

A lexical database for Spanish-speaking children

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This article presents a computerized database of words for use in experimental research in cognitive psychology and psycholinguistics. The data are based on the oral vocabulary of 200 Spanish-speaking children aged from 11.16 to 49.16 months. The database includes 15,428 Spanish words (tokens) and comprises 1,259 different words (types). It provides information about age of acquisition, orthography, grammar, semantics, and frequency.

Experimental tasks that use verbal materials require standardized pools of words, in order to avoid potential misinterpretations of the results. This need has generated studies whose objective has been the standardization of verbal material. Words have been standardized on a number of different variables that may have important effects on semantic and episodic memory, as well as on other cognitive processes. Some of these variables are frequency of occurrence (Freq; Carroll, Davies, & Richman, 1971; Kučera & Francis, 1967; Thorndike & Lorge, 1944), age of acquisition (Acq; Carroll & White, 1973a, 1973b; Gilhooly & Logie, 1980), familiarity (Gernsbacher, 1983), imagery, concreteness, and meaningfulness (Benjafield & Muckenheimer, 1989; Christian, Bickley, Tarka, & Clayton, 1978).

The development of computers has facilitated the organization of word pools into databases (e.g., Coltheart, 1981; Content, Mousty, & Radeau, 1990; Dale & Fenson, 1996; Friendly, Franklin, Hoffman, & Rubin, 1982; Wilson, 1988), allowing for faster and easier searches.

Most of the standardization work for verbal materials has been done in the English language. In the Spanish language, particularly, this kind of work is not frequently found (Dasi, 1986) and it is usually limited to adults (Alameda & Cuetos, 1995; Algarabel, Ruiz, & Sanmartín, 1988; Algarabel & Sanmartín, 1985; Juilland & Chang-Rodríguez, 1964; Manzano, Inguanzo, Piñeiro, & Acen, 1999). For Spanish-speaking children, standardized verbal data either are scarce or have not been published. Researchers in this area have studied mainly the frequency of words written by school-age children, rather than the utterances of younger children (Casanova & Rivera, 1989; Justicia, 1995).

The purpose of this article is to describe a database obtained from the verbal utterances of a group of children under 5 years of age and to show the statistical analysis of some of the variables involved, in order to facilitate comparison with other databases. The variables included in our study are age of first time uttered (FTU), Acq, Freq, number of letters (Nlett) and syllables (Nsyll), grammatical class (GClass), stress pattern (StrP), semantic category (SemCat), and orthographic consonant-vowel pattern (OCVP).

An important aspect of our work is that it fills a gap in current scientific research for such a widely used language as Spanish.

METHOD

Subjects

The subjects were 200 Cuban Spanish-speaking children (96 males), ranging in age from 11.16 to 49.16 months (mean = 24.03 months, $SD = 10.14$). They were grouped by age in intervals of 2–4 months, so that each group was composed of 16–20 children. The groups were formed of different age intervals so that the number of children in each group would be approximately equal. The following groups (months.days) were used: 11.16–14.15, 14.16–17.15, 17.16–20.15, 20.16–22.15, 22.16–25.15, 26.04–29.16, 30.04–33.22, 34.07–37.21, 38.04–41.23, 42.06–45.21, and 46.03–49.16.

The subjects were selected from six day-care centers in four different municipalities of the city of Havana. The children included in the study had a normal development for their age, as reported by the nursery assistant. The risk of including a child with auditory problems was reduced by an interview with their parents. All the mothers had at least a high school educational level. The socioeconomic level of the families was average, representative of the general Cuban population.

Vocabulary size was not influenced by sex, socioeconomic level, or mother's education. The variables of interest (sex, socioeconomic status, and mother's education) have not influenced the results of the other studies that have investigated vocabulary size in young children. For example, in recent research (not yet published) in which we studied the vocabulary development of 605 children in western Cuba, we did not find any significant differences in the vocabulary size for the variables sex, attendance at nurseries, mothers' educational level, zone of residence (rural or urban), or mothers' occupation. Jackson-Maldonado, Thal, Marchman, Bates, and Gutierrez-

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Clellen (1993) did not find lexical differences related to sex or mother's educational level in their study with Mexican children.

Materials and Procedure

The words included in the database were obtained from the utterances produced by 200 children. The utterances were selected from the children's conversations with their peers and with the researchers.

The data were collected while the subject was in a room where he/she was able to play freely with toys (teddy bears, plastic toys, musical instruments, cars, balls, and the like), alone or with other children. In order to facilitate communication, the child was allowed to interact not only with his/her peers and the toys, but also with the two researchers in the room. Each observation lasted approximately 30 min. A total of four observers (two of whom worked with children under 25.15 months, whereas the other two observed the older ones) made a literal transcription of the children's utterances.

An observation was excluded if the observers did not concur on the identity of the word. Approximately 7% of the utterances were rejected.

In most cases, word identification is not affected by the substitutions, omissions, translations, or the use of stable substitutes that are typical of this age group. For example, the omission of the phoneme /s/ in *apato* does not interfere with the recognition, within a given context, of the word *zapato* (shoes). When a child calls *un reloj* (a watch) a "tic-tac" or *una pelota* (a ball) a "pun pun," he/she is making use of a conventional form to name objects or actions (stable substitutes) that, although are not part of the vocabulary used by adults, can be recognized as words. Words that were considered as entries were those that both observers recognized as a word in the Spanish language.

The rejection rates were 12% for younger children (11.16–25.15 months) and 5% for the older group. A word was considered different if it appeared as a different entry, or type, in the dictionary. For instance, the different conjugations for the verb *hacer* (to do)—*hago*, *hace*, and so forth—were considered to be different types. The classification of each word was interpreted in context. In this way *tiro* (to throw) appears only as a verb (i.e., as a variation of the verb to throw), *pesca* (to fish) appears as a verb and not as a noun, *dulce* (candy) as a noun and not as an adjective, and the word *mata* (bush) appears twice—as a noun when it is a synonym for plant and as the verb to kill.

