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PRELIMINARY ADAPTATION INTO PORTUGUESE OF A STANDARDISED PICTURE SET FOR THE USE IN RESEARCH AND NEUROPSYCHOLOGICAL ASSESSMENT

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ABSTRACT - Pictorial stimuli and words have been widely used to evaluate mnemonic processes in clinical settings, neuropsychological investigations, as well as in studies on the mechanisms underlying the phenomena of memory. However, there seem to be few studies of standardisation of pictures for research in this field. The present paper aimed at adapting the use of a set of pictures standardised for English speaking subjects for Portuguese speakers. Name agreement of 150 pictures was assessed in 100 high-school students. Ninety pictures were found to present the same name for over 90 subjects. Results yield data that may help create more controlled tests for the study of memory for pictorial stimuli in Brazil.

KEY WORDS: explicit memory, implicit memory, repetition priming, pictures, neuropsychological tests.

Adaptação preliminar para o português de conjunto de figuras padronizado para uso em pesquisa e avaliação psicológica

RESUMO - Figuras e palavras há muito vêm sendo utilizadas para avaliar processos mnemônicos em investigações clínicas relacionadas a exames neuropsicológicos, bem como em estudos de mecanismos subjacentes ao fenômeno de memória. Existem, porém, poucos estudos de padronização de figuras para pesquisas nessas áreas. O presente estudo propõe uma adaptação preliminar para o português falado no Brasil de um conjunto de figuras padronizado para o idioma inglês. A consistência de nomeação de 150 figuras foi avaliada em 100 estudantes de segundo-grau. Noventa figuras apresentaram o mesmo nome por mais de 90 sujeitos. Resultados permitem auxiliar na criação de testes mais controlados de memória para desenhos de objetos comuns a serem utilizados no Brasil.

PALAVRAS-CHAVE: memória explícita, memória implícita, pré-ativação, figuras, testes neuropsicológicos.

It is now widely accepted that memory is comprised of a series of distinct phenomena and that it can be divided into subtypes which exhibit different characteristics. In 1985 Graf and Schacter[1] proposed a systemic model of long-term memory which comprises an *explicit*, or "consciously" retrievable memory, and an *implicit* memory, retrievable without the aid of "conscious" strategies. Explicit memory can be considered to involve a so called *semantic* memory, responsible for factual, conceptual, impersonal knowledge, as well as an *episodic* memory which stores autobiographic information[1]. Implicit memory, on the other hand, includes learning which can be evaluated through performance such as skills, priming and classical conditioning[2,3]. Others[4-6], however, suggest that the distinction between explicit and implicit memory does not reflect the existence of different memory systems but of distinct processing during acquisition and retrieval of information, which can be based on physical (perceptual) or conceptual characteristics. There are also authors who

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claim that the best approach is a mixed one, that considers both systemic and processing characteristics[7].

Whatever the criteria adopted for classifying memory, its subtypes are pragmatically distinguished by the tasks used to assess them[8] which may include manipulation of both conceptual and perceptual features of words and pictures. However, the retrieval of words seems to involve different memory strategies from that of the latter stimuli, and yields lower memory performance[9-11]. One generally accepted explanation for this "picture superiority effect" is that pictures are represented in a rich sensory-perceptual code and have direct access to semantic processing, whereas words only initiate phonemic and orthographic processes and lexical access[12]. References on use of words to study memory are nevertheless much more widespread than for that of pictorial stimuli. One of the reasons for this difference may be that there are few studies of picture standardisation, which is more complex than for words mainly because of the fact that even the simplest objects can be represented in endless ways.

In order to enhance confidence of studies which investigate phenomena involved in the encoding of pictures, Snodgrass & Vanderwart[13] carried out a standardisation of 260 pictures of common objects drawn in black over a white background. These stimuli where selected according to variables considered important for memory processes and were drawn so as to obey pre-determined rules that permit evaluation of consistency between them (e.g. number of details, orientation, size of drawings). The set of pictures mentioned has been used extensively in clinical settings, neuropsychological evaluations, as well as to evaluate mechanisms underlying the phenomena of memory. Among its practical uses are studies on dissociation of explicit and implicit memory[11,14], forgetting rates[15], recognition[10,12,16,17], hypermnesia[18] and repetition priming[11,19-23], which taken together show that specific features of pictures are important in different memory tasks. Name agreement , or the rate at which objects depicted in the drawings are referred to with the same word or name, is certainly among the most important characteristics[13].

