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French normative data and naming times for action pictures

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The aim of the present study was to provide French normative data for 112 action line drawings. The set of action pictures consisted of 71 drawings taken from Masterson and Druks (1998) and 41 additional drawings. It was standardized on six psycholinguistic variables—that is, name agreement, image agreement, image variability, visual complexity, conceptual familiarity, and age of acquisition (AoA). Naming latencies to the action pictures were collected, and a regression analysis was performed on the naming latencies, with the standardized variables, as well as with word frequency and length, taken as predictors. A reliable influence of AoA, name agreement, and image agreement on the naming latencies was observed. The findings are consistent with previous published studies in other languages. The full set of these norms may be downloaded from www.psychonomic.org/archive/.

Many normative studies have already been carried out on the naming of object pictures in several languages (Alario & Ferrand, 1999; Bonin, Peereman, Malardier, Méot, & Chalard, 2003; Cuetos, Ellis, & Alvarez, 1999; Dell'Acqua, Lotto, & Job, 2000; Snodgrass & Vanderwart, 1980), providing data that can be used in psycholinguistic research, as well as for clinical purposes. In contrast with noun studies, the interest in action pictures and verb production normative studies is quite recent. Until the early 1980s, the interest in verbs came mainly from neurolinguistic studies, which focused on the use of verbs within sentences and on its deficit in Broca's aphasia. Nowadays, the interest in verbs is more diversified, and researchers have dissociated themselves from the exclusive link between agrammatism and deficits of verbs (Bastiaanse, Hugen, Kos, & van Zonneveld, 2002). However, there are several differences between nouns and verbs. Double dissociations between production of nouns and verbs have been reported in aphasic speakers (e.g., Caramazza & Hillis, 1991; McCarthy & Warrington, 1985; Rapp & Caramazza, 1998). Neuroimaging and electrophysiological data suggest that nouns and verbs activate different parts of the brain (e.g., Damasio & Tranel, 1993; Molfese, Burger-Judisch, Gill, Golinkoff, & Hirsch-Pasek, 1996). This evolution has opened perspectives for new research and has encouraged the recording of normative data for verbs (Druks, 2002). In the normative studies of action pictures, the same variables that had already been analyzed in the normative studies of object pictures have been considered. Among these variables, we can distinguish visual and semantic factors (visual complexity [VC], image agreement [IA], image variability [IV], and conceptual familiarity [Fam]), lexical factors (name agreement [NA], age of acquisition [AoA], and word frequency) and phonological factors (word length; for a review, see Alario et al., 2004).

Certain normative studies of action pictures, most of them conducted in English, may thus be cited as important contributions to this domain. Fiez and Tranel (1997) were among the first to develop standardized material for the naming of action pictures. Their material consisted of 280 action photographs, which were standardized on four psycholinguistic variables (IA, Fam, NA, and VC). The work by Masterson and Druks (1998) represents an important step in providing a set of standardized line drawings of actions. Relying on an observation by Berndt, Mitchum, Haendiges, and Sandson (1997) showing that there are no significant differences in aphasic speakers in naming accuracy for video sequences and pictures, the authors developed a battery consisting of 102 black-and-white action line drawings and standardized their material with a 7-point rating task on four variables—namely, AoA, Fam, imageability, and VC. Cuetos and Alija (2003) used this same material as a basis for a normative

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study in Spanish. Besides standardizing the Masterson and Druks material on the same factors and with the same rating method with Spanish speakers, the authors also collected naming times on the same pictures. The study showed that AoA and NA were reliable predictors of naming times for action pictures.

A study by Bonin, Boyer, Méot, Fayol, and Droit (2004) was the first normative work developed for verbs in French. In this study, rated norms were collected on action photographs taken from Fiez and Tranel (1997), and picture naming times were collected. NA, IA, and AoA significantly affected both written and spoken naming latencies, and word length affected written naming latencies.

Since line drawings are used mostly in psycholinguistic, as well as in clinical, naming tasks, the goal of the present study was to standardize action pictures and verbs for picture production for French. By analogy to previous studies, we first collected rated norms for the classical psycholinguistic variables on pictures and on the corresponding verbs. Then, pictures naming times were collected, and a regression approach was used to determine the reliable predictors of naming speed for action pictures.

NORMATIVE STUDY

This study provides French normative data for the Masterson and Druks (1998) pictures and for 41 other line drawings. The action pictures and the corresponding modal verbs were standardized on six variables—that is, NA, IA, IV, VC, Fam, and AoA.

Method

Participants. A total of 188 psychology students at the University of Geneva took part in this study. The participants (136 women and 44 men; mean age, 25 years) were all French native speakers and participated voluntarily. The participants were randomly assigned to the different rating tasks. Thirty-eight participants were involved in the preliminary task leading to NA, and 30 participants were involved in each of the five other rating tasks.

Materials. The initial material consisted of 172 line action pictures: 100 pictures were taken from the Masterson and Druks (1998) database, and the remaining 72 line drawings were specifically produced by an artist. Among these stimuli, only those with an NA superior to or equal to 80% of the participants' producing the modal verb were accepted for the following rating tasks. Thus, the final set retained for inclusion in the normative study consisted of 112 pictures. In order to indicate the distinction between the sets of pictures, the line drawings taken from the Masterson and Druks database are designated by *MD*, and the ones added by *VS* (see Appendixes A and B).

Procedure. The procedure closely followed the one adopted by Masterson and Druks (1998) and by Cuetos and Alija (2003) in their study on action pictures. Fam, IA, VC, IV, and AoA were evaluated through a subjective judgment. However, contrary to the Masterson and Druks study, which used a 7-point scale in the IA, Fam, VC, IV, and AoA judgment tasks, we used a 5-point scale (the same rating scale used in other French studies by Alario & Ferrand, 1999, and Bonin et al., 2003).

At the beginning of each task, the aim and the order of the experiment were clearly explained to the participants. They were particularly informed about the pictures' nature—that is, relatively simple line drawings.

In the NA task, the 172 pictures were projected sequentially on a white screen before a slightly darkened audience. Each picture was presented for 6 sec. An individual five-page booklet was distributed to the participants, in order to note down their answers. They had to identify each picture with the first verb that came to mind and to note it down during the 6 sec of projection.

In the IA task, the pictures were projected sequentially on a computer screen to the participants by groups of three to eight. Individual sheets of paper were distributed with which to note down their answers. This experiment was carried out in three steps. For each action, the written verb was projected for 2 sec, followed by a white screen lasting 3 sec. The participants were asked to mentally represent the action corresponding to the verb. The corresponding picture was finally presented for 5 sec, and the participants had to indicate on a 5-point scale the degree of accordance between their mental picture and the projected picture (with 1 = *low degree of correspondence* and 5 = *very high degree*).

