Imagery ratings for 338 nouns¹

HOWARD J. WALKER, *THE PENNSYLVANIA STATE UNIVERSITY, University Park, Pennsylvania 16802*²

This paper reports imagery ratings for 338 nouns by a method similar to that of Paivio. For 111 of the nouns a comparison with ratings reported by Paivio with those reported here yielded a correlation of 0.944. Selection of nouns rated for this study was made from stimulus terms employed in various free-word-association studies.

The imagery ratings reported here were obtained in conjunction with other studies (Walker, 1969). Nouns were selected from stimuli used in various free-association normative studies (see Shapiro & Palermo, 1968) and in restricted association norms to category names (Cohen, Bousfield, & Whitmarsh, 1957). To provide for comparisons with prior work, 111 of the 338 nouns used in the present study were taken from the nouns used by Paivio, Yuille, and Madigan (1968).

METHOD

The imagery ratings were obtained using a slight modification of the instructions and procedures of Paivio et al (1968). This modification involved the way in which the Ss indicated their rating for each noun. In the Paivio et al procedure, Ss did this by circling a number from 1 to 7 on a 7-point numerical scale printed next to each noun. In the present set of ratings, Ss indicated their judgments of imagery value by writing a number from 1 to 7 in a blank preceding each noun. In both cases 1 indicated the lowest imagery value and 7 the highest. The instructions given to the Ss are presented below.

"Nouns differ in their capacity to arouse mental images of things or events. Some words arouse a sensory experience, such as a mental picture or sound, very quickly and easily, whereas others may do so only with difficulty (i.e., after a long delay) or not at all. The purpose of this experiment is to rate a list of words as to the ease or difficulty with which they arouse mental images. Any word which, in your estimation, arouses a mental image (i.e., a mental picture, or sound, or other sensory experience) very quickly and easily should be given a *high imagery* rating; any word that arouses a mental picture with difficulty or not at all should be given a *low imagery* rating. Think of the words 'arrow' and 'fact.' Arrow would probably arouse an image relatively easily and would

be rated as high imagery; fact would probably do so with difficulty and would be rated as low imagery. Since words tend to make you think of other words as associates, e.g., knife-fork, it is important that you note only the ease of getting a mental image of an object or an event to a word.

"Your ratings will be made on a 7-point scale, where 1 is the low imagery end of the scale and 7 is the high imagery end of the scale. Make your rating by writing the number from 1 to 7 that best indicates your judgment of the ease or difficulty with which the word arouses imagery in the blank to the left of each word. The words which arouse mental images with the greatest difficulty or not at all should be rated 1; words that are intermediate in ease or difficulty of imagery should be rated appropriately between the two extremes. Feel free to use the entire range of numbers, from 1 to 7; at the same time, don't be concerned about how often you use a particular number as long as it is your true judgment. Work fairly quickly but do not be careless in your judgments.

"If necessary, refer back to these instructions when rating the words on the following pages. If there are any questions, ask them now. Otherwise, turn the page and begin."

The test booklets consisted of the above instructions plus the nouns to be rated, which were typed with double spacing in two columns on each page. In each case, two forms of the test booklets were constructed, using two different randomizations of the nouns. Each of the randomizations was given to half of the Ss in each group. Ss were given unlimited time for their ratings, although they usually required no more than 15 min.

The Ss were all undergraduates at The Pennsylvania State University who were enrolled in the introductory psychology course during the fall term of 1968 or the winter or spring terms of 1969. All Ss were volunteers and received extra course credit for their participation. Forty Ss were used in the fall and winter ratings; 42 were used in the spring ratings. In all three cases, the Ss were run in small groups of approximately 10 to 20.

RESULTS

The nouns are presented in Table 1 together with the means (I) and standard deviations (SD) of their respective imagery ratings. Code letters are also given to indicate the term in which the ratings were obtained: f = fall 1968; w = winter 1969;

s = spring 1969. In those cases where a noun appeared in more than one rating set, the imagery value given is the mean of the pooled ratings of all Ss in the respective sets.

