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Normative data for 102 Spanish remote associate problems and age-related differences in performance

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The Remote Associates Test (RAT) is a measure developed by Mednick (1962) which is used to assess the convergent thinking component of creativity. This study presents a normative database in Spanish including 102 problems based on the RAT. Three sets of problems were built according to the type of between-word associations: semantic, compound, and two-word expressions. These problems were administered to a sample of 309 elementary, high-school, and university students. The results show good internal consistency as well as good convergent validity with insight problems, and discriminant validity using Guilford's Alternative Uses Test. In addition, the results indicate age-related differences in the ability to solve the different types of problems.

In the 1960s, Mednick designed the Remote Associates Test (RAT; Mednick, 1962, 1968) as a domain-general test to assess individual differences in the ability to form associations between seemingly unrelated words. A RAT problem comprises a triad of cue words that are not directly related to each other, but rather are related to a common associate fourth word through semantic association, synonymy, or compound word formation. The three problem words can be associated with a solution word in a number of ways. An example would be the associations between the cue words *cheese, computer*, and *elephant*, and the solution word *mouse.* In this case, the words

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are related given their semantic association: the mouse likes cheese, a computer needs a mouse to work, and the elephant is afraid of the mouse. Reaching a solution requires creativity because the first retrieved piece of information —most associated with one cue word—is often not related to the other cue words, and the solver must think of more remotely related information in order to connect all three words. Therefore, identifying the correct associative word means that the strongest associates need to be suppressed to retrieve other remote associates of the three cue words (Mednick, 1962).

It is argued that the RAT captures individual differences dependent upon processes similar to those assessed using other analytical or convergent thinking tests, such as insight problems, and which differs from the processes involved in traditional tests of divergent thinking (Bowden & Jung-Beeman, 2003; Lee, Huggins, & Therriault, 2014). Convergent thinking tasks entail a combination of distantly related ideas to identify a correct solution, whereas divergent thinking tasks involve the generation of novel and unusual ideas (Brophy, 2001). Therefore, RAT performance is considered an indicator of convergent thinking given the emphasis placed on analytical processing and its common solution feature, which requires problem solvers to identify a single, correct answer.

Since its beginnings, the RAT has been widely used to research the processes involved in creative thinking, reasoning and problem solving (e.g., Beeman & Bowden, 2000; Bowden, Jung-Beeman, Fleck, & Kounios, 2005); memory and cognitive control (e.g., Gómez-Ariza et al., 2017; Howe, Wilkinson, Garner, & Ball, 2016; Storm & Angello, 2010); attention (e.g., Ansburg & Hill, 2003; Wegbreit, Suzuki, Grabowecky, Kounios, & Beeman, 2012); and even in the study of certain types of psychopathologies (e.g., Fodor, 1999; Mikulincer & Sheffi, 2000).

To date, most studies that have used the RAT have focused on adults, and very little attention has been paid to possible developmental changes in RAT performance. There is, however, recent evidence of age-related differences in RAT problem-solving. Kleibeuker, De Dreu, and Crone (2013) found that young adults and older adolescents outperformed middle adolescents which in turn were more accurate than young adolescents. Thus, their results indicate that the ability to solve these problems is not fully developed until late adolescence. The authors highlighted several factors that might contribute to these differences; for example, an increasing amount of knowledge and experience and improvements in cognitive control functioning with age. Some of these changes may reflect the development of prefrontal cortex areas throughout childhood and adolescence (Blakemore &

Choudhury, 2006). Therefore, the ages corresponding to elementary and high-school educational stages seem to be characterized by student growth in creative skills (Barbot, Lubart, & Besançon, 2016).

The materials used in the RAT include verbal associations that could reasonably be deemed familiar to almost everyone who shares a language and culture. The RAT involves associative processes that depend on semantic knowledge (e.g., vocabulary) and cultural context. For instance, a compound word (e.g., *matchhead*) made up of two words (*match* and *head*) makes sense in a specific cultural context, as it may be impossible to find that very combination of words in other languages to convey the same meaning. Similarly, cultural idioms (e.g., the *White House*) hold a specific meaning in a specific culture and may make no sense in another linguistic context. Consequently, the original RAT cannot be administered in another linguistic context or languages other than English through literal translation. Instead, RAT problems in a particular language must take into account the specific characteristics of the chosen language's vocabulary and its colloquial conventions (Salvi, Costantini, Bricolo, Perugini, & Beeman, 2016). For this reason, the RAT has been adapted to other-language versions, including among others Chinese (Shen, Yuan, Liu, Yi, & Dou, 2016; Wu & Chen, 2017), Dutch (Chermahini, Hickendorff, & Hommel, 2012), or Italian (Salvi et al., 2016) and adapted to other cultural-contexts, such as Jamaica (Hamilton, 1982) or Spain (Romo, 1980). The adaptations usually start from the original RAT developed by Mendick, selecting only those items appropriate for their respective cultural context.

To our knowledge, Romo (1980) appears to be the first that adapted the RAT into Spanish. She selected 30 problems from the original English version after discarding those items that contained non-habitual concepts in colloquial Spanish. Two correction keys were used, one based on the original answers used by Mednick and another based on response frequency to each problem. A striking result was that the most frequent response for almost half of the items was conceptually different to the original solution. This finding therefore highlights the importance of taking into account the cultural differences of the population for which the test is intended.

The present study

The current study sought to build a normative database of RAT problems in Spanish, which could be suitably administered to children and adults. It is important to have appropriate measures to assess convergent thinking in individuals both young and old. Not only would this allow us to study creativity performance in different age groups separately, but it would

also enable us to carry out studies aimed at determining developmental or age-related changes in these cognitive abilities, for which it is necessary to employ the same instrument. To this end, different RAT-type problems were created, taking into account the specific characteristics of Spanish vocabulary and its colloquial conventions. This pool of RAT problems was administered to elementary, high-school, and university students.

Cue words of a RAT problem may be related to each other through different types of associations. For example, the words *same*, *tennis* and *head* are associated with the solution (*match*) via synonymy (same = match); compound word formation (matchhead); and semantic association (tennis match). The inclusion of different types of associations within the same problem can affect task consistency, as pointed out by some authors (e.g., Bowden & Jung-Beeman, 2003; Marko, Michalko, & Riečanský, 2018; Wu & Chen, 2017). To address this limitation, Bowden and Jung-Beeman (2003) created a series of 144 RAT problems using only one type of associative link. Following this approach, different sets of problems were designed for this study. Problems in each set had the same type of associative link between the cue words and the solution word.

