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BRAZILIAN STANDARDISED NORMS FOR A SET OF PICTURES ARE COMPARABLE WITH THOSE OBTAINED INTERNATIONALLY

Sabine Pompéia[1], Mônica Carolina Miranda[1], Orlando Francisco Amodeo Bueno[1]

ABSTRACT - Snodgrass & Vanderwart (1980) standardized a set of 260 pictures in the USA for use in studies of cognitive processes that employ pictured objects as laboratory analogues of object themselves. Since then similar norms for this set were obtained in Britain, Spain, Japan and Iceland and a larger set of 400 pictures (including the original 260: Cycowicz et al., 1997) was studied in France and Brazil. The present article provides a comparison of the norms obtained in Brazil and internationally. The pattern of correlations among the Brazilian and other standardizations were equivalent to that previously observed: despite pictures being judged to be of similar familiarity and visual complexity (high positive correlations), name agreement was less correlated, possibly due to differences in the languages spoken in each country and/or in the sample size used in each study. Results confirm the adequacy of the Brazilian norms.

KEY WORDS: picture, naming, familiarity, visual complexity, norms, standardization.

A padronização brasileira para um conjunto de figuras é comparável à obtida internacionalmente

RESUMO - Snodgrass & Vanderwart (1980) padronizaram um conjunto de 260 figuras nos EUA para uso em pesquisas de processos cognitivos nas quais figuras de objetos são utilizadas como análogos laboratoriais de objetos propriamente ditos. Desde então normas similares foram obtidas no Reino Unido, Espanha, Japão e Islândia, e um conjunto de 400 figuras (incluindo as 260 originais: Cycowicz et al., 1997) foi estudado na França e no Brasil. O presente estudo traz uma comparação das normas obtidas no Brasil e internacionalmente. O padrão de correlações entre as padronizações brasileira e as demais foi equiparável ao previamente descrito: apesar das figuras serem julgadas como tendo familiaridade e complexidade visual similares (correlações positivas elevadas), a consistência de nomeação foi menos correlacionada, possivelmente devido a diferenças nos idiomas de cada pais pesquisado e/ou devido ao tamanho da amostra empregada em cada estudo. Os resultados confirmaram a adequação das normas brasileiras.

PALAVRAS-CHAVE: figura, nomeação, familiaridade, complexidade visual, normas, padronização.

Investigations into the complex cognitive processes involved in naming objects[1,2] require that studies be conducted under carefully controlled conditions. These often include pictured objects as laboratory analogues of object themselves. However, no normative data for such stimuli was available until the end of the 1970s, precluding adequate comparisons between studies because they employed different sets of drawings. A turning point in this line of study was the publication of Snodgrass & Vanderwart's[3] standardisation of 260 pictures of common objects drawn in black over a white background. These stimuli were drawn so as to follow pre-determined rules that permit evaluation of consistency between them, such as size[4], number of details and orientation[3]. Among the most important aspects of pictures determined in Snodgrass & Vanderwart's[3] study were name agreement, or the rate at which objects depicted in the drawings are referred to with the same name, familiarity with the pictured concepts and visual complexity of the drawings. Name agreement is a robust predictor of naming difficulty and is important for studies of naming latency, picture-name matching, recall, recognition and investigations in which verbal coding is manipulated[6]. Familiarity is an important predictor of picture naming latencies (the more familiar the concepts, the shorter the naming time), while visual complexity affects variables such as na-

Departamento de Psicobiologia da Universidade Federal de São Paulo (UNIFESP), São Paulo SP, Brasil: [1]Graduate Student. [1]Professor. Study supported by AFIP and FAPESP (grant 1998/15397-1).

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Dr. Orlando F.A. Bueno - Departamento de Psicobiologia-UNIFESP - Rua Botucatu 826/1° andar - 04023-062 São Paulo SP - Brasil. FAX: 55 11 5572-5092. E-mail: ofabueno@psicobio.epm.br

Table 1. Picture assessed and sample size in each study that obtained normative data.

	USA[3]	Japan[9]	UK[7]	Spain[8]	France[6]	Iceland[10]	Brazil[11]
Nº. Pictures assessed	260	260	260	254	393	257	400
Pictures not included&	-	-	-	45, 213, 239, 244, 253, 260	19, 95, 96, 283, 288, 327, 373	95, 96, 177	
Sample size	42 (naming) 40 (fam.) 40 (compl.)	67 (naming) 71 (fam.) 70 (compl.)	26 (all tasks)	62 (naming) 51 (fam.) 59 (compl.)	28 (naming) 30 (fam.) 29 (compl.)	26 (naming) 25 (fam.)	150 (all tasks)

Note: numbers next to countries=references; &=numbered according to the original set; fam.=mean rating of familiarity with concepts; compl.=mean rating of complexity of drawings.

