

# Supplementary materials

This document contains supplementary materials for the article ‘Investigating the shared meaning of metaphorical sound attributes: bright, warm, round and rough.’

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# Study 1: Interviews

## Questionnaire of the interviews in French (Study 1)

ID :

ATTRIBUT :

### FORMULAIRE

1. Quelle est le contexte et la fréquence d'utilisation de l'attribut ?

2. Comment définissez-vous l'attribut étudié ?

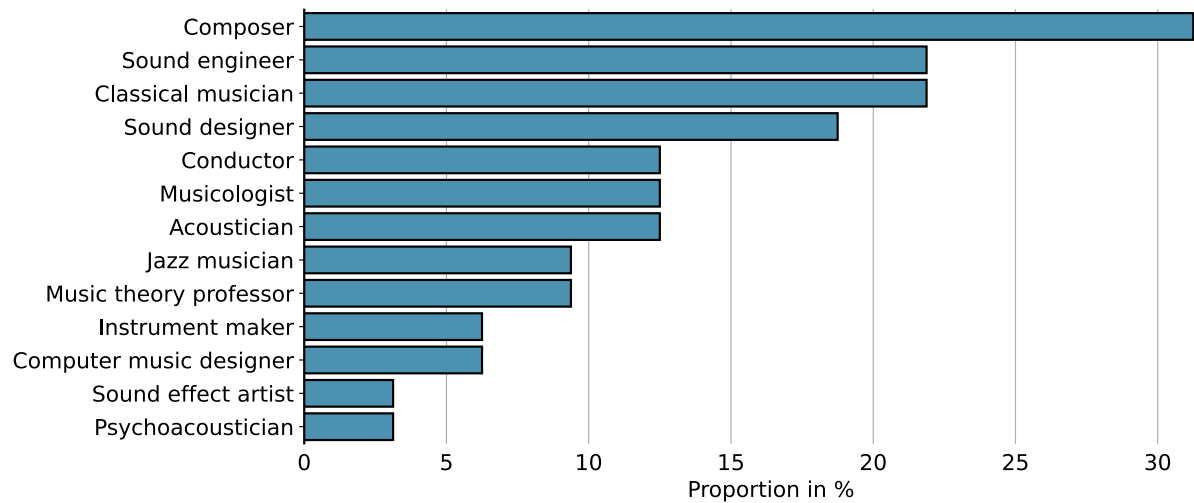
3. Pouvez-vous trouver des exemples sonores associé à cette définition (au moins trois) ?

4. Pouvez-vous trouver des exemples sonores opposé à cette définition (au moins trois) ?

5. Comment définissez-vous l'opposé de l'attribut étudié ?

6. Y-a-t'il un affect rattaché à cet attribut et/ou son opposé ?

## Distribution of the professional profiles of the participants (Study 1)



**Figure.** Percentage of professional profiles in the population for Study 1 (1 participant = 2%)

# Description of lemmas for the four attributes (Study 1)

**Table 1** reports the number of lemmas for the four studied attribute for the two questions  
**Table 2 and Table 3** reports the top lemmas for the four studied attribute for the two questions

Question 1: How do you define the studied attribute?

Question 5: How do you define the opposite of the studied attribute?

**Table 1.** Number of lemmas evoked at least by three experts both for question 2 and question 5 of the interviews for each of the four attributes.