Considering the importance of studies on memory it is surprising that there are no studies of standardisation of pictorial stimuli in Brazil. The present paper proposes an adaptation of part of the set of pictures proposed by Snodgrass & Vanderwart[13] for use in the construction of tests to be applied in Portuguese speaking subjects in Brazil. Naming of 150 pictures from the original set was studied in 100 high-school students. These pictures were selected because they present low to moderate complexity and area which enables the creation of distinct fragmented images (in 8 levels) of the complete drawing[19] (Fig 1) that can be used to study repetition priming. In this case, memory is indexed by ease of identification of pictures to which subjects were exposed to from fragments as compared to that of fragments of unseen drawings[21,23].

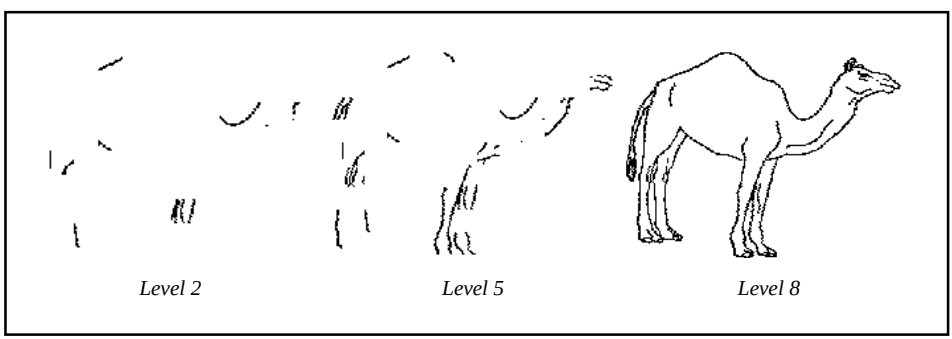

Fig 1: Example of a picture of the original set[13] (picture no. 43-Camel) with levels 2, 5 and 8 of fragmentation[19]. (Printed by permission of Dr. J. G. Snodgrass).

METHODS

Subject

One hundred high-school students from institutions around the city of São Paulo, Brazil, aged 20.0±5.3 years (mean±SD) ranging from 15 to 39 years. All subjects were native Portuguese speakers.

Stimuli

One hundred and fifty pictures from Snodgrass & Corwin's[19] work were used (Pictures, digitized or as slides, are available from Life Science Associates, 1 Fenimore Rd., Bayport, NY 11705-2115, USA. e-mail: franksa@aol.com). These pictures are drawn in black over white background and present low to moderate complexity and sufficient area to enable the creation of distinctly different fragmented images.

Procedure

a. Naming: forms containing the 150 pictures printed on 6 sheets of paper were handed out to subjects during class and they received written instructions to write the name of each object bellow its representation. In case of problems in naming they should indicate if the picture was difficult to identify (di), difficult to name (dn), whether they did not know its name (kn) or did not identify the representation (ni). Order of pictures was varied in 3 different versions. Subjects were also instructed to complete 137 word stems so that tendency and rank completion could be established in order to create adequate word priming tests. These results will be published elsewhere (Pompéia & Bueno, in preparation).

b. Consistency estimates: three criteria were used:

i. Simple name consistency: ascribed to pictures which received the same name by more than 90 subjects.

ii. Name consistency with specifications: ascribed to pictures named with simple name and name as a subclass of the most common name of the picture (i.e. polar bear for bear) resulting in more than 90 comparable names.

iii. Identification consistency: attributed to pictures which were named with common synonyms by more than 90 subjects (i.e. "TV", "TV set" and "television").

Picture names are presented in Table 1 in alphabetical order according to the most frequent names assigned to them by subjects, frequency of most common name and other names. Pictures are also numbered according to Snodgrass & Vanderwart[13].

RESULTS

Following the criteria adopted in this paper, i.e., that agreement in naming or identifying should exceed 90 subjects for consistency to be present, simple name consistency was found for 90 pictures, name consistency with specifications for 5 and identification consistency for 6 drawings.