For the Fam and the VC tasks, the pictures were presented on individual sheets of paper (four pictures on each). For the Fam rating task, the participants had to indicate on a 5-point scale their familiarity with the action depicted by the picture. Fam was defined as "the degree to which the participant comes in contact with the action or thinks about the action" (1 = *very unfamiliar* and 5 = *very familiar*). There was no time constraint on performance of this task.

For the VC task, the participants had to rate on a 5-point scale the VC of the picture. VC was defined as "the amount of lines and details in the drawing" (1 = *very simple drawing* and 5 = *very complex drawing*). There was no time constraint on performance of the task.

In both the IV and the AoA rating tasks, a written list of verbs was provided. For the IV task, the participants had to indicate on a 5-point scale whether the verb evoked few or many different mental images (1 = *few different images* and 5 = *many different images*), whereas in the AoA rating task, they had to estimate the age at which they thought they had learned each verb (1 = *learned before 3 years old* and 5 = *learned after 12 years*, each point on the scale representing 3 years).

Results

A total of 112 drawings (71 from the MD set and 41 from the VS set) were provided, each with a single verb whose NA was higher than or equal to 80%. Table 1 shows the means and standard deviations for each rated variable.

For the correlational analysis, word frequency and length (number of syllables and phonemes) of the modal names were also considered. The word frequency values per million were obtained from the French database LEXIQUE (New, Pallier, Ferrand, & Matos, 2001) and

Table 1
Means and Standard Deviations for the Five Rated Variables

	MD Pictures		VS Pictures		Total Pictures	
Variable	*M*	*SD*	*M*	*SD*	*M*	*SD*
Image agreement	3.82	0.21	3.7	0.29	3.8	0.21
Familiarity	3.12	0.92	2.82	0.84	3.02	0.9
Visual complexity	2.95	0.70	2.77	0.47	2.89	0.68
Image variability	2.54	0.62	2.35	0.54	2.47	0.6
Age of acquisition	2.23	0.62	2.46	0.57	2.31	0.61

Note—MD, pictures from Masterson and Druks, 1998; VS, added pictures.

Table 2
Correlation Matrix Among All Variables

	NA	IA	Fam	VC	IV	AoA	F-Lex	NbSyll	NbPho
NA	1.00								
IA	.252	1.00							
Fam	.199	.176	1.00						
VC	−.085	.010	−.159	1.00					
IV	.164	−.249	.464*	−.133	1.00				
AoA	−.181	.275	−.453*	.330	−.649*	1.00			
F-Lex	.066	−.311	.386*	−.164	.657*	−.551*	1.00		
NbSyll	−.093	−.055	.106	.144	−.107	.093	−.135	1.00	
NbPho	−.015	.103	.227	.076	−.101	.065	−.133	.785*	1.00

Note—NA, name agreement; IA, image agreement; Fam, familiarity; VC, visual complexity; IV, image variability; AoA, age of acquisition; F-Lex, lexical frequency; NbSyll, number of syllables; NbPho, number of phonemes. *Relevant correlations ($p < .0001$).

were log-transformed. The correlations between variables are shown in Table 2. The significant correlations between AoA and Fam, AoA and IV, and between AoA and word frequency were negative, and positive correlations can be observed between IV and Fam, word frequency and Fam, word frequency and IV, and numbers of syllables and phonemes.

In order to compare our results with those of previous studies, we calculated pairwise correlations between our results and those of Masterson and Druks (1998) in English and Cuetos and Alija (2003) in Spanish for the common Masterson and Druks items. The correlations do not include IA, since this variable was not considered in these two studies and the results for the NA variable is not available in the English study. Significant interstudy correlations appear for the following variables: Fam, VC, AoA, and word frequency. These correlations are higher between English and French than between Spanish and French. The strongest correlations are observed for VC and AoA. There are no significant interlanguage correlations for IV, number of syllables, and number of phonemes (see Table 3).

NAMING TIME

Method

Participants. A total of 40 students, 25 from the University Blaise Pascal of Clermont-Ferrand and 15 from the University of Geneva took part in this experiment. All were French native speakers. None of them had participated in the normative study.

Materials. The action line drawings were the same as those in the normative study.

Procedure. The participants were tested individually in a small room. They were seated in front of the screen and carried a head-mounted microphone. The participants were asked to name, as quickly as possible, a picture that appeared on the screen with a verb in the infinitive form. The pictures were presented randomly across participants. A short break was given to the participants after every 35 items. The experiment was run with DMDX software (Forster & Forster, 2003) on a PC computer. The participants' responses naming latencies and spoken responses were recorded.

Each picture was presented in the center of the screen. An experimental trial had the following structure: A "+" sign appeared in the middle of the screen for 500 msec, followed by the picture, which remained on screen until the voice key was triggered.

Table 3
Correlations With the Results of Previous Studies

	Correlation	
Variable	French/English[a]	French/Spanish[b]
Name agreement	not available	.186
Image agreement	not studied	not studied
Familiarity	.717*	.559*
Visual complexity	.875*	.830*
Image variability	.259	.170
Age of acquisition	.858*	.732*
Lexical frequency	.658*	.510*
Number of syllables	.076	.390
Number of phonemes	−.072	.323

*Relevant correlations ($p < .0001$). [a]Masterson and Druks, 1998. [b]Cuetos and Alija, 2003.

Results

Responses were considered incorrect and were excluded whenever a verb did not correspond to the modal verb, when no naming response was provided, or when a technical problem occurred. The rate of incorrect responses reached 16%. We also excluded from the analysis five verbs that led to fewer than 50% correct responses (*compter* [to count; 48%], *sculpter* [to sculpt; 45%], *jurer* [to swear; 43%], *dépasser* [to pass; 40%], and *s'appuyer* [to lean; 38%]). Thus, the following analyses were carried out on 107 items. With regard to the naming reaction times, no latencies were above 500 msec once we excluded technical problems and responses starting with a nonlinguistic noise; at the other extreme, we removed naming latencies higher than 3,000 msec.

The average naming time was 1,097 msec, with a standard deviation of 195 msec. The MD images were generally named more quickly than the other drawings, with a mean naming time of 1,050 msec (SD = 183 msec). The mean naming time for VS images was 1,187 msec (SD = 187 msec).

Correlations were calculated between the naming times and the nine variables mentioned in the normative study (see Table 4). Only VC and length in phonemes did not show significant correlations with naming times.

