

## Estimated receptive age of acquisition for 161 Spanish adjectives

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The table below shows the results of a questionnaire study with Spanish-speaking adults whose task it was to rate the receptive age of acquisition (AoA) for 161 Spanish adjectives. The study was presented by A. Groba and A. De Houwer at the GISKID conference on May 20-21, 2011, in Leipzig, Germany on a poster entitled *Geschätztes rezeptives Erwerbssalter von deutschen & spanischen Adjektiven als Grundlage für die Entwicklung eines bilingualen Adjektiv-Verständnis-Screenings*.

The adjective list was composed of items taken from lexical subtests of language screening instruments (CDI in European (López Ornat et al. 2005) and Mexican Spanish (Jackson-Maldonado et al. 2003); TVIP, Dunn et al. 1986), from studies describing the lexical development of young children (Jackson-Maldonado et al. 1993, Pineiro & Manzano 2000) and from 534 transcripts of spontaneous speech in conversations with Spanish-speaking children aged 3 to 6 years available through the CHILDES database (Mac Whinney 2000, see below for an indication of the specific corpora). Quantifiers, indications of ethnicity, social-pragmatic adjectives and adjectives with affixes for negation were excluded from the list. Derivated adjectives were included if their frequency in the selected CHILDES corpora was higher than the frequency of their corresponding roots (e.g. *peligroso*). Participles were incorporated if they were used in the selected CHILDES corpora more often as an attributive and/or predicative adjective (e.g. *prohibido*) than as a verbal participle in combination with an auxiliary. This frequency measure was also applied to truncated participles (*participios truncos*, e.g. *seco*). Moreover, derivated and participle forms were included if the meaning of the adjective was different from or independent of the root and if the inflectional paradigm was extinct. The list was revised by two Spanish, one Mexican, one Chilean and one Argentinean speaker for variety-specific usage to exclude items which are not used universally by speakers of different Spanish-speaking varieties. After application of the described criteria the list contained 161 adjectives.

Thirty-six Spanish-speaking adults<sup>1</sup> from six different nationalities (13 Spanish, 13 Chilean, 7 Mexican, 1 Argentinean, 1 Columbian, 1 Ecuadorian) rated on a seven-point-scale (1= 1 year, 2= 2 years till 7=7 years and older) at which ages they believe that a child could understand a specific adjective for the first time. Parents and participants in regular contact with preschool-aged children (n=14) were asked to base their estimation on the development of the children they were caring for. The other participants (n=22) were requested to do a self-estimation (see e.g. Bird et al. 2001). Participants had grown up monolingually in their childhood. The same held for their children. (These were growing up without any apparent speech and language problems.) According to similar studies that failed to find any significant effect of the participants' gender (Schröder et al. 2003, Gilhooly & Hay 1977), the uneven distribution of women (n=22) and men (n=11) within the sample was deemed acceptable. Each subject was asked to rate all the 161 Spanish adjectives. To prevent ordering effects, 40 different lists with randomized sequences of the 161 items were created.

Inter-rater agreement was calculated with the Kendall-W coefficient ( $W=.63$ ,  $p<.001$ ) and outliers which appeared outside the whiskers of the item-specific boxplots were excluded from analysis (218 reactions of 5,761 in total). Because of the small sample size of fewer than 30 subjects per subgroup, all following analyses were run by non-parametric statistics (Kolmogorov-Smirnov-test for comparison of variables with a limited number of categories and Spearman's coefficient for correlation analyses). To assess intergroup reliability the ratings of two randomly chosen subgroups within the sample of self-estimations on the one hand and the sample of child-estimations on the other hand were compared leading to satisfactory results (self:  $z=.84$ ,  $p=.49$  child:  $z=1.34$ ,  $p=.06$ ). Furthermore the estimations of these subgroups correlated significantly with each other (self:  $r_s=.94$ ,  $p<.001$ ; child:  $r_s=.92$ ,  $p<.001$ ). Nevertheless significant differences were obtained when we compared the estimations of the two different types of raters ( $z=1.51$ ,  $p<.05$ ) with self-estimations ( $M=4.67$ ) being slightly higher than child-estimations ( $M=4.31$ ). Therefore in the table (p. 3 ff.) the item-specific means for the adjectives are listed separately for the total sample on the one hand and for the different rating types *child* and *self* on the other. Those items with significantly different values between the self- and child-estimations are marked with an asterisk. The table is ordered according to the ascending AoA means of the adjectives indicated in months based on the ratings of the whole sample.