Reliability

In order to assess interS reliability, the Ss in each set were divided randomly into two subgroups. A mean rating for each word in the set was calculated for each subgroup of Ss and a correlation coefficient (Pearson's r) was computed for the two sets of means. The resulting values were as follows: fall, $r = .959$; winter, $r = .960$; spring, $r = .943$. The reliability between sets of ratings was assessed by comparing the mean I values for nouns which occurred in two or more sets. Individual mean I values were computed for each of these nouns based on the ratings of Ss within a given set. For each pair of sets, a correlation coefficient was computed, using the two values for each noun occurring in both sets. The following coefficients were obtained: fall-winter, $r = .945$; fall-spring, $r = .953$; winter-spring, $r = .947$.

To compare the present I ratings with those obtained by Paivio et al (1968), a Pearson product-moment correlation coefficient was calculated between the mean ratings obtained in the present study and those obtained by Paivio et al on the 111 nouns occurring in both norms. The two norms showed a respectably high correlation, $r = .944$. Overall, the Ss in the present study tended to give lower I ratings on these nouns than the Ss of Paivio et al, with a mean difference of 0.795 between the two groups.

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NOTES

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2. Now at State University College, Oswego, New York 13126.

Table 1

Mean Imagery Ratings. The 338 nouns rated for imagery arousal in this study are listed in alphabetical order below, along with their mean imagery ratings (I) and the respective standard deviations (SD) of these ratings. A third column (Source) indicates which rating sets the tabled values are based on and can also be used to calculate the number of Ss rating each word (F = fall, n = 40; W = winter, n = 40; S = spring, n = 42).