Attribut	Question 2	Question 5
<b>Bright</b>	41	50
<b>Warm</b>	68	63
<b>Round</b>	64	45
<b>Rough</b>	37	25

**Table 2.** Top 100 lemmas for question 2 of all attributes.

Lemma	Nb participants	Lemma	Nb participants
brillant	32	agréable	7
chaud	32	variation	7
rond	32	couleur	7
aigu	29	équilibré	7
attaque	27	parasite	7
harmonique	27	espace	7
rugueux	26	archet	7
grave	24	classique	7
spectre	21	large	6
doux	19	présence	6
médium	19	humain	6
fréquence	17	naturel	6
timbre	17	flatterzunge	6
fort	17	net	6
corde	17	trompette	6
musique	16	gratte	6
piano	14	mezzoforte	6
souffle	14	nature	6
plein	14	vibrato	6
riche	13	contrebasse	6
frotter	13	orchestre	6
bas	13	enveloppe	6
lisse	12	bois	6
bruit	12	aspérité	6
matière	12	froid	6
basse	12	impact	6
chaleureux	11	ensemble	6
clair	11	affect	5
haut	11	violoncelle	5
résonant	10	vie	5
agressif	10	intensité	5
pur	10	gros	5
homogène	9	dense	5
voix	9	irrégulier	5
dur	9	timbré	5
proche	9	organique	5
long	8	défini	5
enveloppant	8	métal	5
bruité	8	propre	5
hertz	8	tessiture	5
temporel	8	registre	5
dynamique	8	confortable	5
clarinette	8	franc	5
percussion	8	creux	5
cuivre	8	volume	5
entretenu	8	généreux	5
vibration	7	surface	5
stable	7	sonner	5
nuance	7	lumière	5
vibrer	7	court	5

**Table 3.** Top 100 lemmas for question 5 of all attributes.

Lemma	Nb participants	Lemma	Nb participants
rond	31	terne	7
brillant	30	baguette	7
chaud	30	spectre	7
rugueux	29	cuivre	7
aigu	27	bas	7
attaque	25	marimba	6
harmonique	24	vibration	6
lisse	21	musique	6
froid	21	intéressant	6
grave	20	agréable	6
résonant	20	vibraphone	6
fort	18	propre	6
agressif	15	matière	6
doux	15	tessiture	6
corde	15	xylophone	6
timbre	14	bois	6
piano	14	aspérité	6
pur	14	espace	6
fréquence	12	précis	5
contrebasse	12	long	5
cuivré	11	proximité	5
trompette	11	violoncelle	5
clarinette	11	gros	5
mat	11	flatterzunge	5
étouffé	10	voix	5
stable	10	bruité	5
riche	10	vibrer	5
bruit	10	sec	5
court	10	chaleureux	5
flûte	10	variation	5
pizzicato	9	mou	5
dur	9	saturer	5
vibrato	9	métal	5
métallique	9	sombre	5
souffle	9	sul	5
homogène	8	péjoratif	5
violon	8	tuba	5
sourd	8	accordéon	5
cor	8	bartok	5
plein	8	hautbois	5
glockenspiel	8	droit	5
clair	8	bonne	5
médium	8	basse	5
piccolo	7	haut	5
pauvre	7	contrebasson	5
basson	7	archet	5
sourdine	7	précision	4
mezzoforte	7	plat	4
ponticello	7	intensité	4
franc	7	percussif	4

## Study 2: Survey

### Example of the interface of the survey in French (Study 2)

Selon vous l'expression « un son avec une attaque douce » est ...

