

Children's emotional norms for 600 French words

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The present study provides a French child database containing a large corpus of words ($N = 600$) that were rated on emotional valence (positive, neutral, and negative) by French children differing in both age (5, 7, and 9 years old) and sex (girls and boys). Good response reliability was observed in each of the three age groups. The results showed some age differences in the children's ratings. With increasing age, the percentage of words rated positive decreased, whereas the percentage of neutral words increased and the percentage of negative words remained stable. Our study did not reveal marked differences across sex groups. The database compiled here should become a useful tool for experimental studies in which verbal material is used with children. It would be worthwhile in future research to study how children process emotional words and also to control the emotional variable in the same way as other linguistic variables in the experimental design. The norms from this study may be downloaded from brm.psychonomic-journals.org/content/supplemental.

Many words have an emotional meaning. Emotional words can be classified into two categories: words that directly denote an emotion (e.g., *joy*) and words that do not directly denote an emotion but evoke an emotion (e.g., the word *gift* can evoke an emotion such as joy). Osgood, Suci, and Tannenbaum (1957) were the first to propose that valence and arousal are the fundamental dimensions of word meaning for all kinds of words. According to Lang, Bradley, and Cuthbert (1997), valence (pleasant vs. unpleasant) determines the polarity of emotional activation, and arousal (calming vs. exciting) determines its intensity. Experimental studies on memory and reading processes have shown that the emotional characteristics of words (i.e., valence and arousal) affect performance. Word emotionality effects have been found in a variety of cognitive tasks, such as lexical decision tasks (for a review, see Kissler, Assadollahi, & Herbert, 2006) and memory tasks (e.g., Cook, Hicks, & Marsh, 2007; Dewhurst & Parry, 2000; Doerksen & Shimamura, 2001; Ferré, 2003; Kensing & Corkin, 2003; Monnier & Syssau, 2008). Such studies require standardized pools of emotional words.

In the English language, researchers have often used the Affective Norms for English Words, or ANEW, corpus (Bradley & Lang, 1999), which provides valence, arousal, and dominance (controlled vs. controlling) ratings of more than 600 words evaluated by adults. For the French language, three databases have been compiled (Bonin, Méot, et al., 2003; Messina, Morais, & Cantraine, 1989; Syssau & Font, 2005). Bonin, Méot, et al. collected concreteness, imageability, and emotional valence norms for a set of 866 words. Messina et al.'s norms provide valence ratings for 904 nouns with high imageability values. Syssau and Font's norms give two types of emotional valence evaluations for more than 700 words, one on a

3-point scale (*negative, neutral, or positive*) and the other on an 11-point scale ranging from -5 (*very unpleasant*) to $+5$ (*very pleasant*). These three databases are based on adult ratings.

Recently, word emotionality effects have been examined with children—for example, in memory tasks (see Davidson, Luo, & Burden, 2001; Neshat-Doost, Taghavi, Moradi, Yule, & Dalgleish, 1998). As has been pointed out for adults, such studies require standardized pools of emotional words. Having such databases for children would permit the selection of words that are emotionally evocative at each developmental stage (Vasa, Carlino, London, & Min, 2006). This need has generated studies aimed at standardizing emotional word material for children. As far as we are aware, three standardized pools of emotional words for English-speaking children are now available to researchers (i.e., Neshat-Doost, Moradi, Taghavi, Yule, & Dalgleish, 1999; Vasa et al., 2006; Whissel & Nicholson, 1991). Whissel and Nicholson studied the production of synonyms for seven emotion words (*happy, sad, afraid, mad, comfortable, proud, and guilty*) by 74 children 5, 9, and 13 years of age. Similarly, Neshat-Doost et al. (1999) proposed a word list that reports the responses of 221 elementary and secondary school students (mean age, 10 and 14 years) who were asked, via a 10-item questionnaire, to generate as many words as they could to describe an emotional event (e.g., words to describe happy feelings or things that trigger those feelings). For each of the 10 questions, the authors reported the 25 most frequently generated words for males and females and for elementary and secondary school students. Vasa et al. (2006) provided valence ratings for a preselected list of 81 words from three emotional categories (*threat, positive, and neutral*) rated by 174 children 9, 10, and 11 years of age.

