

CONCRETENESS AND EMOTIONAL VALENCE RATINGS OF 399 DUTCH NOUNS

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This paper presents norms for concreteness and emotional valence of 200 monosyllabic and 199 three-syllabic nouns. Both sets of words were comparable in lexical familiarity. Each word was rated for both characteristics by at least 145 raters. Test-retest and inter-rater reliability proved high for both concreteness and emotional valence ratings. The norms also proved reliable in comparison to three other studies, and they proved effective in two experiments: one with concreteness as an independent variable and one with emotional valence as an independent variable. The nouns, their mean rating and standard deviation are presented in the appendices, together with two measures of their frequency of occurrence.

Introduction

In experimental psychological research the use of words as stimuli is common practice. There is for instance the study of word processing itself (e.g., Brysbaert, 1996; Brysbaert & Praet, 1992). Furthermore, the use of word stimuli is widespread in the study of other cognitive skills and functions such as memory (e.g., Estes, 1985; Rundus & Atkinson, 1970), attention (e.g., Allport, Antonis, & Reynolds, 1972; Spelke, Hirst, & Neisser, 1976), and time perception (e.g., Ornstein, 1969; Poynter, 1983). Findings in all of these domains show that word characteristics of the words and word sets used, affect task performance. For instance, memory for longer words is poorer than that for shorter words (Baddeley, Thomson, & Buchanan, 1975), due to the rehearsal process that is responsible for the maintenance of information in short-term memory. Likewise, word characteristics may influence memory for word lists by means of a long-term memory contribution to short-term memory. Due to

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such contribution memory span is larger for familiar words than for unfamiliar words (Hulme, Maughan, & Brown, 1991), for words that refer to concrete, imaginable things than for words referring to abstract things (Paivio, 1986, 1991; Paivio, Walsh, & Bons, 1994), and for lists of words belonging to the same category than for heterogeneous word lists (Poirier & Saint-Aubin, 1995). Words are also known to be encoded on several dimensions (Wickens, 1972). Evidence for this is found in experiments on release from proactive inhibition (Wickens & Clark, 1968). The typical finding is that words presented on shift trials (i.e., words that in comparison to words on previous memory trials differ in value on encoding dimensions such as emotional valence, frequency, taxonomic categories, sense impression, language, etc.) are remembered better (delayed recall) than those on non-shift trials. The emotional valence of words has for instance been shown to influence recall and recognition, under conditions of few retrieval cues (Reber, Perrig, Flammer, & Walter, 1994), and when conscious, intentional recollection is required (Danion, Kauffmann-Muller, Grange, & Zimmerman, 1995). Furthermore, memory performance in general is known to be better for words that differ in at least one characteristic from other words presented in a list (von Restorff, 1933). This is an effect that researchers normally would like to prevent.

It needs no great argumentation to see that if one is to use word stimuli in order to study aspects of human cognition, care has to be taken in selecting the stimulus sets. If not under control, differences in the characteristics of the sets used, could have an undesirable effect on the outcome of the experiment. Consequently, it will become impossible to draw clear conclusions due to confounding of factors. Such drawbacks can be avoided if stimulus sets are carefully selected on the basis of their specific characteristics. While for the English language norms are available for a great deal of word characteristics (familiarity, frequency, concreteness, imagery, meaningfulness, free recall, availability, goodness (on a good-bad scale), emotionality, pronounceability, categorisability, number of attributes, pleasantness, orthographic variables, grammatical usage, age of acquisition, ambiguity), the number of norm studies available in the Dutch language are rather limited: affectivity and familiarity (Hermans & De Houwer, 1994), familiarity and recognition (De Vries, 1986), lexical familiarity (Baayen, Piepenbrock, & van Rijn, 1993), word associations (de Groot, 1988), imaginability (Janssen, 1973; van Loon-Vervorm, 1984), age of acquisition (Kohnstamm, Schaerlaekens, de Vries, Akkerhuis, & Frooninckx, 1981).

The present study provides concreteness and emotional valence norms for 399 Dutch nouns: 199 monosyllabic and 200 three-syllabic. The reason for this choice was twofold. First, as mentioned earlier, it is known that word length (pronunciation time) affects memory performance. As the pronunciation of words differing in only one syllable does not always lead to a difference in

pronunciation time, we opted for two sets of words differing in two syllables. Second, previous norm studies on related characteristics of nouns (affectivity, Hermans & De Houwer, 1994; and imaginability, Janssen, 1973), used words ranging from 1 to 5 or 6 syllables (see Table 1). However, in these studies the words are not evenly distributed among the various *number of syllables* categories, with the set of two-syllabic nouns containing the largest number of items. Selecting a good set of words from these studies may be troublesome if one also wants to control for word length.

Table 1. *Word Sets Used in Previous Norm Studies*

Study	1-syll. N=	2-syll. N=	3-syll. N=	4-syll. N=	5-syll. N=	6-syll. N=
Hermans & De Houwer (1994)	117	164	67	19	3	6
Janssen (1993)	98	131	63	31	3	1

Method

Participants

Three hundred and eleven first-year students at the Faculty of Psychology and Educational Science of the University of Ghent (Belgium) participated for course requirements and credit. The native language of all participants was Dutch. They were seated in two large lecture rooms of approximately 200 seats each, in which they were given a booklet containing all the necessary instruction and rating forms. Before they started to fill in these forms, they were informed about the importance of this kind of study, and about the necessity to judge all items to the best of their ability.

Stimulus Selection

Three hundred and ninety nine Dutch nouns were selected on the basis of (a) the number of syllables, i.e., 199 monosyllabic words, and 200 three-syllabic words. (b) The two sets were selected in such a manner that they are comparable for lexical familiarity measured as the frequency with which a word occurs in printed text, as provided by the Centre for Lexical Information (Baayen et al., 1993). Table 2 gives an overview of the characteristics of the lexical familiarity of those two sets.

Table 2: *Frequency of Occurrence*

Frequency	1-syll. words	3-syll. words
< 2000	188	128
< 3000	64	53
< 4000	18	19
Mean frequency	1986	1949
Standard deviation	622	668

The two sets were put together, and by means of random selection, three lists were constructed: two lists of 150 words (Lists 1 and 3), and one list containing 100 words (List 2). Of each list two permutations were prepared. Each participant rated a permutation of each of these three lists. They were presented in one booklet, with a set of instructions preceding each list. Four combinations of order of lists and permutations were used (see Table 3). In order to obtain a measure of rating reliability, the first fifteen words of each of these 6 resulting list-permutations were presented twice. For each list the second presentation of these words occurred in a different random position.

Design and Procedure

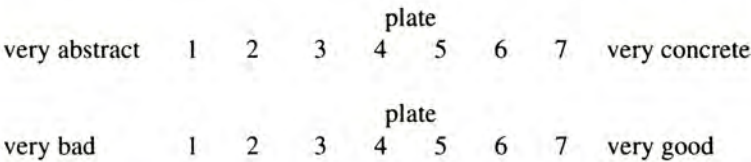
In order to prevent boredom from influencing the ratings, the participants were asked to rate the first and third list, both containing 150 words + 15 reappearances, for one characteristic, while they had to rate the 100 words + 15 reappearances of the second list for the other. So, if the first list had to be rated for concreteness, then the words in the second list were rated for emotional valence. Finally, the words of the third list were rated for concreteness again. One hundred and sixty six participants completed the booklet in this manner. If the first list was rated for emotional valence, then the second list was rated for concreteness, and the third list for emotional valence. One hundred and forty five participants completed the booklet in this manner. Table 3 gives an overview of the data collection strategy.

