Latin American Norms of Emotional Valence for 1917 Spanish words.

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Abstract

The cognitive system and its interaction with other psychological processes (i.e., emotion processing) have been studied for many years thanks to the use of controlled and valid experimental material. The affective system has been established as a possible modulator of cognition and its relationship has become a first-order question to be answered. To continue in the search for the relationship between these two systems, we have collected Latin-American contextualized Emotional Valence Norms for 1917 Spanish words. We used an informatic booklet in a controlled lab where 547 participants were tested. The resulting material has mean scores, standard deviations, and the number of observations for each word. To control the results, correlation analyses were performed, including some of the available normative studies in Spanish as a measure of reliability and validity. Data were discussed in terms of the important role of context when processing words’ emotional information.

Keywords: Normative Study, Emotional Valence, Pan-Hispanism, Psycholinguistics

Introduction

Despite more than 50 years of cognitive research, the mysteries of the human mind remain a mystery to science. Although there has been significant progress in our knowledge of how cognitive processes like memory, language, and attention work, there is still a critical need for more research. To reduce any potential confusion that may result from utilizing the incorrect materials, it is essential to have the best equipment available. Words have been used as experimental materials in countless investigations because they have properties that can affect how people perceive information. However, it can be difficult to understand the potential effects of its uncontrolled use if these properties are not regulated. As an illustration, in their meta-analysis from 2006, Larsen, Mercer, and Balota discovered that the negative words, used in the studies they examined, tended to be longer and less frequent than the neutral words. Frequency and word length increase the reaction time it takes for a word to be recognized (e.g., Balota, Cortese, Sergent-Marshall, Spieler, & Yap, 2004), and those effects could account for the effects seen in emotion studies. Larsen and colleagues (2006) also discovered that negative words no longer caused slower reactions than neutral words after controlling the lexical aspects of the words. This important finding has prompted additional research in which controlling the materials is essential to preventing confounding. The aim of Kuperman, Estes, Brysbaert and Warriner’s (2014) study was to investigate the relationships between emotion and language processing. Because emotional
valence interacts with word frequency and lexical judgments are more susceptible to emotional valence than, for example, naming, they discovered that, after adjusting word characteristics, emotional valence was a more potent indication of the word processing alteration than arousal. It is important to mention that word attributes can be intrinsic or relational. Thus, attributes such as word frequency, concreteness, age of acquisition, length, or emotional valence represent the formal structure of the word, whereas associative relationship (best known as associative strength) reflects a word’s link to another one (Hutchison, 2003). Let us start with some examples of different ways to add citations. The style we use for formatting references is based on the guidelines of the American Psychological Association (APA, 7th edition). The most common citation types are the single parenthetical citation (Rabbitt, 2020) and the single text citation: Kessler (2003). Here is also a parenthetical example of citing multiple works (Adams et al., 2019; Kessler, 2003; Rabbitt, 2020). Here are some more examples with comments within parentheses or with year and author introduced within the narrative: (Rabbitt, 2020; as cited in Adams et al., 2019). (see Rabbitt, 2020, for more detail). Rabbitt (2020) noted the dangers of falsely balanced news coverage. In 2020, Rabbitt noted the dangers of falsely balanced news coverage. In the references section at the end of the manuscript you can see examples of how to reference journal articles, book chapters and books.

As mentioned before, word attributes can affect the way we process them. For example, it has been found that the frequency of a word could facilitate its processing, an effect now known as the Word-Frequency Effect (Bybee, 2007; Ellis, 2002). It also happens with other variables such as concreteness (Altarriba, Bauer, & Benvenuto, 1999; Holmes & Langford, 1976; Jessen et al., 2000; Xiao, Zhao, Zhang, & Guo, 2012), age of acquisition (Barry, Morrison, & Ellis, 1997; Bird, Franklin, & Howard, 2001; Morrison, Ellis, & Quinlan, 1992), word length (Baddeley, Thomson, & Buchanan, 1975; Miguel A Pérez, 2007) or emotional valence (Kousta, Vigliocco, Vinson, Andrews, & Del Campo, 2011; Lane, Chua, & Dolan, 1999; León et al., 2010; Nielen et al., 2009; Piguet, Connally, Krendl, Huot, & Corkin, 2008; Rozenkrants & Polich, 2008; Stevenson, Mikels, & James, 2007).