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All three of these studies examined the degree to which emotional responses are the same or different across both sex and age. For sex, Whissel and Nicholson (1991) found that, in the youngest group only (5-year-olds), boys produced more synonyms than did girls, whereas Neshat-Doost et al. (1999) and Vasa et al. (2006) reported that girls were more emotionally reactive than boys (i.e., girls produced more emotional words or provided more extreme valence ratings than did boys). For age, Whissel and Nicholson showed that the two groups of older children produced more synonyms than did the 5-year-olds. Similarly, Neshat-Doost et al.'s (1999) results revealed that secondary school students produced significantly more words than did elementary school children. On the other hand, Vasa et al. observed that children's ratings of emotional words were similar across a 3-year age range (9, 10, and 11 years). It is clear from these studies that valence ratings for emotional words vary according to sex and age, at least to an extent. Future child databases of emotional words should, therefore, include sex and age as key variables. The availability of sex-based and age-related ratings of words' emotional characteristics in databases would make them powerful tools for analyzing word emotionality effects in children.

The purpose of the present study was to collect valence ratings of a large pool of words from French children differing in both age (5-, 7-, and 9-year-olds) and sex (boys and girls). We assumed that children as young as 5 were able to rate the emotional valence of words. Previous work has shown that emotional words appear in most children's conversations between the ages of 18 and 36 months (Dunn, Bretherton, & Munn, 1987). Research has addressed children's understanding of these words by examining young children's labeling of facial expressions and children's ability to infer emotions from stories. By 2 years of age, most children can identify and label facial expressions of basic emotions with above-chance accuracy. Accuracy in choosing the appropriate label increases from 2 to 5 years (Denham & Couchoud, 1990; Russell & Widen, 2002; Widen & Russell, 2003). By 5 years of age, most children can accurately understand the emotional states of characters when stories describe familiar situations (Harris, 1985; Lagattuta, Wellman, & Flavell, 1997; Stein & Levine, 1989; Trabasso, Stein, & Johnson, 1981; Widen & Russell, 2004). Taken as a whole, these results indicate that words can induce children to think about emotions at age 5, or even earlier.

Two points motivated us to develop this database. First, there is currently no published database of emotional words for French-speaking children. As was mentioned above, the availability of such a database is crucial for studies whose aim is to assess word emotionality effects in French-speaking children. Second, our database was designed to overcome two important limitations present in existing databases. The first limitation concerns the selection of words used in the database. In some studies, children have been asked to produce words from their own vocabularies (e.g., Neshat-Doost et al., 1999; Whissel & Nicholson, 1991). Although self-produced words are likely to be the most familiar emotional words for

children, they may reflect idiosyncratic responses and thus reduce the reliability of the data. To avoid this limitation, our database makes use of a preselected list of words taken from two French databases (compiled by Bonin, Méot, et al., 2003, and Syssau & Font, 2005). The second limitation is related to the number of emotional words the database comprises. Previous studies with child participants have used only a limited set of words (e.g., the largest database, compiled by Vasa et al., 2006, contains 81 English words). A small number of words seriously lowers the possibility of finding enough words to vary along a series of criteria (e.g., pleasant, unpleasant, and neutral while controlling for age of acquisition [AoA], frequency, and concreteness). This limitation can be overcome by having a large number of words in the database. Our database thus included 600 French words, which were used as material for the valence-rating task with child participants.

In the present study, we first collected valence ratings for each of the three age groups (5-, 7-, and 9-year-olds) and assessed reliability of children's ratings at each age. Then we assessed differences across the three age groups. Given that Vasa et al. (2006) had found similar ratings between the ages of 9 and 11, we checked to see whether this stability would also be observed between ages 5 and 9 for a larger pool of words. Next, we assessed the sex differences suggested by earlier data (McManis, Bradley, Berg, Cuthbert, & Lang, 2001; Neshat-Doost et al., 1999; Vasa et al., 2006) by testing the hypothesis that girls are more emotionally reactive than boys.