Problems in naming were seldom indicated. Nineteen subjects referred not knowing the name of picture 249 (wagon), 14 subjects of picture 207 (sled), 9 of picture 243 (trumpet), 7 of pictures 17 (barn) and 80 (drum), 5 of picture 95 (football), 4 of picture 190 (rolling pin) and 3 subjects of pictures 150 (mushroom), 31 (eagle), 80 (mitten) and 234 (toaster). Difficulty in naming was referred by 3 subjects in respect to picture 80 (drum) and 5 subjects to picture 248 (violin). Only 11 subjects referred picture 207 (sled) as difficult to identify.

DISCUSSION

Name and identification consistency were considered here as the main variables to be investigated for they probably reflect more accurately the differences between subjects of different native languages. However, other factors which are found to be important for picture memorisation and were also studied by Snodgrass & Vanderwart[13] such as familiarity with object, visual complexity, agreement between mental image and drawing were not studied in the present investigation. Although it is not possible to determine the similarity between such populations concerning these other factors without an effective study, it is probable that they are more closely related when name consistency and identification are equivalent.

Pictures can be selected from Table 1 so as to fit the requirements of different research objectives such as constructing tests to investigate semantic and episodic memory, repetition priming effects, memorisation by populations with different characteristics, evaluation of amnestic effects of drugs, as well as memory impairment caused by amnestic disorders or damage to brain functioning.

Name agreement thus serves as an indication that drawings represent known objects which will be named consistently at recall and that are probably similar in terms of the variables considered important for memory processes determined for the picture set in English[13]. For an example of how to use the data described here, consider that different versions of a memory test for drawings has to be constructed to evaluate subjects in 4 sessions during a treatment programme. In this case, versions containing the same number of stimuli balanced according to name agreement should be used in order to establish comparability between them. In other words, if versions differ in terms of difficulty in naming it is possible that alterations in memory along the treatment may be distorted or masked. Also, in order to diminish effects of differences in difficulty of recalling pictures between versions it is necessary to balance the presentation between subjects and test groups. In terms of the method of applying the test, pictures from each set can be presented in various forms (e.g. cards, computer screen) for periods of time determined as adequate for the population under investigation and subjects may be asked to process them in different manner (e.g. perceptually, conceptually) or simply to try to remember them for a forthcoming memory test. Later they may be asked to, for instance: a) freely recall the drawings seen or recognise them among various figures which were not presented, in which case explicit memory would be evaluated; b) see fragments of the pictures presented previously (available in 8 levels; from Life Science Associates, see Methods) and determine at which level they are identified in comparison to drawings which were not shown, making it a repetition priming test.

If the work to be conducted aims at picture recognition and is not dependent on precise naming, for instance, stimuli with identification and name consistency with specifications can be used in addition to those with high name agreement. Nevertheless, it must be kept in mind that the criteria used in the present investigation was conservative. Differences between the naming of picture number 43 (Fig 1) in this study as camel or dromedary (dromedaries have only one hump while camels have 2), may be of no importance in the study to be conducted. Instead, the researcher may need to use such a picture in order to test categorisation of four footed animals, in which case the use of this particular picture is justifiable. Snodgrass & Vanderwart[13] also presented pictures organised into categories, information useful in studies of semantic memory. For another example of how to use results from the present study, one may evaluate memory for pictures which belong to different categories such as animals and tools taking care to select items from each category which have similar name agreements. In this case, the use of stimuli that belong to a standardised set in which categorisation was studied, even if in another language, is indispensable and has not been able to be carried out in Brazil until now due to lack of studies in this field. This is obviously valid as long as pictures are determined as being known and named in the idiom in which research is to be conducted.

It must be said, however, that regional, social, educational, age and possibly gender differences[24] in naming may occur, so a pilot study to check similarity in naming between the population to be investigated and the one presented here is recommended.

Thus, result presented here should be used as a guide to the selection of pictorial stimuli to be used in the creation of test to assess any subtype of memory. The evaluation of the capacity to name and identify pictures from Snodgrass & Corwin's[19] work by a population of Brazilian high-school students may contribute to research in several fields, diminishing distortions resulting from non-controlled features of pictorial stimuli used in tasks of memory evaluation.