Emotional Valence

As we mentioned before, the affective system plays an important role in the modulation of cognitive processing (Anderson & Phelps, 2001; Sussman, Heller, Miller, & Mohanty, 2013). Researchers have been interested in providing new evidence that helps to comprehend this relationship as it seems to be determinant in facilitating memory consolidation (Kensinger, Piguet, Krendl, & Corkin, 2005), lexical access (Balota et al., 2007) or simply emotional processing (Kuperman et al., 2014). That body of evidence has served us to understand that when we observe fearful things, negative emotions are evoked, and, conversely, when observing enjoyable things, positive emotions are
evoked. These stipulations have served as evidence for building up theories such as the two-dimensional circumplex model (Barrett & Russell 1999), which explains emotion based on two neurophysiological independent dimensions: emotional valence and arousal.

Emotional valence refers to a value of pleasantness or hedonism that people give to the stimuli they are presented with (Feldman, 1998). The other dimension is known as arousal, meaning the body activation produced by the concept that had been presented. While some researchers emphasize one or the other quality as basic to affective experience, others incorporate both (Fieldman, 1998). As this is our reference point, we are not explaining other theories of emotional processing. However, there has been a lot of evidence in favor of other approaches like the discrete emotion theories explained that all emotion can be derived from a limited number of innate and universal affective estates (See Ekman, 1992 for a review).

Normative data

Osgood's (Osgood, Suci, & Tanenbaum, 1957) seminal work is one of the earliest normative studies ever done. They created a semantic differential in which factor analyses conducted on a wide variety of verbal judgments indicated that the variance in emotional assessments was accounted for by three major dimensions: The two primary dimensions were one of affective valence (ranging from pleasant to unpleasant) and one of arousal (ranging from calm to excited). The most used in English is the ANEW from Bradley and Lang (1999), which provides a set of normative emotional ratings for many words. Examples in other languages are Syssau, A., Yakhloufi, A., Giudicelli, E., et al. (2021) French version, Kapucu et al. (2021) Turkish version, and Kanske, P., & Kotz, S. A. (2010) German version.

Studies in Spanish for Emotional Valence

In the review of Perez, Campoy, and Navalon (2001) there are only a few studies on emotion norms, and none of them have collected ratings in emotional valence with Latin-American populations as the main target population. In the latest normative studies (Hinojosa et al., 2015) and Stadthagen-Gonzalez et al (2016), only Spaniard people participated in their studies. This question can be problematic because despite using the same language, a person’s cultural background can make language comprehension different.
With the latest corpus, there are plenty of words that have been normed so far, and the methodologies employed have been similar. Stadthagen-Gonzalez (2016) is the one that has the greatest number of words so far: 14031. Before these authors published their study, there were not much more than 2000 Spanish words normed in emotional valence. As a matter of fact, Hinojosa et al (2016) included 875 words that were not included in other corpora, in Redondo, Fraga, Comesaña, & Perea’s (2005) study norms were provided for 478 Spanish words, and in Redondo, Fraga, Padrón, & Comesaña (2007) they published their adaptation of the Affective Norms for English Words (ANEW) for 1034 Spanish words. In their work, they mentioned a previous study (1983), where Muñoz-Yago and Lopez-Buró obtained norms for pleasantness for more than 2000 Spanish words. In those studies, they considered pleasantness as analogous to emotional valence but clearly, both variables are different. As mentioned above, there is a worldwide interest in increasing the knowledge of both the affective and the cognitive systems. To do that, researchers will need the best tools, especially if they are going to consider testing populations where the Spanish language can vary, such as in Latin American countries.