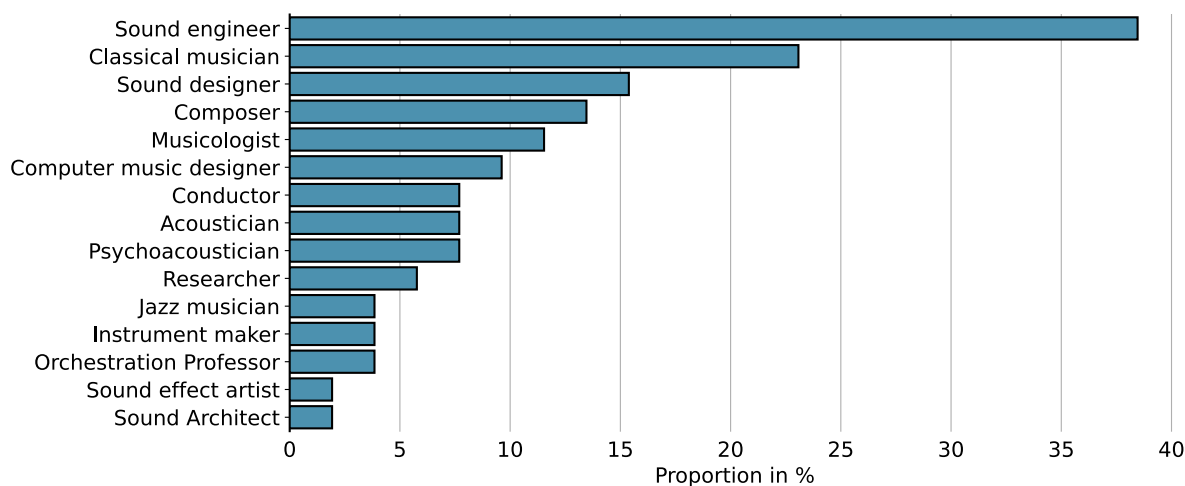
- ☐ Précis
- ☐ Vague
- ☐ Incompréhensible

Selon vous un son brillant est un son avec une attaque douce ?

☐ Non pertinent

Pas du tout d'accord ☐ ☐ ☐ ☐ ☐ Tout à fait d'accord

### Distribution of the professional profiles of the participants (Study 2)



**Figure.** Percentage of professional profiles in the population for Study 2 (1 participant = 2%)

# Statistical analysis of the survey results (Study 2)

This document presents the statistical tests performed on the answers for the survey of study 2. All the translations of the descriptions are presented in the supplementary file, 'translations/all\_translations.docx'.

Tables 1, 2, 3 and, 4 present the tests results for the descriptions of the four attributes. In addition, we give some details on the nature of the tests, the criterion for selecting the descriptions based on the tests results, and the choice made regarding the management of multiple comparisons. The English translations of the French descriptions were formulated by the authors.

## Statistical tests

In the tables, the columns *Familiarity* and *Relevance* group the results of two Chi-squared tests ( $\chi^2$ ) evaluating the familiarity (question 1) and the relevance (question 2A) of a description with the test value and p-value. The third column presents the test for *tendencies* on Likert scales (question 2B). It is a Wilcoxon signed-rank test (T, p), with an assessment of the sign of the tendency on Likert scales (sign) and an estimate of the effect size by calculating a pseudo-median (Mdn).

## Selection of descriptions

The three tests were performed for each sentence in the corpus with R. Following the order of the questions, if a description was not significantly familiar, relevant, or with a clear tendency, then it was discarded. For example, the description *fermé* (closed) for bright was not considered significantly familiar and was therefore rejected. On the other hand, the description *résonant* (resonant) was found to be significantly familiar but also not significantly relevant and was therefore discarded.

Italicized p-values for familiarity and relevance tests mean that the description was rated as significantly unfamiliar or irrelevant.

For example, the description *court* (short) for bright was evaluated as significantly irrelevant ( $p=.001$ ).

## Note on multiple comparison

For each description we performed three tests for the three questions that allow to filter the descriptions sequentially with regards to:

1. Familiarity
2. Relevance
3. Tendency

Therefore, a description with a p-value below an alpha level of .05 for all three tests would be equivalent to an overall p-value being below a alpha level resulting of the product of the three test alpha levels ( $.05^3=.0001$ ). The probability of type 1 error is therefore very low.

If we applied a Bonferroni correction to those alpha levels, the chances of type 1 errors would remain very low. For instance, the most numerous descriptions concerned roundness.

$$\begin{aligned}\alpha_{\text{corrected}} &= 68 \cdot .05^3 \\ &= 0.009 (<.05)\end{aligned}$$

The p-values of the selected descriptions are below the criterion of .05. Therefore, no correction was applied for the selection of the descriptions.