We conducted a multiple regression analysis with naming latency as the dependent variable and the seven pre-

Table 4
Correlations Between Reaction Time (RT) and the Independent Variables

	NA	IA	Fam	VC	IV	AoA	F-Lex	NbSyll	NbPho
RT	−.430**	−.424**	−.301*	.173	−.227*	.225*	−.195*	.223*	.130

Note—NA, name agreement; IA, image agreement; Fam, familiarity; VC, visual complexity; IV, image variability; AoA, age of acquisition; F-Lex, lexical frequency; NbSyll, number of syllables; NbPho, number of phonemes; RT, reaction time. *Relevant correlations ($p < .05$). **Relevant correlations ($p < .01$).

dictors that correlated significantly with naming times. Naming time scores were log-transformed. The regression equation was significant [$F(7,289) = 12.053$, $p < .0001$; $r^2 = .460$]. NA, IA, and AoA were reliable predictors of naming latencies (see Table 5).

We compared our results with those of a previous French study on photographs (Bonin et al., 2004). It first appears that fewer items had an NA higher than or equal to 80% for photographs (44% in Bonin et al., 2004, and 65% for the present data). With only those items being used for comparisons (Table 6), naming latencies, VC, and AoA were the only variables showing important discrepancies between the two databases. These differences were significant for RT [$t(53) = -6.72$, $p < .001$], NA [$t(56) = 5.501$, $p < .001$], VC [$t(56) = 3.901$, $p < .001$], and AoA [$t(56) = 5.113$, $p < .001$].

Using NA, IA, Fam, AoA, lexical frequency (F-Lex, log-transformed) and the number of phonemes as predictors of naming latencies in a multiple regression showed similar determinants at the .05 level in the two databases—NA, IA, and AoA. However, whereas IA appeared to be the most important determinant in the present data, it was AoA for Bonin et al.'s (2004) experiment. These principal determinants were the same in Bonin et al. (2004) when all items with NA higher than or equal to 50% were used.

For items common to the two databases, correlations between the same variables taken from the two databases were all significant at the .01 level, except for NA and VC (Table 7).

DISCUSSION

The goal of the present study was, first, to develop standardized French line action drawing materials and relate them to six psycholinguistic variables. Norms for NA on 172 line drawings were first collected, and action pictures with an NA inferior to 80% were excluded. IA, AoA, IV, VC, and Fam judgments were then obtained on 112 action pictures and the corresponding modal verbs.

Subjective judgments were used for collecting norms on IA, Fam, VC, IV, and AoA.

Pairwise correlations among variables showed negative correlations between AoA and two other variables, Fam and IV. Overall, the findings suggest that verbs are more familiar and provide a greater number of different mental images when they are learned early in life. The correlations between IV, Fam, and F-Lex were positive, suggesting that more frequent verbs are more conceptually familiar and generate a greater number of different mental images than do less frequent verbs (or the reverse).

Comparison with other normative data obtained from English and Spanish on the same line drawing materials underline that the obtained results have global similar tendencies for the variables Fam, VC, AoA, and F-Lex. Thus, interlanguage similar rating scores were observed for language-independent variables or visual–semantic variables, with the exception of IV. Moreover, interlanguage correlations were also observed for lexical variables, showing that similar patterns can appear between various languages, even for variables, such as F-Lex and AoA, that a priori seem specific to each language. On the other hand, no significant interlanguage correlations were observed for language-specific phonological variables (number of syllables and number of phonemes). These interlanguage correlations also corroborate the reliability of subjective rating scores. Indeed, studies comparing subjective and objective AoA data have already shown that correlations exist between these subjective measures and objective statements (Chalard, Bonin, Méot, Boyer, & Fayol, 2003); the observation of interlanguage correlation further suggests the appropriateness of subjective ratings.

A comparison with French normative data obtained on photographs (Bonin et al., 2004) showed that fewer items obtained an NA higher than or equal to 80% for photographs than for line drawings. This indicates the relevance of using black-and-white line drawings in psycholinguistic research and in clinical practice, notwithstanding the fact that VC is considered more important for line drawings than for photographs.

The second goal of the study was to identify the reliable determinants of action-naming latencies. Naming latencies were collected on the 112 action line drawings.

Table 5
Simultaneous Multiple Regression Analyses on Reaction Time

Variable	β	t	p
NA	−.288	−3.742	.0003
IA	−.496	−5.497	.0001
Fam	−.024	−.250	.8034
IV	−.057	−.500	.6182
AoA	.222	2.096	.0386
F-Lex	−.126	−1.206	.2305
NbSyll	.141	1.801	.0748

Note—NA, name agreement; IA, image agreement; Fam, familiarity; IV, image variability; AoA, age of acquisition; F-Lex, lexical frequency; NbSyll, number of syllables.

Table 6
Means and Standard Deviations for Different Sets of Items in the Bonin, Boyer, Méot, Fayol, and Droit (2004) Database and in the Present One

	All Items With NA > .8				Common Items Only			
	Bonin et al.		Schwitter et al.		Bonin et al.		Schwitter et al.	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
RT	1,259	252	1,097	195	1,300	288	1,052	179
NA	92.80	6.40	95.00	6.00	83.16	17.02	95.28	5.63
IA	3.88	0.72	3.75	0.65	3.68	0.86	3.72	0.68
Fam	3.08	1.04	2.99	0.90	2.91	1.07	2.98	0.90
VC	2.23	0.76	2.91	0.68	2.37	0.82	2.82	0.65
AoA	2.21	0.66	2.35	0.63	2.13	0.60	2.27	0.63
F-Lex	25.72	37.25	20.70	28.02				
NbPho	4.97	1.09	4.96	1.07				

Note—RT, reaction time (naming latencies); NA, name agreement; IA, image agreement; Fam, familiarity; VC, visual complexity; AoA, age of acquisition; F-Lex, lexical frequency; NbPho, number of phonemes.

Naming latencies for the added pictures (VS) were slower than those for the MD pictures. These differences may be due to later AoA and lower Fam in the VS pictures. Besides, F-Lex is lower for the latter (word frequency per million: 25 vs. 15). Moreover, on common items, naming speeds are slower for action photographs (Bonin et al., 2004) than for line drawings.