Pan-Hispanic language usage

In 1951, some academics of the Spanish language and American man of letters funded the Association of Academies of the Spanish Language in response to the need of having not only one grammatical, phonological, or semantic generality but a specific normative regulation of language in different contexts. The association meets every four years and discusses the common-based language characteristics but also includes and regulates the use of local expressions and their need to be considered as language variants of the Spanish language. The contextual and cultural differences could be an issue to address the way they impact concept processing. According to Del Valle (2014) Pan-Hispanism has reached a special status in politics that makes it important to focus on the social nature of language. For this reason, we considered that offering a normative study where participants use another variation of the Spanish language will help us to broaden the field of studying the cognitive-social processing of language and its relationship with emotion. According to Lim (2016), the relationship between emotion and cognition is mediated by cultural aspects. Moreover, Russell’s (1980) and Russell and Barrett’s (1999) theory, they have proposed that there is a bias along the negative valence of emotional words that are described in an ontogenetic tendency of humans to attend more to negative emotions (see Vaish et al., 2008, for a review). For this reason, it has been observed in the numerous occurrences of negative emotion words in the affective lexicon (Averill, 1980).

On the other hand, positive emotions play distinctive roles in guiding human social behavior (Fredrickson, 1998), and thus, emotions are associated with life-enhancing effects (Cohn et al., 2009). In the case of positive emotions, such as...
empathy and sympathy, it has been pointed out their effect in establishing social bonds and sustaining care-taking behavior (Darwin, 2004; Keltner, 2009; see, Goetz et al., 2010, for a review). Additionally, Fernandez, Carrera, Sánchez, Paez & Candia (2000) found cultural differences in emotional reactions both verbal and nonverbal emotions. In summary, there is evidence that valence and arousal are pan-cultural (Russell, 1991) and both are present in young children (Russell & Bullock, 1985).

Taken together all the above described, our first goal was to collect emotional valence norms for a subset of 1917 Spanish words previously used in one of the most cited normative studies in Spanish that collected norms for imageability, concreteness, synonymous, and pleasantness (Algarabel, 1996). In consequence, this goal is two-fold: on the one hand, we want to add another psycholinguistic index to Algarabel’s study, and, on the other hand, we want to expand the scores to a wider sample of Spanish language speakers.

**Methods**

**Participants**

In this study participated a total of 547 university students from Bogotá, Colombia. The average age was 20.72 (0.7) and the age range was 16 to 27 years. All of them reported no visual impairments. Eighty-nine percent of the sample were a woman.

**Materials**

We selected 1917 words from Algarabel’s normative study. Words were obtained using NIPE (Díez, Fernández, & Alonso, 2006). Two words from the original study were replaced.

**Procedure**

The data collection for this paper was introduced to the Qualtrics software (Copyright ©, 2020) and placed in a single block. Every word was revised for spelling before being imported. For each word, a single 7 Likert scale was created. The complete set of 1917 words was randomized, counterbalanced, and split into 8 different versions so that each participant had to score 250 words. The participants were placed in a controlled environment and a computer, or a tablet was provided to each one, so they could fulfill the task individually. The application was performed in groups of up to 25 people. General instructions were given to all the participants by the experimenter and then individual screens with the same instructions appeared on the first slide of the application software as a reminder control. To best capture the possible differences that can emerge between this study and others with similar goals, care was taken in instructing
the subjects to respond only to those words that they knew. In case the word was not known by the participant, instructions were given for them to leave the word un-scored.

Before starting each participant signed an informed consent. The mean time employed by the participants to fulfill the task was 20 min. There was always a researcher in the testing room.

Results

In response to our main goal, emotional valence scores were obtained for the 1917-word set used in the Algarabel study. Thus, the final set contains the list of words, their corresponding English translations, their mean scores in emotional valence, as well as the standard deviation and the number of observations for each word. This set can be found in https://osf.io/5wzdr/

After collecting the data, scores were organized using the Qualtrics software, and later the complete set was exported to a calculation sheet in excel. Averages scores, Standard deviations, and the number of observations per word were calculated. Regarding the number of observations per word, the mean score was 58.55, ranging from 50 to 101. 113 words had at least 50 observations and only one word had 101 observations. The mean score for emotional valence was 4.30, ranging from 1.89 (fatality) to 6.73 (mother). This means that almost all the words were evaluated as neutral. Finally, the standard deviation means the score was 1.55, ranging from 0.66 to 2.36.