<sup>1</sup>Recruitment of participants was done in cooperation with E. Álvarez López (Universidad de Sonora, Mexico), M.R. del Río Miguel (Sprachenzentrum, Universität Erfurt) and the International Office of the University of Erfurt. Their help is gratefully acknowledged.

## Sources for the selection of adjectives

### **Lexical screening instruments**

- López Ornat, S., Gallego, C., Gallo, P., Karousou, A., Mariscal, S. & Martínez, M. (2005). *MacArthur: Inventario de desarrollo comunicativo. Manual y Cuadernillos*. Madrid: TEA Ediciones.
- Jackson-Maldonado, D., Thal, D., Marchman, V., Newton, T., Fenson, L., & Conboy, B. (2003). *MacArthur Inventarios del Desarrollo de Habilidades Comunicativas. User's Guide and Technical Manual*. Baltimore: Brookes.
- Dunn, L.M., Lugo, D.E., Padilla, E.R. & Dunn, L.M. (1986). *Test de Vocabulario en Imagenes Peabody (TVIP)*. Circle Pines, MN: AGS Publishing.

### **Studies on lexical development**

- Pineiro, A. & Manzano, M. (2000). A lexical database for Spanish-speaking children. *Behavior Research Methods, Instruments, & Computers* 32 (4), 616-628.
- Jackson-Maldonado, D., Thal, D., Marchman, V., Bates, E., & Gutierrez-Clellen, V. (1993). Early lexical development of Spanish-speaking infants and toddlers, *Journal of Child Language* (20), 523-549.

### **CHILDES corpora**

*(Analysis of input and output in transcripts of conversations with children aged 3;0 to 6;0 years.)*

- Marrero & Albalá: *Ida & Rafael* (7 transcripts)
- Fernández-Aguado: *50 children* (409 transcripts)
- Linaza & del Barrio (1981): *Juan* (15 transcripts)
- López Ornat (1994): *María* (22 transcripts)
- Vila (1990): *Emilio* (9 transcripts)
- Diez-Itza (1998): *20 children* (21 transcripts)
- Becasesno: *41 children* (51 transcripts)

### References

- Bird, H., Franklin, S. & Howard, D. (2001). Age-of-acquisition and imageability ratings for a large set of words, including verbs and function words. *Behaviour Research Methods, Instruments, and Computers* 33, 73-79.
- Gilhooly, K. J. & Hay, D. (1977). Imagery, concreteness, age-of-acquisition, familiarity, and meaningfulness values for 205 five-letter words having single-solution anagrams. *Behaviour Research Methods and Instrumentation* 12, 428-450.
- MacWhinney, B. (2000). *The CHILDES project: Tools for analyzing talk. Third Edition*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Schröder, A., Kauschke, C. & De Bleser, R. (2003). Messungen des Erwerbalters für konkrete Nomina. *Neurolinguistik* 17 (2), 83-114.