All words were rated on a seven-point scale, ranging from (1) "very abstract" to (7) "very concrete", and ranging from (1) "very bad" to (7) "very good". Only the end labels were given, and the words were rated by circling the number which indicated its concreteness or emotional value best. Forms were provided which displayed the items for concreteness and for emotional valence as follows:

Table 3. Presentation Order of Lists

Presentation order			1st list	2nd list	3rd list
cond.	N	female	Concreteness	Emotional valence	Concreteness
Cond. 1	40	69%	List 1 Perm. 1	List 2 Perm. 1	List 3 Perm. 1
Cond. 2	42	71%	List 3 Perm. 1	List 2 Perm. 1	List 1 Perm. 1
Cond. 3	42	71%	List 1 Perm. 2	List 2 Perm. 2	List 3 Perm. 2
Cond. 4	42	53%	List 3 Perm. 2	List 2 Perm. 2	List 1 Perm. 2

			Emotional valence	Concreteness	Emotional valence
Cond. 5	35	66%	List 1 Perm. 1	List 2 Perm. 1	List 3 Perm. 1
Cond. 6	35	74%	List 3 Perm. 1	List 2 Perm. 1	List 1 Perm. 1
Cond. 7	39	77%	List 1 Perm. 2	List 2 Perm. 2	List 3 Perm. 2
Cond. 8	36	79%	List 3 Perm. 2	List 2 Perm. 2	List 1 Perm. 2



Each booklet started off with general instructions telling the participants that they would be asked to judge 399 nouns either for concreteness or for whether they induce a good/bad feeling. It was explained that for each judgement a seven point scale was to be used. It was also said that it was not necessary to reflect on all possible meanings of a word, but that instead it would be better to make a quick judgement. The instruction also contained an extensive example on how to use a seven point scale (e.g., boring/interesting). Thereafter, specific instructions were given according to whether the words had to be judged for concreteness or emotional valence. For concreteness the instructions mentioned that nouns can refer to existing things, persons, places, or to things which cannot be seen, heard or touched. As such the referents of abstract nouns cannot be experienced by means of our senses. The extent to which the referents of nouns can be perceived as existing, varies. Subsequently, the participants were instructed to judge the following list of words for the extent to which their referents can be perceived as existing. For emotional valence the instructions mentioned that the referents of nouns can induce a good or a bad feeling. Moreover, the intensity of this feeling can be strong or weak. Then the participants were required to judge the extent to which the nouns induce a good or a bad feeling.

Results

The mean values for concreteness and emotional valence are presented in Appendices A and B, for mono-syllabic and three-syllabic words respectively. In addition, these lists contain the nouns in Dutch, an English translation, and each word's frequency of appearance as reported by Baayen et al. (1993).

Reliability

The correlation between the two kinds of ratings was $r = .06$. This indicates that the participants did rate the nouns for different dimensions. Fifteen words of each of the three lists were rated twice. This allowed us to compute test-retest reliability, which is taken as an index of rating stability. Following the strategy reported by Browne and Ure (1969; see also Hermans & De Houwer, 1994; and Messina, Morais, & Cantraine, 1989), for each of the six lists (3 lists $\times$ 2 permutations), for both kinds of rating, and for each of those fifteen words the means of their first and second appearance were computed across participants. For each list, these two sets of means were correlated, and these coefficients are taken as an indication of rating stability. For both concreteness and emotional valence these correlations always turned out to be higher than $r = .97$.

In order to exclude unreliable raters, we also computed the test-retest correlation for each of the three lists rated by a participant. If this correlation is low, or negative, then this may indicate that (a) the task was not taken seriously, or (b) that the scale was reversed while using it. As it is preferable not to include these kinds of ratings in norm calculations, the following procedure was used to exclude these raters. First, the correlation coefficients of each of the twelve sets obtained by combining 3 Lists, Permutations, and 2 kinds of rating, were transformed into standard z-scores. Second, participants whose z-score was lower than -1.96 (2.5% of the distribution of correlations), were considered as unreliable and excluded from all further calculations. Averaged over the six sets used for each rating-type, this procedure resulted in a mean rejection rate of 6% of the raters for concreteness and 5% for emotional valence.

In addition to the test-retest reliability, rating stability was also checked by computing inter-rater agreement. Therefore, we calculated the mean of all pairwise correlations between the raters given the same list with similar rating instructions (i.e., concreteness or emotional valence). In this manner, a mean correlation was obtained for each of the six lists for both concreteness and emotional valence ratings. These mean inter-rater correlations were then used to estimate the *effective reliability* of the ratings in a way suggested by Rosenthal (1982; see also Hermans & De Houwer, 1994). This procedure is based on the Spearman-Brown estimate of the reliability of measurements, in

which the true magnitude of the characteristic being measured (the true rating of a word), is assumed to remain invariant across measurements (both between and within raters). As in Hermans and De Houwer (1994), effective rating reliability was computed by means of formula (1), in which R indicates the inter-rater reliability, N indicates the number of raters of which a similar set of ratings was obtained, and r stands for the mean inter-rater correlation for a particular list.

$$R = \frac{N \times r}{1 + (N - 1) \times r}$$

R ranges from zero to one. For both the concreteness and the emotional valence ratings all six inter-rater agreements were higher than $R = .97$.

Comparison with Similar Studies

It can be argued that our emotional valence ratings (good/bad) probe the same encoding dimension as the affectivity ratings (positive/negative) of Hermans and De Houwer (1994). If this is correct, and given the high reliability of the norms in both studies, the ratings of nouns that were included in both studies should be (a) highly correlated, and (b) nearly equal. Forty six nouns were common to both studies, 32 monosyllabic and 14 three-syllabic. The correlation between both sets of norms was $r = .97$, with $p < .001$. In order to conclude similarity between emotional valence and affectivity ratings, next to the observed high positive correlation, the norms should also be similar in value. The overall degree of difference between the norm values can be inferred from the slope and from the intercept of the regression equation ($y = b + ax$). With a correlation $r \approx 1$, the slope a will also be near to 1. If in addition the norms do not differ in value, then the intercept b should be near to zero. This is exactly what was found, $b = 0.09$ (see Figure 1).

In the same way, it can be argued that our concreteness ratings (abstract/concrete) probe the same encoding dimension as the imaginability ratings of Janssen (1973) and of van Loon-Vervoor (1984). The present study has 47 nouns, 24 mono-syllabic and 23 three-syllabic, in common with the study of Janssen. The correlation between the two sets of ratings was $r = .95$, with $p < .001$. Here, the intercept was $b = -.84$.

With the study of van Loon-Vervoor there was an overlap of 300 words, 196 mono-syllabic and 104 three-syllabic. The correlation between the two sets of ratings was $r = .89$, with $p < .001$. The intercept was $b = 0.78$ (see Figure 2). $p < .001$.

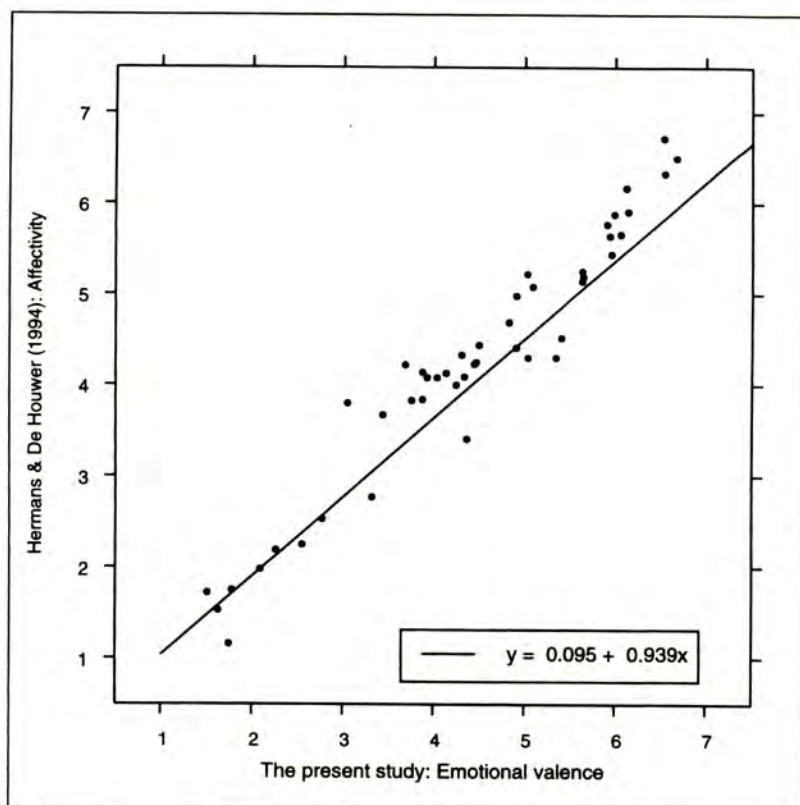


Figure 1. Norm values for emotional valence/affectivity of the same words rated both in the present study and in that of Hermans and De Houwer (1994).

