident with regard to the negative feedback, the impact of which varies depending on its intensity, quality and nature and also on the interviewee's past experiences in questionings. However, this model recognizes suggestibility as a stable trait that depends on cognitive factors (e.g., memory, intelligence) and personality (e.g., self-esteem, strategies for coping with stress, anxiety and dependence on social approval), which are variables that mediate suggestibility. Consequently, individual differences in suggestibility can be measured accurately and can be used to predict the behaviour of people in real life interrogation. According to the model, people with poor memory recollections and those with low intelligence are expected to be more suggestible than those with higher cognitive competencies. Similarly, suggestibility is expected to be related to personality variables such as low self-esteem, the tendency to experience anxiety, lack of assertion and fear of negative evaluation.

The adaptation of the Gudjonsson Suggestibility Scales for the Portuguese population was carried out in a PhD research on the influence of personality styles in suggestibility (Pires, 2011). Translation and adaptation of the scales was authorized and conducted according to the standards proposed by the International Test Commission

(ITC) for the translation and adaptation of psychological tests (Hambleton, Merenda, & Spielberger, 2005).

The first step in the adaptation of the scales for the Portuguese population involved the translation of the original GSS1 and GSS2 from English to Portuguese. Experts in English and in personality assessment carried out independent evaluations of the scales' stories and questions translation. Since the scales are measures of memory, memory experts evaluated the adequacy of translations regarding the theoretical and empirical knowledge about memory. The translations were considered suitable.

The final step in assessing the suitability of the Portuguese translation of the scales involved the back translation of these translated versions. Another translator carried out the translation of the Portuguese versions of the GSS1 and GSS2 into English. The back translation was performed without access to the original versions. Overall, there was agreement between the back translation and the original English.

The equivalence of both the original and translated language versions has not been evaluated through their application to a sample of bilingual individuals, since the nature of the scales predicts that individuals memorize the stories and questions.

In the Portuguese adaptation of the GSS1, the Cronbach's alpha of Yield 1, Yield 2 and Shift were .74, .76 and .58, respectively. In the GSS2 the alpha coefficients for Yield 1, Yield 2 and Shift were .65, .82 and .67, respectively. The Portuguese results are in line with those obtained by Gudjonsson (1997), although Shift indicates a lower internal consistency than the original measure. Our results are also in accordance with the Polish adaptation's results (Polczyk, 2005).

The temporal stability of Yield 1, Yield 2, Shift and Total Suggestibility were r_s = .39, p <.01, r_s = .46, p <.01, r_s = .11 and r = .32, p <.05, respectively. The correlations obtained are significant in all cases except for Shift. The psychometric limitations of the

Gudjonsson Suggestibility Scales, particularly of Shift and Total Suggestibility scale, a composite measure which is the sum of Yield 1 and Shift, have been identified in several independent studies (Gignac & Powell, 2009, Liebman et al. in 2002; Polczyk, 2005).

As for the validity of the Portuguese adaptation of the Gudjonsson Suggestibility Scales, which is the topic of this paper, univariate and bivariate analyses were performed and their results compared with those of Gudjonsson (1997). Furthermore, empirical studies of the relationships between suggestibility and psychological and demographic variables were carried out.

2. Study 1

Study 1 comprises two sections. First, evidence for the validity of the Portuguese GSS1 and GSS2 is given through the comparison of means and standard deviations for the original and the translated scales and the analysis of the correlations between the GSS1 and GSS2 scores. The second section presents the relationships between the scales and the five personality factors operationalized by the Portuguese adaptation of the NEO-PI-R (Costa & McCrae, 2000; Lima, 1997) in order to corroborate the findings of Gudjonsson (2003), suggesting a weak but significant correlation between Total Suggestibility and neuroticism.

2.1. Method

2.1.1. Participants

The sample consisted of 51 individuals, 43 females and eight males, ages ranged from 18-50, with a mean age of 21.4 years and a standard deviation of 5.7. Most

participants (88.2%) were students in higher education. The remaining participants (11.8%) were scientific and intellectual professionals.

2.1.2 Measures

In this study participants responded to the Portuguese adaptation of the Gudjonsson Suggestibility Scales (Pires, 2011) and to the Portuguese adaptation of the Revised NEO Personality Inventory, NEO-PI-R (Costa & McCrae, 2000; Lima, 1997).