METHOD

Participants

Three hundred fifty French children participated in the study: 85 kindergartners (44 girls; mean age, 5.8 years; range, 5.3–6.2; $SD = 0.4$), 127 second graders (75 girls; mean age, 7.8 years; range, 7.2–8.2; $SD = 0.3$), and 138 fourth graders (71 girls; mean age, 9.8 years; range, 9.2–10.3, $SD = 0.4$). The children were recruited from a variety of schools located in or around the cities of Valréas and Montpellier. These areas included a broad range of socioeconomic strata. All children were native speakers of French.

Materials

In all, 600 words were selected from among the emotion databases compiled by Bonin, Méot, et al. (2003) and Syssau and Font (2005). Of these 600 words, 279 occur in both databases, 191 are in Bonin, Méot, et al. only, and 130 are in Syssau and Font only. In the full corpus, 464 of the 600 words were the names of pictures that had already been rated in French by Alario and Ferrand (1999) and by Bonin, Peereman, Malardier, Méot, and Chalard (2003) on a wide range of values, such as printed frequency or AoA. However, in the present study, we used only words and not pictures. The 600 words were selected on the basis of AoA (age 9) as defined in the following sources: Alario and Ferrand (1999); Bonin, Peereman, et al. (2003); Ferrand, Grainger, and New (2003); Lachaud (2007); and Niedenthal et al. (2004).¹ The full 600-word corpus was presented to the 9-year-old children, who had no trouble reading any of the written words. For the 7-year-olds, the corpus was reduced to 588 words, because 12 words were deleted due to their AoA. The 5-year-olds' corpus contained only 200 words after removal of all the words not acquired at age 5. In addition, knowing that the 5-year-old children would not be able to read the written words themselves, all homophones were discarded.

Procedure

Following the procedure developed by Syssau and Font (2005, Evaluation 1), a 3-point scale (i.e., *negative*, *neutral*, and *positive*) was used. In order to keep the rating task simple for the children, the 3 points on the scale were labeled, using drawings of faces showing a sad mouth, a straight mouth, and a smiling mouth, respectively.

For the 5-year-old children, the 200 words were divided into four sets of 50 words. Each child rated two sets of words in two separate sessions. In each session, one full set of 50 words was presented. For each set, the 50 words were written in a test booklet, with 1 word per page. Below each word, the three faces were shown (from left to right: the sad face, the neutral face, and the happy face). A little geometric figure was drawn at the top of each page of the test booklet (instead of a page number) so the experimenter could quickly make sure that the children were on the correct page.

For the 7-year-old children, the 588-word corpus was divided into eight sets: four sets of 74 words and four sets of 73 words. Each child rated two sets of words (one of 74 words and one of 73 words) in two separate sessions. For the 9-year-old children, the 600 words were divided into eight sets of 75 words. Each child rated two sets of words in two separate sessions. For the 7- and 9-year-olds, the words were presented in a test booklet with 15 words per page. Next to each word were the three face drawings.

At each age, the order in which the two sets were rated was counterbalanced across the children. Two different random orders for word presentation were defined for each set (one for each set presentation order).

The children were tested in groups in a quiet room in their school. Each session lasted approximately 45 min at age 5 and 30 min at ages 7 and 9. The two sessions for each child were conducted over a period ranging from 1 day to 1 week. At the first testing session, the experimenter showed the children the face drawings and said, "this person is sulking, is unhappy" (for the first face), "this person doesn't care" (for the second face), and "this person is smiling, is happy" (for the third face). Then four practice items were reviewed. Each word was read aloud by the experimenter and the child at the same time. The children were asked to circle the face that best described their initial feeling upon hearing the word. They were instructed to answer before the next word was read aloud. If a child lagged behind, testing was temporarily stopped to assist the child.