NA, IA, and AoA contributed significantly to naming times. These results are consistent with other published studies on action-naming times. In the Spanish study of Cuetos and Alija (2003), AoA and NA were the best predictors of action-naming times. In this study, number of syllables and imageability also had a reliable influence on naming times, but with lower β scores. As far as French is concerned, Bonin et al.'s (2004) action-naming study with photographs also showed that NA, IA, and AoA made a reliable contribution to naming times. F-Lex did not affect naming times in the present study when the other variables were held constant, nor in any of the studies mentioned on the naming of action pictures. The absence of a frequency effect in studies in which AoA was also controlled has already been outlined in object picture naming (Bonin et al., 2003; Carroll & White, 1973; Morrison, Chappell, & Ellis, 1997; Morrison, Ellis, & Quinlan, 1992, but see Alario et al., 2004; Barry, Morrison, & Ellis, 1997). F-Lex did not affect naming times in the present study, nor in any of the studies on action naming mentioned. It thus seems that the variables affecting noun production elicited by the naming of line drawing pictures also affect verb naming. Indeed, only three variables systematically affected noun naming in all the normative studies conducted in several languages—that is, NA, IA, and AoA (for a review, see Alario et al., 2004). However, it is possible that such other variables as transitivity or argument structure, taken into consideration in neurolinguistic studies (Collina, Marangolo, & Tabossi, 2001; Kim & Thompson, 2000; Schneider & Thompson, 2003), may have an effect on verb production.

In conclusion, this study provides French normative data for 112 line action pictures (see Appendix C) composed of 71 drawings taken from Masterson and Druks (1998) and 41 additional drawings and their corresponding verbs. We hope that this material will be a useful base for psycholinguistic researchers, as well as for the assessment and development of material for clinical purposes.

Table 7
Correlations Between the Same Variables for the Items Common to the Two Databases

Variable	*n*	*r*	*p*
RT	54	.400	.003
NA	57	.233	.081
IA	57	.422	.001
Fam	57	.749	.000
VC	57	.318	.016
AoA	57	.942	.000

Note—RT, reaction time; NA, name agreement; IA, image agreement; Fam, familiarity; VC, visual complexity; AoA, age of acquisition; *n*, number of items.

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File: Schwitter-BRMIC-2004.zip.

Description: The compressed archive file contains three files:

schwitter2004norms.xls contains the norms developed by Schwitter et al. (2004), as Excel for Windows file. Each row represents 1 of the 112 words; each column one of the psycholinguistic variables.

schwitter2004norms.csv contains duplicate information in comma-delimited format.

schwitter2004pictures.zip contains the 41 additional drawings.

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(*Continued on next page*)

APPENDIX A
Modal and Other Responses for the MD Pictures

Target Response	English	%	Other Responses
aboyer	to bark	100	
allumer	to light	100	
arrêter	to stop	61	stopper (34%), dire stop (3%), circuler (3%)
arroser	to water	100	
attraper	to catch	39	recevoir (32%), rattraper (21%), lancer (5%), jouer (3%)
bâiller	to yawn	97	rire (3%)
bercer	to rock	79	balancer (11%), basculer (3%), faire bouger (3%), pousser (3%), secouer (3%)
boire	to drink	100	
caresser	to stroke	92	flatter (3%), se reposer (3%), s'ennuyer (3%)
chanter	to sing	100	
chatouiller	to tickle	100	
conduire	to drive	97	rouler (3%)
construire	to build	76	empiler (11%), ajuster (3%), bâtir (3%), maçonner (3%)
coudre	to sew	97	raccommoder (3%)
couler	to sink	97	sombrer (3%)
couper	to cut	61	découper (39%)
courir	to run	100	
creuser	to dig	97	peller (3%)
cuisiner	to cook	100	
dactylographier	to type	8	taper à la machine (84%)
danser	to dance	100	
défiler	to march	16	marcher (66%), marcher au pas (5%), se battre (3%), partir (3%), parader (3%), marcher en rangs (3%), guerroyer (3%)
dessiner	to draw	87	peindre (13%)
dormir	to sleep	100	
dribbler	to bounce	71	jouer (8%), rebondir (5%), faire rebondir (5%), faire du ballon (3%), jouer au ballon (3%), jouer au basket (3%), taper (3%)
écrire	to write	97	rédiger (3%)
embrasser	to kiss	89	baiser (3%), donner bec (3%), donner un baiser (3%), faire un bisou (3%)
éternuer	to sneeze	89	atchoumer (3%), expirer (3%), respirer (3%), se moucher (3%)
être assis	to sit	37	s'asseoir (47%), regarder (5%), se reposer (5%), attendre (3%), ne rien faire (3%)
flotter	to float	95	dériver (3%), vaguer (3%)
fondre	to melt	87	briller (3%), chauffer (3%), ensoleiller (3%)
frapper	to knock	58	toquer (39%), taper (3%)
fumer	to smoke	100	
glisser	to slide	92	descendre (5%), faire du toboggan (3%)
goutter	to drip	47	couler (42%), s'égoutter (5%), fuir (3%), tomber (3%)
grimper	to climb	45	escalader (24%), monter (21%), descendre (5%), équilibrer (3%), surpasser (3%)
indiquer	to point	3	montrer (53%), pointer (45%)
jongler	to juggle	100	
jouer	to play	100	
lacer	to tie	63	nouer (18%), attacher (13%), faire ses lacets (3%)
lâcher	to drop	29	laisser tomber (32%), tomber (18%), faire tomber (5%), casser (3%), choir (3%), chuter (3%), glisser (3%), jouer (3%), renverser (3%)
lécher	to lick	100	
lire	to read	100	
manger	to eat	97	sourire (3%)
marcher	to walk	82	se promener (16%), NR (3%)
mendier	to beg	84	quémander (5%), demander (3%), donner (3%), faire la manche (3%), quêter (3%)
monter cheval	to ride	53	aller à cheval (13%), chevaucher (11%), faire du cheval (11%), galoper (5%), faire du coco (3%), se promener (3%), trotter (3%)
mordre	to bite	100	
nager	to swim	100	
naviguer	to sail	55	flotter (24%), voguer (13%), faire de la voile (8%)
neiger	to snow	95	tomber (5%)

APPENDIX A (Continued)