The software used to create the database was dBaseIII (Ashton-Tate, 1986). For each word, we included different variables that are frequently used in verbal tasks. The composition of the database is summarized in Table 1. The first column of the table provides the linguistic properties described in an entry, the second column specifies the identity of the linguistic property, and the third column indicates the number of types.

Description of the Database

Word. This is the name of each word included. The database has 15,428 tokens and 1,259 types.

Table 1
Composition of the Database

Name	Property	Occurrence
Wd	words	1,259
FTU	first time uttered	1,259
Aacq	age of acquisition	298
Nlett	number of letters in the word	1,209
Nsyll	number of syllables in the word	1,209
Freq	frequency	1,259
Gclass	grammatical class	1,259
StrP	stress pattern	1,209
SemCat	semantic categories	447
OCVP	consonant-vowel pattern	1,209

First time uttered. The FTU variable shows the age range in which at least 1 child produced the word for the first time.

Age of Acquisition. The age range in which the words cumulative frequency reaches 10% of its total frequency. This variable was calculated for words whose frequency is equal to or higher than 10. In order to clarify the difference between the FTU and Aacq variables, we will use the word *gato* (cat) as an example. This word was produced for the first time by a child in the age group 14.16–17.15, which makes FTU = 14.16–17.15. On the other hand, the total Freq for the same word is 38. For Aacq = 17.16–20.15, the word *gato* has an Freq of 6, which represents 15% of the total Freq (38). In summary, the variable FTU indicates the age range within which a specific word may appear for the first time, whereas Aacq shows approximately the age at which the same word begins to acquire a determined meaning in the active vocabulary of the child.

Number of letters. The Nlett variable is the number of letters in each word.

Number of syllables. The Nsyll variable is the number of syllables in each word. We used the same syllabication algorithm as that published by Mañas (1987). Rules to syllabicate Spanish language words are stated by the Real Academia Española (1973).

Frequency. The Freq variable is the number of occurrences of each type.

Grammatical class. The Gclass variable classifies the words by their grammatical role in speech. The observers took literal note of the children's verbalizations, pointing out in each case the context in which they were produced; this process made their classification easier in terms of grammatical functions.

Stress pattern. The StrP variable refers to the stressed syllable. In the Spanish language, StrPs are easily stated by means of a set of specific orthographic rules. Words called *agudas* are stressed in the last syllable, words called *llanas* are stressed in the penultimate syllable, and those called *esdrújulas* are stressed in the antepenultimate one.

Semantic category. Common nouns were classified according to their SemCats. A total of 23 categories were used, 12 of which were taken from the categories of Morenza et al. (1989) and Piñeiro, Morenza, Torres, and Sierra, (1999).

Orthographic consonant-vowel pattern. The letters that form each syllable were codified with the character C (for consonant) or V (for vowel).

The FTU, Aacq, Nlett, Nsyll, and Freq variables are numeric, whereas the rest are characters. For compound words—those with a single meaning but made up of more than one word (e.g., *por qué*, why)—the following variables were not recorded: Nlett, Nsyll, StrP, and OCVP.

RESULTS AND DISCUSSION

Appendix A lists each word included in the database, along with FTU, Aacq, Nlett, Nsyll, Freq, and StrP. Appendix B shows stable substitutes and their FTU, Aacq, and Freq.

The most important results for each variable are presented below.

First Time Uttered and Age of Acquisition

Table 2 shows the number of types produced for the first time (FTU) in each age range. The number of children in each age group is also included.

Most words were produced during the interval of 22.16–25.15 months for both FTU and Aacq. At this period in life, which is called the vocabulary spurt, the rate of word acquisition is markedly accelerated (Goldfield

Table 2
Range of First Time Uttered (FTU, in Months)
and Distribution of Types

FTU	<i>n</i>	Types
Younger Group		
11.16–14.15	20	24
14.16–17.15	20	25
17.16–20.15	19	41
20.16–22.15	20	75
22.16–25.15	17	257
Older Group		
26.04–29.16	18	129
30.04–33.22	19	151
34.07–37.21	17	141
38.04–41.23	18	146
42.06–45.21	16	127
46.03–49.16	16	143

& Reznick, 1990; McCarthy, 1946). After the age of 25.15 months, the number of types that children produces almost doubles. Since there appears to be an important change in their vocabulary between 22.15 and 25.15 months of age, for further analysis, we will continue to divide the sample into those younger than 25.15 months and those older than 25.16 months.

Number of Letters

Nlett ranged from 1 to 11. Most words had 4 to 6 letters; the mean for Nlett was 5.71 ($SD = 1.85$).

Number of Syllables

Nsyll ranged from 1 to 5. Most words have two or three syllables (mean = 2.46, $SD = 0.82$). These results seem to indicate that Spanish words are relatively long, and this can be seen even in the earliest Aacq. Although they have been obtained in different ways and with different subjects, our results coincide with those of Algarabel et al. (1988) with adult subjects, where the mean Nlett was 8.25, and with those of Justicia (1995), who found a primacy of three-syllable words in a study of Freq in texts written by children.