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*Table 1. Names and frequency (freq.) of use by 100 Portuguese speaking high-school students of 150 pictures numbered (no.) and named (concept) according to the original standardised set in English[13]. Consistency is indicated by: capital letters, simple name consistency (>90 subjects); *, pictures with name consistency with specifications; **, pictures with identification consistency.*

Common	Freq.	Other name	Freq.	Concept names	No.
ABAJUR	96			lamp	132
abóbora	75	alho	1	pumpkin	181
		cebola	1		
		moranga	10		
ALICATE	92			pliers	176
APITO	91	assobio	4	whistle	255
ÁRVORE	94			tree	241
AVIÃO	94			air plane	2
balanço	50	aspirador	1	swing	225
		balança	24		
		cadeira de balanço	1		
		enceradeira	4		
		passadeira	1		
		vassoura	1		
		vassoura mágica	1		
BANANA	96			banana	16
banco	58	banqueta	5	stool	218
		banquinho	23		
		cadeira	8		
		tamborete	1		
barco	61	barco	14	boat	193
		caravela	4	a vela	
		iate	1		
		navio	9		
		veleiro	3		
bexiga	45	balão	32	balloon	15
		balão de ar	1		
		balão de bexiga	1		
		balão de gás	1		
		balão de hélio	1		
		laço	2		
BICICLETA	96	bike	2	bicycle	27
blusa	81	agasalho	1	sweater	224
		blusa de frio	4		
		blusão	1		
		camisa	1		
		casaco	2		
		malha	2		
		moletom	1		
		paletó	1		
		suéter	1		
boca	67	lábios	27	mouth	141
bode	43	cabra	31	goat	107
		cabrito	13		
		veado	7		
BOLA	97			ball	14
bola de futebol americano	33	bola	35	football	95
		bola de arremesso	1		
		bola de basebol	6		
		bola de futebol	1		
		bola de handebol	1		
		bola de jogo americano	1		
		bola de rugbi	2		
		balão	2		
bolo	88	queijo	4	cake	42
BOLSA	96	mochila	1	pocketbook	178
boneca	74	criança	1	doll	88
		menina	8		
boneco de neve	70	boneco	8	snowman	210
		boneco espantalho de neve	1		
		boneco de gelo	7		
		boneco feito de gelo	1		
		boneco polar	1		
		homem de neve	1		
		pingüim	3		
		pingüim de neve	1		
		urso	2		
BRAÇO	98			arm	7
cabelo	77	cabeça	4	hair	113
		peruca	1		
		toca	1		
CABIDE	94			hanger	116
cachimbo	88	charuto	10	pipe	174
cachorro**	80	cão	17	dog	73
CADEADO	95	chaveiro	1	lock	143
CADEIRA	96			chair	53
CALÇA	97			pants	162
CAMA	96			bed	22
camelo	87	dromedário	9	camel	43
CAMINHÃO	91	carreta	5	truck	242
		escânia	2		
camisa	81	blaiser	1	shirt	203
		camisão	1		
		casaco	1		
		blusa	7		
		blusão	1		

(table continues)

Table 1. (continued).