Three sets of RAT problems were built with a different associative link between the cue words and the solution word (see Table 1). The first problem type comprised problems in which the words were semantically associated with each other (s-RAT). That is, the remote associate was a word with a related meaning to the three cue words. One such example is the solution word *ratón* (mouse) and the cue words *queso* (cheese)*, ordenador* (computer) and *elefante* (elephant).

The second problem type comprised compound words that share an initial lexeme (c-RAT). These compound words appear this way in the Spanish dictionary (Real Academia Española, 2014). The solution for a c-RAT problem was the initial lexeme shared by all three compound words. For example, the triad *abrebotellas* (bottle opener), *abrecartas* (letter opener), and *abrelatas* (can opener) share the initial lexeme "*abre*" which means "to open". Thus, the solution was the word "*abre*". In the Spanish language, there are very few cases of compound words (e.g., *abrelatas*, [can opener]).

A third and final problem type (e-RAT) comprised two-word expressions with a common word. The solution word was the shared word. For example, the triad *Unión Soviética* (Soviet Union), *Unión Europea* (European Union), and *unión monetaria* (monetary union) share the initial word *unión*, which is the solution to the problem. These word combinations convey a complete idea, which cannot be expressed without both words

together, although each word separately may take on a completely different meaning.

Table 1. Type of RAT problems according to associative link between the cue words and the solution word.

Type	Cue Words	Solution Word
s-RAT	*queso* (cheese), *ordenador* (computer), *elefante* (elephant)	*ratón* (mouse)
c-RAT	*botellas* (bottle), *cartas* (letter), *latas* (can)	*abre* (open)
e-RAT	*Soviética* (Soviet), *Europea* (European), *monetaria* (monetary)	*unión* (union)

Note. s-RAT= semantic problems; c-RAT = compound problems; e-RAT= expressions problems.
s-RAT instructions: find a solution word whose meaning can be associated with each of the three cue words. c-RAT instructions: find a solution word which can form a compound word with each of the three cue words given. e-RAT instructions: find a solution word that allows forming expressions of two words with each of the three cue words.

In order to assess the validity of RAT problems, its relationship with other measures linked to convergent and divergent thinking processes was examined, as undertaken in previous studies (e.g., Chermahini et al., 2012; Lee et al., 2014; Lee & Therriault, 2013). Evidence for convergent validity is established when correlations between scores from the same construct obtained using different measurement methods are strong (Campbell & Fiske, 1959). Similar to the RAT, insight problems require a unique response; at first glance, they are not obvious and require some restructuring of the to-be-solved problem (DeYoung, Flanders, & Peterson, 2008). Conversely, evidence for discriminant validity is established when correlations among scores from different constructs obtained using different measurement methods are weak (Campbell & Fiske, 1959). It is claimed that the required process for solving RAT problems differs from those involved in traditional divergent thinking tests (e.g., Lee et al., 2014). A classical test of divergent thinking is Guilford's Alternative Uses Test (1967), which asks participants to come up with as many solutions or unusual uses as possible for a given object. As in previous studies (e.g., Chermahini et al., 2012; Lee et al., 2014; Lee & Therriault, 2013), we expected RAT problems to show significant and positive correlations with insight problems and no significant relationship—or a lesser one—with the measures obtained using the Alternative Uses Test.

It has been suggested that associative fluency tasks tap a person's ability to retrieve and organize verbal information in their memory (e.g., Benedek, Könen, & Neubauer, 2012; Lee & Therriault, 2013), and which have traditionally been used to assess semantic memory (Collins & Loftus, 1975). To assess associative fluency as the ability to effectively retrieve a wide range of associations, we used a phonological and category fluency task. We expected the RAT problem scores to correlate positively with associative fluency, as observed in other studies (Lee & Therriault, 2013).

Regarding age-related differences, developmental changes in a person's efficiency to solve RAT problems have been previously reported (e.g., Kleibeuker et al., 2013a). As such, we expected elementary students to solve fewer problems than high-school students, and the latter less than university students.

METHOD

Participants. Three hundred and nine students (176 female) were recruited as participants from across different educational stages. Ninety-seven were fifth- and sixth-year pupils of elementary education (37 girls); 111 were third- and fourth-year pupils of high-school education (65 girls); and 101 were third-year university students taking a degree in Psychology (74 girls). The average age of the elementary participants was 11.27 years (SD = 0.63); high-school students had an average age of 15.45 years (SD = 0.81); and university students averaged 22.38 years (SD = 2.13). The study was approved by the ethics committee of the University of Jaén. Informed consent was obtained from the participants themselves and from the parents of the children and adolescents.

Materials.

Remote Associates Test (RAT; based on Mednick, 1962). The RAT calls upon participants to identify a solution which is associated with three cue words presented semantically, through compound word formation, or through a two-word expression.

Semantic remote associates problems (s-RAT). A total of 60 problems in which the three cue-word items were semantically associated with a fourth solution word were constructed. An example would be the solution word *ratón* (mouse*)* prompted by the cue words *queso* (cheese)*,* ordenador *(*computer*)* and *elefante (*elephant*)*. Participants were instructed to search for a word related through meaning to the three cue words presented. The words were selected from Macizo, Gómez-Ariza, and Bajo's (2000) database of

associated words for children based on their associative strength. Given that 58 words were contained in the aforementioned study, two additional problems were taken from the associates' database published by Fernández, Díez, Alonso, and Beato (2004). Three words were chosen for each problem, so they had different associative strengths.

Compound remote associates problems (c-RAT). The second set comprised 30 problems in which participants had to find a solution that formed a compound word from each of the three proposed words. For example, the word "*abre*" which means "to open" was the initial lexeme for the triad *abrebotellas* (bottle opener), *abrecartas* (letter opener), and *abrelatas* (can opener). The words that were selected as cue were the second components of the compound words (e.g., *botellas, cartas, latas*) and the solution word was the initial lexeme for the compound words. Compound words were considered those with an entry in the Spanish dictionary (Real Academia Española, 2014). In the Spanish language, the number of compound words sharing the same lexeme in at least three cases is relatively limited, so the selection was reduced to 30.

Two-word expression remote associates problems (e-RAT).

Thirty problems were constructed in which participants were asked to search for a solution that would form a two-word expression using the three cue words presented. For example, participants given the cue words "*Soviética, Europea, monetaria*" (Soviet, European, monetary) had to identify the solution "*unión*" (union). Two-word expressions are frequently used to convey a complete idea, which could not be expressed without both words placed together. To construct this particular set of problems, we used the Spanish dictionary (Real Academia Española, 2014) and the website WordReference.com. A list of 50 triads was initially drawn up, of which 30 were finally selected. They were deemed frequent in the Spanish cultural context based on the opinion of two external judges (a high-school teacher and a university professor). Both judges reached full agreement on the appropriate use of these expressions in this cultural context.