**Table: Estimated receptive age of acquisition for 161 Spanish adjectives**

Total: AoA ratings for the whole sample (n=36 participants)  
 Child: Child-estimations by parents and adults in contact with preschool-aged children (n=14 participants)  
 Self: Self-estimations by adults (n=22 participants)  
 Rank: Indication of rank for the different adjectives based on the ratings of the whole sample  
 Months: Estimated receptive AoA based on the mean of the whole sample  
 M & SD: Mean and standard deviation of the AoA ratings in years  
 \* : Items with significant differences between Child- and Self-estimations (n=3)

	Rank	Total			Child		Self	
		Months	M	SD	M	SD	M	SD
rojo	1	27,33	<b>2,28</b>	2,28	2,00	0,88	2,45	1,10
blanco	2	28,11	<b>2,34</b>	1,03	2,36	1,01	2,33	1,06
negro	3	28,26	<b>2,35</b>	0,91	2,43	0,94	2,29	0,92
caliente	4	28,33	<b>2,36</b>	1,25	1,86	0,77	2,68	1,39
amarillo	5	28,67	<b>2,39</b>	1,05	2,29	0,91	2,45	1,14
azul	6	28,67	<b>2,39</b>	0,99	2,21	0,97	2,50	1,01
pequeño	7	28,80	<b>2,40</b>	1,22	2,15	1,07	2,55	1,30
frío	8	29,00	<b>2,42</b>	1,23	2,14	1,17	2,59	1,26
grande	9	29,67	<b>2,47</b>	1,21	1,93	0,83	2,82	1,30
verde	10	29,67	<b>2,47</b>	1,00	2,29	0,91	2,59	1,05
contento	11	30,21	<b>2,52</b>	1,02	2,08	0,67	2,82	1,13
sucio	12	31,67	<b>2,64</b>	1,20	2,14	0,95	2,95	1,25
mojado	13	32,33	<b>2,69</b>	1,21	2,21	0,97	3,00	1,27
feo	14	32,67	<b>2,72</b>	1,28	2,64	1,01	2,77	1,45
cuadrado	15	32,80	<b>2,73</b>	0,87	2,67	0,89	2,78	0,88
roto	16	33,60	<b>2,80</b>	1,21	2,57	1,22	2,95	1,20
dulce	17	33,67	<b>2,81</b>	1,14	2,29	1,07	3,14	1,08
blando	18	33,75	<b>2,81</b>	1,12	2,50	0,80	3,00	1,26
descalzo	19	34,45	<b>2,87</b>	1,36	2,25	0,87	3,26	1,48
lleno	20	35,00	<b>2,92</b>	1,42	2,79	1,05	3,00	1,63
feliz	21	35,33	<b>2,94</b>	1,45	2,50	1,22	3,23	1,54
limpio*	22	35,67	<b>2,97</b>	1,21	2,36	1,01	3,36	1,18
despierto	23	36,33	<b>3,03</b>	1,50	2,29	1,20	3,50	1,50
rápido	24	36,33	<b>3,03</b>	1,21	2,86	1,10	3,14	1,28
oscuro	25	36,33	<b>3,03</b>	1,23	2,50	1,16	3,36	1,18
duro	26	36,67	<b>3,06</b>	1,22	2,86	1,03	3,18	1,33
alto	27	36,69	<b>3,06</b>	1,08	2,86	0,95	3,19	1,17
vacío	28	37,00	<b>3,08</b>	1,25	2,71	0,99	3,32	1,36
largo	29	37,33	<b>3,11</b>	1,26	3,07	1,07	3,14	1,39
redondo	30	37,33	<b>3,11</b>	1,51	3,00	1,04	3,18	1,76
gordo	31	37,33	<b>3,11</b>	1,26	2,93	0,83	3,23	1,48
enfermo	32	37,67	<b>3,14</b>	1,27	2,86	1,17	3,32	1,32
alegre	33	39,33	<b>3,28</b>	1,32	2,57	1,09	3,73	1,28
bajo	34	39,33	<b>3,28</b>	1,30	2,93	1,00	3,50	1,44
corto	35	39,75	<b>3,31</b>	0,86	3,21	1,05	3,39	0,70
morado	36	39,77	<b>3,31</b>	0,90	3,21	0,70	3,38	1,02
suave	37	39,77	<b>3,31</b>	1,39	3,29	1,49	3,33	1,35
seco	38	40,33	<b>3,36</b>	1,38	2,79	1,25	3,73	1,35
nuevo	39	40,33	<b>3,36</b>	1,10	2,79	0,97	3,73	1,03
apagado*	40	40,46	<b>3,37</b>	1,21	2,50	0,94	3,95	1,02