Finally, in order to assess the reliability of the individual ratings over time, the procedure was repeated with a small set of words ($n = 20$; 10 words from the first session and 10 words from the second session) immediately after the second session was completed (see Bonin, Méot, et al., 2003, for an identical reliability assessment). This test lasted approximately 10 min.

RESULTS

For each word, the percentage of children producing each kind of response (negative, neutral, or positive) was calculated for each age group, irrespective of sex. This gave us the percentage of negative, neutral, and positive ratings for each word at the three ages. Percentages were also calculated separately for girls and boys at each age.

Children's Affective Ratings of Words

The children's affective ratings of words were compiled in a database. In order to facilitate database browsing and use, the entries are listed in alphabetical order in column 1, with an English translation in column 2. Column 3 gives the emotional database source ("B" stands for Bonin, Méot, et al., 2003; "S" stands for Syssau & Font, 2005). Although we used words as materials, column 4 lists picture sources (when available), because we believe that

this information may be helpful for future studies ("AF" for Alario & Ferrand, 1999; "B" for Bonin, Peereman, et al., 2003), and column 5 gives the number originally assigned to each picture. Column 6 lists the age at which each word was rated (5, 7, or 9). In the columns reporting overall data (columns 7–33), the percentages of children who evaluated the word as negative, neutral, or positive in each age group are provided, along with the percentages of the girls and boys taken separately. Note that adult emotional ratings of the full corpus of 600 French words were added (columns 34–38) to the data obtained in the present study with children. The adult ratings were taken from Syssau and Font's norms (columns 34–36), and from Bonin, Méot, et al.'s norms (columns 37 and 38). Table 1 presents a sample of this database for the 7-year-old children, for words starting with the letter A. For instance, we can see in Table 1 that, at age 7, the word *agneau* (*lamb*) was evaluated negatively by 8% of the children, neutrally by 17%, and positively by 75%.

Reliability of Children's Ratings

In order to examine the reliability of the children's responses, we performed two correlation analyses. An alpha level of .05 was used for all the correlational analyses. The first analysis correlated repeated ratings (i.e., 20 duplicated words) within each age group (5, 7, and 9) and for each valence percentage (negative, neutral, and positive). These correlations were all significant ($p < .05$) and ranged from .69 for 5-year-old neutral percentages to .97 for 9-year-old positive percentages. In the second analysis, we assigned an order number to the children and then performed a correlation analysis between the data obtained for even-numbered children and the data obtained for odd-numbered children, for the three age groups and the three valence percentages. The correlations were fairly high and significant ($p < .05$) for all the responses (ranging from .61 to .86). In short, the high correlations obtained indicated good response reliability within each of the three age groups and, thereby, validated our word categorization according to the children's responses.

High-Agreement Words Versus Low-Agreement Words

We distinguished between high-agreement (HA) words and low-agreement (LA) words. The former were rated as negative, positive, or neutral by at least 60% of the children. The latter were evaluated as negative, positive, or neutral by fewer than 40% of the children. For instance (see Table 1), at age 7, the word *argent* (*money*) was classified as an HA word because it was evaluated as positive by 90% of the children. On the other hand, the word *ail* (*garlic*) was labeled an LA word because it was evaluated as negative by 39% of the 7-year-old children, as neutral by 28%, and as positive by 33%.

The results in Table 2 show that the distribution of words in the HA and LA categories varied significantly with age [$\chi^2(2) = 17.8, p < .0027$].² At ages 5 and 9, more than 50% of the words were given the same rating by more than 60% of the children in each age group; that is to say,