Only singular names were considered problem solutions for all RAT problem types. Because Spanish morphosyntax requires number and gender consistency, the latter was preserved throughout all problems. Moreover, no presented words were repeated in any problem, neither as a cue word nor as a solution for any triad.

Category fluency task (Lee & Therriault, 2013). The category fluency task required participants to generate a list of as many different types of animals as possible for two minutes. The total number of appropriately named animals was used for the total score.

Letter fluency task (Lee & Therriault, 2013). The letter fluency task assessed phonetic fluency and required participants to generate a list of as many words as possible that begin with the letter P for two minutes. The total number of appropriately named words was used for the total score.

Unusual Uses Test (Guilford, 1967). The Unusual Uses Test required participants to come up with unusual uses for a common household item for two minutes. The item for this task was a brick. Participants' responses on the Unusual Uses Test were measured using the number of different uses (fluency); the number of different categories for these uses (flexibility); and the degree of uniqueness (originality) as scores. The originality score was assessed for each different use on a scale of 0 to 1, with 0 being 'not original at all' and 1 being 'completely original'. Each response was compared to the total responses from all participants at the same educational stage. Specifically, the score was the result of dividing 1 by the number of same-aged people who gave the same solution. For instance, a score of 1 was given if the use was proposed by a single participant; and a score of .33 was awarded when the solution was proposed by three participants. The final score was the sum of the originality scores across all the different uses proposed by each participant.

Insight problems. For this task, participants were required to solve four insight problems (see Appendix A). They were selected among a pool of lateral thinking exercises based on their apparent difficulty. Participants had two minutes to solve each one. A point was awarded for each correctly solved problem. An example was: "A child playing on the beach has six piles of sand in one place and another three piles somewhere close by. If the child gathered up all the piles, how many piles of sand would the child have?" The proportion of problems solved was taken as the final score.

Procedure

Students were given a paper-and pencil-booklet which contained all the tests they had to complete as well as the written instructions for each test. The order of the tasks and their administration time was controlled by the examiner, who explained each task aloud and announced the start and end of each task.

The tests were held over one session in the students' classroom, lasting approximately one hour and thirty minutes. Tests were administered in the following order: category fluency (2 min), phonological fluency (2 min), unusual uses (2 min), insight problems (8 min), and RAT problems (45 min). For the RAT problems, each problem set came with specific instructions and two practice exercises. The problem sets also contained a common block of general instructions, where participants were instructed to respond to all the

presented problems and specific instructions for each type of problem (see Table 1). Participants had 10 minutes to complete each block of 30 problems. The set of s-RAT problems was divided into two 30-item blocks. For each block, participants had 10 minutes to complete all 30 problems, with a short break (1 min) between both blocks. There was also a 5-min break before administering the RAT problems. The problems sets were administered in a fixed order: s-RAT, c-RAT, e-RAT.

Data Analysis

A preliminary analysis was conducted on the psychometric characteristics of the 120 RAT problems used. Each correct answer was given a score of 1. The final score reflects the proportion of correctly solved problems. The Cronbach's alpha coefficient was calculated as a measure of internal consistency and the item-total correlation of each item was calculated for the total sample. Small item-total correlations indicate that the item responses were not strongly related to the test score based on all other items. Items whose item-total coefficients showed values less than .20 were discarded; as they did not discriminate, and they lowered the scale's internal consistency[1]. The definitive number of problems was reduced to 102, of which 44 were semantic associate problems (s-RAT); 30 were compound associates problems (c-RAT); and 28 were two-word expression problems (e-RAT). The proportion of participants solving each problem was calculated.

The Appendix B shows the normative data for the RAT, featuring the words used in each problem and the proportion of hits corresponding to both the total sample and each educational stage. Item-test correlations are also provided. We have included as supplementary material an analysis of the alternative responses (errors) exceeding 5% of the frequency by educational stage.

The internal consistency of the RAT scales is presented, followed by the correlations among these three types of RAT problems and the measures of divergent thinking (Unusual Uses Test) and convergent thinking (insight problems). Finally, the scales' score differences by educational stage are examined.

RESULTS

Classical test theory

[1] It should be noted that when the analyses were performed separately for each educational level, there were some correlations item-test below this criterion (see Appendix B). Although these items could have been discarded, it was decided to keep them because they could still be administered to samples from educational levels for which the coefficients are acceptable.

An analysis of the scales' internal consistency using Cronbach's alpha was performed on the correct answers for each problem type: s-RAT, c-RAT and e-RAT. The correlation of each problem with the total scale is reported in the Appendix B.

The total scale's internal consistency proved to be excellent, with a Cronbach's alpha coefficient of .95 for the 102 RAT problems, showing evidence for the scores' internal reliability. Internal consistency for each problem type and educational stage was also very good (see Table 2).

Table 2. Internal consistency (Cronbach's alpha coefficient) by educational stage.

	Educational Stage			
	Elementary	High-school	University	Total
s-RAT	.82	.78	.63	.86
c-RAT	.76	.82	.73	.92
e-RAT	.89	.88	.78	.88
Total	.92	.92	.84	.95

Note: s-RAT= semantic problems; c-RAT = compound problems; e-RAT= expressions problems.

Convergent and discriminant validity

In order to evaluate the validity of the RAT problems, Pearson's correlation analysis was carried out alongside other measures related to convergent and divergent thinking. Table 3 shows the results of the zero-order correlations (lower section) and the partial correlations by educational stage (upper section) between the RAT and measures of associative fluency, as well as between the divergent and convergent thinking tasks.

Scores on the phonological fluency task were moderately related to the category fluency scores for animal names, providing evidence for convergent validity. RAT scores were highly and consistently related to both the category fluency and phonological fluency measures. Correlations showed a decline in magnitude when educational stage was taken into account, which may indicate that relationships between variables depend on age.

Convergent validity was evaluated by examining the correlations between the RAT and insight problem scores. The RAT scores were significantly and positively related to the proportion of insight problems solved (.40). They were also slightly lower when controlling for the effect of educational stage (.33 partial).

Table 3. Descriptive statistics and coefficients for tests of correlation (zero-order correlations, lower section; partial correlations by educational stage, upper section) between Remote Associates Task, associative fluency scores (category, phonological), alternative uses task (fluency, flexibility, and originality) and insight problems.