Target Response	English	%	Other Responses
ouvrir	to open	95	appuyer (3%), fermer (3%)
patiner	to skate	92	glisser (8%)
pêcher	to fish	100	
peigner	to comb	58	se coiffer (42%)
peindre	to paint	100	
peler	to peel	45	éplucher (53%), plucher (3%)
percer	to drill	87	trouer (5%), bricoler (3%), forer (3%), visser (3%)
pincer	to pinch	100	
planter	to plant	97	enterrer (3%)
pleurer	to cry	100	
pleuvoir	to rain	100	
plier	to fold	97	NR (3%)
plonger	to dive	97	sauter (3%)
porter	to carry	97	marcher (3%)
poster	to post	79	envoyer (21%)
pousser	to push	100	
prier	to pray	100	
ramper	to crawl	82	marcher à 4 pattes (11%), avancer (3%), marcher (3%), se déplacer (3%)
ratisser	to rake	34	ramasser (45%), balayer (11%), râteler (5%), jardiner (3%), passer le râteau (3%)
regarder	to watch	100	
remuer	to stir	37	mélanger (21%), brasser (13%), touiller (13%), tourner (11%), cuisiner (5%)
repasser	to iron	100	
rêver	to dream	100	
rire	to laugh	92	se marrer (5%), s'esclaffer (3%)
rugir	to roar	89	crier (5%), beugler (3%), hurler (3%)
s'agenouiller	to kneel	71	être à genoux (8%), s'asseoir (8%), être accroupi (5%), prier (3%), rester (3%), NR (3%)
saigner	to bleed	100	
saluer	to wave	71	faire un signe (11%), dire au revoir (5%), agiter la main (3%), partir (3%), se quitter (3%), secouer (3%), NR (3%)
s'appuyer	to lean	82	s'adosser (13%), être appuyé (3%), se reposer (3%)
sauter	to jump	87	descendre (13%)
sauter corde	to skip	100	
se balancer	to swing	97	s'amuser (3%)
se laver	to wash	100	
se pencher	to bend	47	se baisser (37%), se plier (8%), se courber (5%), se cambrer (3%)
se peser	to weigh	97	regarder (3%)
se raser	to shave	97	gargouiller (3%)
shooter	to kick	71	lancer (8%), taper (8%), frapper (5%), tirer (5%), jouer (3%)
skier	to ski	100	
sonner	to ring	92	faire sonner (5%), tinter (3%)
souffler	to blow	100	
sourire	to smile	100	
tirer	to pull	95	promener (3%), traîner (3%)
tirer coup feu	to shoot	82	chasser (18%)
tisser	to weave	92	coudre (3%), filer (5%)
toucher	to touch	76	NR (11%), communiquer (3%), contacter (3%), frôler (3%), joindre (3%), pointer (3%)
traverser	to cross	100	
tricoter	to knit	95	coudre (5%)
verser	to pour	97	renverser (3%)
voler	to fly	100	

Note—NR, no response.

APPENDIX B
Modal and Other Responses for the VS Pictures

Target Response	English	%	Other Responses
acheter	to buy	63	payer (21%), prendre (5%), demander (3%), donner (3%), recevoir (3%), saisir (3%)
applaudir	to applaud	100	
attacher	to tie up	100	
atterrir	to land	95	décoller (3%), se poser (3%)
ausculter	to examine	50	écouter (45%), mesurer (3%), soigner (3%)
balayer	to sweep	100	
bêcher	to dig	47	labourer (16%), cultiver (8%), jardiner (8%), NR (5%)
bercer	to rock	87	balancer (5%), porter (5%), lander (3%)
briser	to break	21	casser (68%), rompre (5%), couper (3%), fendre (3%)
bronzer	to tan	100	
calculer	to calculate	97	numéroter (3%)
caresser	to stroke	95	flatter (3%), porter (3%)
clouer	to nail	63	planter (21%), enfoncer (11%), taper (5%)
coiffer	to comb	37	peigner (63%)
coller	to stick	29	timbrer (45%), affranchir (8%), poster (5%), cacheter (3%), envoyer (3%), estampiller (3%), mettre (3%), mettre un timbre (3%)
compter	to count	84	payer (5%), feuilleter (3%), regarder (3%), regarder des images (3%), NR (3%)
coudre	to sew	71	recoudre (16%), raccommoder (8%), NR (5%)
crier	to shout	84	parler (13%), hurler (3%)
cueillir	to pick	84	ramasser (13%), attraper (3%)
débarrasser	to clear	42	desservir (16%), ramasser (16%), prendre (8%), enlever (5%), mettre la table (5%), servir (5%), déblayer (3%)
déboucher	to uncork	74	débouchonner (18%), ouvrir (8%)
décoller	to take off	97	voler (3%)
demander	to ask for	21	questionner (47%), interroger (24%), poser une question (8%),
dépasser	to pass	84	devancer (5%), conduire (3%), doubler (3%), précéder (3%), ralentir (3%)
descendre	to go down	100	
dessiner	to draw	97	tracer (3%)
écouter	to listen	89	dormir (5%), relaxer (3%), s'assourdir (3%)
effacer	to clean	87	essuyer (8%), nettoyer (5%)
entrer	to enter	79	rentrer (13%), sortir (5%), avancer (3%)
essuyer	to wipe	89	laver (3%), lustrer (3%), nettoyer (3%), sécher (3%)
faucher	to mow	53	couper (37%), arracher (3%), scalper (3%), tailler (3%), NR (3%)
fermer	to close	50	ouvrir (42%), aérer (3%), entrouvrir (3%), NR (3%)
filmer	to film	95	viser (3%), visionner (3%)
gonfler	to pump up	89	pomper (5%), jouer (3%), regonfler (3%)
heurter	to hit	11	se cogner (68%), percuter (11%), bousculer (3%), frapper (3%), rentrer (3%), se taper (3%)
jeter	to throw	100	
jouer	to play	95	chanter (3%), faire de la musique (3%)
jurer	to swear	82	bénir (3%), faire serment (3%), prêter serment (3%), prier (3%), prononcer (3%), recevoir (3%), signer (3%)
laver	to wash	76	essorer (13%), lessiver (5%), faire la lessive (3%), remuer (3%)
mesurer	to measure	95	prendre une mesure (3%), scier (3%)
nettoyer	to clean	68	laver (26%), essuyer (5%)
offrir	to give	92	donner (5%), recevoir (3%)
payer	to pay	97	donner (3%)
pédaler	to pedal	58	aller à vélo (11%), faire du vélo (11%), rouler (8%), aller (3%), aller en vélo (3%), rouler à vélo (3%), NR (5%)

APPENDIX B (Continued)