On the one hand, both comparisons show a high positive correlation between the norm values presented here and those presented in earlier studies. On the other hand, as can be seen from the intercept value, the presented norm values do differ somewhat from those of Janssen and of van Loon-Vervoor. There are however some differences with the study presented here. First, the probing question was different, i.e., imaginability vs. concreteness in the present study. Second, these two studies were conducted in the Netherlands, so there may be some differences in the sample groups. So, even though the high inter-study correlations indicate that concreteness does probe the same encoding dimension as imaginability, the results show that they may probe it differently, or that there may be differences between the sample groups (Flemish/Dutch), or both. Taken together, the results indicate that these sets of norms do not completely overlap those of the present study.

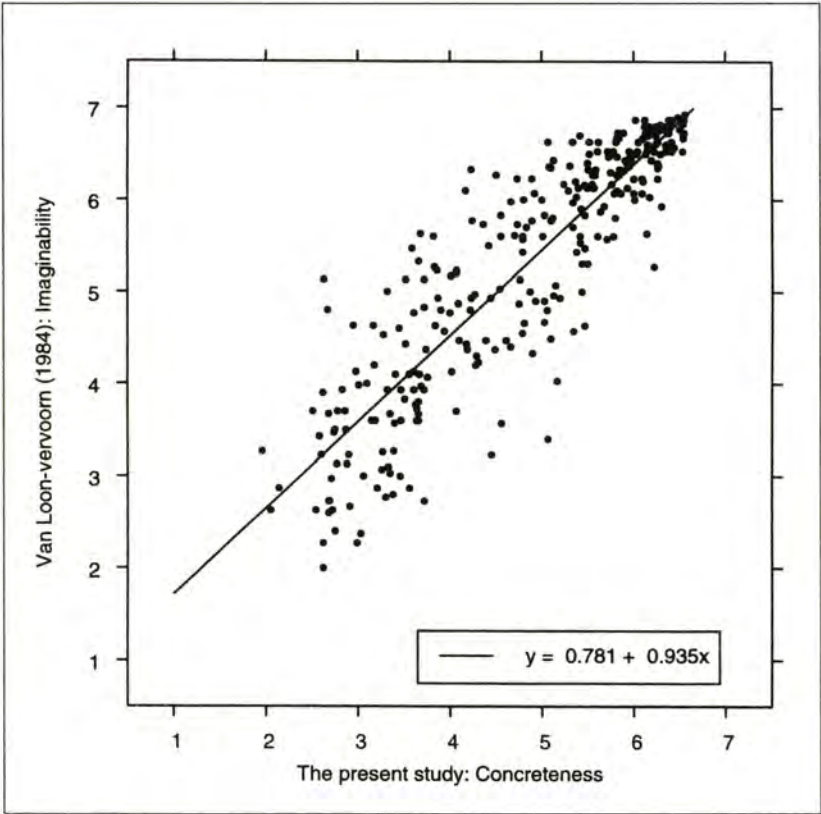


Figure 2. Norm values for concreteness/imaginability of the same words rated both in the present study and in that of van Loon-Vervooorn (1984).

Effectivity of the Norms

Two studies were conducted in which the effectivity of the presented norms was tested. In a first study, the norms for concreteness were used to create two sets of words: one with words of high concreteness, one with words of low concreteness. According to the dual coding theory (Paivio, 1986, 1991) concrete words can be encoded both verbally and visually, whereas abstract words can only be encoded in a verbal manner. This leads to a memory benefit for words referring to concrete things in contrast to words referring to abstract entities. If the norms presented here are reliable, then precisely such a difference should be found in a memory task contrasting a set of nouns rated as concrete and a set of nouns rated as abstract.

On the basis of the norms in Appendices A and B, six lists of 15 words were created. Each list consisted of seven mono-syllabic words and eight three-syllabic words. Three lists consisted of highly abstract words (mean values of concreteness: 2.92, 2.93, 2.95) and three contained words rated as concrete (mean values: 5.94, 5.95, 5.95). The average word frequency of the words used in each list ranged from 49.0 to 50.8 (frequency per million according to the CELEX lexical database, Baayen et al., 1993). Twenty-four first year psychology students of the Faculty of Psychology and Educational Sciences of the University of Ghent participated voluntarily in a 2 (Concreteness) $\times$ 2 (List order) mixed factorial experiment with concreteness of the word list items as a within subjects variable, and with the order of the lists as a between subjects variable. Half of the subjects received the concrete lists first, the other half received the three abstract lists first. The words of each list were presented orally by means of headphones. After presentation of the last word, written free recall was required. As expected, performance on concrete lists ($M = 9.35$) was better than on abstract lists ($M = 6.74$): $F(1, 22) = 81.68, p < .001$. This result confirms the reliability of the concreteness norms presented here.

A second study investigated whether emotional valence could count as an independent dimension for word encoding. To this end an experiment on release from proactive inhibition (RPI) was conducted. Several studies within this paradigm have shown that the semantic meaning of words constitutes a specific encoding dimension (for an overview see Wickens, 1972). In the present study 105 students at the Faculty of Psychology and Educational Sciences of the University of Ghent participated for course requirements. Per trial subjects were presented a triad of words (1200 ms) similar in value on the dimension of interest (e.g. three words of positive valence), preceded by a fixation point (+). Subsequently, a three-digit number was presented and subjects were required to count backwards by three from this number for a period of 30 s. Next they were asked to recall the triad. Seven such trials were presented. In the control condition ($N = 51$) all seven trials consisted of words of the same emotional valence. In the experimental condition ($N = 54$) words of the opposite valence were presented on the seventh trial. The results are shown in Figure 3 and reveal a typical RPI pattern. As long as words of the same valence were presented on subsequent trials, performance systematically continued to drop due to proactive inhibition. However, when words of the opposite valence were presented (the seventh trial in the experimental condition), RPI occurred, such that recall was significantly enhanced in comparison with the sixth trial $t(53) = 2.36, p < .05$. In the control condition performance on trials 6 and 7 did not differ significantly, $t(50) < 1$. The Condition $\times$ Trial interaction effect on the 6th and 7th trial fell short from significance, $t(103) = 1.52, p < .07$. This tendency must however be evaluated by keeping in mind that studies on RPI generally involve twice or three times as many subjects. As such, we think

it is safe to consider the effect reliable. The stimuli of this experiment consisted of the 21 words rated most positively and most negatively on emotional valence in the norm study, out of both the 1-syllable and the 3-syllable words. In short, this experiment showed an effect of release from proactive inhibition using word triads differing in emotional valence as rated in the norm study, hence demonstrating the relevance of this dimension in word processing.