Common	Freq.	Other name	Freq.	Concept names	No.
CANGURU	92	esquilo	1	kangaroo	126
carrinho	32	carrinho de mão	11	wagon	249
		carrinho de puxar	2		
		caminhãozinho			
		areia	1		
		carrinho de areia	1		
		carroça	2		
		carriola	1		
		carrinho de criança brincar	1		
		carro de rolemã	1		
		carrinho de garimpeiro	1		
		carrinho de trem	1		
		carro	1		
		carrocinha	1		
carrinho de bebê**	81	berço	1	baby carriage	13
		carrinho	9		
		carrinho de nené	4		
		carro de bebê	1		
CARRO	90	automóvel	3	car	47
		landau	1		
casa	86	casarão	3	house	122
		escola	3		
CAVALO	94			horse	121
CEBOLA	92	figo	2	onion	157
celeiro	33	armazém	2	barn	17
		cabana	1		
		casa	22		
		casebre	1		
		casinha	3		
		casinha de cachorro	1		
		estábulo	2		
		fábrica	2		
		galpão	12		
		igreja	2		
CENOURA	96			carrot	48
chaleira**	87	bule	6	kettle	127
		leiteira	1		
CHAPÉU	95			hat	118
CHAVE	94			key	128
CHAVE DE FENDA	92	alicate	1	screw driver	199
		chave	3		
cinto	88	anel	1	belt	26
		cinta	4		
		coleira	4		
CINZEIRO	94			ashtray	10
cisne	59	pato	21	swan	223
		ganso	10		
		marreco	3		
COBRA	92	serpente	3	snake	209
COELHO	94	rato	2	rabbit	182
COGUMELO	91	fungos	1	mushroom	150
colete	89	blusa	1	vest	247
		pulôver	1		
		spencer	1		
COLHER	97			spoon	215
cômoda	77	armário	2	dresser	79
		camiseira	1		
		gavetas	2		
		gaveteiro	1		
		guarda-roupa	2		
		móvel	1		
		penteadeira	5		
corneta	49	clarineta	4	trumpet	243
		flauta	10		
		guitarra	1		
		pistão	2		
		trombeta	4		
		trompa	4		
		trompete	1		
		saxofone	1		
CORRENTE	94	elos de corrente	2	chair	52
CORUJA	95			owl	160
dedo**	66	dedão	5	thumb	231
		polegar	26		
		unha	1		
ELEFANTE	94			elephant	84
ESCADA	96			ladder	131
escrivaninha	59	armário	1	desk	72
		balcão	1		
		cômoda	4		
		gabinete	4		
		mesa	12		
		mesa de arquivo	1		
		mesa de escritório	5		
		mesinha	1		
		penteadeira	4		
esquilo	83	canguru	2	squirrel	216
		castor	3		
		coelho	1		
		gato	1		
		raposa	1		
		rato	1		
ESTRELA	95			star	217
FACA	95			knife	130
ferro*	64	ferro elétrico de passar	29	iron	123
FLOR	95			flower	91
FOGÃO	97			stove	219
FOLHA	93	galho	1	leaf	133
		maconha	1		

(table continues)

Table 1. (continued).

Common	Freq.	Other name	Freq.	Concept names	No.
GARRAFA	91	litro	3	bottle	32
GATO	96			cat	49
gavião	31	águia	28	eagle	82
		arara	1		
		ave	1		
		carcará	1		
		corvo	1		
		falcão	1		
		papagaio	5		
		pomba	2		
		pássaro	12		
		tucano	1		
GELADEIRA	95	armário	1	refrigerator	185
gorila	67	chimpanzé	8	gorilla	108
		macaco	18		
		orangotango	2		
GRAVATA	94			tie	232
GUARDA-CHUVA	90	guarda-sol	4	umbrella	245
		para-quedas	1		
		sombrinha	3		
HELICÓPTERO	91	avião	3	helicopter	120
JARRA	95	pote	1	pitcher	175
LÁPIS	94			pencil	168
LEÃO	94			lion	140
limão	68	castanha	1	lemon	135
		fruta	1		
		goiaba	1		
		laranja	1		
		noz	1		
		ovo	1		
		pêssego	8		
LIVRO	96			book	30
LUA	96			moon	146
luva	81	mão	16	glove	106
luva	80	luva de bebê	2	mitten	144
		luva de boxe	5		
		luva de cozinheiro	1		
		luva térmica	1		
MAÇA	96	fruta	1	apple	6
macaco	88	chimpanzé	1	monkey	145
		mico	3		
MACHADO	92	enxada	1	axe	12
		chave	1		
		foice	1		
		martelo	1		
MALA	96	maleta	1	suitcase	221
		valise	1		
MÃO	91	dedos	1	hand	115
MARTELO	94			hammer	114
MEIA	98			sock	211
MESA	95			table	226
montanha	76	monte	2	mountain	148
		morro	2		
		pico	7		
		serra	1		
		vulcão	4		
MORANGO	93			strawberry	220
MOTO	91	motocicleta	4	motorcycle	147
NARIZ	94			nose	155
ÓCULOS	96			glasses	105
OLHO	94			eye	86
ÔNIBUS	95			bus	39
orelha	82	ouvido	13	ear	83
paletó	29	avental	2	coat	64
		blaiser	10		
		blusão	1		
		camiseta	1		
		capa	1		
		capa de chuva	1		
		casaco	33		
		roupa	1		
		sobretudo	2		
		terno	7		
		uniforme	3		
PANELA	97			pan	179
pão*	87	bolo	1	bread	36
		bolo pulmann	1		
		muzzarela	1		
		pão de forma	8		
pássaro	44	canário	2	bird	28
		passarinho	39		
		pardal	5		
		periquito	1		
		pintinho	1		
		rouxinol	1		
		sabiá	1		
patins	80	carrinho	1	roller skate	189
		mobilete	1		
		motinho	1		
		moto	1		
		motoca	2		
		motocicleta	1		
		triciclo	1		
		velocímetro	1		
pato	84	ave	1	duck	81
		galinha	2		
		ganso	1		
		marreco	3		
		patinho	1		
		pomba	1		
PÉ	95			foot	92
PEIXE	93			fish	89
PENTE	95			comb	62
PERA	96			pear	166
PIANO	95			piano	171
PIÃO	92			top	238
PINGÜIM	95			penguin	169
PIPA	90	papagaio	3	kite	129
PORCO	94	rinoceronte	1	rhinoceros	172
RATO	92	camundongo	1	mouse	149
RÉGUA	94	fita métrica	1	ruler	192