The NEO-PI-R is a 240-item inventory designed to measure personality traits of normally functioning adults. The test characterizes the five basic dimensions of personality (Neuroticism, Extraversion, Openness to experience, Agreeableness and Conscientiousness), with six specific facets within each domain.

2.1.3. Procedure

GSS1 and GSS2 were applied in the same experimental session, in a balanced order of application to control possible order effects. GSS1 and GSS2 stories were presented from an audio tape, to ensure that the participants heard the stories under the same conditions, avoiding the interference of variables that were difficult to control, such as the constancy of reading speed in the same session and from one session to another. For each scale, the retention interval between the immediate recall task and the delayed recall task was approximately 50 minutes, during which participants responded to the NEO-PI-R and other psychological assessment instruments. The experimental sessions were carried out at Lisbon University, were held individually and lasted around 2 hours.

2.2. Results

Table 1 gives the means and standard deviations for memory and suggestibility for the 51 individuals, as well as the correlations between suggestibility and memory

scores in the Portuguese GSS1 and GSS2. To enable comparison, the original data is also presented (Gudjonsson, 1997).

(Table 1)

Means and standard deviations scores for memory and suggestibility for the Portuguese sample are in line with those obtained by Gudjonsson (1997). As for the correlation between GSS1 and GSS2 scores, although all the variables present highly significant relationships, the memory measures and Shift obtain weak relationships between the scales. Moreover, although the Portuguese results assure that GSS1 and GSS2 are related measures, they are much lower than those obtained by the author (Gudjonsson, 1997).

Pearson's correlation coefficient and the corresponding test for significance were used to examine the relationships between the NEO-PI-R variables and the normally distributed suggestibility variables. Spearman's correlation coefficient was used for the GSS2 Yield 1 and Shift, since these variables did not have a normal distribution.

There are no significant relationships between the NEO-PI-R five factors of personality and the GSS1 and GSS2 Total Suggestibility, Yield 1, Yield 2 and Shift.

3. Study 2

Within the scope of the external validity studies of the Portuguese adaptation of the suggestibility scales, study 2 comprises three sections: a) the relationship between suggestibility and anxiety; b) the relationship between suggestibility and age; c) the relationship between suggestibility and gender.

a) Gudjonsson (2003) used the Spielberger State-Trait Anxiety Inventory (STAI), to test the hypothesis that suggestibility relates more to state anxiety than to trait anxiety. State anxiety refers to an emotional state characterized by transient arrest

and an increased response of the autonomic nervous system. Trait anxiety refers to relatively stable individual differences in the propensity to experience anxiety.

In the Gudjonsson study (Gudjonsson, 2003), participants responded to the STAI twice: before the GSS1 formal questioning and after the negative feedback. The results showed that Shift and Yield 2 correlated with state anxiety in the two applications, but in the second application, the correlations were higher than in the first. In the first application the correlation between Shift and state anxiety was .42, in the second application, the correlation was .69. These results support the hypothesis that suggestibility relates more to state anxiety triggered by interrogative pressure than to a predisposition to experience anxiety (trait anxiety). Therefore, Gudjonsson concluded that Yield 2 and Shift are more related to anxiety than Yield 1.

The first section of study 2 explores the relationship between vulnerability to suggestion measured by the Portuguese adaptation of the suggestibility scales and anxiety measured by the Portuguese adaptation of the State-Trait Anxiety Inventory, STAI, Form Y (Silva, 2006, Silva & Campos, 1998).

b) The majority of studies concerning the relationship between interrogative suggestibility and age have focused primarily on young populations: children and adolescents. Several studies show that teenagers are not more vulnerable to misleading questions than adults (Yield 1). They are, however, significantly more sensitive to negative pressure (Gudjonsson, 2003; Richardson & Kelly, 1995). Up to 12 years, children are more vulnerable than adults to misleading questions and negative feedback. Children 12 years and older have performances similar to those of adults in memory indicators and Yield, but obtain significantly higher scores in Shift. After 16 years, there are no relations between age and suggestibility (Gudjonsson, 2003).

Polczyk et al. (2004) found that older adults were more vulnerable to misleading questions (Yield 1) than younger adults, although they did not react differently to negative pressure. However, a recent study did not confirm that older adults are more suggestible than younger adults (Mueller-Johnson & Ceci, 2007).