Once data were calculated, a correlational analysis was performed. Figure 1 shows the results, which include the affective scores obtained by us and Hinojosa et al, Redondo et al, and Stadthagen-González et al very same variable. As can be seen, our scores were highly correlated with Hinojosa’s study (r =0.92). Table 1 shows the correlation measures obtained when we compared other studies’ measures to ours.

<table>
<thead>
<tr>
<th>Studies</th>
<th>Hinojosa</th>
<th>Algarabel</th>
<th>Redondo</th>
<th>Stadthagen-González</th>
</tr>
</thead>
<tbody>
<tr>
<td>r</td>
<td>0.929</td>
<td>0.767</td>
<td>0.852</td>
<td>0.875</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>0.001</td>
<td>0.001</td>
<td>0.001</td>
<td>0.001</td>
</tr>
<tr>
<td>N</td>
<td>185</td>
<td>1917</td>
<td>477</td>
<td>1854</td>
</tr>
</tbody>
</table>

The reason behind the correlation results being highly related to our study might be associated with the number of words shared, which is the smallest one in the complete set of studies (185). However, is high enough to establish a
relationship that, in this case, was very close regarding to the other studies. Redondo et al’s study are the second most related. We thought that the more items included, the more variability we were going to find, and thus, the influence of the context may play a significant role in processing the emotional value of words. Stadthagen-González et al cor relational analysis also showed a very high correlation, which is a good sign for the validity of our study. Finally, pleasantness scores obtained in Algarabel and Affective values in our study showed a high relationship although it was not that high in comparison with the other two studies. We think that this is due to the conceptual differences existing between these two variables.

Discussion

Our study provides emotional valence norms for 1917 Spanish words obtained in Latin-American populations, which is, at present, the first one of the Spanish words normative that have done this. In consequence, we believe that the most relevant question that addresses our research is the inclusion of Latin-American participants, which is an aggregate value for our study. This is important in the sense that differences may exist between Spanish and Latin-American conceptual processing of some words due to differences in cultural background, which represent, at the same time, some concepts may have different meanings and therefore, different emotional impacts in the conceptual domain. One way to see this possible confounding is by observing some special cases occurring with the Spanish association norms (Fernandez, Diez, Alonso, & Beato, 2004) where, for example, for the word “BUS”, the strongest associated word for Spanish participants was “GUAGUA” but for Colombians, this word is hardly used, and if so, it implies another conceptual management. The correlation analysis showed that even though our results were highly correlated with Algarabel’s pleasantness scores and Redondo et al’s, Hinojosa et al’s, and Stadthagen-González emotional valence scores, there seems to exist some subtle differences that we should take care of when including Latin-American people when using verbal materials. Only Hinojosa et al showed an almost perfect match in the three different dimensions (positive-neutral and negative), which can be explained by the low amount of the number of items shared. Regarding the correlation and comparison with the pleasantness scores, it is evident how the conceptual differences existing between these two conceptions could have risen to the different patterns obtained in comparison with emotional valence. In this regard, pleasantness is not the same as it has been well established that pleasantness does not reflect intrinsic attributes to the word but a personal point of view about the physical experience of the emotion activated by the word (Bellezza, Greenwald, & Banaji, 1986).

From our point of view, this is an important point to be addressed as it can yield conflictive results. There may be some subtle differences in the methodology that our study has regarding the normative studies available in Spanish. Generally, normative studies have been made using a paper-pencil strategy, which we consider more time-demanding and more prone to human error. By using informatics tools, researchers could correct this situation and automatize
the counterbalancing, which is the best scenario to obtain data for a big number of words without losing data from a single participant. It is also true that the Likert scale we used differed from the one used by other researchers. We consider that these aspects will not affect too much the comparison of the affective valence. Moreover, we obtained high correlations with their studies, which is interpreted as coherence and validity in our approach.

In summary, this study could be used by researchers that are currently carrying out a series of studies that are intended to address the question related to the impact of emotional valence on recognition memory, language processing, and attention in Latin-American contexts, which will help them to get ecological validity.

Finally, this research could be considered as a complement to the Spanish normative corpora of affective valence that have already been created, as well as an opportunity to include other users of the same language but in different contexts.

**Conflict of interest**

The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.
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