Frequency

This value ranged from 1 to 444 (mean = 12.25, $SD = 31.95$). For 386 types (30.6%), the frequency was 1. For 31 types, Freq was greater than 100. Some of these high-frequency words were open-class items (51.6%): nouns, verbs, verbal forms, adjectives, and adverbs—*nené* (baby), *papá* (daddy), *dame* (give me), *mamá* (mother), *agua* (water), and so forth. The rest were closed-class items (48.3%): pronouns, prepositions, articles, interjections, numerals, conjunctions, and contractions—*yo* (I, me), *mía* (my, mine), *esto* (this), *el* (the), and so forth. As for the words' lengths some studies (e.g., Justicia, 1995) have reported similar results to ours.

Grammatical Categories

In order to analyze the results of this variable, the sample was split into two groups: younger (under 25.15 months, $n = 96$) and older (25.16 months and older, $n =$

104). Table 3 displays the 15 different syntactic categories that were used and the number of their occurrences. The words are categorized on the basis of first use only. The table also shows the number of types included in each GClass for the two groups of ages (younger and older), as well as for the total sample.

Nouns and verbs appear to be the most common words. Only 58 verbs (15.06%) were produced in their infinitive form. Older children produced 51 of them. In Spanish, the infinitive forms of verbs have three endings: *-ar* (for instance, *jugar*, to play), *-er* (*comer*, to eat), and *-ir* (*dormir*, to sleep). In our database, the most frequent ending for the infinitive forms of verbs was *-ar* (found 39 times).

For younger children, the total number of conjugated verbs was 96. This number went up to 231 for the older group. The conjugated verbs were produced 265 times in the present tense. The verbs appeared 62 times in the past tense; they were only produced 10 times by children younger than 25.15 months and 52 times by those in the older group.

When the words were reclassified as open class and closed class, the results were as follows. For types, 1,189 were open-class words (94.4%), and 70 were closed-class (5.5%). For tokens, 10,722 (69.4%) were open-class words, and 4,706 (30.5%) were closed-class words, which supports our claim that closed-class words are the most widely used, even though they are the least represented in the vocabulary. Open-class words represented 89.6% (378 words), whereas closed-class words accounted for 10.4% (44 words) of the types in the younger group. For the older group, open-class words represented 96.8% (811 words) of the types, and closed-class words represented 3.10% (26 words).

Stress Pattern

Nine hundred and nine words were classified as *llanas* (75.1% of the total set of 1,209 types). The words called *agudas* were produced 264 times (21.8%). The *esdrúju-*

Table 3
Number of Types First Used in
Each Grammatical Category in Each Group

Grammatical Category	Younger	Older	Types
Common nouns	172	277	449
Verbs	103	182	385
Proper nouns	33	192	225
Stable substitutes*	40	6	46
Adjectives	13	18	31
Pronouns	20	11	31
Adverbs	14	13	27
Gerunds	3	18	21
Prepositions	4	5	9
Articles	4	5	9
Interjections	9	0	9
Numerals	5	3	8
Past participles	0	5	5
Conjunctions	1	1	2
Contractions	1	1	2

Note—Younger, 25.15 months or less; older, more than 25.15 months.
 *Stable substitutes are a series of sounds naming an object that differ from the words adults produce—for example, *miau* (meow) instead of the word *gato* (cat) (Manzano, Perera, & Correa, 1989).

las words were found 36 times (2.9%) only. These proportions match those in adult language: *llanas*, 69.37%; *agudas*, 25.03%; *esdrújulas*, 5.59% (Manzano et al., 1999).

Semantic Categories

Table 4 shows the 23 categories into which types were classified, as well as the number of members of each category for those children under 25.15 months and for those older. Two words, *goticas* (little drop) and *huequito* (little hole), could not be classified in SemCats. The number of exemplars in each category and the percentage of the total sample (447) that they represented are also shown.

The categories with a greater number of instances were animal, person, food/beverage, and clothing article. These have been reported as the most inclusive and largest categories (Battig & Montague, 1969; Pascual & Musitu, 1980; Piñeiro et al., 1999; Posnansky, 1978). Some researchers have shown results similar to ours—for instance, when Nelson (1973) studied the emergence of the first 50 words in children, she found that words for food and beverages were the most frequently used, followed by animals' names. In decreasing order, these two categories are followed by clothing, toys, vehicles, and furniture. In one of our previous research studies (not yet published), when using an inventory equivalent to the Communicative Development Inventory words (Fenson et al., 1994), the words most frequently produced belonged to the categories of people, animals, food/beverages, and toys. In the case of animals, we cannot rule out the possible influence of the toys (stuffed animals, teddy bears, and the like) that the children were exposed to during observation. As for

the rest of these categories, the children produced words that cannot be related to the toys in the room.

Other authors (Morenza et al., 1989) have reported a similar distribution of categories when using a production-paradigm technique with adults: animals (12.46%), food/beverages (13.75%), clothing (9.32%), vehicles (3.37%), furniture (6.51%), kitchenware (8.06%), reading materials (10.05%), musical instruments (6.25%), tools (9.7%), cleaning utensils (4.58%), and means of communication (7.72%).

Orthographic Consonant–Vowel Patterns

The words produced by children are formed by 596 different syllables. They are made up of 19 different combinations of OCVPs. The most frequent patterns are CVC (found in 191 syllables), CV (140), CVV (70), CCV (61), and CVVC (45). These five combinations were found in 85% of the syllables, which is congruent with other research done on written Spanish, where these five consonant–vowel combinations have been found to be the most frequent ones (Alvarez, Carreiras, & de Vega, 1992; Justicia, 1995).

Correlation Among the Variables

Table 5 presents the Pearson intercorrelation matrix for the five numeric variables. In the correlation analysis, we have taken the log 10 of the raw Freq, because the distribution of Freq is highly skewed in the positive direction.