In order to clarify whether older people are more vulnerable to suggestion than younger adults, the second section of study 2 explores the relationship between age and vulnerability to suggestion measured by the Portuguese adaptation of the suggestibility scales.

c) As for the effect of gender on interrogative suggestibility, Gudjonsson (2003) found a trend toward higher suggestibility in women compared to men. This difference of around one point in the result of Total Suggestibility is not enough, however, to be significant. Redlich (1999) contradicts this trend, showing that in youths aged 12 to 26 years, men are significantly more suggestible than women in Yield 1, Yield 2 and Total Suggestibility. However, these differences may be due to better results for women in immediate recall.

The influence of gender on suggestibility scores within the Portuguese adaptation of the suggestibility scales is addressed in the last section of study 2.

3.1. Method

3.1.1. Participants

The sample consisted of 87 individuals from the general population, 63 females and 24 males, with a mean age of 48.9 years and a standard deviation of 20.7. More than half of the sample had had higher education (51.7%).

3.1.2 Measures

In this study participants responded to the Portuguese adaptation of the GSS1 (Pires, 2011) and to the Portuguese adaptation of the State-Trait Anxiety Inventory, STAI, Form Y (Silva, 2006; Silva & Campos, 1998).

The STAI comprises two self-report scales for measuring state and trait anxiety. The state anxiety scale consists of 20 items to evaluate how participants feel at the moment they are answering the test. The trait anxiety scale consists of 20 items to evaluate how participants usually feel.

3.1.3. Procedure

The experimental sessions were held individually and were carried out at Lisbon University, in a Vocational/Job Centre and in Senior Associations. The sessions began with the application of the GSS1 (story played from a tape recorder and immediate recall task). During the retention interval, individuals responded to the STAI (Form Y-1 and Y-2) and to another test in an adaptation process. At the end of the retention interval the application of the GSS1 proceeded with the delayed recall task and the formal questioning.

3.2. Results

Table 2 presents the correlation coefficients between state and trait anxiety and the suggestibility and memory scores in the sample of 87 individuals. The relationship between variables with a normal distribution (Yield 1, Yield 2, Total Suggestibility, Immediate Recall, Delayed Recall and Trait Anxiety) was studied using Pearson's correlation coefficient. Spearman's ordinal correlation coefficient was used to study Shift and State Anxiety which did not have a normal distribution.

(Table 2)

These results show that state and trait anxiety do not correlate with interrogative suggestibility; therefore the Portuguese study did not confirm the relationship between state anxiety and Yield 2 and Shift found by Gudjonsson (2003).

As for the relationship between age and interrogative suggestibility, the sample was divided in two sub-samples: one consisting of 30 adults aged 65 years or more (older adults' sample) and the remaining sample consisting of 57 individuals aged between 18 and 64 years old (young adults' sample).

Student's-t test was used to verify whether the group of adults aged 65 years or more (n = 30) differed from the group of adults under 65 years (n = 57) in Total Suggestibility (Total), Yield 1, Yield 2, Immediate Recall (IR) and Delayed Recall (DR). The Mann-Whitney test was used to compare the two groups in relation to the Shift variable that did not have a normal distribution.

Table 3 presents the mean scores, t-test values, p values and Cohen's d for age group differences on the GSS1.

(Table 3)

The two groups differed significantly, with large effect, in Total Suggestibility, Yield 1 and Yield 2. Older adults were more vulnerable to misleading questions and were more suggestible than young adults. Neither group differed with regard to vulnerability to negative pressure in the context of a social relationship (Shift): z = -1.13, p = .260.

These results may be due to the fact that the two groups had very significant differences in Immediate Recall and Delayed Recall. Older adults showed lower memory capacity than younger adults. It should be noted that the negative correlation between suggestibility and intelligence and memory in adults (Gudjonsson & Clare,

1995; Gudjonsson, 2003), children and adolescents (Danielsdottir et al., 1993; Richardson & Kelly, 1995) is a consistent empirical finding in several studies.

Table 4 presents the correlations obtained between Immediate and Delayed Recall, Total Suggestibility, Yield 1, Yield 2 and Shift in the sample of 87 individuals.

(Table 4)

The pattern of correlations obtained between suggestibility scales and memory indicators in the Portuguese adaptation of the GSS1 was similar to that found in the studies mentioned above.

