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# Normative data for 210 emotional colour pictures

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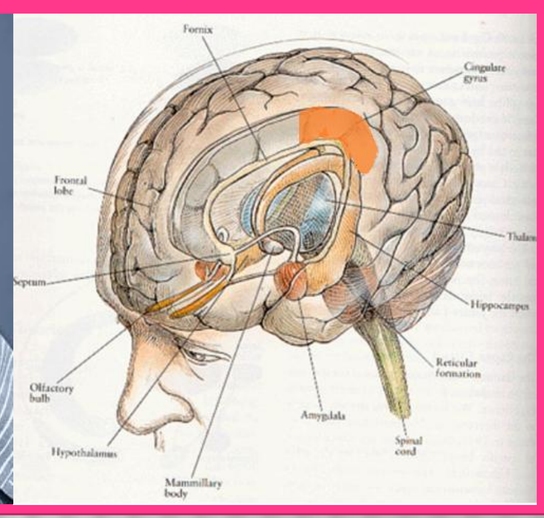
## INTRODUCTION

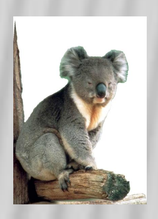
Normative data for pictures are needed to the careful design of experiments on perception, memory and language. As picture norms seem to be influenced by cultural/linguistic factors (e.g., name agreement), cognitive researchers call for the selection of language-adapted materials (see Yoon et al., 2004). Thus, the aim of the present study was to provide researchers with normative data for 210 emotional colour pictures in European Portuguese. The pictures were standardized on five dimensions: Name agreement, image agreement, conceptual familiarity, visual complexity, and valence and arousal. **Interestingly**, most of these pictures were designated by low-frequency nouns making them really suitable for **Tip of the Tongue (TOT)-induction studies**.




## MATERIALS AND PROCEDURE

210 images of real objects or animals were selected from public picture databases such as Google Images (www.google.com/imghp). All pictures were colored and had a size of 800x400 pixels.

A Web-based application was created by following the recommendations of Burke and James (2006) to collect the data in Portugal. Assessments were done in soundproof booths. To do that, each participant accessed the online survey (via the URL link) and after completing the registration data, he/she had to rate all pictures in two out of five dimensions: a) name agreement and conceptual familiarity, b) image agreement and valence and arousal, or c) visual complexity and other one of the mentioned dimensions.



## PARTICIPANTS

100 university students from Portugal(86 female and 14 male; mean age = 21,59; SD = 4,17) took part in this experiment. All had normal or corrected-to-normal vision acuity. The data of participants whose native language were other than European Portuguese were not considered for the analysis (1%).

## RESULTS

The results revealed a different number of Positive (102), Neutral (79) and Negative (29) pictures. Then, we selected two random subsamples of 29 Positive and 29 Neutral pictures to compare the values obtained with them with those obtained with Negative pictures (see Table 1). The analysis of data (One-way ANOVA) showed a higher **%TOT** for **Neutral** pictures relative to Positive and Negative ones ($F(2, 84) = 6.77$; , $< .01$) whereas Positive pictures showed a higher number of IA ($F(2, 84) = 8.34$; $p < 001$) , and CF ($F(2, 84) = 8.58$; $p < .001$) than Neutral and Negative ones.

Table 1. The percentage of TOT states (%TOT), Do not Know Name (DKN), Do not Know Object (DKO), Name Agreement (NA), as well as the Mean and Standard Deviations (in brackets) for Image Agreement (IA), Conceptual Familiarity (CF), Visual Complexity (VC), and Valence (Val.) and Arousal (Ar.) are presented as a function of picture's valence (positive, neutral and negative). We used a 5 point-scale to assess IA, CF, and VC, and a 9 point-scale to assess Val and Ar.

| European Portuguese | %TOT | %DKN | %DKO | %NA | IA | CF | VC | Val | Ar |
|---|---|---|---|---|---|---|---|---|---|
| Positive | 7.38 (10.41) | 3.69 (6.05) | 0.79 (2.41) | 85.17 (17.77) | 4.48 (0.57) | 3.03 (1.05) | 2.72 (0.88) | 6.63 (0.40) | 3.97 (0.49) |
| Neutral | 17.86 (16.35) | 14.52 (14.84) | 5.38 (8.97) | 77.66 (30.67) | 3.66 (1.01) | 2.66 (0.94) | 2.24 (0.95) | 4.92 (0.04) | 3.86 (0.32) |
| Negative | 8.62 (6.77) | 8.41 (10.91) | 8.79 (15.82) | 73.68 (20.12) | 3.69 (0.97) | 2.10 (0.49) | 2.69 (0.89) | 2.82 (0.70) | 5.57 (0.85) |

Table 2. An example of the database in which the %TOT, DKN, DKO, and NA for each image as well as the Mean and Standard Deviations (in brackets) for IA, CF, VC, Val., and Ar. are presented.

| European Portuguese | Modal Name | %TOT | %DKN | %DKO | %NA | IA | CF | VC | Val | Ar |
|---|---|---|---|---|---|---|---|---|---|---|
| Positive | Coala | 9.1 | 0 | 0 | 100 | 4.56 (0.88) | 2.00 (1.36) | 2.90 (1.24) | 6.36 (1.40) | 3.97 (1.74) |
| | Queque | 0 | 0 | 0 | 76.74 | 4.50 (0.98) | 4.05 (1.01) | 2.13 (0.98) | 7.15 (1.20) | 4.64 (2.10) |
| Neutral | Tampão | 0 | 0 | 0 | 97.67 | 4.82 (0.40) | 3.89 (1.16) | 1.31 (0.53) | 4.15 (1.30) | 3.52 (1.94) |
| | Pilão | 30 | 25 | 0 | 66.67 | 2.41 (2.77) | 2.13 (1.40) | 1.56 (0.76) | 4.70 (0.98) | 3.48 (1.94) |
| Negative | Caixão | 0 | 0 | 0 | 100 | 4.34 (0.94) | 2.42 (1.43) | 2.66 (1.15) | 1.91 (1.64) | 6.49 (2.87) |
| | Seringa | 2.33 | 0 | 0 | 97.62 | 4.69 (0.82) | 2.92 (1.53) | 1.64 (0.82) | 2.78 (1.72) | 5.97 (2.35) |

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