Nlett and Nsyll are highly correlated ($r = .87$). FTU and Aacq also present a high and significant correlation. The FTU and Aacq correlation with word Freq is relatively small, although significant. Aacq and FTU correlate negatively with Freq, suggesting that the words that children use the most are learned at an early age. The correlation between word length (Nlett and Nsyll) and word Freq is relatively small and negative, suggesting that the shorter words are used more frequently than the longer ones. Even long words with high Freq are reduced—for instance, many children say *bici* (bike) more frequently than *bicicleta* (bicycle). Correlations between FTU and Aacq with word length are the lowest and are positive, which shows that longer words are acquired at a later age and that the shorter ones are learned earlier in life.

In summary, the computerized database presented here provides new information about Spanish words used by young children. The variables included in our database are among those most frequently used by experimental researchers to create word lists. Despite the fact that there are different regional variations in the Spanish language that may produce grammatical, semantic, and phonological differences; adding up to cultural, environmental, and regional characteristics, we hope that this database may be useful for researchers who work with Spanish speakers. It is logical to expect that some of our results—for example, proportion of open- and closed-class words—will be very similar among Spanish-speaking children of different cultures. Nevertheless, the issues of similarity and difference

Table 4
Semantic Categories of Common Nouns

Categories	Number of			
	Younger	Older	Different Words	%
Animal	35	30	65	14.54
Person	25	36	59	13.64
Food and beverage	13	25	38	8.50
Article of clothing	7	27	34	7.60
Toy	9	24	33	7.38
Type of vehicle	15	13	28	6.26
Part of the human body	9	19	28	6.26
Activity	4	21	25	5.59
Place	11	12	23	5.14
Article of furniture	8	13	21	4.69
Kitchen utensil	9	6	15	3.35
Reading material	6	7	13	2.90
Tree and flower	5	6	11	2.46
Part of a building	1	9	10	2.23
Disease	3	5	8	1.79
Part of animal body	2	4	6	1.34
Musical instrument	2	4	6	1.34
Heavenly body	1	4	5	1.11
Unit of measure time	1	4	5	1.11
Tool	2	3	5	1.11
Cleaning utensil	1	3	4	0.89
Weapon	2	1	3	0.67
Mean of communication	1	1	2	0.45

Note—Younger, 25.15 months or less; older, more than 25.15 months.

Table 5
Correlation Between Dependent Measures

Measure	1	2	3	4	5
1 FTU	1.00				
2 Aacq	.74*	1.00			
3 Nlett	.21*	.30*	1.00		
4 Nsyll	.13†	.20†	.87*	1.00	
5 Log. Freq	-.47*	-.22†	-.26*	-.21*	1.00

* $p \leq .01$; † $p \leq .05$.

represent empirical questions to be answered by future studies on the oral language of young children.

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APPENDIX A
Words Included in the Database and First Time Uttered (FTU), Age of Acquisition (Aacq),
Number of Letters (Nlett), Number of Syllables (Nsyll), Frequency (Freq), and Stress Pattern (StrP)

Word	FTU	Aacq	Nlett	Nsyll	Freq	StrP	Word	FTU	Aacq	Nlett	Nsyll	Freq	StrP
COMMON NOUNS							jicoteita	j		9	4	4	L
Activities							jirafa	f		6	3	1	L
actividad	j		9	4	4	A	lagartija	h		9	4	1	L
besito	f	f	6	3	18	L	lechuza	d		7	3	2	L
brigada	j		7	3	1	L	león	e		4	2	1	A
canción	g		7	2	3	A	lobo	i		4	2	5	L
carnavales	j		10	4	2	L	mariposa	c		8	4	4	L
comparsa	g		8	3	1	L	mariposita	g	g	10	5	14	L
cuento	g		6	2	5	L	mono	d	e	4	2	14	L
cumpleaños	f	f	10	4	38	L	monos	g		5	2	3	L
fiesta	e	i	6	2	10	L	mosquito	k		8	3	1	L
fin	i		3	1	1	A	osito	d	e	5	3	22	L
foto	f	i	4	2	13	L	oso	e	i	3	2	19	L
golpe	i		5	2	7	L	pajarito	d		8	4	9	L
guerra	f		6	2	2	L	pájaro	e		6	3	2	E
mentira	k		7	3	2	L	palomita	j		8	4	2	L
miedo	h		5	2	1	L	patico	g		6	3	4	L
música	j		6	3	3	E	pato	b	d	4	2	47	L
natación	j		8	3	1	A	pecesito	e	e	8	4	13	L
paz	f		3	1	2	A	pecesitos	d		9	4	3	L
preescolar	k		10	4	1	A	perra	e		5	2	3	L
pregunta	k		8	3	6	L	perrita	k		7	3	2	L
preguntas	k		9	3	1	L	perrito	e	h	7	3	28	L
respuesta	k		9	3	2	L	perro	b	e	5	2	70	L
sed	d		3	1	2	A	pecadito	e	f	9	4	10	L
trabajo	e	h	7	3	50	L	pecaditos	i		10	4	5	L
vacaciones	f		10	4	6	L	pecado	d	h	7	3	15	L
Animals							pingüino	e		8	3	1	L
animal	k		6	3	5	A	pollito	d	d	7	3	23	L
animalito	h		9	5	6	L	pollo	e		5	2	8	L
araña	g		5	3	2	L	rana	d	e	4	2	13	L
ardilla	e		7	3	3	L	ratón	e		5	2	5	A
ardillita	g		9	4	1	L	vaca	d	d	4	2	10	L
bicho	d		5	2	2	L	Articles of Clothing						
caballito	f	f	9	4	11	L	arete	g	g	5	3	10	L
caballo	b	d	7	3	59	L	bata	h		4	2	4	L
caballos	i		8	3	5	L	batica	e		6	3	1	L
cangrejito	j		10	4	3	L	blumer	i		6	2	5	A
cangrejo	h		8	3	7	L	blusita	g		7	3	3	L
caracol	g		7	3	3	A	cartera	g	g	7	3	21	L
caracoles	h		9	4	4	L	cestica	g		7	3	1	L
caracolitos	g		11	5	1	L	cinto	g		5	2	1	L
chiva	h		5	2	1	L	collarito	j		9	4	2	L
cochinita	f		9	4	2	L	hilo	h		4	2	1	L
cochinito	j		9	4	3	L	jaba	j		4	2	3	L
cochino	d		7	3	3	L	jabita	f	f	6	3	10	L
cocodrilo	j		9	4	1	L	lazo	k		4	2	2	L
conejito	c		8	4	1	L	maleta	h		6	3	3	L
conejo	d	d	6	3	11	L	medias	j	j	6	2	16	L
cucaracha	i		9	4	2	L	mosquitero	k		10	4	2	L
cucarachita	e		11	5	5	L	pañoleta	j		8	4	3	L
elefante	g		8	4	6	L	pantalón	i		8	3	1	A
gallina	d		7	3	4	L	pipa	e		4	2	3	L
gallito	e		7	3	2	L	popis	g		5	2	1	L
gallo	d	d	5	2	10	L	pulso	i		5	2	1	L
gatico	e	f	6	3	12	L	reloj	a	d	5	2	13	A
gato	b	c	4	2	38	L	ropa	h		4	2	5	L
gatos	i		5	2	1	L	saya	f		4	2	3	L
hormiguita	j		10	4	5	L	sombrero	d		8	3	2	L
jicotea	e		7	4	5	L	sombrilla	i		9	3	1	L