	1	2	3	4	5	6	7	8	9	10
1. Category fluency	1	.53**	.16*	.17*	.06	.25**	.39**	.28**	.29**	.42**
2. Phonological fluency	.63**	1	.21**	.24**	.19**	.25**	.37**	.29**	.30**	.36**
3. Creative fluency	.06	.06	1	.60**	.44**	.06	.03	.02	.04	.02
4. Creative flexibility	.11	.14*	.61**	1	.62**	.07	.10	.03	.07	.15*
5. Originality	.06	.16**	.43**	.62**	1	.06	.13*	.06	.11	.14*
6. Insight problems	.32**	.34**	.01	.04	.06	1	.33**	.29**	.24**	.32**
7. Total RAT	.55**	.61**	-.13*	-.01	.09	.40**	1	.76**	.88**	.85**
8. s-RAT	.46**	.53**	-.12*	-.05	.10	.39**	.92**	1	.54**	.53**
9. c-RAT	.47**	.54**	-.10	-.02	.05	.37**	.87**	.72**	1	.62**
10. e-RAT	.56**	.58**	-.13*	.04	.09	.33**	.93**	.73**	.78**	1
M	24.56	20.50	8.95	4.80	.34	.30	.55	.60	.60	.45
SD	6.53	6.32	4.29	2.36	.40	.26	.19	.17	.24	.21
Min	4	4	1	1	0	0	.07	.02	0	0
Max	43	38	36	14	2.20	4	.91	.91	1	.93
Skewness	.08	.27	1.27	.54	2.12	.56	-.44	-.70	-.66	-.07
Kurtosis	.26	-.24	4.47	.19	4.69	-.31	-.52	.65	-.05	-.92

Note: ** $p < .01$; * $p < .05$.

Discriminant validity was evaluated by examining the correlations between the total RAT scores and the indicators of divergent thinking from the Unusual Uses Test (fluency, originality, and flexibility). The total RAT scores were negatively related to fluency (-.13) and did not correlate with scores of flexibility or originality, providing evidence for discriminant validity. The total RAT scores were significantly and positively related to one of the three indicators of divergent thinking (originality) when educational stage was considered.

Educational-stage differences

To determine possible age-related differences across the whole set of RAT problems, univariate analyses were carried out for each type of RAT problem, with educational stage as the between-group variable (elementary, high-school, and university). The effect of educational stage was significant across all RAT problem types: s-RAT, $F(2, 306) = 95.69$, $p < .001$, $\eta^2 = .36$, c-RAT, $F(2, 306) = 100.57$, $p = <.001$, $\eta^2 = .40$, and e-RAT, $F(2, 306) =$

147.56, $p = <.001$, $\eta^2 = .49$. A post-hoc analysis with Bonferroni corrections confirmed significant differences between each educational stage ($p <.001$). Table 4 shows the mean proportion (and standard deviation) of correct answers for each RAT problem type by educational stage.

Table 4. Proportion of correct answers according to the type of RAT problem by educational stage (standard deviation between parentheses).

	Educational Stage			
	Elementary	High-school	University	Total
s-RAT	.47 (*.15)*	.60 (*.14)*	.73 (*.10)*	.60 (*.17*)
c-RAT	.41 (*.21)*	.59 (*.20)*	.78 (*.14)*	.60 (*.24*)
e-RAT	.24 (*.13)*	.48 (*.17)*	.61 (*.15)*	.44 (*.21*)
Total	.37 (*.15)*	.56(*.16)*	.71 (*.16)*	

Note. s-RAT= semantic problems; c-RAT = compound problems; e-RAT= expressions problems.

DISCUSSION

The main aim of this study was to develop a Spanish normative database of the Remote Associates Test (RAT) designed by Mednick (1968) suitable for use with students of different educational stages. To this end, a wide set of remote associate problems was created which involved different types of associative links in memory. A set of problems was built on the basis that the cue words and the solution word would share a semantic relationship in each problem. A second problem type was constructed by forming compound words. Another set of problems was developed using remote associations based on two-word expressions.

The results reveal that the problems constructed following these three criteria show good internal consistency, both for the entire sample and for the different educational stages. The reliability coefficients are similar to those reported for other normative data sets (e.g., Chermahini et al., 2012). The mean rates of correct responses for the set of Spanish problems ranged between .06 and .98. This range is comparable to those reported for other normed sets. For example, in the Dutch version, mean hit rates ranged between .02 and .72 (Chermahini et al., 2012), and in the Italian version, they were between 0 and .98 (Salvi et al, 2016).

As for the convergent validity of the designed RAT problems, a positive and consistent relationship was observed between the RAT problems and the solving of insight-type problems, in line with those found in other studies on adults (Chermahini et al., 2012; Lee et al., 2014; Lee & Therriault, 2013; Shen et al., 2016). Both measures have traditionally been used in the creativity domain as measures of convergent thinking, given that both call for a solution-finding approach to the problem which ignores the obvious and sees the problem from an alternative or unusual perspective (Brophy, 2001).

The results show that the RAT problem scores are not related—or are only weakly related— to the indicators of divergent thinking obtained in the unusual uses task. This coincides with the results achieved by other authors (e.g., Chermahini et al., 2012; Lee et al., 2014; Lee & Therriault, 2013) and demonstrates the discriminant validity of our RAT version. When the effect of age was controlled, the results showed a positive correlation, albeit of small magnitude, between the RAT scores and the originality scores in the divergent thinking task.

It is worth noting the high correlation between the RAT problem scores and the associative fluency tasks. These tasks measure not only the ability to retrieve information quickly and easily, but also the effectiveness of semantic information organization in memory (Benedek et al., 2012; Lee & Therriault, 2013; Marko et al., 2018). Associative fluency is a cognitive process shared by divergent and convergent thinking (e.g., Benedek et al., 2012; Benedek & Neubauer, 2013), and could prove particularly interesting as a measure for assessing students' ability to activate, retrieve and combine concepts.

The age-related differences found in our study for RAT problem-solving are in line with recent research conducted by Kleibeuker et al. (2013a). These authors observed improvements in convergent thinking performance throughout adolescence and into adulthood. Our results revealed improvements in the ability to solve all types of RAT problems, yielding differences between elementary and high-school students and between the aforementioned students and university students. These improvements were more pronounced in the c-RAT and e-RAT problems than in the s-RAT problems. This may be due to the methods used to construct different types of problems: s-RAT problems were built taking into account associative frequency for elementary-school children, whereas the c-RAT and e-RAT problems were built using dictionaries that could better represent adult-level vocabulary.

Age-related differences in convergent thinking may be related to changes in organizing information in memory and executive functions.

Regarding changes in knowledge, both the quantity of links and the organization of conceptual representations vary significantly during development (Bjorklund, 1987). As experience and knowledge increase, representations and associations between related concepts gain in complexity, favoring their semantic integration. In particular, given the decidedly verbal nature of the RAT, it is likely to depend on a certain level of verbal intelligence and the cultural knowledge shared by native speakers of the same language (Chermahini et al., 2012; Lee et al., 2014; Salvi et al., 2016; Shen et al., 2016; Wu & Chen, 2017). Vocabulary changes in quantity and quality across adolescence. As children grow older, they demonstrate more sophisticated knowledge about word formation through compounding. They are also sensitive to a larger repertoire of set expressions (Berman, 2007). Semantic development may contribute to the enhanced performance in the RAT task with age observed in this study.