Table 2. Significant (ps<0.01) correlations cited in the literature among measures obtained in different cultures.

	(Japan vs. USA)[9]	(France vs. USA)[6]	(France vs. Spain)[6]	(Spain vs. USA)[8]	(Spain vs. Japan)[8]
H	0.333	0.428	0.313	0.268	0.258
%	0.272	0.429	0.506	0.427	0.185
Fam.	0.711	0.913	0.778	0.739	0.858
Compl.	0.938	0.954	0.727	0.745	0.941

Note: see note of Table 1; H=name information statistics; %=percentage of name agreement; nos. next to countries=references.

Table 3. Significant (ps<0.01) correlations among measures obtained in each of the norms cited in the literature.

			USA[3]	Japan[9]	UK[7]	Spain[8]	France[6]	Iceland[10]	Brazil[11]
		%	-	-0.928	-	-0.740	-0.952	-	-0.967
H	vs.	Fam.	ns#	-0.196	ns	ns	-0.183	ns#	-0.474
		Compl.	ns#	ns	-	ns	ns	-	0.269
%	vs.	Fam.	ns#	0.335	-	ns	0.215	ns#	0.558
		Compl.	ns#	ns	-	ns	ns	-	-0.312
Fam.	vs.	Compl.	-0.466	-0.350	-0.460	-0.459	-0.391	-	-0.643

Note: Note: see note of Table 1 and 2; ns=non-significant; #unclear if H or % where used as name agreement; -=not evaluated.

ming latency, tachistoscopic recognition threshold and memorability[6]. Since the pioneering paper of Snodgrass & Vanderwart[3] in the USA, similar work has been conducted on the 260 picture-set for British[7], Spanish[8], Japanese[9] and Icelandic[10] university students. A larger set of 400 pictures, which includes the original 260, has been studied more recently for both Frenchmen[6] and Brazilians[11]. The number of subjects and of pictures used in each normative paper can be found in Table 1.

Correlations between variables in each of the normative studies were conducted in order to determine how they related to each other (Table 3). Measures of name agreement were highly negatively correlated, ratings of familiarity and complexity were modestly correlated, and the remaining comparisons between measures yielded small or non-significant effects. The largest correlations found occurred in the Brazilian study, probably because it used the larger sample (Table 1) and had every subjects rate naming, familiarity and visual complexity of all 400 pictures, thus lowering variance,, which increases correlations. Nevertheless, the pattern of correlations betweenamong measures reported for different cultures is equivalent, supporting the idea that naming, familiarity and complexity are essentially independent and may be assumed to affect different stages during picture processing[5].

Correlations between norms of different cultures were also conducted in some of the above-mentioned papers (Table 2) in order to determine whether ratings from different countries were comparable. This comparison can be carried out because the procedure employed in all studies was essentially the same: subjects were all young university students that were native speakers of the particular language under investigation; were tested in groups (except[12], in which individuals were tested alone); were ins-

Table 4. Significant (ps<0.01) Spearman's rho correlations among measures obtained in Brazil and other cultures (n= number of pictures compared).

	USA[3] (n=260)	Japan[9] (n=260)	UK[7] (n=260)	Spain[8] (n=254)	France[6] (n=393)	Iceland[10] (n=257)
H	0.458	0.281	-	0.581	0.429	0.436
%	0.467	0.306	0.297	0.598	0.458	0.423
Fam.	0.824	0.773	0.824	0.722	0.868	0.861
Compl.	0.837	0.815	-	0.708	0.777	-

Note: see note of Tables 1, 2 and 3.

tructed to name the objects depicted on slides or on the computer screen, as well as to judge their familiarity with the concept and visual complexity of the drawings using 5 point scales (1 represented the least familiar and complex). Results showed large significant positive correlations for familiarity and complexity ratings (Table 2). This probably occurs because such measures relate to judgements about the pictures or objects themselves, which are similar irrespective of the language spoken by the person who rates them[8]. Smaller correlations occur for name agreement, which is not surprising considering that the word or words used to name each object varies across tongues[8]. Hence, the similar pattern of correlations among naming, familiarity with concepts and complexity of drawings in each normative study, and between these measures in different cultures, confirm the usefulness of the 260[3] and 400[5] picture-sets as tools for international cognitive research.