TABLE 1. BRIGHT *BRILLANT*

Phrase	$\chi^2$ (2, N=51) <i>Familiarity</i>		$\chi^2$ (2, N=51) <i>Relevance</i>		Wilcoxon signed-rank test <i>Tendency</i>			
	$\chi^2$	p	$\chi^2$	p	T	p	sign	Mdn
closed <i>fermé</i>	1.58	.208						
resonant <i>résonant</i>	47.08	<.001	0.49	.110				
with a soft attack <i>avec une attaque douce</i>	51.0	<.001	0.96	.327				
with little precision/definition <i>avec peu de précision/définition</i>	43.31	<.001	18.84	<.001	23.0	<.001	-	1.5
soft <i>doux</i>	39.71	<.001	21.35	<.001	47.0	<.001	-	2.0
with a lot of high harmonics <i>avec beaucoup d'harmoniques aigus</i>	43.31	<.001	32.96	<.001	899.0	<.001	+	5.0
low <i>grave</i>	51.0	<.001	4.41	.036	29.50	<.001	-	1.5
matte <i>mat</i>	51.0	<.001	21.35	<.001	0	<.001	-	1.0
round <i>rond</i>	51.0	<.001	24.02	<.001	116.0	<.001	-	1.5
short <i>court</i>	39.71	<.001	10.37	.001				
medium <i>medium</i>	1.40	<.001	7.80	.008	63.0	.001	-	2.0
warm <i>chaud</i>	47.08	<.001	16.50	<.001	68.0	<.001	-	1.5
high-medium <i>médium-aigu</i>	43.31	<.001	16.49	<.001	447.0	<.001	+	4.0
with a lot of harmonics <i>avec beaucoup d'harmoniques</i>	51.0	<.001	29.82	<.001	818.0	<.001	+	4.5
with attack <i>avec de l'attaque</i>	39.70	<.001	0.96	.327				
dull <i>sourd</i>	43.31	<.001	29.82	<.001	0	<.001	-	1.0
with a lot of low harmonics <i>avec beaucoup d'harmoniques graves</i>	36.25	<.001	16.49	<.001	70.0	<.001	-	1.5
pure <i>pur</i>	39.70	<.001	0.49	.484				
with little attack <i>avec peu d'attaque</i>	39.70	<.001	2.37	.123				
metallic <i>métallique</i>	51.0	<.001	26.84	<.001	560.0	<.001	+	4.0
with little harmonics <i>avec peu d'harmoniques</i>	51.0	<.001	21.35	<.001	40.0	<.001	-	1.5
low-medium <i>bas-médium</i>	43.31	<.001	4.41	.036	9.0	<.001	-	1.5
rough <i>rugueux</i>	36.25	<.001	0.18	.674				



*BRIGHT*

Phrase	$\chi^2$	p	$\chi^2$	p	T	p	sign	Mdn
wooden <i>boisé</i>	32.96	<.001	3.31	.069				
with a posed attack <i>avec une attaque posée</i>	0.96	0.327						
muffled <i>étouffé</i>	51.0	<.001	39.70	<.001	0	<.001	-	1.0
with a clear attack <i>avec une attaque franche</i>	51.0	<.001	0.49	.484				
with clarity in the attack <i>avec de la clarté dans l'attaque</i>	43.31	<.001	3.31	.069				
dark <i>sombre</i>	24.01	<.001	21.35	<.001	0	<.001	-	1.0
high <i>aigu</i>	51.0	<.001	12.25	<.001	459.50	<.001	+	4.0
with little high harmonics <i>avec peu d'harmoniques aigus</i>	43.31	<.001	29.82	<.001	58.50	<.001	-	1.5
that stands out <i>qui ressort</i>	12.25	<.001	0.49	.484				
with a precise attack <i>avec une attaque précise</i>	51.0	<.001	0.02	.889				
loud <i>fort</i>	39.70	<.001	2.37	.123				
<i>piano/pianissimo</i>	51.0	<.001	0.18	.674				
with shine <i>avec de l'éclat</i>	21.35	<.001	21.35	<.001	861.0	<.001	+	4.5
with a dull attack <i>avec une attaque molle</i>	43.31	<.001	0.18	.674				
with projection <i>avec de la projection</i>	18.84	<.001	0.02	.889				
with impact <i>avec de l'impact</i>	12.25	<.001	2.37	.123				
with clarity of articulation <i>avec une clarté d'articulation</i>	12.25	<.001	2.37	.123				
inharmonic <i>inharmonique</i>	14.29	<.001	4.41	.036				
clear <i>clair</i>	51.0	<.001	32.96	<.001	739.50	<.001	+	4.2
dull <i>terne</i>	26.84	<.001	18.84	<.001	0	<.001	-	1.0
with clarity <i>avec de la clarté</i>	47.08	<.001	29.82	<.001	848.50	<.001	+	4.5
velvety <i>feutré</i>	39.70	<.001	26.84	<.001	0	<.001	-	1.0