Age-related differences in the RAT task may also reflect an improvement in executive functions (Beaty, Silvia, Nusbaum, Jauk, & Benedek. 2014). Executive functions, and especially working memory updating, have shown to be related to measures of convergent thinking such as those included in intelligence tests (e.g., Friedman et al., 2006). Given that executive functions undergo significant changes through childhood and adolescence (Best, Miller, & Jones, 2009; Huizinga, Dolan, & van der Molen, 2006), it could be argued that these improvements give rise to differences in the generation of novel and complex associations involved in creative thinking.

Creative thinking is recognized as a valuable ability stemming from both individual and environmental influences that together contribute to creativity development (Barbot, et al., 2016; Kleibeuker, De Dreu, & Crone, 2016). Several studies have observed specific improvements in performance on relational reasoning tasks during adolescence and early adulthood, which require the simultaneous integration of multiple relations (e.g., Dumontheil, Houlton, Christoff, & Blakemore, 2010; Kleibeuker et al., 2013b). The results of our study showing educational stage-related differences in the ability to solve RAT problems could be considered an indicator of improved student ability to solve well-defined problems, which is also required in numerous tasks used in an educational context. Given that academic measures tend to focus on convergent thinking (i.e., problem solvers must meet task constraints and identify the correct answer), the use of these types of measures may enable a suitable estimation of the relationship between creativity and academic achievement, as reported by various authors (see Barbot et al., 2016; Gajda, Karwowski, & Beghetto, 2017). A further step in this research would be the creation of a test, comprising a smaller number of

problems that could be administered in a short period of time, and that could be used as a discriminative measure of convergent thinking in students of different education levels.

A final aspect we would like to highlight is the individualized error analysis put forward as supplementary material. We believe that the pattern of errors provides valuable information about the items. First, the error analysis qualifies the information on the difficulty of each problem. At times, especially in high-error-rate items, the response given may be more frequent than the one deemed correct. That is, the correct answer to a problem from the experimenter's point of view may not coincide with the solution reached by a group of individuals of a particular cultural context. A second aspect to emerge from the error analysis is that the frequency of each word error seems to depend on the participants' age. For example, the correct answer to the problem whose cue words were *cuidadora, mujer, buena* (carer, woman, good) was *madre* (mother). However, the most frequent elementary-level error (18%) was *canguro* (babysitter), although this response was not given by any university student. This could reflect how associations between words change with age. Given that results were stratified by educational level, researchers may select the most appropriate items for a given level or the more suitable problems for different ages. Although information about error frequency is not usually included when presenting normative data of RAT problems, it may be useful when it comes to selecting items for a particular task.

This study provides normative data on 102 RAT problems adapted to the Spanish linguistic context, which fills the gap left by a lack of RAT problem-solving studies in Spanish. Additional adaptations could be required to other Spanish-speaking countries to take into account their respective cultural background. The present study used a rather moderate sample size. Future studies would benefit from larger samples.

In conclusion, we aimed to provide a useful tool that could be employed to investigate the mental processes underlying creativity in languages other than English. A novel contribution of the present study is the classification of the three types of RAT problems identified in Spanish. Future research could explore whether specific cognitive processes are engaged depending on the particular type of problem to be solved. Moreover, the results of this study reveal age-related changes in the ability to solve RAT problems, which could be indicative of improvements in convergent thinking abilities during the adolescent years. Efforts need to be made to develop measures to assess creative thinking more comprehensively. The database presented in this study can prove useful for undertaking this challenge.

RESUMEN

Datos normativos para 102 problemas de asociados remotos en español y diferencias relacionadas con la edad en la ejecución

El Test de Asociados Remotos (RAT) es una medida desarrollada por Mednick (1962) que se utiliza para evaluar el componente de pensamiento convergente de la creatividad. Este estudio presenta una base de datos normativa en español que incluye 102 problemas basados en asociados remotos. Se construyeron tres conjuntos de problemas según el tipo de asociaciones entre palabras: asociados semánticos, palabras compuestas y expresiones de dos palabras. Estos problemas se administraron a una muestra de 309 estudiantes de primaria, secundaria y universidad. Los resultados muestran una buena consistencia interna así como una buena validez convergente con problemas tipo insight y una validez discriminante con la Prueba de Usos Alternativos de Guilford. Además, los resultados indican diferencias relacionadas con la edad en la capacidad para resolver los diferentes tipos de problemas.

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APPENDIX A. Insight problems

Problem 1: A man bought a watch for 60 euros and sold it for 70 euros. Then, he returned to the shop, bought it again for 80 euros, and sold it for 90 euros. How much did he earn or lose in total?
The answer is considered correct when it is that "he earned € 20".

Problema 1: Un hombre compró un reloj por 60 euros y lo vendió por 70 euros. Después, regresó al lugar y lo volvió a comprar por 80 euros y lo vendió por 90 euros ¿cuánto ganó o perdió en total, en los tratos del reloj?
*Se considera correcta la respuesta cuando ésta es que "**gana 20 €**".*

Problem 2: A child who plays on the beach has 6 piles of sand in one part and another 3 piles in another nearby part. If the child gathered them all, how many piles of sand would the child have?
The answer is considered correct when this is "1 pile of sand".

Problema 2: Un niño/a que juega en la playa tiene 6 montones de arena en una parte y otros 3 montones en otra parte cercana. ¿Si los reuniera todos, cuántos montones de arena tendría?
*Se considera correcta la respuesta cuando ésta es "**1 montón de arena**".*

Problem 3: In the Pérez family, there are 7 sisters and each sister has 1 brother. If we consider the father, Mr. Pérez. How many boys are in the Pérez family?
The answer is considered correct when it is "2 boys".

Problema 3: En la familia de los Pérez, hay 7 hermanas y cada hermana tiene 1 hermano. Si tenemos en cuenta al padre, el señor Pérez. ¿Cuántos varones hay en la familia Pérez?
Se considera correcta la respuesta cuando ésta es "2 varones".

Problem 4: A prisoner was trying to escape from a cell located on top of a very tall tower. He found in his cell a rope that was half as long as he would need to allow him to reach the ground safely. So, he divided the rope in half, gathered and tied the two halves of the rope and was able to escape. Explain how he could do it?
The answer is considered correct when it is that "the prisoner divided the rope longitudinally thus making it long enough to cover the height of the tower."