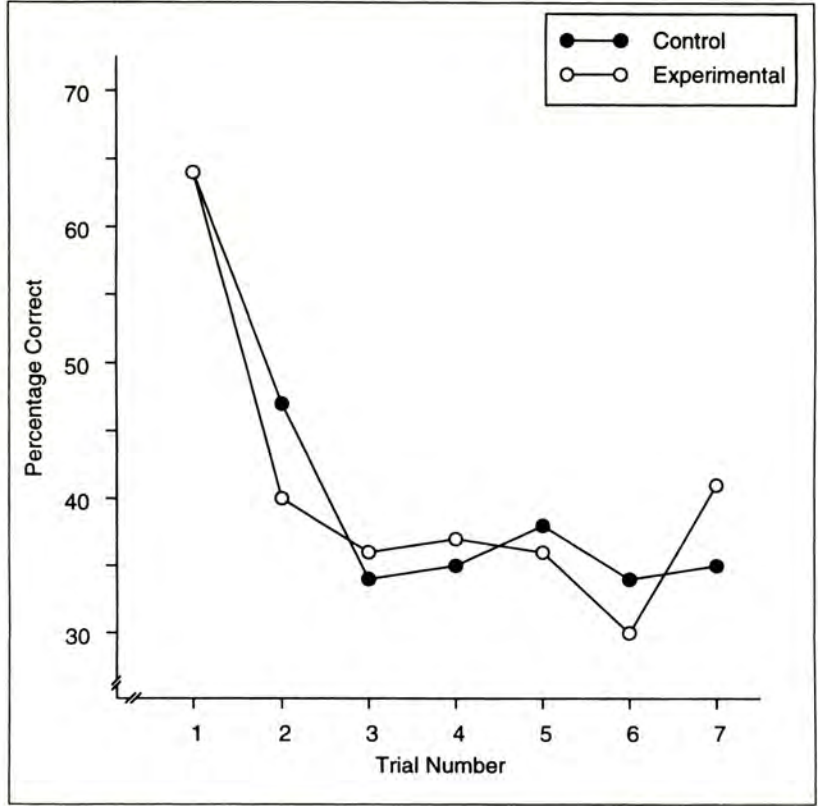


Figure 3. Release from proactive inhibition: Percentage correct recall as a function of trial number and condition. A control condition with word-triads of similar emotional valence on all seven trials, and an experimental condition in which the emotional valence of the word-triads of the seventh trial contrasted those of the preceding trials.

Discussion

A total of 311 subjects participated in this study in which 199 monosyllabic, and 200 three-syllabic Dutch nouns were rated by approximately half of the participants for concreteness and by the other half for emotional valence. About 5% of all rated lists were discarded due to poor personal test-retest reliability on that list. However, even before discarding the ratings obtained from bad raters, test-retest reliability was very high, and this was the case for both concreteness and emotional valence ratings. In addition, the effective reliability of the obtained ratings as measured by the Spearman-Brown R proved to be high.

Taken the high reliability of the ratings, and the large correspondence with similar studies, we think it is safe to conclude that the ratings obtained are stable, and that the procedure used managed to minimise rating errors due to for instance boredom or lack of interest. Moreover, the norms presented did not include the rating of participants identified as bad raters. In addition, both sets of norms proved effective in experimental studies. One study showed that words that were rated as concrete (in the study presented here), were remembered better than words rated as abstract. Another study showed release from proactive inhibition on shift trials in which a triad of words differed in emotional valence from previous trials. In short, the norms presented in Appendices A and B are reliable and complementary to norms presented by Hermans and De Houwer (1994). It was also shown that they are effective in experimental settings. It can thus be concluded that they can safely be used as experimental materials¹.

The norms for the sets of words presented here add to norms presented elsewhere. In particular, given the high similarity between the presented emotional valence ratings and Hermans and De Houwer's (1994) affectivity ratings, the present study provides a substantial enlargement of the database for this dimension. In addition, the presented set could be of particular benefit for those interested in controlling for word length, because both a set of monosyllabic and an equally large set of three-syllabic words are offered, comparable in word frequency, and with norms for emotional valence and concreteness.

¹The tables of Appendices A and B are also available on the web both in postscript and ASCII. To obtain the norms go to <http://www.rug.ac.be>, link to *Faculties, Departments and Laboratories*, then link to *Department of Experimental Psychology*. Finally, click on the link to *Research*, where you will find a link to *Available documents, data, etc.*

References

- Allport, D.A., Antonis, B., & Reynolds, P. (1972). On the division of attention: A disproof of the single channel hypothesis. *Quarterly Journal of Experimental Psychology*, 24, 225-235.
- Baayen, R.H., Piepenbrock, R., & van Rijn, H. (1993). *The CELEX lexical database (CD-Rom)*. Linguistic Data Consortium, University of Pennsylvania, Philadelphia, PA.
- Baddeley, A.D., Thomson, N., & Buchanan, M. (1975). Word length and the structure of short-term memory. *Journal of Verbal Learning and Verbal Behavior*, 14, 575-589.
- Browne, W.P., & Ure, D.M.J. (1969). Five rated characteristics of 650 word association stimuli. *British Journal of Psychology*, 60, 233-249.
- Brysaert, M. (1996). Word frequency affects naming latency in Dutch when age of acquisition is controlled. *European Journal of Cognitive Psychology*, 8, 185-193.
- Brysaert, M., & Praet, C. (1992). Reading isolated words: No evidence for automatic incorporation of the phonetic code. *Psychological Research*, 54, 91-102.
- Danion, J.-M., Kauffmann-Muller, F., Grange, D., & Zimmerman, M.A. (1995). Affective valence of words, explicit and implicit memory in clinical depression. *Journal of Affective Disorders*, 34, 227-234.
- de Groot, A.M.B. (1988). Woordassociatienormen met reactietijden. *Nederlands Tijdschrift voor Psychologie en haar Grensgebieden*, 43, 280-296.
- de Vries, K.L.M. (1986). Vertrouwdheid van woorden en woordherkenning [Word familiarity and word recognition]. *Nederlands Tijdschrift voor Psychologie*, 41, 295-304.
- Estes, W.K. (1985). Memory for temporal information. In J.A. Micho & J.L. Jackson (Eds.), *Time, mind, and behavior* (pp. 151-168). Berlin Heidelberg: Springer-Verlag.
- Hermans, D., & De Houwer, J. (1994). Affective and subjective familiarity ratings of 740 Dutch words. *Psychologica Belgica*, 34, 115-139.
- Hulme, C., Maughan, S., & Brown, G.D.A. (1991). Memory for familiar and unfamiliar words: Evidence for a long-term memory contribution to short-term memory span. *Journal of Memory and Language*, 30, 685-701.
- Janssen, W.H. (1973). Voorstelbaarheidswaarden van 327 zelfstandige naamwoorden. *Nederlands Tijdschrift voor de Psychologie en haar Grensgebieden*, 28, 465-475.
- Kohnstamm, G.A., Schaerlaekens, A.M., de Vries A.K., Akkerhuis, G.W., & Frooninckx, M. (1981). *Nieuwe streeflijst woordenschat voor zesjarigen*. Lisse: Swets & Zeitlinger.
- Messina, D., Morais, J., & Cantrian, F. (1989). Valeur affective de 904 mots de la langue française. *Cahiers de Psychologie Cognitive*, 9, 165-187.
- Ornstein, R.E. (1969). *On the experience of time*. Harmondsworth, England: Penguin.
- Paivio, A. (1986). *Mental representations: A dual coding approach*. New York: Oxford University Press.
- Paivio, A. (1991). Dual coding theory: Retrospect and current status. *Canadian Journal of Psychology*, 45, 225-287.
- Paivio, A., Walsh, M., & Bons, T. (1994). Concreteness effects on memory: When and

