Table 1: Classification of words and expressions into semantic categories, based on the classification by the method of natural language processing and k-means clustering.

Semantic category	Clusters	Words and expressions	Classified into opposite endpoints
Room size	Cluster 1	"smaller", "large room", etc.	Containing synonyms of "small" vs. "big"
Width	Cluster 2, Cluster 4	"narrow", "wider room", etc.	Containing the string "narrow" vs. "wide"
Low frequencies	Cluster 3	"more lows", "less low", etc.	Containing the word "less" vs. "more"
Sound directivity	Cluster 5	"more direct", "less direct", etc.	Containing the word "less" vs. "more"
Distance	Cluster 6, words "close" and "closer" in Cluster 10	"farther away", "closer", etc.	Containing the string "close" vs. "far"
Reverb	Cluster 7	"more reverb", "less reverb", etc.	Containing the word "less" vs. "more"

A Chi-square test was performed on each contingency table containing the amount of words on the two opposite endpoints assigned to *art+* and *art-* sounds, of each semantic category. The results show that *art+* sounds were significantly more often perceived in a *bigger* and *wider* space, *further* and with more *reverb* than *art-* sounds, while *art-* sounds were significantly more often categorized as more *direct* than *art+* sounds (figure 1).

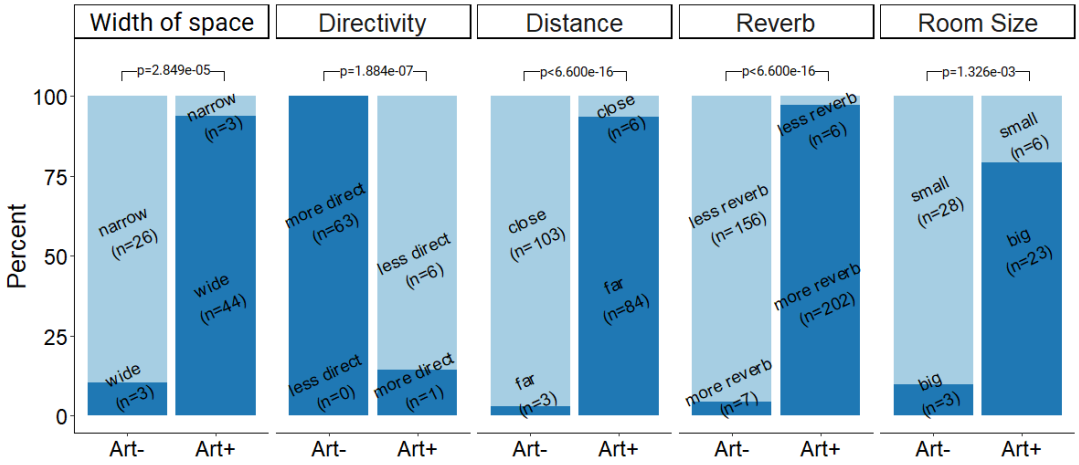

Figure 1: Proportion of *positive* and *negative* words of each semantic category attributed to *art+* and *art-* sounds.

The results from the analysis of the contingency tables determine that there are audible differences between *art+* and *art-* sounds. These differences in perception can be attributed to the differences in terms of reverberation revealed in the previously conducted analysis of the impulse responses. Longer reverberation can induce the perception of a space as larger and wider (Cabrera et al., 2005). In comparison to a dry space, a reverberant acoustic environment can also create the effect of the sound source being further from the receiver (Bronkhorst & Houtgast, 1999; Kolarik et al., 2015). In a reverberant space, by definition, sounds are perceived as less direct because the direct sound from the source is blended with the reflections from the surfaces. In the present study, a difference was found between the acoustic perception of those sites of the studied area of Cuevas de la Araña that are marked with paintings, and of those that are not marked. Furthermore, a corpus of vocabulary for the description of a particular type of outdoor acoustic space –mountain shelters- has been identified, and sets up a basis for further research about the psychoacoustics of rock art sites.

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