	Total			Child			Self	
	Rank	Months	<i>M</i>	Rank	Months	<i>M</i>	Rank	Months
flaco	41	40,46	<b>3,37</b>	1,19	3,08	0,76	3,55	1,37
lento	42	40,67	<b>3,39</b>	1,34	3,50	1,22	3,32	1,43
fuerte	43	40,67	<b>3,39</b>	1,34	3,14	1,10	3,55	1,47
triste	44	40,80	<b>3,40</b>	1,56	2,93	1,21	3,71	1,71
gris	45	41,67	<b>3,47</b>	1,32	3,21	0,97	3,64	1,50
rico	46	41,83	<b>3,49</b>	1,54	2,77	1,42	3,91	1,48
fácil	47	42,33	<b>3,53</b>	1,25	3,29	1,27	3,68	1,25
asustado	48	42,33	<b>3,53</b>	1,23	3,00	0,88	3,86	1,32
viejo	49	42,33	<b>3,53</b>	1,13	3,43	1,09	3,59	1,18
peludo	50	42,67	<b>3,56</b>	1,08	3,00	1,04	3,91	0,97
rubio	51	42,86	<b>3,57</b>	1,52	3,23	1,09	3,77	1,72
desnudo	52	43,00	<b>3,58</b>	1,50	3,14	1,17	3,86	1,64
divertido	53	43,00	<b>3,58</b>	1,08	3,29	0,91	3,77	1,15
cansado	54	43,33	<b>3,61</b>	1,50	3,21	1,12	3,86	1,67
rosado	55	43,54	<b>3,63</b>	1,55	3,14	1,61	3,95	1,47
tarde	56	43,88	<b>3,66</b>	1,10	3,42	1,08	3,80	1,11
difícil	57	45,00	<b>3,75</b>	1,25	3,79	1,25	3,73	1,28
peligroso	58	45,00	<b>3,75</b>	0,95	3,82	0,98	3,71	0,96
pesado	59	45,33	<b>3,78</b>	1,42	3,07	1,27	4,23	1,34
mediano	60	46,00	<b>3,83</b>	1,30	3,71	0,91	3,91	1,51
gracioso	61	46,67	<b>3,89</b>	1,39	3,64	1,34	4,05	1,43
tranquilo	62	47,00	<b>3,92</b>	1,50	3,50	1,51	4,18	1,47
travieso	63	47,00	<b>3,92</b>	1,48	3,86	1,51	3,95	1,50
herido	64	47,00	<b>3,92</b>	1,61	3,29	1,27	4,32	1,70
favorito	65	47,60	<b>3,97</b>	1,27	3,33	1,15	4,39	1,20
ancho	66	47,67	<b>3,97</b>	1,18	3,71	1,14	4,14	1,21
temprano	67	48,67	<b>4,06</b>	1,45	3,71	1,54	4,27	1,39
amargo	68	49,33	<b>4,11</b>	1,77	3,79	1,97	4,32	1,64
mudo	69	50,32	<b>4,19</b>	1,01	3,70	0,95	4,43	0,98
dorado	70	50,57	<b>4,21</b>	0,92	3,91	0,70	4,41	1,00
mágico	71	50,67	<b>4,22</b>	1,44	4,57	1,70	4,00	1,23
prohibido	72	52,11	<b>4,34</b>	1,71	4,15	1,68	4,45	1,77
ciego	73	52,33	<b>4,36</b>	1,36	4,07	1,33	4,55	1,37
simpático	74	52,33	<b>4,36</b>	1,38	4,07	1,44	4,55	1,34
picante	75	52,67	<b>4,39</b>	1,64	4,43	1,95	4,36	1,47
plano	76	52,80	<b>4,40</b>	1,50	4,23	0,83	4,50	1,79
frito	77	52,89	<b>4,41</b>	1,01	4,00	0,95	4,73	0,96
suelto	78	53,33	<b>4,44</b>	1,54	4,00	1,24	4,73	1,67
cómodo	79	53,67	<b>4,47</b>	1,54	4,00	1,52	4,77	1,51
joven	80	53,83	<b>4,49</b>	1,50	4,85	1,41	4,27	1,55
precioso	81	54,00	<b>4,50</b>	1,68	4,00	1,57	4,82	1,71
sordo	82	54,00	<b>4,50</b>	1,32	4,21	1,48	4,68	1,21
ocupado	83	54,67	<b>4,56</b>	1,50	3,86	1,03	5,00	1,60
valiente	84	55,00	<b>4,58</b>	1,30	4,29	0,91	4,77	1,48
invisible	85	55,33	<b>4,61</b>	1,02	4,50	1,09	4,68	0,99
secreto	86	55,33	<b>4,61</b>	1,40	4,36	1,28	4,77	1,48
falso	87	55,67	<b>4,64</b>	1,38	4,21	1,48	4,91	1,27
transparente	88	55,67	<b>4,64</b>	1,55	4,64	1,45	4,64	1,65
importante	89	56,33	<b>4,69</b>	1,49	4,43	1,50	4,86	1,49
fresco	90	56,57	<b>4,71</b>	1,43	4,69	1,55	4,73	1,39
plateado*	91	56,57	<b>4,71</b>	1,47	3,79	0,89	5,33	1,46