APPENDIX A (Continued)

Word	FTU	Aacq	Nlett	Nsyll	Freq	StrP	Word	FTU	Aacq	Nlett	Nsyll	Freq	StrP
sombrillas	h		10	3	1	L	dulcecito	h		9	4	1	L
tela	h		4	2	2	L	frijoles	g		8	3	5	L
tete	c	d	4	2	11	L	galleta	e	g	7	3	13	L
trapito	k		7	3	5	L	galletica	f	f	9	4	13	L
trusa	i		5	2	5	L	helado	f	f	6	3	29	L
zapatico	f		8	4	2	L	hielo	d		5	2	1	L
zapato	c	d	6	3	36	L	jugo	e	g	4	2	24	L
zapatos	b		7	3	4	L	juguito	e		7	3	3	L
Articles of Furniture							leche	d	e	5	2	45	L
almohada	j		8	4	5	L	lechita	i	i	7	3	19	L
banco	j		5	2	2	L	limonada	i		8	4	3	L
banquito	g		8	3	2	L	malanguita	g		10	4	5	L
caja	k		4	2	2	L	mango	i		5	2	3	L
cama	g	g	4	2	18	L	merienda	f	f	8	3	47	L
camita	d		6	3	1	L	naranja	e		7	3	6	L
catre	i		5	2	7	L	pan	h	h	3	1	12	A
cortina	j		7	3	3	L	papa	d	e	4	2	25	L
cosa	h		4	2	6	L	refresco	h	h	8	3	14	L
cuna	f		4	2	9	L	refresquito	g		11	4	3	L
cunita	e		6	3	1	L	sopa	g	g	4	2	11	L
escaparate	k		10	5	1	L	tomate	e		6	3	6	L
espejo	e		6	3	2	L	Heavenly Bodies						
hamaca	h		6	3	1	L	cielo	i		5	2	1	L
mesa	e		4	2	7	L	estrella	f		8	3	3	L
mesita	f		6	3	5	L	estrellita	g		10	4	2	L
pecera	i		6	3	2	L	nubes	i		5	2	1	L
percha	e		6	2	2	L	sol	d	f	3	1	25	A
perchero	f		8	3	2	L	Kitchen Utensils						
silla	c	e	5	2	10	L	calor	f		5	2	2	A
sillita	e	e	7	3	16	L	cuchara	e	e	7	3	17	L
Cleaning Utensils							cucharita	i		9	4	1	L
cepillo	k		7	3	3	L	cuchillo	j		8	3	3	L
cubo	e		4	2	9	L	jarrito	e	e	7	3	24	L
escoba	f		6	3	1	L	platico	e		7	3	3	L
peine	f		5	2	7	L	platicos	i		8	3	1	L
Diseases							plato	e	e	5	2	18	L
bronquitis	k		10	3	2	L	pomito	e		6	3	5	L
caspa	e		5	2	2	L	pomo	d	e	4	2	16	L
catarro	k		7	3	3	L	tacita	e		6	3	3	L
enfermita	e		9	4	2	L	tapa	h		4	2	1	L
enfermito	e		9	4	2	L	tenedor	g		7	3	3	A
herida	k		6	3	1	L	vasito	e		6	3	5	L
jeringuilla	i		11	4	1	L	vaso	e		4	2	9	L
yaya	a		4	2	2	L	Means of Communication						
Foods and Beverages							teléfono	d	e	8	4	13	E
agua	a	e	4	2	123	L	televisor	j		9	4	6	A
agüita	f		6	3	5	L	Musical Instruments						
arroz	j		5	2	8	A	clave	j		5	2	4	L
azúcar	f		6	3	1	L	guitarra	e	e	8	3	13	L
café	g		4	2	7	A	maracas	g		7	3	1	L
cake	f	f	4	2	11	L	piano	f	g	5	2	14	L
calabaza	f		8	4	1	L	tambor	h		6	2	5	A
caramelito	e		10	5	6	L	trompeta	e		8	3	3	L
caramelo	g		8	4	9	L	Parts of a Building						
caramelos	k	k	9	4	11	L	basura	k		6	3	2	L
carne	g	g	5	2	18	L	bloque	g		6	2	1	L
cerveza	e		7	3	4	L	luz	d		3	1	4	A
chocolate	f		9	4	7	L	pared	j		5	2	2	A
coco	d		4	2	2	L	piedra	g		6	2	9	L
comida	e	g	6	3	51	L	piso	h		4	2	5	L
comidita	g	g	8	4	19	L	puerta	d	e	6	2	16	L
dulce	f		5	2	6	L	techo	k		5	2	2	L