Problema 4: Un prisionero estaba intentando escapar de una celda situada en lo alto de una torre muy alta. Él encontró en su celda una soga que era la mitad de larga de lo que necesitaría para permitirle llegar al suelo de forma segura. Así que dividió la soga por la mitad, juntó y ató las dos mitades de la soga y pudo escapar. ¿Explica cómo pudo hacerlo?
Se considera correcta la respuesta cuando ésta es que "divide longitudinalmente la soga consiguiendo así salvar la distancia de altura de la torre".

APPENDIX B.

Table 4. Normative data for the RAT, featuring the words used in each problem and the proportion of hits (mean and standard deviations) corresponding to both the total sample and each educational stage. Item-test correlations are also provided. The English translations (in parentheses) of each word are given for information purposes only. The translations provided do not always capture the original meaning in Spanish.

				Educational Stage											
				Total			Elementary			High-school			Universtity		
Item	Type	Cue words	Solution	Mean	*Sd*	Item-test correlation	Mean	*Sd*	Item-test correlation	Mean	*Sd*	Item-test correlation	Mean	*Sd*	Item-test correlation
s01	Semantic	negro/bolsillo/ozono (black/pocket/ozone)	agujero (hole)	.28	.45	.46	.06	.24	.30	.13	.33	.09	.64	.48	.27
s06	Semantic	caricia/escribir/guantazo (caress/write/slap)	mano (hand)	.43	.50	.49	.22	.41	.31	.33	.47	.28	.74	.44	.39
s07	Semantic	sillón/televisión/alfombra (armchair/television/carpet)	salón (living room)	.60	.49	.38	.43	.50	.30	.59	.49	.36	.76	.43	.13
s08	Semantic	bola/esquí/muñeco (ball/ski/doll)	nieve (snow)	.83	.37	.38	.67	.47	.33	.87	.33	.20	.95	.22	.09
s09	Semantic	molestar/desagradable/sonido (disturb/unpleasant/sound)	ruido (noise)	.41	.49	.28	.25	.43	.18	.41	.49	.11	.58	.50	.09
s10	Semantic	amigo/correa/animal (friend/leash/animal)	perro (dog)	.69	.46	.27	.63	.49	.14	.58	.50	.31	.88	.33	-.06
s12	Semantic	colchón/edredón/habitación (mattress/duvet/room)	cama (bed)	.79	.41	.20	.71	.46	.22	.84	.37	.08	.82	.38	.25
s13	Semantic	centímetro/medir/compresa (centimeter/measure/sanitary pad)	regla (ruler/period)	.58	.49	.34	.44	.50	.26	.59	.49	.22	.70	.46	.38
s14	Semantic	romántica/cantar/melodía (romantic/sing/melody)	canción (song)	.46	.50	.24	.36	.48	.20	.50	.50	.25	.50	.50	.23
s16	Semantic	borrego/vaca/sabrosa (lamb/cow/tasty)	carne (meat)	.54	.50	.30	.41	.49	.32	.64	.48	.35	.56	.50	.22
s20	Semantic	leyenda/infancia/hada	cuento	.75	.44	.36	.57	.50	.29	.79	.41	.26	.87	.34	.05

		(legend/childhood/fairy)	(tale)											
s21	Semantic	oscuridad/estrellada/luna (darkness/starry/moon)	noche (night)	.73	.44	.33	.60	.49	.45	.75	.44	.12	.84	.37	.14
s23	Semantic	comida/redonda/tabla (food/round/board)	mesa (table)	.54	.50	.24	.40	.49	.24	.60	.49	.13	.61	.49	.14
s24	Semantic	pata/cómodo/sentarse (leg/comfortable/sit)	silla (chair)	.69	.46	.25	.55	.50	.24	.74	.44	.23	.76	.43	-.03
s25	Semantic	cuidadora/mujer/buena (carer/woman/good)	madre (mum)	.50	.50	.45	.13	.34	.19	.63	.48	.24	.72	.45	.09
s26	Semantic	planeta/plantas/arena (planet/plants/sand)	tierra (land/earth)	.41	.49	.21	.36	.48	.28	.41	.49	.07	.47	.50	.39
s27	Semantic	metal/candado/abrir (metal/padlock/open)	llave (key)	.40	.49	.27	.32	.47	.27	.35	.48	.14	.52	.50	.31
s28	Semantic	uva/borracho/bodega (grape/drunk/cellar)	vino (wine)	.91	.29	.38	.82	.38	.46	.93	.26	.30	.96	.20	.24
s29	Semantic	bonito/chalet/flores (pretty/chalet/flowers)	Jardín (garden)	.30	.46	.26	.23	.42	.23	.27	.45	.26	.40	.49	.17
s30	Semantic	hoja/ojos/césped (leaf/eyes/grass)	verde (green)	.27	.44	.37	.06	.24	.22	.23	.43	.17	.50	.50	.09
s31	Semantic	gris/tabaco/tos (gray/tobacco/cough)	humo (smoke)	.43	.50	.38	.26	.44	.14	.41	.49	.42	.62	.49	.17
s32	Semantic	líquido/mar/transparente (liquid/sea/transparent)	Agua (water)	.93	.26	.21	.87	.34	.19	.93	.26	.06	.99	.10	-.02
s34	Semantic	oxígeno/sombra/tronco (oxygen/shadow/trunk)	árbol (tree)	.71	.46	.37	.61	.49	.31	.66	.48	.39	.85	.36	.17
s35	Semantic	globos/bailar/cumpleaños (balloons/dance/birthday)	fiesta (party)	.87	.34	.26	.80	.40	.36	.85	.36	.15	.95	.22	-.01
s36	Semantic	volar/rapidez/piloto (fly/speed/pilot)	avión (airplane)	.86	.35	.31	.78	.41	.25	.84	.37	.24	.95	.22	.31
s37	Semantic	encía/cepillo/dentista (gums/brush/dentist)	diente (tooth)	.85	.36	.20	.81	.39	.31	.86	.34	.23	.87	.34	.06
s38	Semantic	cariño/labios/mejilla (sweetie/lips/cheek)	beso (kiss)	.85	.35	.28	.79	.41	.20	.85	.36	.39	.92	.27	.14