Table 1
Sample of the Database for the 7-Year-Old Children

French Words	English Translation	Emotional Source	Picture Source	Picture Number	Rating Age	Age 7								
						% Negative			% Neutral			% Positive		
						All	Girls	Boys	All	Girls	Boys	All	Girls	Boys
Abeille	Bee	SB	AF	23	5	48	47	50	26	21	33	26	32	17
Agneau	Lamb	B	AF	362	7	8	10	7	17	14	22	75	76	71
Aigle	Eagle	SB	AF	82	7	11	10	14	22	38	0	67	52	86
Aiguille	Needle	SB	AF	154	7	31	24	36	50	67	28	19	9	36
Ail	Garlic	SB	B	4	7	39	52	14	28	19	43	33	29	43
Aile	Wing	B	B	5	7	0	0	0	19	19	21	81	81	79
Alcool	Alcohol	S			5	55	73	36	21	27	14	24	0	50
Allumette	Match	SB	B	7	7	22	25	17	47	55	33	31	20	50
Ambulance	Ambulance	B	B	8	7	29	32	25	48	47	50	23	21	25
Ami	Friend	S			5	3	0	8	3	5	0	94	95	92
Amour	Love	S			5	25	14	43	22	19	28	53	67	29
Ampoule	Lightbulb	SB	AF	138	7	29	26	34	58	58	58	13	16	8
Ananas	Pineapple	SB	AF	173	7	31	53	7	14	0	29	55	47	64
Âne	Donkey	SB	AF	75	7	16	15	17	31	30	33	53	55	50
Ange	Angel	B	B	9	7	16	15	17	12	15	8	72	70	75
Année	Year	S			7	0	0	0	52	53	50	48	47	50
Antenne	Aerial	B	B	12	7	6	9	0	86	86	86	8	5	14
Appareil photo	Camera	B	AF	268	7	6	5	8	36	26	50	58	69	42
Araignée	Spider	SB	AF	212	7	31	43	15	40	43	39	29	14	46
Arbre	Tree	SB	AF	241	5	0	0	0	58	53	67	42	47	33
Arc	Bow	SB	B	13	7	28	30	25	28	40	8	44	30	67
Argent	Money	SB			5	3	0	7	7	0	14	90	100	79
Arme	Weapon	S			7	34	60	7	21	27	14	45	13	79
Arrosoir	Watering can	SB	AF	251	7	11	5	21	42	47	36	47	48	43
Art	Art	S			9									
Aspirateur	Vacuum cleaner	SB	B	15	7	17	19	14	64	62	72	19	19	14
Assiette	Plate	SB	B	16	5	3	5	0	81	74	92	16	21	8
Autruche	Ostrich	SB	AF	159	7	37	40	33	16	15	17	47	45	50
Avenir	Future	S			7	19	15	25	25	15	42	56	70	33
Avion	Airplane	SB	AF	2	5	22	24	22	36	52	14	42	24	64
Avocat	Avocado	B	AF	326	7	16	21	9	23	16	33	61	63	58

Note—For Emotional Source, S stands for Syssau and Font (2005), and B stands for Bonin, Méot, et al. (2003). For Picture Source, AF stands for Alario and Ferrand (1999), and B stands for Bonin, Peereman, Malardier, Méot, and Chalard (2003).

more than half the words were HA words. Conversely, at age 7, there was less agreement in the ratings, and fewer than 50% of the words were HA words.

In terms of differences between the sexes, chi-squared analyses revealed two significant differences. At age 7, the number of HA words was higher for girls than for boys [out of 588 words, 353 were HA words for girls and 252 were HA words for boys; $\chi^2(1) = 34.73, p < .0027$]. The same pattern was observed at age 9 [out of 600 words, 394 were HA words for girls and 319 were HA words for boys; $\chi^2(1) = 19.44, p < .0027$].

Distribution of High-Agreement Words Into Positive, Neutral, and Negative Response Categories

In order to assess age and sex differences in the children's ratings, we looked at whether the distribution of the HA words in the three response categories (positive, neutral, and negative) varied across the age and sex groups. Because the corpus size differed in each age group, we limited our analysis to the 200 words common to all three age groups—that is to say, the 5-year-old children's corpus. In this 200-word corpus, the total number of HA words was 104 at age 5, 102 at age 7, and 117 at age 9.