APPENDIX A (Continued)

Word	FTU	Aacq	Nlett	Nsyll	Freq	StrP	Word	FTU	Aacq	Nlett	Nsyll	Freq	StrP
tubo	j		4	2	2	L	mamita	e		6	3	1	L
ventana	k		7	3	8	L	muchacha	f		8	3	4	L
Parts of Animal Body							muchacho	e		8	3	1	L
ala	g		3	2	1	L	mujer	j		5	2	3	A
cola	e		4	2	1	L	mena	e		4	2	2	L
espina	h		6	3	6	L	nené	a	d	4	2	131	A
patas	j		5	2	1	L	niña	e	f	4	2	18	L
rabo	e		4	2	2	L	niñita	e	g	6	3	11	L
trompa	g		6	2	1	L	niñito	e	f	6	3	25	L
Parts of the Human Body							niño	c	e	4	2	37	L
barriga	h		7	3	9	L	niños	h	h	5	2	10	L
boca	d		4	2	5	L	nombre	k	k	6	2	20	L
boquita	d		7	3	1	L	novia	k		5	2	2	L
brazo	i		5	2	2	L	novio	i		5	2	1	L
cabeza	g	g	6	3	24	L	papá	a	e	4	2	122	A
caca	c		4	2	2	L	papi	d	e	4	2	10	L
cara	f		4	2	4	L	payasito	g		8	4	2	L
corazón	f		7	3	3	A	payaso	e	e	6	3	11	L
corazoncito	h		11	5	9	L	personas	j	j	8	3	15	L
dedo	h		4	2	7	L	pipó	e		4	2	9	L
diente	j	j	6	2	11	L	pirata	k		6	3	1	L
manito	f		6	3	1	L	policía	f		7	4	6	L
mano	e	e	4	2	10	L	preso	i		5	2	8	L
manos	k		5	2	6	L	prima	f	f	5	2	14	L
naricita	g		8	4	5	L	primita	f		7	3	2	L
nariz	c	c	5	2	14	A	primito	f		7	3	9	L
ojito	g		5	3	5	L	primo	f	f	5	2	10	L
ojo	f	g	3	2	20	L	primos	k		6	2	3	L
ojos	j		4	2	5	L	princesa	i		8	3	3	L
oreja	f		5	3	2	L	seño	c	e	4	2	120	L
orejita	d		7	4	1	L	tata	a	a	4	2	14	L
pelo	b	e	4	2	13	L	tía	b	b	3	2	26	L
pie	e	g	3	1	12	A	tías	k		4	2	1	L
pies	j	j	4	1	23	A	tío	h	h	3	2	13	L
sangre	h		6	2	8	L	tíos	k		4	2	3	L
teta	d		4	2	1	L	viejita	i		7	3	3	L
trencita	k		8	3	3	L	Places						
uñas	j		4	2	2	L	calle	e	h	5	2	12	L
People							casa	e	g	4	2	60	L
abuela	e	h	6	3	26	L	casita	e	e	6	3	27	L
abuelito	f		8	4	2	L	cine	k		4	2	2	L
abuelo	e	h	6	3	40	L	cinécito	e		8	4	1	L
amigo	f		5	3	1	L	círculo	e	f	7	3	35	E
amigueta	e	f	8	4	12	L	cocina	e		6	3	2	L
amiguito	e	e	8	4	13	L	cocinita	f	f	8	4	28	L
chica	e		5	2	1	L	cuarto	j		6	2	3	L
chino	d		5	2	1	L	edificio	j		8	4	4	L
doctora	h	h	7	3	12	L	escuela	h	i	7	3	17	L
enanito	g		7	4	2	L	ferretería	h		10	5	1	L
gente	i		5	2	5	L	jardín	j		6	2	1	A
hembra	h	h	6	2	15	L	lado	e		4	2	1	L
hermana	f		7	3	8	L	mar	e		3	1	1	A
hermanita	e	e	9	4	34	L	mina	c		4	2	1	L
hermanito	e	f	9	4	35	L	monte	i		5	2	1	L
hermano	f		7	3	3	L	parque	e	e	6	2	18	L
hombre	k		6	2	1	L	piscina	j		7	3	1	L
macho	h	h	5	2	12	L	playa	e	f	5	2	74	L
madre	g		5	2	1	L	sala	i		4	2	6	L
maestra	f		7	3	1	L	salón	g	h	5	2	26	A
mago	j		4	2	1	L	zoológico	g		9	4	1	E
mamá	b	e	4	2	169	A	Reading Material						
mami	b	e	4	2	21	L	color	h		5	2	1	A

APPENDIX A (Continued)