s40	Semantic	camino/acera/ciudad (path/sidewalk/city)	calle (street)	.36	.48	.24	.30	.46	.22	.31	.46	.21	.49	.50	.15
s41	Semantic	estufa/verano/sudor (stove/summer/sweat)	calor (hot)	.88	.33	.22	.80	.40	.09	.89	.31	.22	.94	.24	.15
s43	Semantic	naturaleza/tranquilidad/hierba (nature/tranquility/grass)	campo (field)	.46	.50	.28	.30	.46	.33	.50	.50	.18	.57	.50	.00
s44	Semantic	pequeño/casas/campesinos (small/houses/peasants)	pueblo (village)	.42	.49	.43	.18	.38	.42	.41	.49	.16	.67	.47	.17
s45	Semantic	sonrisa/nariz/moflete (smile/nose/cheek)	cara (face)	.65	.48	.39	.47	.50	.26	.65	.48	.26	.83	.38	.27
s47	Semantic	bolígrafo/sobre/recibir (pen/envelope/receive)	carta (letter)	.79	.41	.36	.64	.48	.23	.80	.40	.37	.92	.27	-.04
s48	Semantic	agujas/tictac/despertador (hands/ticktock/alarm)	reloj (clock)	.88	.32	.32	.81	.39	.39	.89	.31	.25	.94	.24	.23
s49	Semantic	arcoíris/pintura/amarillo (rainbow/paint/yellow)	color (color)	.62	.49	.33	.47	.50	.29	.67	.47	.31	.72	.45	.14
s50	Semantic	flor/espina/bella (flower/thorn/beautiful)	rosa (rose)	.77	.42	.42	.60	.49	.52	.77	.42	.13	.94	.24	.00
s51	Semantic	blanco/arroz/anillos (white/rice/rings)	boda (wedding)	.60	.49	.37	.39	.49	.38	.62	.49	.19	.76	.43	.10
s52	Semantic	dedal/gordo/meñique (thimble/fat/little finger)	dedo (finger)	.60	.49	.32	.48	.50	.22	.60	.49	.36	.71	.45	.20
s53	Semantic	diversión/ritmo/moverse (fun/rhythm/move)	baile (dance)	.71	.45	.25	.65	.48	.45	.74	.44	.30	.74	.44	-.01
s54	Semantic	consulta/curar/hospital (appointment/treat/hospital)	doctor (doctor)	.59	.49	.31	.39	.49	.14	.58	.50	.14	.78	.41	.13
s55	Semantic	puente/flecha/romano (bridge/arrow/Roman)	arco (arch)	.18	.38	.20	.16	.37	.22	.14	.34	.19	.24	.43	.26
s57	Semantic	respirar/fresco/viento (breathe/cool/wind)	aire (air)	.74	.44	.43	.47	.50	.22	.80	.40	.25	.94	.24	.04
s59	Semantic	teatro/estrella/película (theater/star/movie)	actor (actor)	.51	.50	.30	.41	.49	.31	.50	.50	.34	.61	.49	.13
s60	Semantic	playa/palmera/barco (beach/palm tree/boat)	isla (island)	.19	.40	.22	.11	.32	.23	.17	.38	.11	.30	.46	.10

c01	Compound	fuego/plumas/uñas (fire/feathers/nails)	corta (cut)	.85	.36	.45	.72	.45	.38	.86	.34	.43	.96	.20	.26
c02	Compound	bosques/espaldas/meta (forests/back/goal)	guarda (guard)	.78	.41	.49	.64	.48	.53	.77	.42	.40	.93	.26	.28
c03	Compound	frutas/platos/vajillas (fruit/dishes/tableware)	lava (wash)	.84	.37	.36	.79	.41	.42	.79	.41	.37	.94	.24	.20
c04	Compound	moscas/ratas/suegras (flies/rats/mother-in-laws)	mata (kill)	.86	.35	.47	.72	.45	.52	.90	.30	.41	.95	.22	.19
c05	Compound	caídas/choques/rayos (falls/crashes/rays)	para (for)	.91	.29	.43	.84	.37	.52	.91	.29	.44	.97	.17	.15
c06	Compound	montañas/purés/tiempo (mountains/purees/time)	pasa (pass)	.69	.46	.53	.48	.50	.49	.74	.44	.60	.82	.38	.24
c07	Compound	maletas/lámparas/aviones (suitcases/lamps/planes)	porta (holder)	.47	.50	.49	.16	.37	.14	.50	.50	.43	.71	.45	.21
c08	Compound	manchas/miedos/esmalte (stains/fears/polish)	quita (remove)	.88	.33	.50	.73	.45	.53	.95	.23	.50	.95	.22	.29
c09	Compound	corchos/muelas/puntas (corks/molars/tips)	saca (pull out)	.83	.37	.44	.73	.45	.54	.84	.37	.35	.92	.27	.39
c10	Compound	manteles/pantallas/vidas (tablecloths/screens/lives)	salva (save)	.82	.38	.49	.71	.46	.59	.82	.39	.50	.93	.26	.17
c11	Compound	móvil/servicio/lavado (mobile/service/wash)	auto (auto)	.52	.50	.41	.35	.48	.37	.52	.50	.37	.68	.47	.21
c12	Compound	cabezas/hielos/olas (heads/ice/waves)	rompe (break)	.75	.43	.40	.67	.47	.54	.69	.46	.27	.89	.31	.27
c13	Compound	volea/cesto/pie (volley/basket/foot)	balón (ball)	.54	.50	.43	.35	.48	.43	.61	.49	.36	.63	.48	.40
c14	Compound	gotas/kilómetros/revoluciones (drops/kilometers/revolutions)	cuenta (count)	.84	.37	.51	.72	.45	.63	.86	.34	.52	.93	.26	.23
c15	Compound	chimeneas/cristales/parabrisas (chimneys/windows/windshield)	limpia (clean)	.84	.37	.46	.66	.48	.45	.90	.30	.35	.95	.22	.14
c16	Compound	portada/punto/peso (cover/point/weight)	contra (counter)	.37	.48	.45	.12	.33	.26	.32	.47	.26	.66	.47	.16
c17	Compound	razón/sabor/sentido (reason/taste/sense)	sin (without)	.42	.49	.58	.20	.40	.39	.30	.46	.47	.78	.41	.35

