# Perceptual Strength Norms of 270 words of the French language and their relationship with other psycholinguistic variables

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## 1. Introduction

While the key role in semantics of **perceptual experience** has been demonstrated (e.g. Chedid et al., 2019)[1], data are not available across the five modalities (i.e. visual, auditory, haptic, gustatory and olfactory) in the French language.  The aims of this study were :

1) to present norms of Perceptual Strength (PS) ratings across these five sensory modalities for 270 words of the French language

2) to question the relationships between these modalities and psycholinguistic variables (PV).

## 2. Participants

- N =141 French-speaking participants (100 women)
- Age : 18-50 years (25.75; SD=7.43)
- Socio-cultural-level : high education
- Inclusion criteria : normal or corrected-to-normal vision, normal or corrected-to-normal hearing, not other sensory disturbances, no motor disorders.
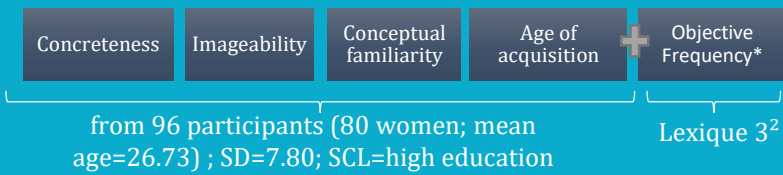
## 3. Method

- Online questionnaire platform (Limesurvey)
- Rate the extent to which they experience each word through a specific modality on a Likert-like scale, ranging from 0 (*not at all*) to 5 (greatly)

- For 270 words for which we also collected :

| Concreteness | Imageability | Conceptual familiarity | Age of acquisition | + Objective Frequency* |

from 96 participants (80 women; mean age=26.73) ; SD=7.80; SCL=high education

Lexique 3[2]

## 4. Results

### a) Descriptive statistics

Table 1 shows numbers of words, per dominant modality, with the mean ratings of perceptual strength (0-5) in each modality.
The vast majority of concepts (N=217) were  visually-dominant, as in Lynott and Connell (2013)[3]
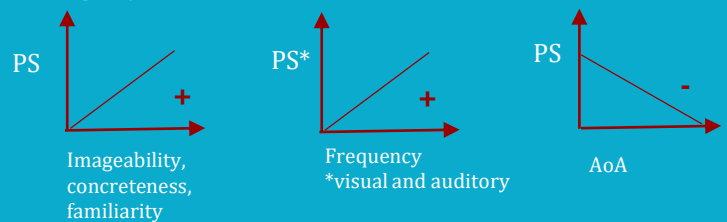
Table 1

| | Dominant Modality | | | | |
|---|---|---|---|---|---|
| | Visual | Auditory | Haptic | Gustatory | Olfactory |
| **Visual rating** | 2.61 | 2.29 | 2.77 | 3.12 | 2.47 |
| **Auditory rating** | 1.05 | 2.80 | 1.17 | 0.69 | 0.58 |
| **Haptic rating** | 1.76 | 1.28 | 2.93 | 2.51 | 1.65 |
| **Gustatory rating** | 0.25 | 0.14 | 0.70 | 3.43 | 1.17 |
| **Olfactory rating** | 0.52 | 0.55 | 0.51 | 2.65 | 3.23 |
| **N** | 217 | 13 | 9 | 30 | 1 |

### b) Relationship analyses

Table 2 shows correlation values for the five PS and PV. Most variables show significant correlations.

Table 2 (The Spearman correlation is significant at the .05 level* and at the .01 level**)

| | Visual | Auditory | Haptic | Gustatory | Olfactory |
|---|---|---|---|---|---|
| **Imageability** | .632** | .235** | .555** | .282** | .295** |
| **Familiarity** | .857** | .370** | .767** | .356** | .313** |
| **Concreteness** | .656** | .298** | .739** | .293** | .289** |
| **AOA** | -.250** | -.094 | -.244** | -.188** | -.221** |
| **Book frequency** | .333** | .230** | .153* | .102 | .131* |
| **Film frequency** | .265** | .298** | .072 | .094 | .115 |

PS — Imageability, concreteness, familiarity — +

PS* — Frequency *visual and auditory — +

PS — AoA — -

## 5. Conclusion and perspective

This study provided norms for 270 French words for the five classic sensory modalities. The correlations observed with the semantic variables extend to the five perceptual modalities the initial results made by Chedid et al. (2019) on the visual and auditory PS and suggest that PS variables have also a semantic value. This corroborates the proposition that PS variables index one aspect of the semantic representations of a word. Future research could use these norms in the investigation of the role of perceptual experience in the representation of concepts and test their impact on word processing.

## References

1. Chedid, G., Brambati, S. M., Bedetti, C., Rey, A. E., Wilson, M. A., & Vallet, G. T. (2019). Visual and auditory perceptual strength norms for 3,596 French nouns and their relationship with other psycholinguistic variables. *Behavior research methods, 51*(5), 2094-2105.
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