TABLE 2. WARM CHAUD

Phrase	$\chi^2$ (2, N=51) Familiarity		$\chi^2$ (2, N=51) Relevance		Wilcoxon signed-rank test Tendency			
	$\chi^2$	p	$\chi^2$	p	T	p	sign	Mdn
comfortable <i>confortable</i>	10.37	.001	4.41	.036	0485	<.001	+	4.5
with little high harmonics <i>avec peu d'harmoniques aigus</i>	43.31	<.001	24.01	<.001	349.0	.172		
unpleasant <i>désagréables</i>	29.82	<.001	1.59	.207				
generous <i>généreux</i>	18.84	<.001	14.29	<.001	703.0	<.001	+	4.0
with a dense timbre <i>avec un timbre dense</i>	29.82	<.001	4.41	.036	332.0	<.001	+	4.0
loud <i>fort</i>	32.96	<.001	14.29	<.001				
with a loud attack <i>avec une attaque forte</i>	39.70	<.001	3.31	.069				
piano	43.31	<.001	10.37	.001				
low <i>grave</i>	51.0	<.001	5.67	<.001	304.0	<.001	+	4.0
sharp / net <i>net</i>	21.35	<.001	1.59	.208				
with a lot of low harmonics <i>avec beaucoup d'harmoniques graves</i>	39.71	<.001	21.35	<.001	570.0	<.001	+	4.0
wide <i>large</i>	36.25	<.001	4.41	<.001	331.0	<.001	+	4.0
with clarity <i>avec de la clarté</i>	32.96	<.001	7.08	.008	82.0	.003	-	2.0
with a hard attack <i>avec une attaque dure</i>	39.71	<.001	0.49	.484				
expressive <i>expressif</i>	8.65	<.001	0.18	.674				
with little harmonics <i>avec peu d'harmoniques</i>	51.0	<.001	18.84	<.001	52.5	<.001	-	2.0
mezzoforte-forte	51.0	<.001	12.25	<.001				
that emit breadth <i>qui dégage de l'ampleur</i>	18.84	<.001	2.37	.123				
high <i>aigu</i>	51.0	<.001	10.37	<.001	0	<.001	-	1.5
with low frequencies in the attack <i>avec du grave dans l'attaque</i>	26.84	<.001	0.49	.484				
breathing <i>avec du souffle</i>	43.31	<.001	0.49	.484				
with a lot of high harmonics <i>avec beaucoup d'harmoniques</i>	47.08	<.001	26.84	<.001	49.50	<.001	-	2.0
that vibrates <i>qui vibre</i>	21.35	<.001	0.96	.327				