An analysis of covariance (ANCOVA) was used to study the influence of memory and age on the dependent variable Total Suggestibility. Immediate Recall was used as a covariate; age was the fixed factor and Total Suggestibility the dependent variable. Since Shift does not have a normal distribution, the ANCOVA could not be completed for this suggestibility score, although it would have been interesting to compare the ANCOVA for Yield 1 and Shift with the results obtained by Gudjonsson (2003) which show greater memory effects for Yield than Shift.

Table 5 shows the effect of memory and age on the dependent variable Total Suggestibility.

(Table 5)

ANCOVA confirms that, excluding the effect of the co-variable memory, age has not a statistically significant effect on suggestibility, thus the increased suggestibility in old age (table 3) was not due to age differences but to the limited memory capacity of the older adults group.

Finally, Student's-t test (Yield 1, Yield 2, Total Suggestibility, Immediate Recall and Delayed Recall) and the Mann-Whitney test (Shift) were used to verify the existence of gender differences in suggestibility assessed with the Portuguese version of

the GSS1. There were no significant differences between women and men in the GSS1 scales.

5. Discussion

Within the scope of the validation process of the Portuguese adaptation of the Gudjonsson Suggestibility Scales, the mean scores on the GSS1 and GSS2 and the correlations between the two scales were compared with those of Gudjonsson (1997). The mean scores on the translated scales compared favourably with the original ones but the correlations between the Portuguese GSS1 and GSS2, although highly significant, were lower than those obtained by the author (Gudjonsson, 1997).

The weak relationships between the memory measures in both scales were not totally unexpected since parallel forms of a test must have the same number of items, expressed in the same way and with the same content (Anastasi & Urbina, 1997). Although the suggestibility scales are identical in structure, administration and scoring, they do not have the same content. In spite of justifying the choice of different contents, stating that there is no reason to suppose that the nature of the stimulus affects suggestibility, Gudjonsson (2003) goes on to say that "the content making up the GSS2 narrative is somewhat simpler than that of the GSS1" (p. 366) and, therefore, prefers to use the GSS2 in research with children and people with learning difficulties. In our opinion, individuals' degree of familiarity with the different contents may influence the level of recall of the narratives, justifying the lower correlations obtained in the Portuguese study.

Another possible explanation for the lower correlations obtained could be that both scales were used with the same participants in the same session. While the doubt and uncertainty needed in order to yield to the leading questions and accept negative

feedback are expectable in the first test application, the second confrontation with the same instructions and with negative feedback is likely to increase distrust and resistance to Shift. Therefore, performance in the second test, mainly at the level of Shift and consequently Total Suggestibility, is probably affected by the first test. In addition, the way an individual reacts to the scales, in particular to Shift, depends on situational factors such as the individual's perception of the interviewer and the test performance context. A research setting, where the researcher asks for the voluntary collaboration of participants, is very different to a forensic setting in which the individuals' responses may have consequences for their lives.

The weak, but still significant relationship obtained by Gudjonsson in a study on the relationship between interrogative suggestibility and neuroticism was not confirmed by the results obtained in the Portuguese study with the Gudjonsson Suggestibility Scales and the NEO-PI-R. These results point to an independence between interrogative suggestibility and the basic traits of personality and are in line with those obtained by Polczyk (2005) who found no significant correlations between the Polish adaptation of the GSS1 and the five personality factors assessed by the NEO Five Factor Inventory (NEO-FFI). Liebman et al. (2002) studied the relationships between the GSS2 and the NEO-PI-R and did not find any significant correlations between suggestibility and personality factors either.

In the Portuguese adaptation of the Gudjonsson Suggestibility Scales there were no significant correlations between state anxiety and trait anxiety measured by the STAI and vulnerability to suggestion. These results, although contrary to those obtained by the author, are consistent with other studies that also point to a lack of relationship between suggestibility and anxiety in normal samples (see Gudjonsson, 2003, for a review; Polczyk, 2005; Wolfradt & Meyer, 1998).

Gudjonsson (2003) considers that these different results are justified by the methodology used. In Gudjonsson's study, the STAI was applied after the negative feedback and formal questioning. In other studies, such as in the Portuguese study, the STAI was applied during the retention interval, after the immediate recall task but before the interrogative pressure. This methodological difference has implications for the level of state anxiety experienced by the individuals, which is obviously enhanced by the questioning and especially by the negative feedback.