	I	SD	Source		I	SD	Source		I	SD	Source
abatement	2.07	1.81	F	code	3.25	2.09	F	grasshopper	6.17	1.56	W
abyss	3.21	2.12	FW	committee	3.92	2.12	S	greed	2.65	1.67	W
acrobat	5.87	1.75	F	controversy	2.52	1.72	S	grief	2.67	1.40	W
action	3.28	2.04	S	cook	5.27	1.53	W	guns	6.45	1.09	W
actor	5.11	1.98	S	cop	5.95	1.77	W	hair	5.59	2.15	S
admiration	2.05	1.50	W	cottage	6.15	1.30	F	hammer	6.25	1.55	F
affection	4.05	2.16	W	cotton	4.64	2.19	S	hand	6.30	1.38	F
age	3.28	2.15	S	couch	6.20	1.29	WS	harness	5.30	1.84	FW
ale	5.06	2.00	FS	courage	3.14	2.05	S	harp	6.15	1.54	FS
anarchy	2.32	1.86	W	cow	6.53	1.19	WS	hat	5.96	1.58	WS
anger	2.57	1.58	W	coward	3.71	2.21	S	hate	2.35	1.67	W
animal	5.09	2.18	S	coyote	6.17	1.39	W	head	5.89	1.66	FS
ant	6.40	1.16	W	crater	5.77	1.70	W	health	3.35	2.01	S
antelope	6.12	1.60	F	cracker	4.83	2.41	S	height	3.68	1.87	WS
anxiety	2.35	1.73	W	creek	6.22	1.04	W	hill	5.75	1.39	W
apple	6.51	1.13	FWS	crow	6.42	1.12	FS	hint	1.90	1.22	F
arm	6.36	1.40	FW	crown	5.69	2.05	S	hog	6.52	1.16	W
army	5.71	1.86	S	cube	5.14	2.29	S	hope	2.61	1.91	S
art	4.26	2.19	S	dagger	6.02	1.57	F	horse	6.07	1.83	S
asparagus	5.82	1.80	W	daisy	6.77	0.61	F	hunger	3.52	2.02	WS
attribute	1.75	1.44	F	danger	3.73	2.20	S	ice	5.71	2.02	S
baby	6.19	1.47	FS	day	3.97	2.36	F	idea	2.31	1.65	FS
bacteria	4.48	2.32	FW	debate	3.80	2.04	S	igloo	6.00	1.75	S
badger	4.22	2.19	W	decay	3.90	1.71	W	ignorance	2.55	1.63	W
bag	5.68	1.82	FS	deer	6.60	1.26	F	income	3.47	2.20	S
banana	6.62	1.02	W	delerium	2.97	2.08	S	India	4.57	2.22	F
bath	5.52	1.82	F	demon	4.90	1.76	F	infection	4.02	2.08	S
bear	6.25	1.41	W	depth	3.32	1.93	W	ink	4.85	2.28	S
beauty	4.61	2.12	S	desk	6.08	1.66	W	insect	6.00	1.79	S
bed	6.62	0.86	F	devotion	3.02	2.18	S	iron	5.53	1.85	FS
bee	6.36	1.30	FS	dignity	2.85	1.75	W	jacket	6.37	1.18	W
beer	6.32	1.17	F	disease	3.85	1.89	WS	jealousy	3.02	2.03	W
beetle	6.00	1.48	FS	doctor	5.91	1.42	FW	joy	3.60	2.07	FW
blossom	6.03	1.45	FS	dog	6.75	1.02	F	judgment	2.00	1.36	S
boat	6.29	1.33	FS	donkey	6.67	0.85	W	juggler	5.97	1.77	F
boot	5.64	1.99	FS	door	5.78	1.97	S	justice	2.81	1.77	WS
box	5.16	2.26	S	dream	4.05	2.07	FWS	king	5.57	1.81	S
boy	6.45	1.38	F	dress	5.98	1.56	FWS	knee	6.08	1.54	FS
bread	6.12	1.40	W	eagle	6.50	1.05	FS	knife	5.29	2.26	WS
bronze	4.69	1.85	FS	earth	5.85	1.54	F	knuckle	5.57	1.69	W
brotherhood	3.39	2.05	WS	elephant	6.56	1.24	FW	lake	6.55	0.86	FWS
brush	6.00	1.50	F	emotion	3.30	2.30	S	lamb	6.04	1.44	WS
buffalo	6.42	1.18	W	encore	2.72	2.14	W	lamp	6.30	1.35	W
bullet	5.92	1.89	F	faith	2.83	2.00	S	larceny	3.14	2.19	S
butter	5.38	2.18	S	falconer	3.40	2.30	W	law	3.35	2.14	S
butterfly	6.09	1.81	S	fame	3.23	1.83	WS	lawyer	5.17	1.50	W
cabbage	5.82	1.72	W	farmer	5.95	1.26	W	leg	6.62	0.99	F
cake	5.90	1.85	S	fatigue	3.68	1.96	FWS	length	2.91	1.91	WS
campus	5.59	1.89	S	fear	3.45	2.05	S	lettuce	6.20	1.33	W
candy	5.11	2.16	S	figment	1.55	0.80	F	liberty	2.90	1.62	W
cannon	6.37	1.56	W	finger	6.78	0.52	W	life	3.45	2.37	W
canyon	5.80	1.73	W	fish	6.41	1.27	FS	link	3.83	2.11	FW
captive	3.67	1.82	FW	flea	6.17	1.14	W	lion	6.48	1.17	FS
car	6.65	0.98	FS	fly	6.18	1.34	FS	liquor	6.22	1.33	W
carrot	5.59	2.19	S	fog	6.15	1.24	F	lock	5.47	2.10	S
cashmere	4.97	2.20	F	food	5.40	2.09	S	love	4.37	2.23	WS
cat	6.26	1.41	FWS	foot	5.96	1.86	FS	loyalty	2.87	1.98	WS
cave	6.15	1.11	W	frame	5.37	1.87	F	man	6.82	0.44	F
chair	6.18	1.53	FWS	fraud	2.28	1.78	S	marriage	4.50	2.21	S
charm	3.33	2.11	S	freedom	2.77	1.84	W	martyr	3.92	2.15	S
cheese	6.08	1.44	FS	fruit	6.05	1.22	W	maturity	2.45	1.80	S
cherry	6.40	1.16	WS	furnace	5.23	2.16	S	mechanic	5.48	1.91	F
child	6.35	1.33	FS	garage	6.20	1.36	F	memory	2.14	1.55	S
Chile	4.12	2.16	F	garden	6.12	1.50	F	method	1.85	1.15	F
chisel	5.46	2.01	FS	gardenia	5.32	2.16	F	Mexico	4.87	1.95	F
church	5.73	2.15	S	glamour	3.64	1.94	S	milk	6.42	1.24	F
cider	6.10	1.20	F	glass	5.87	1.50	F	mind	2.59	2.02	S
city	5.38	2.20	S	glove	6.62	1.07	F	miner	5.87	1.35	W
clemency	1.85	1.17	F	goat	6.47	1.05	W	minister	5.92	1.46	W
cloak	5.75	1.73	F	gore	3.25	2.22	FW	minute	3.10	2.17	FS
club	5.52	1.45	W	gorilla	6.52	1.12	W	monkey	6.47	1.14	FS
coal	5.69	2.08	S	government	3.50	2.15	S	mood	2.45	1.66	S
coat	6.17	1.18	W	grace	3.14	2.10	S	moon	6.65	0.88	F
cocoa	5.32	1.81	W	grape	6.34	1.23	WS	moth	5.85	1.64	WS