- why? *Journal of Experimental Psychology: Learning, Memory and Cognition*, 20, 1196-1204.
- Poirier, M., & Saint-Aubin, J. (1995). Memory for related and unrelated words: Further evidence on the influence of semantic factors in immediate serial recall. *The Quarterly Journal of Experimental Psychology*, 48A, 384-404.
- Poynter, W.D. (1983). Duration judgment and the segmentation of experience. *Memory & Cognition*, 11, 77-82.
- Reber, R., Perrig, W., Flammer, A., & Walter, D. (1994). Levels of processing and memory for emotional words. *Schweizerische Zeitschrift für Psychologie*, 53, 78-85.
- Rosenthal, R. (1982). Conducting judgment studies. In K.R. Scherer & P. Ekman (Eds.), *Handbook of methods in nonverbal research* (pp. 387-361). Cambridge: Cambridge University Press.
- Rundus, D., & Atkinson, R.C. (1970). Rehearsal processes in free recall: A procedure for direct observation. *Journal of Verbal Learning and Verbal Behavior*, 9, 99-105.
- Spelke, E.S., Hirst, W.C., & Neisser, U. (1976). Skills of divided attention. *Cognition*, 4, 215-230.
- van Loon-Vervoorn, W.A., (1984). Afbeeldbaarheidsnormen van 1087 Nederlandse woorden. *Nederlands Tijdschrift voor de Psychologie en haar Grensgebieden*, 39, 462-470.
- von Restorff, H. (1933). Über die Wirkung von Bereichsbildungen im Spurenfeld. *Psychologische Forschung*, 18, 299-342.
- Wickens, D.D. (1972). Characteristics of word encoding. In A.W. Melton & E. Martin (Eds.), *Coding processes in human memory* (pp. 191-215). New York: Winston.
- Wickens, D.D., & Clark, S., (1968). Osgood dimensions as an encoding class in short-term memory. *Journal of Experimental Psychology*, 78, 580-584.

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Appendix A²

The information presented below contains norm ratings on emotional valence and concreteness of mono-syllabic nouns. The table shows the nouns in Dutch, a translation in English, mean rating values and their standard deviation, and word-frequency information (CELEX lexical database, Baayen, Piepenbrock, & van Rijn, 1993).

Dutch	English	Mean rat. Em. val.	Std Em. val.	Mean rat. Concr.	Std Concr.	Freq.	Freq./ mlj
baan	job	4.91	1.32	4.90	1.43	3121	74
baas	boss	3.07	1.23	5.01	1.36	2866	68
bal	ball	5.15	1.14	6.24	1.28	1515	36
band	tyre	4.77	1.31	4.50	1.64	3181	75
bar	bar	5.19	1.46	6.01	1.12	1251	30
beest	animal	4.37	1.58	5.71	1.22	1673	39
bel	bell	4.42	1.34	6.22	1.03	1446	34
berg	mountain	5.38	1.16	6.15	1.09	2338	55
bier	beer	4.34	1.90	6.28	0.93	2725	64
blok	block *	2.73	1.37	5.03	1.47	1499	35
bocht	curve	3.83	1.20	5.12	1.51	1202	28
boog	bow	4.25	1.13	5.40	1.51	1966	46
boord	edge	3.57	1.07	4.66	1.68	1973	47
boot	boat	5.35	1.13	6.27	1.18	2829	67
bord	plate	3.93	1.02	5.95	1.30	2695	64
brand	fire	2.13	1.29	5.52	1.21	1910	45
bril	glasses	3.05	1.30	6.54	0.78	1544	36
broek	trousers	4.91	1.13	6.35	0.90	2605	61
bron	source	5.45	1.19	4.44	1.56	2730	64
brood	bread	4.91	1.30	6.54	0.85	2965	70
brug	bridge	4.42	1.17	6.19	0.97	2189	52
buik	belly	4.45	1.47	6.37	0.86	2946	70
bus	bus	3.76	1.30	6.29	0.97	1695	40
cel	cell	2.18	1.41	5.07	1.77	1958	46
daad	deed	4.86	1.23	3.76	1.49	2446	58
dak	roof	4.55	1.24	6.19	1.08	2431	57
dal	valley	4.25	1.67	4.89	1.39	1513	36
dank	thanks	6.06	0.89	3.47	1.43	3348	79
doos	box	4.14	0.99	6.26	1.22	1648	39
drank	drink	4.62	1.78	5.76	1.21	1653	39
duim	thumb	4.68	1.11	6.55	0.88	1289	30
duur	duration	3.08	1.20	3.32	1.34	2570	61
eer	honour	5.05	1.41	2.60	1.42	1660	39
ei	egg	4.68	1.32	6.50	1.00	2839	67
eis	demand	2.56	1.10	2.74	1.25	3420	81
ernst	seriousness	4.09	1.33	2.68	1.25	1325	31

* The remarkably low emotional score for the word block may be attributed to its more frequent connotation among Flemish students: study leave prior to exams.

² See footnote 1.

Dutch	English	Mean rat. Em. val.	Std Em. val.	Mean rat. Concr.	Std Concr.	Freq.	Freq./ mlj
feest	party	6.14	0.93	4.92	1.41	2563	60
fiets	bicycle	5.40	1.13	6.56	0.95	2048	48
flat	apartment	4.07	1.36	5.84	1.09	1311	31
fout	mistake	2.72	1.26	3.52	1.47	2102	50
gast	guest	5.31	1.08	5.10	1.40	2391	56
geur	scent	5.41	1.21	4.02	1.94	2947	70
god	god	3.33	1.69	1.96	1.65	2431	57
goud	gold	5.03	1.52	5.75	1.42	1518	36
graad	degree	3.85	1.34	2.95	1.41	1299	31
gras	grass	5.65	1.21	6.26	0.98	2645	62
graf	grave	2.09	1.50	5.78	1.38	1457	34
greep	grip	3.07	1.17	3.66	1.47	1900	45
groei	growth	5.61	1.07	4.10	1.44	2584	61
hal	lobby	3.80	0.95	5.79	1.18	1278	30
hals	neck	4.93	1.10	6.29	0.96	2431	57
hek	fence	3.76	1.03	6.13	1.08	1307	31
held	hero	5.09	1.29	4.24	1.57	1407	33
helft	half	3.83	1.03	4.17	1.53	3469	82
hoed	hat	4.31	1.25	6.41	0.96	1752	41
hoop	hope	5.93	1.10	2.67	1.54	1242	29
hout	wood	4.71	1.27	6.09	1.22	2035	48
hut	hut	4.81	1.38	6.30	0.96	1635	39
jas	coat	4.23	1.33	6.38	1.01	2089	49
jeugd	youth	5.96	0.94	3.90	1.47	2688	63
jong	young	5.89	0.90	3.68	1.52	1747	41
jurk	dress	4.66	1.69	6.44	0.85	1794	42
kaas	cheese	4.83	1.44	6.31	1.11	2266	53
kast	cupboard	4.07	0.98	6.41	0.92	2021	48
kat	cat	4.91	1.77	6.53	0.94	3039	72
keel	throat	3.88	1.29	6.22	1.05	2581	61
kern	core	4.43	1.19	3.52	1.48	1842	43
kin	chin	4.00	1.14	6.35	1.03	1377	32
kip	chicken	4.45	1.39	6.55	0.83	1411	33
kist	chest	3.23	1.58	6.15	1.17	1886	45
klacht	complaint	2.46	1.02	3.35	1.40	1875	44
klank	sound	5.61	1.21	3.61	1.73	1391	33
klant	customer	4.27	1.12	5.38	1.26	2121	50
klap	blow	2.39	1.10	4.55	1.58	2015	48
klas	class	3.88	1.44	5.59	1.28	2027	48
klok	clock	3.96	1.32	6.15	1.21	1569	37
knop	button	4.02	1.06	5.82	1.27	1269	30
koe	cow	4.48	1.41	6.54	0.85	1514	36
kom	bowl	4.12	1.03	5.52	1.58	1450	34
komst	coming	5.21	1.28	3.64	1.47	1395	33
kreet	shriek	3.88	1.59	4.93	1.59	1466	35
kruis	cross	3.16	1.59	5.50	1.61	1651	39
kust	coast	6.24	1.01	5.91	1.10	2184	52
laag	layer	2.96	1.10	3.56	1.49	1679	40
lach	laugh	6.53	0.83	4.89	1.59	1619	38
lamp	lamp	4.64	1.09	6.27	1.03	1307	31
last	burden	2.10	0.92	3.47	1.43	3055	72
les	lesson	3.58	1.32	4.79	1.43	1370	32
lied	song	6.06	0.80	5.44	1.51	1578	37
lijk	corpse	1.78	1.32	5.80	1.46	1662	39
lijst	list	3.66	1.20	5.57	1.44	1858	44