(table continues)

Table 1. (continued).

Common	Freq.	Other name	Freq.	Concept names	No.
relógio*	70	despertador	3	clock	60
		relógio despertador	1		
		relógio de parede	20		
relógio*	84	relógio de pulso	8	watch	250
REVÓLVER	92	arma	3	gun	112
rolo macarrão	24	pau de macarrão	9	rolling pin	190
		pau de massa	4		
		rolo	28		
		rolo de amassar	2		
		rolo de massa	18		
		rolo de pastel	2		
SAIA	93	saiote	1	skirt	205
saleiro	74	colocador de sal	1	barn	94
		garrafa de café	1		
		garrafa térmica	1		
		paliteiro	1		
		pimenta	1		
		pimenteiro	1		
		porta sal	2		
		pote de sal	1		
		salgueiro	1		
		salino	1		
		tempero	1		
		vidro de sal	1		
sanduíche	83	lanche	8	sandwich	195
		pizza	1		
		sanduba	1		
		x-salada	2		
SAPATO	95			shoe	204
SAPO	93			frog	100
SERROTE	96	serra	1	saw	196
SOFÁ	96			sofa	67
SOL	93			sun	222
tambor	55	bumbo	8	drum	80
		cuíca	1		
		instrumento	1		
		lata de lixo	1		
		lixo	1		
		pandeiro	1		
		tamborim	7		
		timba	2		
		zabumba	2		
TELEFONE	91	aparelho de telefone	2	telephone	227
televisão**	86	aparelho de tv	1	television	228
		televisor	2		
		tv	8		
TESOURA	96			scissors	197
tigela	66	bacia	9	bowl	34
		cuba	1		
		cuia	3		
		pires	1		
		travessa	3		
		vasilha	10		
		vasilhame	1		
tigre	52	gato	2	tiger	233
		leopardo	2		
		lobo	1		
		onça	40		
torradeira	80	assadeira de pão	1	toaster	234
		caixa	1		
		fogão	1		
		forninho	1		
		tanque	1		
		tostadeira	6		
		tostador	1		
TREM	90	bonde	1	train	240
		metrô	4		
trenó	16	banco de praça	1	sled	207
		cadeira de praia	1		
		carrinho de esquiar	1		
		esqueite	1		
		esqui	17		
		lâmina	2		
		maca	2		
		prancha de esquiar	1		
URSO	93	leão	1	bear	21
		urso polar	2		
uvas*	82	cacho de uva	14	grapes	109
vaca	87	boi	8	cow	68
VASO	92			vase	246
VASSOURA	95			broom	37
VELA	97			candle	44
VESTIDO	91	roupa	6	dress	78
		conjunto feminino	1		
violão	89	viola	4	guitar	111
violino	72	guitarra	6	violin	248
		viola	1		
		violão	5		
		violoncelo	1		
vitrola	76	aparelho de som	1	record-player	184
		som	1		
		radiola	1		
		toca discos	13		
XÍCARA	94	copo	1	cup	70

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