	Total			Child			Self	
	Rank	Months	M	Rank	Months	M	Rank	Months
alargado	92	56,67	4,72	1,58	4,21	1,58	5,05	1,53
bruto	93	56,91	4,74	1,29	4,50	1,40	4,90	1,22
pobre	94	56,91	4,74	1,29	4,86	1,23	4,67	1,35
inteligente	95	57,00	4,75	1,36	4,64	0,93	4,82	1,59
ácido	96	57,18	4,76	1,83	4,08	1,98	5,19	1,63
crudo	97	57,26	4,77	1,61	4,07	1,82	5,24	1,30
serio	98	57,33	4,78	1,49	4,86	1,51	4,73	1,52
completo	99	57,67	4,81	1,47	4,57	1,45	4,95	1,50
raro	100	57,94	4,83	1,38	4,50	1,65	5,05	1,16
asqueroso	101	58,67	4,89	1,80	4,57	1,70	5,09	1,87
torcido	102	58,94	4,91	1,52	4,71	1,68	5,05	1,43
loco	103	59,33	4,94	1,79	4,50	1,91	5,23	1,69
nervioso	104	61,00	5,08	1,46	5,36	1,45	4,91	1,48
débil	105	61,00	5,08	1,48	5,29	1,49	4,95	1,50
agresivo	106	61,67	5,14	1,53	5,07	1,54	5,18	1,56
amable	107	61,67	5,14	1,55	4,86	1,61	5,32	1,52
antiguo	108	62,33	5,19	1,45	5,29	1,49	5,14	1,46
atento	109	62,33	5,19	1,39	5,00	1,47	5,32	1,36
curioso	110	62,74	5,23	1,26	4,93	1,27	5,43	1,25
fino	111	63,00	5,25	1,42	5,21	1,12	5,27	1,61
generoso	112	63,00	5,25	1,65	5,00	1,62	5,41	1,68
ronco	113	64,33	5,36	1,46	4,64	1,50	5,82	1,26
caro	114	65,09	5,42	1,30	5,15	1,34	5,60	1,27
torpe	115	65,25	5,44	1,05	5,42	1,38	5,45	0,83
repleto	116	65,33	5,44	1,56	5,07	1,73	5,68	1,43
revuelto	117	66,33	5,53	1,46	4,86	1,70	5,95	1,13
portátil	118	66,67	5,56	1,38	5,00	1,52	5,91	1,19
complicado	119	66,86	5,57	1,31	5,31	1,03	5,73	1,45
agotado	120	67,00	5,58	1,44	5,79	1,48	5,45	1,44
salvaje	121	67,27	5,61	1,03	5,62	0,96	5,60	1,10
eléctrico	122	67,33	5,61	1,48	5,14	1,51	5,91	1,41
vago	123	68,57	5,71	1,43	5,69	1,44	5,73	1,45
santo	124	68,67	5,72	1,67	6,43	1,02	5,27	1,86
natural	125	68,82	5,74	1,24	6,00	1,35	5,59	1,18
hijo	126	68,82	5,74	1,26	5,46	1,39	5,90	1,18
retrasado	127	71,00	5,92	1,27	6,21	0,89	5,73	1,45
destrutivo	128	72,69	6,06	1,11	5,85	1,14	6,18	1,10
soltero	129	73,00	6,08	1,18	6,14	1,23	6,05	1,17
formal	130	73,71	6,14	1,06	6,00	1,22	6,23	0,97
justo	131	73,71	6,14	1,06	6,36	0,93	6,00	1,14
físico	132	73,94	6,16	0,93	6,00	1,08	6,28	0,83
distraído	133	74,22	6,19	0,74	6,20	0,92	6,18	0,64
exagerado	134	74,40	6,20	0,99	6,07	1,00	6,29	1,01
grave	135	75,20	6,27	0,83	6,08	0,90	6,39	0,78
responsable	136	75,31	6,28	0,70	6,45	0,52	6,17	0,79
terrible	137	75,31	6,28	0,80	6,10	0,99	6,37	0,68
divino	138	75,67	6,31	1,19	5,93	1,44	6,55	0,96
orgullosa	139	75,67	6,31	1,04	6,36	1,01	6,27	1,08
entusiasmado	140	75,75	6,31	0,78	6,25	0,75	6,35	0,81
válido	141	76,00	6,33	0,99	6,21	0,97	6,41	1,01
libre	142	76,00	6,33	0,73	6,11	0,78	6,44	0,70