As regards the influence of age in interrogative suggestibility, the results obtained with the Portuguese adaptation of the suggestibility scales were similar to those obtained with the Polish adaptation of the scales (Polczyk, 2005), showing that older adults were more vulnerable to misleading questions than young adults. However, older adults and young adults did not differ in vulnerability to interrogative pressure.

Since older adults differed quite significantly from young adults in memory capacity, it was hypothesized that these differences were due to older adults' lower memory capacity. Further analysis confirmed that the increased vulnerability to suggestion in old age was due to the lower memory capacity of the older adults.

The finding that both immediate and delayed recall correlated better with the Yield scores than Shift is consistent with the two reasonably independent types of interrogative suggestibility described in the Gudjonsson-Clark theoretical model (Gudjonsson, 1997, 2003). The extent to which people give in to misleading questions (Yield) depends more on intellectual and memory processes than on how they cope with interrogative pressure (Shift), the latter linked to interpersonal variables and social processes.

Finally, the effect of gender on interrogative suggestibility was also studied. There were no significant differences between women and men in the Portuguese

adaptation of the GSS1. These results confirm those obtained by the author and justify that the normative data developed for the suggestibility scales are not differentiated by gender.

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Table 1

Means, standard deviations, Pearson's correlation coefficients* and respective *p* values of Immediate Recall, Delayed Recall, Yield 1, Yield 2, Shift and Total Suggestibility in the GSS1 and GSS2

	Portugal $N = 51$					UK $N = 157^a$ $N = 83^b$		$N = 28^c$
	M	*DP*	Range	*r*	*p*	*M*	*DP*	
IRGSS1	23.62	5.48	24.00	.44	.001	21.3	7.1	.77
IRGSS2	22.63	4.73	20.00			19.7	6.1	
DRGSS1	23.10	6.35	28.00	.46	.001	19.5	7.5	.73
DRGSS2	22.25	5.24	22.00			18.4	6.0	
Yield1GSS1	4.02	2.90	12.00	.60	.000	4.6	3.0	.84
Yield1GSS2	3.82	2.39	11.00			4.5	3.6	
Yield2GSS1	4.65	2.85	11.00	.60	.000	5.6	3.8	.86
Yield2GSS2	4.71	3.50	14.00			5.5	4.0	
ShiftGSS1	2.41	1.75	7.00	.44	.001	2.9	2.5	.79
ShiftGSS2	2.31	2.23	9.00			3.0	3.0	
TotalGSS1	6.43	3.99	16.00	.73	.000	7.5	4.6	.90
TotalGSS2	6.16	3.84	14.00			7.5	5.3	

Note. IR = Immediate Recall, DR = Delayed Recall, Total = Total Suggestibility

* Spearman's correlation coefficient was used for the GSS2 Yield 1 and Shift, since these variables did not have a normal distribution

[a b] Adults from the general population who completed the GSS1 and GSS2, respectively

[c] Adults from the general population who completed the scales within the same session

Table 2

Correlation coefficients between state and trait anxiety with the GSS1 suggestibility and memory scores (N = 87)

	Yield 1	Yield 2	Shift	Total	IR	DR
State Anxiety	.12	.11	.06	.14	-.17	-.14
Trait Anxiety	.14	.07	-.03	.11	-.18	-.17

Table 3

Mean scores, test values, *p* values and size effect for age group differences on the GSS1

	n	*M*	*t*	*p*	Cohen's *d*
IR	57	21.64	5.27	.000	1.20
	30	13.83			
DR	57	20.64	5.97	.000	1.36
	30	11.22			
Yield 1	57	3.18	-4.03	.000	-.92
	30	5.57			
Yield 2	57	4.39	-3.03	.003	-.69
	30	6.60			
Total	57	5.23	-3.15	.002	-.72
	30	7.77			

Table 4

Correlation coefficients between Immediate Recall and Delayed Recall with Total Suggestibility, Yield 1, Yield 2 and Shift (N = 87)

	Yield 1	Yield 2	Shift	Total
IR	-.45**	-.49**	-.29**	-.47**
DR	-.42**	-.44**	-.25*	-.43**

Note. * Significant correlations p <.05, ** Significant correlations p <.01

Table 5

Influence of memory and age on suggestibility

	Sum of Squares	Degrees of Freedom	Mean Square	*F*	*p*	η^2_p	π
Memory Factor	154.55	1	154.55	13.92	.000	.14	.75
Age Factor	13.02	1	13.02	1.17	.282	.01	.19