For all the age and sex groups pooled together, the majority of the HA words were positive (Table 3). Conversely, negative and neutral words formed a minority of the HA words.

In the case of age, a chi-squared analysis revealed that the distribution of HA words in the positive, negative, and neutral categories varied significantly across age groups [$\chi^2(4) = 41.01, p < .0027$]. A detailed analysis of the distribution showed that the number of negative words did not differ significantly across the three ages ($p > .0027$), whereas the number of neutral words significantly increased between ages 5 and 7 [1 of the 104 HA words was neutral at age 5 vs. 13 out of 102 at age 7; $\chi^2(1) = 11.29, p < .0027$]. The number of positive words fell significantly between the ages of 5 and 7 [101 out of 104 HA words were positive at age 5 vs. 84 out of 102 at age 7; $\chi^2(1) = 12.26, p < .0027$]. It also decreased significantly between ages 7 and 9 [84 out of 102 at age 7 vs. 74 out of 117 at age 9; $\chi^2(1) = 9.9, p < .0027$]. In sum, our results indicated an age-related increase in the number of neutral words between ages 5 and 7 and a continuous age-related decrease in the number of positive words.

For the two sexes, the results did not show any marked sex-related differences. The single main difference that

Table 2
Number of High-Agreement and Low-Agreement Words
in the Corpus for Each Age Group and
for Girls and Boys (With Percentages)

Age	Sex	Words				Total (Corpus Size)
		High Agreement		Low Agreement		
		No.	%	No.	%	
5 years	Girls	116	58	84	42	200
	Boys	111	56	89	44	200
	All	104	52	96	48	200
7 years	Girls	353	60	235	40	588
	Boys	252	43	336	57	588
	All	261	44	327	56	588
9 years	Girls	394	66	206	34	600
	Boys	319	53	281	47	600
	All	340	57	260	43	600

emerged from our results was for the 9-year-olds. At age 9, there was a higher number of neutral words and a lower number of positive words for girls than for boys. A chi-squared analysis indicated that the distribution of HA words into the positive, negative, and neutral categories varied significantly between girls and boys only at age 9 [$\chi^2(2) = 27.29, p < .0027$]. Further analyses revealed that, as compared with boys, girls rated more words as neutral [girls, 37 neutral words out of 134 HA words; boys, 1 out of 61; $\chi^2(1) = 18.02, p < .0027$] and fewer words as positive [girls, 81 positive words out of 134 HA words; boys, 59 out of 61; $\chi^2(1) = 27.24, p < .0027$].

Age and Sex Differences for Individual Words

To further investigate these apparent age and sex differences, we ran chi-squared analyses on ratings for individual words. Given the number of chi-squared tests to be carried out, we divided the sample into two halves. Analyses conducted on the first half-sample were considered to be exploratory, and analyses conducted on the second half-sample were considered confirmatory. We considered only the results of the chi-squared analyses that were confirmed by both halves (i.e., $p < .05$ or $p > .05$ in the two sample halves). The results of individual word analyses are summarized in the last five columns of the database. Age effects on ratings for individual words are given in column 39 for the comparison between ages 5 and 7 and in column 40 for the comparison between ages 7 and 9. Sex effects on ratings for individual words at ages 5, 7, and 9 are shown in columns 41, 42, and 43, respectively. In all these columns, * indicates a significant effect ($p < .05$), NS a nonsignificant effect, and NC a nonconfirmed effect. On average, 84% of the chi-squared analyses were confirmed (ranging from 78% to 88%).