Dutch	English	Mean rat. Em. val.	Std Em. val.	Mean rat. Concr.	Std Concr.	Freq.	Freq./ mlj
lijf	body	4.69	1.46	5.82	1.18	2591	61
lot	fate	3.60	1.64	2.63	1.60	2336	55
maag	stomach	3.84	1.22	5.38	1.36	1690	40
maan	moon	5.92	1.07	6.12	1.19	2759	65
maart	March	4.57	1.37	4.15	1.86	1832	43
maat	size	4.17	1.39	3.94	1.58	1578	37
markt	market	4.91	1.12	5.10	1.45	2869	68
mei	May	5.23	1.54	4.28	1.98	2641	62
melk	milk	4.73	1.56	6.41	0.82	2144	51
mes	knife	3.09	1.51	6.41	0.99	1733	41
moed	courage	5.97	1.09	2.62	1.43	2101	50
moord	murder	1.75	1.11	5.03	1.53	1888	45
nieuws	news	4.58	1.43	4.23	1.54	1237	29
nood	need	2.52	1.39	2.83	1.31	1296	31
norm	standard	3.23	1.25	2.58	1.41	2830	67
pak	packet	4.15	1.32	5.13	1.68	2606	61
pan	pan	4.07	1.22	6.10	1.33	1492	35
park	park	5.99	1.13	5.86	1.10	1622	38
pas	pace	3.84	1.09	3.87	1.66	1281	30
pers	press	3.78	1.37	4.01	1.40	1712	40
plaat	record	5.23	1.35	5.61	1.39	1658	39
plank	plank	3.95	1.15	5.83	1.31	1431	34
plein	square	5.04	1.12	5.93	1.19	1402	33
plicht	duty	3.36	1.35	2.78	1.29	1571	37
poort	gate	4.14	1.16	6.03	1.13	1468	35
poot	paw	3.87	1.27	5.82	1.27	1701	40
poos	while	3.78	0.94	2.51	1.27	1956	46
pot	pot	3.82	1.14	6.00	1.36	1482	35
proef	test	3.20	1.15	4.31	1.48	1361	32
rechts	right	3.39	1.83	4.18	1.95	1369	32
reeks	series	3.80	1.05	3.40	1.56	2508	59
rij	row	3.31	1.12	4.73	1.49	3267	77
ring	ring	5.14	1.45	5.96	1.23	1424	34
rok	skirt	4.47	1.64	6.24	1.04	1312	31
rook	smoke	3.12	1.69	5.56	1.24	1580	37
roos	rose	5.99	1.09	6.29	0.99	1213	29
rots	rock	4.83	1.26	6.21	1.07	1491	35
schaal	scale	3.77	0.97	4.23	1.69	2368	56
schoen	shoe	4.32	1.16	6.48	0.93	2861	68
schok	shock	2.77	1.18	3.45	1.42	1245	29
schoot	lap	5.12	1.32	4.79	1.47	1725	41
schrik	fright	2.43	1.12	3.01	1.47	1311	31
slaap	sleep	5.91	1.06	4.70	1.68	134	3
slaaf	slave	1.53	0.86	5.42	1.46	1836	43
slag	blow	2.64	1.24	4.79	1.38	2647	62
slot	lock	3.72	1.31	5.24	1.61	3042	72
smaak	taste	5.53	1.04	3.66	1.69	3276	77
sneeuw	snow	5.64	1.57	6.17	0.90	1652	39
soort	sort	3.91	1.03	3.06	1.51	14050	332
spier	muscle	4.80	1.31	5.43	1.50	1321	31
sport	sport	5.64	1.33	4.73	1.63	1578	37
sprong	jump	4.66	1.32	4.83	1.36	1694	40
spul	stuff	3.65	1.53	3.72	1.78	1391	33
staart	tail	3.73	1.31	6.15	1.09	1374	32
stam	trunk	4.65	1.11	5.08	1.51	1291	30

Dutch	English	Mean rat. Em. val.	Std Em. val.	Mean rat. Concr.	Std Concr.	Freq.	Freq./ mlj
staf	rod	3.53	1.17	4.79	1.69	1236	29
steek	stab	2.92	1.24	4.07	1.60	1759	42
ster	star	5.98	1.17	5.82	1.43	2604	61
steun	support	5.85	1.12	2.99	1.42	2473	58
stijl	style	5.23	1.14	3.30	1.55	2088	49
stok	stick	3.42	1.23	6.04	1.32	1469	35
straf	punishment	2.09	1.03	3.61	1.43	2001	47
strand	beach	6.42	0.87	6.24	0.88	2178	51
streek	region	4.42	1.22	4.07	1.40	3215	76
stroom	stream	4.64	1.33	4.54	1.69	2009	47
struik	bush	4.87	1.22	5.97	1.17	1254	30
stuk	piece	3.62	1.49	4.00	1.63	9600	227
stuur	steering wheel	4.26	1.27	6.02	1.13	1872	44
tak	branch	4.71	1.19	5.76	1.30	2305	54
tas	bag	4.04	1.06	6.00	1.15	1614	38
taxi	taxi	4.00	1.31	6.10	1.04	1211	29
teen	toe	4.22	1.23	6.41	0.87	1422	34
thee	tea	4.45	1.81	6.26	0.92	2181	51
tocht	draught	5.08	1.35	4.61	1.44	1738	41
ton	barrel	3.66	1.23	5.51	1.49	1286	30
touw	rope	4.01	1.23	6.19	1.11	1522	36
traan	tear	3.59	1.72	5.58	1.48	3264	77
trein	train	4.86	1.45	6.42	0.86	3435	81
troep	mess	2.85	1.36	4.07	1.63	1784	42
twee	two	4.80	1.64	4.35	2.26	1714	40
vak	compartment	3.64	1.17	3.83	1.55	2182	51
val	fall	2.43	1.06	4.55	1.53	1491	35
vel	skin	4.30	1.40	6.09	1.03	1386	33
veld	field	5.15	1.28	5.29	1.34	2392	56
vent	fellow	4.17	1.55	5.37	1.42	1700	40
vis	fish	4.39	1.65	6.37	0.95	3104	73
vlag	flag	4.15	1.43	6.05	1.18	1217	29
vlak	surface	3.89	0.99	4.09	1.73	1917	45
vlam	flame	5.04	1.41	5.34	1.28	1452	34
vlees	meat	3.69	1.68	5.85	1.22	3444	81
vloer	floor	4.01	0.98	5.89	1.16	2827	67
vlucht	flight	3.07	1.39	3.59	1.48	2444	58
vrees	fear	2.55	1.17	2.75	1.37	1441	34
vrucht	fruit	5.69	0.98	5.47	1.38	1635	39
wacht	guard	3.26	1.21	3.86	1.51	1330	31
wand	wall	3.88	0.98	5.31	1.39	1885	44
wang	cheek	5.45	1.18	6.27	0.97	2832	67
wens	wish	6.06	0.79	3.40	1.59	2754	65
wier	seaweed	3.82	1.44	5.78	1.29	1465	35
winst	profit	4.82	1.42	3.72	1.48	2004	47
wolk	cloud	5.35	1.48	5.42	1.39	2040	48
zaad	seed	4.89	1.31	5.35	1.35	1339	32
zaal	hall	3.98	1.09	5.68	1.32	2250	53
zand	sand	5.93	1.10	6.17	1.12	2365	56
ziel	soul	4.95	1.43	2.05	1.36	3224	76
zon	sun	6.54	0.73	6.12	1.04	1953	46
zout	salt	3.86	1.32	5.93	1.30	1592	38
zweet	sweat	2.61	1.29	5.84	1.16	1553	37

Appendix B¹

The information presented below contains norm ratings on emotional valence and concreteness of three-syllabic nouns. The table shows the nouns in Dutch, a translation in English, mean rating values and their standard deviation, and word-frequency information (CELEX lexical database, Baayen, Piepenbrock, & van Rijn, 1993).