Target Response	English	%	Other Responses
peindre	to paint	100	
peser	to weigh	95	déposer (3%), prendre (3%)
piquer	to prick	100	
poignarder	to stab	37	tuer (45%), assassiner (8%), agresser (3%), enfoncer (3%), marquer (3%), menacer (3%)
presser	to squeeze	97	appuyer (3%)
punir	to punish	87	gronder (8%), désigner (3%), engueuler (3%)
ramer	to row	87	naviguer (8%), faire du bateau (5%)
recevoir	to receive	55	donner (26%), prendre (11%), distribuer (3%), livrer courrier (3%), réceptionner (3%)
recoller	to stick back	71	coller (18%), réparer (8%), bricoler (3%)
scier	to saw	92	couper (8%)
sculpter	to carve	95	marteler (3%), taper (3%)
se casser	to break	53	lâcher (13%), laisser tomber (11%), briser (5%), lancer (5%), tomber (5%), faire tomber (3%), jeter (3%), rompre (3%)
se faner	to fade	87	flétrir (8%), mourir (5%)
se noyer	to drown	79	couler (21%)
semer	to sow	100	
s'enfuir	to run away	32	fuir (39%), courir (18%), partir (5%), s'échapper (3%), s'encourir (3%)
siffler	to whistle	100	
signer	to sign	79	écrire (21%)
sortir	to go out	79	entrer (11%), avancer (3%), franchir (3%), partir (3%), rentrer (3%)
sucer	to suck	97	téter (3%)
suivre	to follow	53	dépasser (13%), rouler (13%), poursuivre (8%), conduire (5%), coller (3%), doubler (3%), faire de la moto (3%)
suspendre	to hang	21	étendre (66%), accrocher (5%), pendre (5%), sécher (3%)
tailler	to trim	53	couper (37%), ébourgeonner (3%), élaguer (3%), façonner (3%), sectionner (3%)
téléphoner	to phone	92	appeler (3%), composer (5%)
tirer	to pull	97	lutter (3%)
traire	to milk	100	
viser	to aim at	53	tirer (45%), pointer (3%)
visser	to screw on	79	tourner (16%), dévisser (5%)

Note—NR, no response.

APPENDIX C
Item Information

Modal Verb	English	Source	Name Agreement (>80%)	Image Agreement		Age of Acquisition		Visual Complexity		Familiarity		Image Variability		Frequency	Reaction Time
				M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*		
aboyer	to bark	MD	100	4.27	0.74	1.97	0.85	4.05	0.94	3.65	1.35	1.92	1.08	1.68	1,049.38
allumer	to light	MD	100	3.43	1.30	2.43	1.14	3.00	0.73	3.45	1.50	3.04	1.02	11.42	974.27
appuyer (s')	to lean	MD	82	2.80	0.92	2.97	1.07	3.05	0.83	2.45	0.89	2.40	1.15	13.32	1,261.40
arroser	to water	MD	100	4.53	0.86	2.73	0.98	2.85	0.67	3.05	1.50	1.88	0.73	2.55	828.62
bâiller	to yawn	MD	97	3.80	0.76	2.23	0.97	2.10	0.72	4.15	0.67	1.68	0.75	1.52	1,062.40
balancer (se)	to swing	MD	97	4.67	0.61	2.10	0.80	2.90	0.72	2.35	1.09	2.36	0.86	6.39	1,080.83
boire	to drink	MD	100	4.27	0.87	1.17	0.38	2.00	0.65	4.80	0.41	3.04	1.17	56.74	758.20
caresser	to stroke	MD	92	4.03	0.96	2.13	0.90	2.80	0.77	2.75	1.33	3.08	0.95	9.32	1,179.71
chanter	to sing	MD	100	4.03	0.81	1.70	0.79	1.95	0.60	3.35	1.27	2.68	1.07	23.1	797.56
chatouiller	to tickle	MD	100	2.47	0.86	1.83	0.87	2.85	0.81	2.20	1.11	2.00	1.04	0.81	1,403.07
conduire	to drive	MD	97	4.27	0.74	2.63	1.00	3.65	0.75	4.05	1.15	2.60	0.96	34.32	848.23
coudre	to sew	MD	97	2.90	0.96	2.93	0.98	2.75	0.79	2.45	1.47	2.20	0.91	5.55	1,362.18
couler	to sink	MD	97	3.03	1.63	2.53	0.94	3.15	0.75	2.00	1.26	2.04	0.89	21.1	1,062.85
courir	to run	MD	100	3.90	0.80	1.50	0.73	2.10	0.79	3.50	1.15	2.40	0.91	42.9	867.57
creuser	to dig	MD	97	4.37	0.85	2.43	0.86	3.05	0.89	2.80	1.47	2.20	0.71	7.61	1,196.73
cuisiner	to cook	MD	100	4.10	0.61	2.63	1.19	3.90	0.72	3.75	1.07	3.20	0.87	1.23	944.57
danser	to dance	MD	100	4.07	0.87	2.03	0.96	3.40	0.68	2.90	1.21	3.48	1.26	21.26	792.85
dessiner	to draw	MD	87	3.83	0.83	1.60	0.62	3.70	0.66	2.90	1.37	3.08	1.08	9.74	1,102.42
dormir	to sleep	MD	100	4.47	0.63	1.20	0.55	3.00	0.65	4.90	0.31	3.04	1.31	51.1	809.00
écrire	to write	MD	97	4.03	0.96	2.20	0.76	2.95	0.76	4.45	0.83	2.96	1.14	89.16	1,045.64
embrasser	to kiss	MD	89	3.73	1.05	2.10	1.12	1.90	0.79	4.30	0.73	3.24	1.16	21.52	1,113.00
éternuer	to sneeze	MD	89	3.43	1.07	2.37	1.03	2.65	0.59	3.50	0.76	1.48	0.82	0.84	1,195.10
flotter	to float	MD	95	3.43	0.73	2.40	0.89	1.95	0.60	2.40	1.23	2.44	0.92	6.58	1,359.76
fondre	to melt	MD	87	3.33	1.18	2.63	0.96	4.15	0.75	2.65	1.57	2.12	0.88	11.45	1,425.22
fumer	to smoke	MD	100	4.00	0.95	2.83	0.87	3.00	0.65	2.10	1.41	2.32	0.90	10.61	1,058.76
glisser	to slide	MD	92	2.03	0.93	2.20	0.96	3.70	0.73	2.20	1.24	2.80	0.91	34.48	1,301.60
jongler	to juggle	MD	100	4.40	0.62	3.43	0.90	4.00	0.73	2.70	1.49	2.20	1.08	0.94	942.25
jouer	to play	MD	100	3.30	1.21	1.20	0.48	3.70	0.80	2.55	1.47	3.96	0.89	94.23	1,168.50
laver (se)	to wash	MD	100	3.13	1.04	1.50	0.63	2.65	0.81	4.40	0.99	3.24	1.13	17.74	1,153.97
lécher	to lick	MD	100	2.70	1.09	2.30	0.95	3.60	0.94	3.10	1.74	2.64	0.91	3.52	915.86
lire	to read	MD	100	4.43	0.57	2.03	0.85	2.75	0.79	4.65	0.59	3.00	1.19	75.55	776.17
manger	to eat	MD	97	3.60	1.13	1.13	0.35	2.95	0.76	4.60	0.60	3.56	1.36	78.26	831.33
marcher	to walk	MD	82	3.83	1.15	1.33	0.55	2.05	0.69	4.00	1.26	2.76	1.16	47.87	996.48
mendier	to beg	MD	84	4.17	0.70	3.90	0.80	3.25	0.85	2.50	1.28	2.16	1.03	1.81	1,326.42
mordre	to bite	MD	100	4.13	0.86	1.97	0.93	4.70	0.47	1.75	0.91	2.36	0.70	7.16	1,013.20
nager	to swim	MD	100	4.37	0.67	2.03	0.72	3.10	0.72	3.00	1.38	2.52	1.05	5.58	812.75
neiger	to snow	MD	95	4.17	0.87	1.53	0.57	4.20	0.70	4.20	0.83	2.56	1.39	0.58	967.23
ouvrir	to open	MD	95	3.47	1.48	1.67	0.88	2.15	0.81	3.85	0.99	2.96	1.21	60.1	982.89
patiner	to skate	MD	92	4.30	0.95	2.63	0.81	2.45	0.89	2.35	1.42	2.16	0.80	0.48	1,238.16
pêcher	to fish	MD	100	4.60	0.62	2.77	0.82	3.55	0.76	1.95	1.50	2.32	0.95	5.84	1,060.00