In order to assess age effects on ratings for individual words, we first compared ages 5 and 7. Age differences were noted for only 11 words out of 200 (5.5%). Of these 11 words, 6 were positive words (>60) at age 5 and LA words at age 7: *brosse* (brush), *chien* (dog), *maillot de bain* (swimming costume), *route* (road), *stylo* (pen), and *tire-lire* (piggy bank). A single word was positive at age 5 and neutral at age 7: *feuille* (leaf). Three words were LA words

at age 5 and, at age 7, negative (*maladie* [illness]), neutral (*assiette* [plate]), or positive (*enfant* [child]). The word *poche* (pocket) showed an age difference but did not change category (LA word). Comparisons between ages 7 and 9 showed a significant difference in rating for 15 words out of 588 (2.5%). Six words were LA words at age 7 and neutral at age 9: *enveloppe* (envelope), *étiquette* (label), *oreille* (ear), *poêle* (frying pan), *temps* (time), and *tuyau* (pipe). Four words were positive at age 7 and LA words at age 9: *carte* (playing card), *fée* (fairy), *matin* (morning), and *sein* (breast). The word *rat* (rat) was an LA word at age 7 and a negative word at age 9. In addition, 4 words showed an age difference but did not change category: *bosse* (bump), *colère* (anger), *griffe* (claw), and *médicament* (medicine).

In terms of differences between the sexes, at age 5, only 2 words differed significantly between girls and boys (1% of the corpus). The word *garçon* (boy) was positive for boys and an LA word for girls, whereas the word *jupe* (skirt) was positive for girls and an LA word for boys. At age 7, 12 words out of 588 (2%) were rated differently by girls and boys. Five words were positive for girls and LA words for boys: *chignon* (bun), *danseuse* (dancer), *fille* (girl), *jupe* (skirt), and *robe* (dress). Four words were negative for girls and positive for boys: *arme* (weapon), *colère* (anger), *crocodile* (alligator), and *peur* (fear). The word *poupée* (doll) was positive for girls and negative for boys. The word *tondeuse* (lawnmower) was positive for boys and neutral for girls. Finally, the word *bruit* (noise) was negative for girls and an LA word for boys. At age 9, only 6 words out of 600 (1%) were rated differently by girls and boys. The word *robe* (dress) was positive for girls and negative for boys. Two words were negative for girls and LA words for boys: *cigare* (cigar) and *guerre* (war). Two words were positive for girls and LA words for boys: *fée* (fairy) and *bague* (ring). The word *épée* (sword) was an LA word for girls and positive for boys.

DISCUSSION AND CONCLUSION

The purpose of the present study was to provide a French database containing a large corpus of words ($N = 600$)

Table 3
Number of High-Agreement Words Assigned to
the Three Categories (Negative, Positive, Neutral) by
Each Age Group and by Sex (With Percentages)

Age	Sex	High-Agreement Words						Total
		Negative		Neutral		Positive		
		No.	%	No.	%	No.	%	
5 years	Girls	4	3.5	4	3.5	108	93	116
	Boys	4	4	1	1	106	95	111
	All	2	2	1	1	101	97	104
7 years	Girls	17	12	27	19	97	69	141
	Boys	2	2	13	14	77	84	92
	All	5	5	13	13	84	82	102
9 years	Girls	16	12	37	28	81	60	134
	Boys	1	1.5	1	1.5	59	97	61
	All	10	9	33	28	74	63	117

Note—The high-agreement words were taken from the 200-word corpus.

with standardized emotional valence values (positive, neutral, and negative). Unlike preexisting French databases (Bonin, Méot, et al., 2003; Messina et al., 1989; Syssau & Font, 2005), our database was compiled from children's ratings, and it distinguishes between ratings made by children of three different age groups (5, 7, and 9 years) and the two sex groups (girls and boys).

The children's ratings were reliable and stable over time, as testified to by the high correlations obtained. This stability makes our database a reliable tool for selecting words according to emotional valence. The fact that children as young as 5 were able to rate the emotional valence of words suggests that they assess the meaning of words (either the names of emotions or words that evoke an emotion) on the basis of their valence, as defined by Osgood et al. (1957). Put differently, these children may process and organize words along the valence dimension.