Dutch	English	Mean rat. Em. val.	Std Em. val.	Mean rat. Concr.	Std Concr.	Freq.	Freq./ mlj
aanleiding	reason	3.91	1.09	2.54	1.14	3042	72
aanmerking	remark	3.59	1.15	2.64	1.06	1327	31
aanwijzing	indication	4.50	1.20	3.28	1.43	1828	43
aardappel	potato	4.14	1.37	6.38	1.01	1171	28
achtergrond	background	4.08	1.27	2.75	1.30	2669	63
advocaat	lawyer	3.44	1.45	5.47	1.26	1331	31
afdeling	department	3.78	1.09	4.18	1.46	2795	66
afwijking	deviation	2.96	1.38	3.23	1.40	1203	28
alcohol	alcohol	4.03	1.68	5.47	1.27	1230	29
ambtenaar	civil servant	3.10	1.07	5.17	1.27	2473	58
apparaat	apparatus	3.84	1.21	4.87	1.61	1324	31
arbeider	labourer	4.02	1.21	5.61	1.18	2606	61
argument	argument	4.66	1.17	3.03	1.43	2271	54
augustus	August	6.19	1.07	4.57	1.92	1688	40
avontuur	adventure	6.18	0.84	3.51	1.68	1233	29
bedoeling	intention	4.46	1.15	2.71	1.22	3558	84
beginsel	principle	3.75	1.16	2.72	1.28	2546	60
bejaarde	elderly person	4.18	1.41	5.55	1.28	1152	27
belasting	tax	2.26	1.07	3.69	1.64	1569	37
belofte	promise	5.36	1.33	3.64	1.68	1179	28
bepaling	definition	3.77	1.03	2.68	1.20	1778	42
beperking	restriction	2.48	0.96	3.25	1.37	1693	40
beschaving	civilization	4.89	1.45	3.28	1.59	1412	33
bescherming	protection	5.69	1.07	3.17	1.38	1666	39
beschikking	disposition	4.17	1.24	2.75	1.22	2126	50
beschouwing	consideration	3.90	1.05	2.39	1.21	1848	44
beschrijving	description	4.12	1.05	3.46	1.41	2027	48
bespreking	discussion	4.16	1.27	3.69	1.48	1430	34
bevoegdheid	authority	4.20	1.27	2.77	1.21	1815	43
bevolking	population	4.04	1.02	4.19	1.61	3520	83
bevrijding	liberation	6.19	0.76	4.05	1.69	1268	30
bewoner	inhabitant	4.32	1.04	5.24	1.28	1485	35
bewustzijn	consciousness	5.39	1.13	2.46	1.40	2834	67
bezoeker	visitor	5.35	1.10	5.06	1.41	1405	33
bijdrage	contribution	4.61	1.22	3.26	1.33	1965	46
bladzijde	page	3.69	1.12	5.81	1.35	1325	31

¹ See footnote 1.

Dutch	English	Mean rat. Em. val.	Std Em. val.	Mean rat. Concr.	Std Concr.	Freq.	Freq./ mlj
boerderij	farm	5.18	1.34	5.92	1.09	1620	38
buitenland	foreign country	6.24	0.88	4.36	1.62	1339	32
christendom	Christianity	2.58	1.37	3.24	1.76	1525	36
collega	colleague	5.05	1.07	5.03	1.37	2715	64
college	college	3.93	1.27	4.80	1.39	1287	30
commentaar	comment	3.88	1.45	3.66	1.52	1252	30
commissie	committee	3.40	1.19	3.75	1.56	2798	66
computer	computer	3.24	1.70	6.00	1.33	2075	49
conclusie	conclusion	4.63	1.21	3.29	1.40	3345	79
consument	consumer	3.84	1.16	4.29	1.61	1330	31
controle	control	3.55	1.43	3.26	1.38	2307	54
december	December	4.52	1.77	4.14	2.08	1865	44
deelnemer	participant	4.56	1.17	4.84	1.43	1394	33
directeur	manager	3.15	1.31	5.50	1.31	2435	57
discussie	discussion	4.48	1.51	3.84	1.50	3152	74
doeleinde	aim	4.84	1.16	2.77	1.41	1319	31
doelstelling	objective	4.22	1.27	3.09	1.28	2327	55
duisternis	darkness	3.88	1.78	4.14	1.71	1594	38
echtgenoot	husband	4.78	1.57	5.56	1.33	1921	45
eenzaamheid	loneliness	1.76	1.20	3.23	1.75	1485	35
eigenaar	owner	3.86	1.20	5.07	1.49	1736	41
eigenschap	property	4.72	1.12	2.70	1.36	2657	63
ellende	misery	1.73	0.94	2.98	1.44	1525	36
emotie	emotion	5.81	0.98	3.18	1.85	1933	46
energie	energy	6.10	0.88	3.06	1.52	2575	61
evenwicht	balance	5.47	1.13	3.34	1.38	1866	44
fantasie	fantasy	6.27	1.05	2.69	1.73	1590	38
filosoof	philosopher	5.12	1.32	4.40	1.70	1253	30
gebeuren	event	4.62	1.09	2.90	1.37	2818	66
geboorte	birth	5.99	1.36	5.20	1.57	1829	43
gedeelte	portion	3.77	0.91	3.19	1.24	2796	66
geheugen	memory	5.09	1.22	3.21	1.67	1716	40
gemeenschap	community	4.79	1.33	3.28	1.52	2964	70
gemeente	municipality	3.74	1.27	4.49	1.67	3133	74
generaal	general	2.99	1.25	5.42	1.28	2671	63
gestalte	figure	4.31	1.14	4.42	1.65	1978	47
geweten	conscience	5.04	1.37	2.14	1.36	1260	30
gewoonte	habit	4.22	1.27	2.87	1.48	2459	58
gezelschap	company	6.09	1.00	4.22	1.56	2689	63
gezondheid	health	5.94	1.29	3.35	1.58	1850	44
grootmoeder	grandmother	5.50	1.33	6.13	1.13	1214	29
grootvader	grandfather	5.58	1.28	6.14	1.12	1426	34
handeling	act	4.34	1.02	3.39	1.71	2629	62
heilige	saint	2.67	1.40	3.12	1.74	1671	39
hoeveelheid	quantity	4.28	1.10	3.15	1.46	3352	79
horloge	watch	4.51	1.39	6.38	1.00	1457	34
ideaal	ideal	5.76	1.31	2.26	1.52	1793	42
illusie	illusion	4.07	1.63	2.63	1.37	1258	30
industrie	industry	2.52	1.21	4.08	1.53	1357	32
inrichting	design	3.58	1.51	3.72	1.56	1749	41
inspanning	effort	4.50	1.37	3.25	1.49	1593	38
instantie	agency	3.30	1.07	2.91	1.49	2080	49
instelling	attitude	2.74	1.21	4.13	1.54	2970	70
instituut	institution	2.90	1.17	4.47	1.53	1239	29
instrument	instrument	5.47	1.28	5.00	1.59	2027	48