APPENDIX C (Continued)

Modal Verb	English	Source	Name Agreement (>80%)	Image Agreement		Age of Acquisition		Visual Complexity		Familiarity		Image Variability		Frequency	Reaction Time
				M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*		
peindre	to paint	MD	100	3.70	1.02	2.53	1.01	2.45	0.89	2.85	1.60	2.84	1.14	15	896.25
percer	to drill	MD	87	4.03	1.30	3.07	0.83	3.35	0.67	2.75	1.41	2.20	1.04	8.16	984.41
peser (se)	to weigh	MD	97	4.03	1.07	2.90	0.99	2.70	0.80	2.85	1.31	1.72	0.79	11.03	1,101.27
pincer	to pinch	MD	100	4.53	0.63	1.97	0.85	1.65	0.88	1.75	1.02	1.56	0.65	2.35	829.15
planter	to plant	MD	97	3.97	0.93	2.47	1.01	2.95	0.83	3.00	1.62	2.52	1.19	8.23	1,026.85
pleurer	to cry	MD	100	4.00	0.83	1.30	0.53	2.40	0.75	3.65	1.27	3.24	1.45	34.1	752.10
pleuvoir	to rain	MD	100	3.57	1.01	1.47	0.51	1.30	0.57	4.60	0.50	2.44	1.26	3.97	1,049.21
plier	to fold	MD	97	3.70	1.02	2.63	1.00	2.85	0.75	2.50	1.10	2.20	0.91	8.06	1,065.00
plonger	to dive	MD	97	4.17	0.99	3.03	0.96	3.20	0.83	2.70	1.42	2.36	0.86	8.94	854.69
porter	to carry	MD	97	3.80	1.10	1.70	0.88	2.05	0.76	3.45	1.10	3.76	1.13	67.61	874.05
pousser	to push	MD	100	3.90	1.09	1.80	1.00	2.35	0.75	2.55	1.19	2.92	1.26	29.84	906.85
prier	to pray	MD	100	4.37	0.81	2.90	1.21	2.85	0.59	2.00	1.30	2.32	1.14	13.26	803.92
ramper	to crawl	MD	82	3.27	1.11	2.63	1.16	2.15	0.75	2.40	1.19	1.76	0.72	2.9	1,288.95
raser (se)	to shave	MD	97	3.93	1.01	3.17	1.12	4.60	0.68	2.80	1.61	1.80	0.82	4.03	1,436.56
regarder	to watch	MD	100	2.80	1.24	1.40	0.77	2.75	0.79	4.50	0.83	3.44	1.39	95.39	1,122.27
repasser	to iron	MD	100	4.30	0.92	2.97	1.03	4.00	0.56	3.35	1.35	1.72	0.98	5.45	951.63
rêver	to dream	MD	100	4.20	0.61	2.37	0.93	2.95	0.76	4.55	0.83	3.32	1.52	19.52	1,209.21
rire	to laugh	MD	92	4.33	0.55	1.40	0.50	1.85	0.75	4.35	0.67	3.48	1.42	139.29	898.08
rugir	to roar	MD	89	4.53	0.73	3.40	0.89	4.65	0.59	1.80	1.11	1.44	0.65	0.55	1,272.96
saigner	to bleed	MD	100	3.90	0.76	2.10	0.76	3.10	0.79	2.95	1.00	3.28	1.02	3.65	1,143.37
sauter	to jump	MD	87	3.10	0.99	1.73	0.94	2.35	0.67	2.65	1.18	3.16	1.07	25.1	1,033.12
skier	to ski	MD	100	4.13	0.82	2.30	0.79	2.70	0.80	3.40	1.50	2.36	1.04	0.19	886.92
sonner	to ring	MD	92	2.53	1.04	2.07	0.83	2.25	0.72	1.95	1.23	1.92	0.86	10.68	1,314.20
souffler	to blow	MD	100	3.67	0.96	1.87	1.01	2.10	0.64	2.35	1.39	2.48	0.92	7.9	911.20
sourire	to smile	MD	100	3.67	0.96	1.70	0.79	1.95	0.76	4.25	0.55	3.28	1.40	128.35	1,092.77
tirer	to pull	MD	95	2.23	1.14	2.17	0.99	3.10	0.72	1.95	1.15	2.60	0.96	76.35	1,328.50
tisser	to weave	MD	92	3.90	1.12	3.67	0.92	4.60	0.75	1.40	0.94	1.32	0.48	3.45	1,244.41
traverser	to cross	MD	100	3.93	1.05	2.40	0.81	3.40	0.88	4.45	0.83	2.16	0.85	22.9	1,246.94
tricoter	to knit	MD	95	4.20	0.81	3.07	1.08	3.05	0.60	1.95	1.10	1.44	0.71	1.77	1,185.55
verser	to pour	MD	97	4.47	0.90	2.43	0.86	3.05	0.76	4.40	0.60	2.12	0.78	7.55	980.79
voler	to fly	MD	100	3.63	1.16	2.10	0.96	3.40	0.75	2.75	1.37	3.28	1.02	15.97	985.33
applaudir	to applaud	VS	100	3.97	0.76	2.30	0.95	3.00	0.86	3.45	1.39	2.20	1.26	2.77	1,191.97
attacher	to tie up	VS	100	2.67	1.42	2.53	0.94	2.90	0.85	2.70	1.45	2.48	0.82	10.71	1,107.32
atterrir	to land	VS	95	4.40	1.00	3.00	0.91	2.90	0.85	2.85	1.31	1.72	1.02	1.71	1,273.13
balayer	to sweep	VS	100	3.97	0.61	2.53	1.01	2.35	0.88	3.25	1.25	1.64	0.70	4.19	955.30
bercer	to rock	VS	87	4.57	0.77	2.30	0.95	2.75	0.85	2.40	1.47	2.20	1.04	2.52	1,027.38
bronzer	to tan	VS	100	4.57	0.63	3.17	0.95	1.85	0.75	3.25	0.85	2.24	1.01	0.97	1,118.81
calculer	to calculate	VS	97	4.13	1.22	2.83	0.91	3.35	1.04	3.70	0.92	2.32	0.80	16.32	1,113.87
caresser	to stroke	VS	95	3.23	1.01	2.07	0.87	2.75	0.85	2.80	1.32	3.12	1.13	9.32	1,109.51
compter	to count	VS	84	2.43	1.07	2.30	0.84	4.00	0.79	3.10	0.79	2.60	0.96	43.65	1,318.10
crier	to shout	VS	84	3.37	1.10	1.50	0.78	1.80	0.70	2.95	1.28	2.60	1.04	27.58	1,281.82