Word	FTU	Aacq	Nlett	Nsyll	Freq	StrP	Word	FTU	Aacq	Nlett	Nsyll	Freq	StrP
colores	e	i	7	3	13	L	tabaco	c		6	3	2	L
crayola	g		7	3	3	L	yerba	e		5	2	1	L
dibujitos	j		9	4	1	L	Types of Vehicles						
dibujos	k		7	3	4	L	ambulancia	j		10	4	1	L
lámina	j		6	3	6	E	avión	c	d	5	2	29	A
lápiz	e		5	2	9	L	avioncito	i		9	4	2	L
libreta	e		7	3	2	L	barco	e	g	5	2	11	L
libretica	e		9	4	3	L	barquito	e	f	8	3	15	L
librito	e		7	3	8	L	camión	d	e	6	2	35	A
libro	j	j	5	2	12	L	camioncito	e		10	4	8	L
papel	c		5	2	6	A	camiones	k		8	3	2	L
pluma	g		5	2	1	L	carro	e	e	5	2	23	L
Tools							carroza	j		7	3	3	L
escalera	e		8	4	4	L	chapa	j		5	2	4	L
escaleras	j		9	4	3	L	coche	e	h	5	2	11	L
pala	e		4	2	2	L	grúa	g		4	2	8	L
pincho	f		6	2	1	L	guagua	b	f	6	2	29	L
tijera	j		6	3	2	L	guaguaita	g		8	3	1	L
Toys							helicóptero	g		11	5	5	E
aparatico	g		9	5	1	L	lada	e		4	2	1	L
arena	i		5	3	8	L	máquina	e		7	3	6	E
bicicleta	i		9	4	8	L	maquinita	e		9	4	6	L
bicicletica	f	i	11	5	13	L	moto	e	e	4	2	12	L
bolas	k		5	2	4	L	motorcito	h	h	9	4	10	L
bolita	g		6	3	7	L	rastra	i		6	2	5	L
bolo	h		4	2	4	L	rueda	e	g	5	2	16	L
carriola	e		8	3	1	L	ruedas	i		6	2	2	L
carrito	e	e	7	3	19	L	timón	i		5	2	4	A
cubito	j		6	3	4	L	tractor	e		7	2	2	A
escopetica	f		10	5	5	L	tren	d	d	4	1	24	A
globo	f		5	2	1	L	trencito	h		8	3	4	L
globos	k		6	2	4	L	Units of Measure						
jueguito	i		8	3	3	L	años	f		4	2	1	L
juguete	c	f	7	3	56	L	día	i		3	2	8	L
juguetes	h	i	8	3	13	L	noche	i		5	2	1	L
juguetico	e	e	9	4	17	L	sábado	j		6	3	1	E
muñeca	d	e	6	3	72	L	tarde	e		5	2	1	L
muñecas	k		7	3	2	L	Weapons						
muñeco	d		6	3	1	L	bala	e		4	2	3	L
muñecos	k		7	3	2	L	escopeta	g		8	4	5	L
muñequita	g	g	9	4	18	L	pistola	e	f	7	3	28	L
muñequito	i		9	4	3	L	ADJECTIVES						
palos	k		5	2	2	L	abierta	f		7	3	1	L
pedazo	f		6	3	1	L	alto	k		4	2	1	L
pelota	c	e	6	3	134	L	amarillito	f		10	5	2	L
pelotica	e	e	8	4	26	L	amarillo	d	g	8	4	50	L
piñata	h		6	3	3	L	azul	d	e	4	2	20	A
plastilina	i		10	4	5	L	azulito	g		7	4	2	L
salvavidas	h		10	4	1	L	blanco	e		6	2	7	L
soguita	i		7	3	1	L	carmelita	f		9	4	1	L
trompo	f		6	2	3	L	chico	d		5	2	2	L
velocípedo	e		10	5	4	E	chiquita	i	i	8	3	15	L
Trees and Flowers							chiquitica	k	k	10	4	14	L
flor	d	h	4	1	21	A	chiquitico	h		10	4	6	L
florecita	f	g	9	4	10	L	chiquito	g	g	8	3	31	L
flores	g		6	2	6	L	duro	i		4	2	1	L
hojita	d		6	3	1	L	fea	i		3	2	2	L
mata	d	h	4	2	10	L	feo	e	f	3	2	25	L
matas	h		5	2	1	L	fria	e		4	2	3	L
matica	k		6	3	5	L	grande	e	g	6	2	115	L
maticas	k		7	3	2	L	grandecito	k	k	10	4	15	L
rosa	i		4	2	2	L	grandes	i		7	2	3	L

APPENDIX A (Continued)