	Total			Child			Self	
	Rank	Months	<i>M</i>	Rank	Months	<i>M</i>	Rank	Months
astuto	143	76,33	6,36	0,87	6,36	0,84	6,36	0,90
ridículo	144	76,88	6,41	0,76	6,36	0,81	6,43	0,75
sabio	145	77,14	6,43	0,85	6,79	0,43	6,19	0,98
perfecto	146	77,14	6,43	0,63	6,18	0,75	6,59	0,51
doméstico	147	77,29	6,44	0,96	6,57	0,76	6,35	1,09
dócil	148	77,33	6,44	1,03	6,50	1,16	6,41	0,96
aplicado	149	78,00	6,50	0,86	6,45	0,93	6,53	0,84
interesante	150	78,00	6,50	0,69	6,55	0,82	6,47	0,62
impaciente	151	78,22	6,52	0,70	6,33	0,78	6,67	0,62
criminal	152	78,33	6,53	0,81	6,64	0,84	6,45	0,80
sospechoso	153	78,58	6,55	0,72	6,38	0,87	6,67	0,59
lógico	154	78,67	6,56	0,77	6,50	0,76	6,59	0,80
creativo	155	79,13	6,59	0,67	6,54	0,78	6,63	0,60
poderoso	156	79,45	6,62	0,73	6,56	0,88	6,65	0,67
atlético	157	79,50	6,63	0,66	6,67	0,49	6,60	0,75
impertinente	158	83,57	6,96	0,19	7,00	0,00	6,94	0,25
concreto	159	83,60	6,97	0,18	6,92	0,29	7,00	0,00
genuino	160	84,00	7,00	0,00	7,00	0,00	7,00	0,00
reversible	161	84,00	7,00	0,00	7,00	0,00	7,00	0,00