Dutch	English	Mean rat. Em. val.	Std Em. val.	Mean rat. Concr.	Std Concr.	Freq.	Freq./ mlj
jongeman	young man	5.31	1.30	5.44	1.40	1753	41
jongere	youngster	5.39	1.22	4.44	1.50	1377	32
kameraad	companion	6.45	0.82	5.47	1.38	1562	37
kapitaal	capital	3.99	1.64	3.73	1.61	1280	30
kolonel	colonel	2.94	1.36	5.26	1.40	2787	66
kolonie	colony	2.75	1.30	4.08	1.53	1347	32
koningin	queen	3.99	1.42	5.72	1.27	1740	41
kunstenaar	artist	5.72	1.10	5.03	1.59	1777	42
kwaliteit	quality	5.64	1.05	2.88	1.33	3252	77
leerlinge	pupil	4.55	1.18	5.25	1.37	1349	32
luitenant	lieutenant	3.40	1.29	5.26	1.54	1871	44
maatregel	measure	3.14	1.09	3.70	1.48	2793	66
machine	machine	3.05	1.26	5.47	1.53	2591	61
meerderheid	majority	4.07	1.40	3.66	1.61	1572	37
menigte	crowd	3.56	1.50	4.89	1.52	1298	31
museum	museum	4.68	1.58	5.34	1.30	2503	59
november	November	3.64	1.59	4.19	2.00	1772	42
oceaan	ocean	5.96	0.98	5.64	1.32	1286	30
oefening	exercise	4.33	1.24	4.56	1.51	1430	34
officier	officer	2.96	1.29	5.15	1.47	2948	70
oktober	October	4.21	1.54	4.09	2.00	1768	42
onderdeel	part	3.80	0.95	3.89	1.43	2951	70
onderscheid	difference	3.70	1.30	3.30	1.43	2140	50
onderwerp	subject	4.16	0.93	3.38	1.54	3949	93
ongeluk	accident	1.63	0.98	3.82	1.58	2105	50
ontdekking	discovery	5.49	1.11	3.67	1.44	1484	35
ontmoeting	encounter	6.08	0.93	4.39	1.43	1736	41
opleiding	training	5.12	1.28	3.61	1.41	2485	59
opmerking	remark	3.42	1.23	3.56	1.52	2897	68
optreden	performance	5.49	1.27	4.33	1.55	1813	43
opvoeding	upbringing	5.17	1.33	2.90	1.48	1639	39
opwinding	excitement	6.00	1.08	3.12	1.63	1470	35
ordening	arrangement	4.31	1.35	3.15	1.46	1878	44
overgang	transition	4.27	1.15	3.06	1.24	1148	27
overkant	opposite side	4.34	1.09	4.27	1.56	1534	36
overleg	consultation	4.98	1.18	3.06	1.36	1957	46
pagina	page	3.66	1.12	5.83	1.35	1247	29
paragraaf	paragraph	3.46	1.11	5.06	1.62	2075	49
parlement	parliament	3.21	1.26	4.62	1.65	1536	36
personeel	staff	3.75	1.17	4.81	1.33	1729	41
perspectief	perspective	4.27	1.36	3.03	1.46	1141	27
poezie	poetry	5.86	1.06	3.74	1.64	1390	33
politiek	politics	2.97	1.50	3.10	1.54	3257	77
president	president	3.45	1.21	5.50	1.36	2166	51
prestatie	accomplishment	5.53	1.30	3.75	1.47	1491	35
principe	principle	4.30	1.56	2.62	1.41	3271	77
productie	production	3.84	1.26	3.54	1.46	2359	56
professor	professor	3.95	1.22	5.86	1.19	2224	52
programma	programme	4.43	1.26	4.66	1.48	3020	71
provincie	province	3.94	1.07	4.17	1.54	1930	46
psycholoog	psychologist	5.56	1.28	5.13	1.48	1743	41
radio	radio	5.91	1.08	6.24	1.02	2216	52
regeling	regulation	4.19	1.20	3.20	1.43	2336	55
republiek	republic	3.53	1.35	3.69	1.62	1192	28
restaurant	restaurant	5.28	1.22	5.97	1.09	1922	45

Dutch	English	Mean rat.	Std	Mean rat.	Std	Freq.	Freq./ mlj
		Em. val.	Em. val.	Concr.	Concr.		
risico	risk	4.36	1.42	2.90	1.24	2177	51
samenhang	coherence	4.95	1.25	3.14	1.27	1570	37
schilderij	painting	5.32	1.15	5.62	1.57	1595	38
seconde	second	3.52	1.39	4.45	2.03	2741	65
september	September	4.28	1.79	4.26	1.79	1874	44
sigaret	cigarette	3.32	2.15	6.40	1.18	3135	74
slaapkamer	bedroom	5.86	1.14	6.26	0.86	1825	43
slachtoffer	victim	1.77	0.87	4.75	1.50	2205	52
stadium	phase	3.93	1.16	3.72	1.67	1914	45
station	station	4.60	1.29	5.89	1.06	1909	45
tekening	drawing	5.51	1.11	5.73	1.26	1277	30
telefoon	telephone	5.42	1.42	6.35	1.14	3567	84
terugkeer	return	4.48	1.53	3.80	1.42	1234	29
therapie	therapy	4.23	1.54	3.72	1.49	1329	31
toepassing	application	4.25	1.13	3.79	1.42	3229	76
toestemming	permission	4.73	1.37	3.05	1.33	1367	32
traditie	tradition	3.74	1.40	2.95	1.44	2084	49
uitbreiding	expansion	4.19	1.26	2.89	1.34	1244	29
uitdrukking	expression	4.37	1.24	3.15	1.36	3627	86
uitgangspunt	starting point	4.12	1.24	2.85	1.41	1936	46
uitgave	expenditure	3.95	1.20	3.76	1.51	1393	33
uitvoering	execution	4.42	1.17	3.62	1.45	1909	45
uitwerking	elaboration	3.83	1.19	3.27	1.37	1310	31
uniform	uniform	2.78	1.53	5.52	1.40	1589	37
vakantie	holiday	6.67	0.69	4.76	1.66	2319	55
veiligheid	safety	5.79	1.18	2.86	1.48	1395	33
verbazing	amazement	4.82	1.08	3.50	1.54	1909	45
verbeelding	imagination	5.94	1.12	2.90	1.51	1280	30
verbinding	connection	4.55	1.20	3.41	1.52	1837	43
verdieping	storey	3.87	1.24	5.01	1.47	1646	39
verlangen	desire	6.00	0.91	2.71	1.52	2427	57
vermoeden	suspicion	4.08	1.28	2.62	1.16	1159	27
vermogen	capacity	4.97	1.14	2.82	1.36	1920	45
verplichting	obligation	3.01	1.35	3.07	1.52	1518	36
verrassing	surprise	6.12	1.08	4.29	1.65	1173	28
vertrouwen	trust	6.10	1.17	2.58	1.32	1885	44
verwachting	expectation	5.40	1.18	2.61	1.34	2552	60
verwarring	confusion	2.91	1.17	2.68	1.12	1330	31
voorkomen	appearance	4.74	1.24	3.45	1.42	1257	30
voorstelling	show	5.12	1.02	3.11	1.62	2030	48
voorwaarde	condition	3.49	1.16	2.75	1.22	3439	81
voorziening	provision	4.44	1.27	2.77	1.22	1508	36
voorzitter	chairman	3.58	1.18	5.10	1.43	2033	48
waardering	appreciation	5.91	1.09	2.85	1.46	1234	29
waarneming	observation	4.76	1.26	3.63	1.70	1555	37
waarschuwing	warning	3.38	1.37	3.32	1.44	1142	27
wandeling	walk	5.74	1.11	5.34	1.38	1317	31
werkgever	employer	3.80	1.31	5.28	1.21	1282	30
werkloosheid	unemployment	1.51	0.71	4.04	1.79	1149	27
werknemer	employee	3.88	1.31	5.17	1.36	2026	48
werkzaamheid	activity	4.60	1.44	3.21	1.51	1524	36
wijziging	alteration	3.56	1.09	3.33	1.25	1552	37
zekerheid	certainty	5.57	1.22	2.68	1.57	3049	72
ziekenhuis	hospital	2.61	1.55	5.95	1.25	3976	94