c18	Compound	gastar/hablado/oliente (spend/spoken/smelling)	mal (bad)	.65	.48	.64	.33	.47	.50	.69	.46	.49	.92	.27	.29
c19	Compound	hombre/oferta/mercado (man/offer/market)	súper (super)	.52	.50	.45	.38	.49	.46	.42	.50	.30	.75	.43	.35
c20	Compound	secretario/rector/presidente (secretary/rector/president)	vice (vice)	.50	.50	.62	.21	.41	.50	.43	.50	.43	.87	.34	.23
c21	Compound	consola/cámara/club (console/camera/club)	video (video)	.59	.49	.47	.34	.48	.41	.65	.48	.31	.77	.42	.21
c22	Compound	carro/sierra/bomba (cart/saw/pump)	moto (motor)	.24	.43	.34	.16	.37	.36	.20	.40	.22	.36	.48	.42
c23	Compound	llamas/misiles/pelotas (flames/missiles/balls)	lanza (launch)	.55	.50	.49	.28	.45	.20	.54	.50	.39	.83	.38	.16
c24	Compound	valorado/rojo/mundo (valued/red/world)	infra (under/infra)	.38	.49	.58	.10	.31	.36	.33	.47	.39	.69	.46	.46
c25	Compound	arriba/manga/bajo (up/sleeve/down)	boca (mouth)	.14	.34	.38	.01	.10	.07	.06	.24	.16	.34	.47	.36
c26	Compound	pensado/aventurado/venido (thought-out/ventured/came)	bien (well)	.42	.49	.47	.16	.37	.27	.43	.50	.31	.66	.47	.28
c27	Compound	estructura/botellón/espectáculo (structure/drinking/show)	macro (macro)	.28	.45	.44	.10	.31	.42	.25	.44	.36	.50	.50	.19
c28	Compound	chinas/líneas/buzones (Chinese/lines/mailboxes)	tira (strip)	.48	.50	.38	.22	.41	.18	.59	.49	.27	.62	.49	.22
c29	Compound	tensión/calórico/ventilado (tension/caloric/ventilated)	hiper (hyper)	.39	.49	.62	.05	.22	.33	.37	.48	.45	.72	.45	.48
c30	Compound	tesoros/fortunas/recompensas (treasures/fortunes/bounties)	caza (hunter/seeker)	.53	.50	.51	.26	.44	.33	.56	.50	.53	.75	.43	.07
e01	Expression	descafeinado/solo/cortado (decaffeinated/just/cut)	café (coffee)	.97	.17	.29	.94	.24	.32	.98	.13	.36	.99	.10	.10
e02	Expression	nula/emergencia/tono (invalid/emergency/tone)	salida (exit)	.26	.44	.30	.05	.22	.26	.42	.50	.21	.27	.44	.28
e03	Expression	masculino/femenino/opuesto (male/female/opposite)	sexo (sex)	.62	.49	.23	.53	.50	.33	.68	.47	.18	.63	.48	.21
e04	Expression	luz/desastre/entorno (light/disaster/environment)	natural (natural)	.23	.42	.45	.07	.26	.23	.14	.35	.33	.47	.50	.37

e05	Expression	reproductor/circulatorio/eléctrico (player/circulatory/electric)	aparato (device)	.64	.48	.44	.42	.50	.22	.73	.45	.53	.75	.43	.30
e06	Expression	pública/bruta/armada (public/brute/armed)	fuerza (force)	.24	.43	.29	.09	.29	.21	.29	.46	.31	.32	.47	.05
e07	Expression	primo/negativo/par (prime/negative/pair)	número (number)	.62	.49	.61	.22	.41	.45	.75	.44	.47	.88	.33	.07
e08	Expression	lento/urbano/fluido (slow/urban/free-flowing)	tráfico (traffic)	.19	.39	.32	.06	.24	.28	.18	.39	.34	.33	.47	-.03
e09	Expression	adosada/vertebral/dórica (adjoining/vertebral/doric)	columna (column)	.64	.48	.54	.38	.49	.44	.72	.45	.49	.79	.41	.38
e10	Expression	partido/representante/discurso (party/representative/speech)	político (politicial)	.40	.49	.52	.10	.31	.11	.36	.48	.36	.73	.44	.31
e11	Expression	diplomática/contrarreloj/universitaria (diplomatic/against-clock/university)	carrera (career/race)	.49	.50	.47	.24	.43	.37	.54	.50	.29	.68	.47	.39
e12	Expression	infusa/exacta/ficción (infused/exact/fiction)	ciencia (science)	.41	.49	.50	.16	.37	.28	.43	.50	.45	.63	.48	.28
e13	Expression	americano/equipo/entrenador (American/team/coach)	fútbol (soccer)	.54	.50	.38	.33	.47	.30	.59	.49	.26	.68	.47	.20
e14	Expression	noble/maciza/tallada (noble/solid/carved)	madera (wood)	.33	.47	.42	.06	.24	.09	.33	.47	.20	.57	.50	.27
e15	Expression	electoral/política/publicitaria (electoral/political/advertising)	campaña (campaign)	.32	.47	.50	.04	.20	.30	.32	.47	.40	.59	.49	.14
e17	Expression	pretérito/crimen/estado (preterite/crime/state)	perfecto (perfect)	.33	.47	.49	.05	.22	.25	.40	.49	.33	.52	.50	.42
e18	Expression	soviética/monetaria/europea (Soviet/monetary/European)	unión (union)	.45	.50	.53	.12	.33	.39	.58	.50	.45	.62	.49	.33
e19	Expression	lotería/moneda/parador (lottery/currency/parador hotel)	nacional (national)	.19	.39	.35	.05	.22	.19	.20	.40	.35	.31	.46	.20
e20	Expression	náutico/ortopédico/tacón (nautic/orthopedic/heel)	zapato (shoe)	.58	.49	.56	.23	.42	.07	.59	.49	.51	.91	.29	.17
e22	Expression	sangre/gemelo/mayor (blood/twin/older)	hermano (brother)	.53	.50	.41	.30	.46	.22	.55	.50	.22	.74	.44	.31
e23	Expression	aire/entrada/taxi (air/entry/taxi)	libre (open / free)	.10	.31	.29	.01	.10	.02	.10	.30	.26	.20	.40	.21

e24	Expression	negrita/cursiva/griega (bold/italics/Greek)	letra (letter)	.76	.43	.63	.43	.50	.58	.86	.34	.48	.95	.22	.14
e25	Expression	parque/broma/juego (park/joke/game)	infantil (children's)	.12	.33	.39	.00	.00	.00	.09	.29	.25	.28	.45	.41
e26	Expression	ambiental/clásica/celestial (ambient/classical/celestial)	música (music)	.70	.46	.46	.49	.50	.24	.69	.46	.50	.90	.30	.06
e27	Expression	justo/especial/familiar (fair/special/family)	precio (price)	.14	.35	.33	.03	.17	.14	.07	.26	.17	.33	.47	.21
e28	Expression	mediterránea/saludable/equilibrada (Mediterranean/healthy/balanced)	dieta (diet)	.79	.41	.43	.59	.49	.47	.87	.33	.32	.88	.33	.06
e29	Expression	cuadrado/cúbico/lineal (square/cubic/linear)	metro (meter)	.14	.35	.21	.09	.29	.17	.14	.35	.21	.19	.39	.19
e30	Expression	cascabel/pitón/marina (rattle/python/sea)	serpiente (snake)	.81	.40	.47	.65	.48	.47	.82	.39	.41	.94	.24	.16

Note: s01-s60 = semantic problems (s-RAT); c01-c30 =compound problems (c-RAT); e01-e30 = expressions problems (e-RAT).