Table 1 (continued)

	I	SD	Source		I	SD	Source		I	SD	Source
motion	3.69	2.14	S	religion	3.19	2.13	S	thumb	6.42	1.39	W
mouse	6.00	1.70	WS	repentance	2.30	1.57	S	tiger	6.70	0.68	W
music	4.33	2.13	S	respect	2.87	1.76	W	time	3.45	2.21	S
muskrat	4.87	2.01	W	roar	4.10	2.22	F	tin	5.03	1.93	FS
nation	4.28	2.19	S	robbery	4.16	2.13	S	toe	6.55	1.05	F
needle	6.35	1.30	F	salary	3.40	2.22	S	train	6.73	0.71	F
nurse	6.45	0.97	F	scissors	6.10	1.62	FS	tree	6.36	1.39	FS
nuts	5.65	2.06	W	scout	4.65	1.98	F	trout	6.00	1.79	S
ocean	6.68	0.73	FWS	shame	2.64	1.68	WS	trumpet	6.52	1.22	WS
odor	3.53	2.21	FW	shape	3.61	2.24	S	truth	2.31	1.69	WS
oil	5.00	2.16	S	sheep	6.35	1.57	F	tunnel	5.97	1.46	W
orange	6.50	1.10	W	silk	5.28	1.89	S	turnip	5.15	2.14	W
ounce	2.30	1.72	S	sin	2.80	2.08	S	uniform	5.57	1.69	F
oven	6.10	1.53	F	size	2.83	2.18	S	unit	1.60	1.09	F
owl	6.55	1.07	F	skin	5.75	1.46	F	ukelele	5.73	1.79	FS
panther	6.00	1.41	W	sleep	4.48	2.07	FS	valley	6.07	1.31	F
pants	6.37	1.20	W	snow	6.80	0.56	F	vase	6.01	1.52	FS
paper	5.64	1.79	FS	sofa	6.17	1.18	W	violin	6.18	1.50	FS
patriot	4.40	2.13	S	soldier	6.26	1.16	WS	wagon	6.40	1.02	W
peace	3.60	2.06	WS	song	3.78	2.12	S	want	2.19	1.87	S
pen	5.47	2.28	S	soul	2.90	2.13	FW	war	5.80	1.66	WS
philosopher	4.33	2.12	S	sound	2.69	2.08	S	warning	3.35	1.97	S
piano	6.55	0.95	F	spear	6.25	1.38	WS	warrior	5.80	1.68	FS
picture	5.50	1.82	F	spider	6.29	1.38	WS	wasp	6.27	1.45	W
pig	6.67	0.82	W	square	5.16	2.43	S	water	5.83	1.86	S
pistol	6.35	1.22	W	stream	6.17	1.38	WS	web	5.95	1.47	F
pity	2.78	1.96	S	steel	5.52	1.86	F	weight	3.51	2.03	WS
pliers	5.92	1.90	F	strife	2.37	1.85	W	wheel	5.92	1.84	S
plumber	5.69	1.77	FS	stomach	5.14	1.85	S	whiskey	5.90	1.45	W
politician	5.27	1.60	W	stool	6.17	1.43	W	whistle	5.62	1.81	F
popularity	3.22	1.89	W	stove	5.42	2.01	S	width	2.82	1.84	W
position	2.52	1.63	F	success	3.14	2.07	WS	window	5.59	2.11	S
prayer	4.23	2.10	S	sweater	6.24	1.33	FS	wine	5.80	1.82	S
prestige	2.47	1.68	WS	sword	6.63	0.80	WS	wish	2.26	1.75	S
preview	2.57	1.72	W	symphony	4.97	2.15	S	wolf	6.30	1.17	W
prison	5.85	1.70	F	tea	5.80	1.44	W	woman	6.62	1.04	F
proxy	1.90	1.20	F	theory	1.87	1.45	F	wool	4.92	2.06	S
queen	6.62	1.33	F	thirst	3.83	1.99	S	zebra	6.25	1.67	W
rabbit	6.54	1.06	WS	thought	2.24	1.80	FS				