Our analyses show few age and sex differences in the ratings. On the one hand, age modulated the distribution of HA words into the neutral and positive categories. With increasing age, the proportion of positive words decreased, and the proportion of neutral words increased. Individual word analyses showed low rates of age differences (2.5% between ages 5 and 7 and 5.5% between ages 7 and 9), which confirms this tendency. Words that were positive at age 5 came to be characterized by LA at age 7. Other words characterized by LA at age 7 became neutral at age 9. These findings suggest that during childhood, ratings shift from the positive to the neutral modality of the valence scale used here. It is interesting to note that, contrary to the study by Vasa et al. (2006), which did not report any significant age-linked differences, our study provides some evidence of a development in children's affective ratings of words. However, in Vasa et al.'s study, the children were 9, 10, and 11 years old. Considering these results along with ours, we suggest that valence attributions by children alternate between periods of relative instability or change (typically, the period extending from 5 to 9 years of age) and periods of relative stability (extending from age 9 to 11). Although our study did not reveal large age differences, future studies could investigate the development of valence attribution with age.

Our database also provides separate ratings for each sex. Vasa et al. (2006) pointed out sex-related differences in children's affective ratings of words. They reported that girls provided more extreme valence ratings than did boys. In the present study, individual word analyses did not reveal marked differences across sex groups: Sex differences were 1% at ages 5 and 9 and 2% at age 7. More specifically, at age 7, girls and boys gave different ratings to 12 words. Half of these words were positive only for girls: *chignon* (*bun*), *danseuse* (*dancer*), *fille* (*girl*), *jupe* (*skirt*), *poupée* (*doll*), and *robe* (*dress*). Four of these 6 words occur in the database created by Stevenson, Mikels, and James (2007), in which adults rated words according to discrete emotional categories. In this database, these 4 words were characterized as related to happiness. Thus, the 7-year-old girls rated these words positively, as do adults. Five of these words were positive only for boys: *arme* (*weapon*), *colère* (*anger*), *crocodile* (*alligator*), *peur*

(*fear*), and *tondeuse* (*lawnmower*). Four of these 5 words occurred in Stevenson et al.'s database, where they were characterized as being related to fear and/or anger. Thus, 7-year-old boys and adults do not give these words the same rating, with 7-year-old boys showing a tendency to give positive ratings to words that usually refer to negative things. In future studies, it would be interesting to confirm this sex effect at age 7.

Our database provides an affective classification of a large set of words, while distinguishing between ratings made by boys and girls at three ages (5, 7, and 9). This database is a reliable and powerful tool for future experimental studies whose aim is to test the impact of word emotionality on children's performance in a variety of cognitive tasks (e.g., memory tasks, lexical decision tasks). The present database would also be useful in studying how emotional words are processed by typically developing children, as compared with children with developmental disorders. For instance, our database could be used to examine childhood anxiety or depression (see Daleiden & Vasey, 1997).

In addition, our child database could be used in combination with French adult databases (e.g., Bonin, Méot, et al., 2003; Syssau & Font, 2005) to study word emotionality effects in a developmental perspective or to address the issue of how words acquire a given valence during ontogenesis. Our database can also be used in combination with English child databases (e.g., Vasa et al., 2006) to examine the extent to which language and culture affect the affective ratings of words by children. In sum, our child database can be effectively used to select words for the purposes of experimental studies on word emotionality effects in children. It also has a broader relevance for future comparative or developmental studies in which words are used as materials.

To conclude, we would like to point out that the present study is but a first step toward establishing a more complete database of French children's emotional valence ratings for words. Extending this database to additional words and age groups, as well as collecting data on other emotional dimensions (e.g., arousal), would provide a more comprehensive understanding of children's emotional responses to words.

AUTHOR NOTE

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NOTES

1. For 64 of the 600 words, AoA was not available. Consequently, 41 participants (mean age, 22.7 years; $SD = 2.1$) were asked by the first author to estimate the AoA of these 64 words. The procedure was identical to the one described in Alario and Ferrand (1999).

2. An alpha level of .0027 was used for the chi-squared analyses (Bonferroni correction for multiple tests).

SUPPLEMENTAL MATERIALS

The word norms discussed here may be downloaded as supplemental materials for this article from brm.psychonomic-journals.org/content/supplemental.

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