APPENDIX C (Continued)

Modal Verb	English	Source	Name Agreement (>80%)	Image Agreement		Age of Acquisition		Visual Complexity		Familiarity		Image Variability		Frequency	Reaction Time
				M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*		
cueillir	to pick	VS	84	3.10	1.27	2.43	0.77	3.05	0.94	2.85	1.23	2.56	1.00	5.97	1,224.41
décoller	to take off	VS	97	3.70	1.76	2.90	0.92	2.40	0.82	3.05	1.28	2.00	0.82	3.52	1,096.29
dépasser	to pass	VS	84	3.53	1.14	2.77	0.90	3.60	0.99	2.50	1.54	2.36	0.91	17.55	1,264.68
descendre	to go down	VS	100	4.43	0.97	1.77	0.82	2.15	0.81	4.05	0.89	2.52	0.87	41.19	1,074.91
dessiner	to draw	VS	97	3.47	0.90	1.60	0.89	2.95	0.69	2.70	1.38	3.12	1.20	9.74	1,610.44
écouter	to listen	VS	89	2.37	1.13	1.60	0.81	3.80	0.89	3.75	1.02	3.16	1.18	34.77	1,516.34
effacer	to clean	VS	87	2.83	1.21	2.43	0.90	3.05	0.83	2.35	1.18	2.04	0.79	12.48	1,102.69
essuyer	to wipe	VS	89	3.63	1.25	2.60	1.04	3.40	0.68	4.05	1.15	2.36	0.86	6.03	1,623.60
faner (se)	to fade	VS	87	4.53	0.63	3.23	1.04	2.50	0.83	2.45	1.23	1.72	1.06	0.65	1,253.81
filmer	to film	VS	95	4.47	0.73	3.33	0.92	2.80	0.95	2.80	1.44	2.72	1.28	0.9	1,119.88
gonfler	to pump up	VS	89	2.53	1.01	2.40	1.00	3.15	0.88	2.10	1.12	2.16	0.90	3.68	1,483.96
jeter	to throw	VS	100	3.67	1.03	1.97	1.03	2.30	0.66	4.25	1.02	2.76	1.13	38.77	880.30
jouer	to play	VS	95	2.03	1.22	1.23	0.50	2.45	1.00	2.65	1.63	3.92	0.91	94.23	1,280.28
jurer	to swear	VS	82	2.67	1.49	3.20	0.85	2.90	0.72	1.65	1.14	2.12	0.88	4.39	1,636.58
mesurer	to measure	VS	95	3.87	0.86	3.23	0.82	2.50	0.83	2.70	1.22	2.40	0.96	25.16	1,277.31
offrir	to give	VS	92	4.13	1.11	2.43	0.94	2.70	0.73	4.00	0.79	2.96	1.17	34.71	1,123.53
payer	to pay	VS	97	4.07	1.01	2.53	1.01	3.40	0.75	4.40	0.68	2.48	1.00	38.77	1,446.06
peindre	to paint	VS	100	3.57	1.30	2.40	1.10	2.95	0.76	2.50	1.67	2.76	1.09	15	954.97
peser	to weigh	VS	95	3.60	1.25	2.63	0.96	3.35	0.99	2.30	1.22	2.08	0.81	11.03	1,168.43
piquer	to prick	VS	100	3.33	1.24	2.23	1.10	2.00	0.79	1.80	0.89	2.60	0.82	7.45	1,205.65
presser	to squeeze	VS	97	3.60	1.57	3.00	1.08	2.75	0.91	3.15	1.27	2.16	0.80	7.65	1,159.26
punir	to punish	VS	87	3.67	1.12	1.97	0.93	3.20	0.89	1.70	1.03	1.76	0.88	5.65	1,395.75
ramer	to row	VS	87	4.43	0.77	3.27	0.87	2.75	0.91	2.00	1.08	1.72	0.74	0.97	1,188.35
scier	to saw	VS	92	4.63	0.67	3.07	1.01	2.50	0.83	2.05	1.36	1.44	0.71	2.39	932.89
sculpter	to carve	VS	95	3.90	1.18	3.73	0.78	3.25	0.85	1.95	1.39	2.24	1.23	1.26	1,580.77
semer	to sow	VS	100	4.53	0.73	3.27	1.01	3.30	0.80	2.10	1.25	1.80	0.82	3.03	1,072.93
siffler	to whistle	VS	100	3.53	0.86	2.40	0.72	1.95	0.69	1.45	0.76	1.88	0.83	4.32	1,263.71
sucer	to suck	VS	97	2.80	1.27	1.57	0.77	2.40	1.05	1.85	1.46	2.48	0.92	2.48	1,348.97
téléphoner	to phone	VS	92	4.30	0.88	2.10	1.12	3.25	0.72	4.50	0.69	2.92	1.15	10.45	879.84
tirer	to pull	VS	97	2.57	1.38	2.17	0.87	3.10	1.02	1.80	1.15	2.80	1.04	76.35	1,010.84
traire	to milk	VS	100	4.80	0.41	3.23	0.97	2.80	0.89	1.50	0.76	1.36	0.64	1.16	1,027.47

Note—MD, pictures from Masterson and Druks, 1998; VS, added pictures.

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