Word	FTU	Aacq	Nlett	Nsyll	Freq	StrP	Word	FTU	Aacq	Nlett	Nsyll	Freq	StrP
malecón	j		7	3	2	A	rafi	j		4	2	2	L
maría	g		5	3	5	L	rainol	h		6	2	1	A
marichú	h		7	3	1	A	raiza	j		5	2	2	L
mariela	g		7	3	2	L	ramoncito	g		9	4	2	L
marino	f		6	3	1	L	randy	h		5	2	1	L
marito	i		6	3	2	L	raúl	i		4	2	1	A
marlén	h		6	2	2	A	raulín	i		6	2	1	A
marlon	e		6	2	3	L	reiford	j		7	2	1	A
marlow	g		6	2	2	A	reina	j		5	2	3	L
marta	h		5	2	1	L	reynol	j		6	2	2	A
martí	i		5	2	3	A	roberto	i		7	3	1	L
martina	g		7	3	3	L	rosario	f		7	3	1	L
mary	e		4	1	3	A	rubén	g		5	2	1	A
mayi	k		4	2	1	L	sairo	f		5	2	1	L
mayo	h		4	2	1	L	samira	k		6	3	2	L
mayté	g		5	2	3	A	sandra	f		6	2	1	L
mery	k		4	2	2	L	sandrita	f		8	3	1	L
mica	e		4	2	2	L	sandry	g		6	2	2	L
miguelito	e		9	4	2	L	savy	h		4	2	1	L
mikelín	k		7	3	1	A	severo	h		6	3	1	L
milagrito	f		9	4	3	L	silvio	j		6	2	2	L
mily	h		4	2	1	L	sisi	f		4	2	1	L
miriam	j		6	2	1	A	sochi	e		5	2	2	L
mirita	e		6	3	3	L	sofi	e		4	2	1	L
mirta	j		5	2	3	L	sofia	e		5	3	1	L
mochi	i		5	2	2	L	taima	f		5	2	1	L
mónica	g		6	3	4	E	taimi	f		5	2	1	A
moraimita	g		9	4	1	L	tani	g		4	2	2	L
moti	k		4	2	2	L	teresita	e		8	4	2	L
naila	k		5	2	2	L	tico	i		4	2	2	L
nairin	j		6	2	1	L	tini	g		4	2	2	L
nancita	k		7	3	1	L	tintin	k		6	2	1	L
nancy	e		5	2	3	A	titica	g		6	3	2	L
nany	j		4	2	1	L	tonito	e		6	3	1	L
nenita	g		6	3	2	L	toqui	h		5	2	3	L
nica	k		4	2	2	L	toto	h		4	2	2	L
nini	f		4	2	3	L	tribilín	h		8	3	1	A
noel	f		4	2	2	A	varadero	k		8	4	2	L
noni	e		4	2	1	L	victoria	k		8	3	1	L
norma	j		5	2	1	L	vinagrito	f		9	4	3	L
obel	f		4	2	2	A	yadira	k		6	3	2	L
ofelia	j		6	3	1	L	yaimeny	i		7	3	1	L
ofelita	f		7	4	2	L	yakie	i		5	2	2	L
omar	i		4	2	1	A	yandra	e		6	2	2	L
onett	g		5	2	1	A	yania	h		5	2	2	L
orlandito	h		9	4	1	L	yaqui	f		5	2	6	L
osvaldito	j		9	4	1	L	yasel	h		5	2	4	A
paco	g		4	2	1	L	yasnai	h		6	2	1	L
paquito	g		7	3	1	L	yeni	i		4	2	1	L
patricia	g		8	3	2	L	yoan	h		4	2	2	L
paula	j		5	2	1	L	yohandri	i		8	3	6	L
pedrito	e		7	3	1	L	yolepsi	g		7	3	1	L
pigue	k		5	2	2	L	yoly	g		4	2	1	L
piky	i		4	2	1	L	yona	h		4	2	1	L
pili	f		4	2	1	L	yoni	e		4	2	2	L
pirito	k		6	3	2	L	yori	j		4	2	2	L
pochi	k		5	2	3	L	yosito	j		6	3	1	L
pucho	e		5	2	2	L	yumuri	k		6	3	2	A
quintín							yuni	f		4	2	3	L
banderas	i				1		yunia	h		5	2	1	L
rafa	h		4	2	1	L	yunio	g		5	2	1	L
rafael	k		6	3	1	A	yunito	g		6	3	1	L

APPENDIX A (Continued)

Word	FTU	Aacq	Nlett	Nsyll	Freq	StrP
yusmani	h		7	3	2	L
yusy	h		4	2	2	L
yuya	e		4	2	2	L
zani	e		4	2	1	L
zanja	j		5	2	3	L
zenia	e		5	2	5	L
zoila	i		5	2	1	L

Note—For FTU and Aacq, letters represent the following ranges, in months and days: a, 11.16–14.15; b, 14.16–17.15; c, 17.16–20.15; d, 20.16–22.15; e, 22.16–25.15; f, 26.04–29.16; g, 30.04–33.22; h, 34.07–37.21; i, 38.04–41.23; j, 42.06–45.21; and k, 46.03–49.16.

APPENDIX B

Stable Substitutes and Their First Time Uttered (FTU), Age of Acquisition (Aacq), and Frequency (Freq)

Stable Substitute	FTU	Aacq	Freq
au (como hace el perro)	e		4
ca (heces fecales)	e	h	46
caca (prohibición)	h		4
chichi (orine)	g		2
chuchua (sonido del tren)	e		2
croa (como hace la rana)	e		2
cua (pato)	d		2
cua cua (pato)	b		2
gua gua (perro)	b	c	25
gua guau (perro)	d	d	26
guau guau (perro)	e	e	29
jau (perro)	a		6
jau jau (perro)	b	c	55
kikiriki (gallo)	c		1
miau (gato)	c	d	24
misu (gato)	c	e	10
mu (vaca)	b		1
pam pam (sonido de un arma)	e		1

APPENDIX B (Continued)

Stable Substitute	FTU	Aacq	Freq
papa (comida)	e	e	40
pau (dar golpe)	e		8
pau pau (golpe)	c		5
pau pau (dar golpes)	f	f	57
pí (pollo)	c		6
pío (pollito)	b		3
pio (pollo)	d		9
pío pío (pollo)	e	e	10
pipa (carro)	e		1
pipi (carro)	b	c	10
pipi (orine)	e	e	43
pu (carro)	b	e	25
pu pú (carro)	a		2
pua (pelota)	b		1
pum (algo que cae)	c		5
pun (tirar)	g	g	29
pun (tiro)	f		9
pun pun (pelota)	f	f	12
pun pun (tirar la pelota)	e		4
pupú (carrito)	e		3
pupu (carro)	d		3
sh sh (sonido de cuando se frie)	e		1
tic tac (reloj)	a	c	31
tin tin (tirar la pelota)	e		2
tití (pollito)	a	a	23
titi (pollo)	d		5
titi (pollo)	c	c	25
yaya (golpe)	e	e	28

Note—For FTU and Aacq, letters represent the following ranges, in months and days: a, 11.16–14.15; b, 14.16–17.15; c, 17.16–20.15; d, 20.16–22.15; e, 22.16–25.15; f, 26.04–29.16; g, 30.04–33.22; and h, 34.07–37.21.

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