The objective of the present study was to determine the adequacy of the Brazilian normative data through the comparison (correlations) of results on name agreement, familiarity and complexity with those of other cultural groups.

METHOD

Comparisons between the Brazilian[11], North-American[3], French[6], British[7], Spanish[8], Japanese[9] and Icelandic[10] norms were conducted considering the following measures for each picture:

a. Name agreement: refers to the degree to which subjects agree on the name of the picture. Two measures were used: the percentage of subjects who used the modal name and the H index, calculated in the following manner:

$$H^k = \sum_{i=1} P_i \log_2 (1/P_i)$$

This H index takes into account the number of subjects that gives each one of the different names used for the same picture[3,5]; k refers to the number of different names given to each picture, and the Pi is the proportion of subjects who gave each name. The greater the naming agreement between subjects, the closer the H is to 0.

b. Familiarity: refers to the familiarity of the concept depicted. Scores ranged from 1 to 5 (1=very unfamiliar, 2=unfamiliar, 3=medium, 4=familiar, 5=very familiar).

c. Visual complexity: refers to the amount of lines and details in the drawing. Scores ranged from 1 to 5 (1= least complex; 5= most complex).

Some of the normative studies also evaluated other measures for the sets of pictures such as age of acquisition (through adult estimates of word learning age, a method that is no longer considered a good predictor of this variable[10,12]), imageability, image agreement, and naming latency. These variables were not established in the Brazilian norms and will therefore not be discussed here.

Statistical analysis involved pictures as units of measure. Thus, comparisons were conducted considering the pictures for which data were available in both the Brazilian and other norms (see Table 1 for information on the number of pictures studied in each culture). Most measures did not show normal distribution or homocedasticity, so comparisons were conducted through non parametric Spearman rho correlations. The level of significance adopted was 0.01 because of the large number of comparisons conducted.

RESULTS

Table 4 lists the correlations between the Brazilian data and that of the other countries for which norms were obtained.

DISCUSSION

Correlations of the Brazilian normative data with that of other cultures showed that despite pictures being judged to be of similar familiarity and visual complexity (high positive correlations), name agreement was less correlated, as previously observed[6,8,9].

High correlations between familiarity and complexity ratings probably occurs because such measures relate to judgements about the pictures or objects themselves, which are similar irrespective of the language spoken by the person who rates them[8].

In terms of naming, the smallest correlations obtained were between the Brazilians and Japanese, confirming low agreement between norms from Japan and the USA[9]. Therefore, similarity in the languages spoken seems to influence correlations in naming because they were higher when comparing data from the Brazilian, Portuguese speaking sample, with that of Spaniards[8] and Frenchmen[6] (both of which use Latin rooted languages), than when comparing Brazilian with Japanese[9], British[7], and Icelandic[10] norms. However, correlations between naming by the British[7] and Brazilian samples were surprisingly low, very similar to that of Brazil and Japan, although the language spoken is the same as in North-America[3], which had naming ratings that were very similar to those obtained in Brazil. Hence, differences in naming seem to follow some other characteristic that not only the language spoken in the country in which norms are obtained. We suggest that correlations of naming measures are also determined by the sample size, which was small in the British and Icelandic studies (Table 1). Differences in naming may be over or underrepresented if few subjects are used, increasing variability which inevitably lowers correlations. Differently, familiarity and complexity norms did not seem to be in any way related to the sample size used. This is not surprising since ratings of these measures vary only between 1 and 5, while it is impossible to determine how many different names will be attributed to a picture.

The pattern of correlations between the Brazilian and international standardizations thus confirms the adequacy of the Brazilian norms and that data from this country using these pictures can be directly compared to that obtained abroad. Nevertheless, apart from cultural differences, the names attributed to pictures may also differ among subjects who speak the same native language but who inhabit distinct regions or countries, are from different social and educational background, and of different ages. Norms for children were obtained only for the North-Americans[5,13] and Brazilians[11]; information on picture ratings by other age groups are lacking. Also, gender differences in picture attributes have seldom been studied and were not determined in any of the norms cited here, so they may also lead to distinct effects. Hence, pilot studies with the specific population to be investigated should always be conducted so as to determine the adequacy of the norms employed.

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