WARM Phrase	$\chi^2$	p	$\chi^2$	p	T	p	sign	Mdn
hard <i>dur</i>	29.82	<.001	10.37	.001	0	<.001	-	1.0
narrow in frequency <i>resserré en fréquence</i>	26.84	<.001	3.31	.069				
rich <i>riche</i>	39.71	<.001	12.26	<.001	465.0	<.001	+	4.5
full <i>plein</i>	39.71	<.001	24.02	<.001	665.5	<.001	+	4.0
with a lot of medium harmonics <i>avec bcp d'harmoniques médium</i>	39.71	<.001	21.35	<.001	360.0	<.001	+	4.0
with little low-medium harmonics <i>avec peu d'harmoniques bas-méd.</i>	32.96	<.001	12.26	<.001	60	<.001	-	2.0
with a lot of low-medium harmonics <i>avec bcp. d'harmoniques bas-méd.</i>	39.71	<.001	16.49	<.001	691.0	<.001	+	5.0
not vibrated <i>non vibré</i>	16.49	<.001	2.37	.123				
without variation <i>sans variation</i>	24.02	<.001	5.67	.017				
pleasant <i>agréable</i>	32.96	<.001	18.24	<.001	728.5	<.001	+	4.5
with little low harmonics <i>avec peu d'harmoniques aigus</i>	39.70	<.001	14.29	<.001	50.5	<.001	-	1.5
metallic <i>métallique</i>	51.0	<.001	12.25	<.001	0	<.001	-	1.0
cold <i>froid</i>	18.84	<.001	5.67	.017	0	<.001	-	1.0
poor <i>pauvre</i>	36.25	<.001	4.41	.036	0	<.001	-	1.0
organic <i>organique</i>	8.65	.003	0.49	.484				
rough <i>rugueux</i>	39.71	<.001	.020	.889				
balanced <i>équilibré</i>	26.84	<.001	5.67	.035	153.5	.318		
brassy <i>cuivré</i>	47.08	<.001	16.49	<.001	237.0	.299		
pure <i>pur</i>	43.31	<.001	5.67	.017	35.0	<.001	-	1.5
smooth <i>lisse</i>	32.96	<.001	0.49	.888				
soft <i>doux</i>	36.25	<.001	24.02	<.001	585.5	<.001	+	4.0
with a presence <i>avec une présence</i>	5.67	.017	0.02	.889				
resonant <i>résonant</i>	47.08	<.001	4.41	.036	219.50	.005	+	4.0
with life <i>avec de la vie</i>	4.41	.036	0.96	0.33				
straight <i>droit</i>	0.49	.484						

WARM Phrase	$\chi^2$	p	$\chi^2$	p	T	p	sign	Mdn
aggressive <i>agressif</i>	43.31	<.001	16.49	<.001	6.50	<.001	-	1.5
a little rough <i>un peu rugueux</i>	39.71	<.001	0.49	.484				
with a soft attack <i>avec une attaque douce</i>	51.0	<.001	3.31	.069				
neutral <i>neutre</i>	0.96	.327						
sustained <i>entretenu</i>	32.96	<.001	2.37	.123				
bright <i>brillant</i>	51.0	<.001	29.82	<.001	106.0	<.001	-	2.0
medium-high <i>médium-aigu</i>	43.31	<.001	4.41	.036	34.0	<.001	-	2.0
stable <i>stable</i>	29.82	<.001	5.67	.017				
enveloping <i>enveloppant</i>	36.26	<.001	21.35	<.001	741.0	<.001	+	4.5
with little medium harmonic <i>avec peu d'harmoniques médium</i>	36.26	<.001	16.49	<.001	22.50	<.001	-	1.5
which gives a proximity sensation <i>qui donne une sensation de proximité</i>	24.02	<.001	0.18	.674				
distant <i>distant</i>	32.96	<.001	0.02	.889				
short <i>court</i>	32.96	<.001	8.65	.003				
defined <i>défini</i>	36.25	<.001	0.18	.674				
with a human touch <i>avec une dimension humaine</i>	1.59	.208						
low-medium <i>bas-médium</i>	36.25	<.001	12.26	<.001	493.50	<.001	+	4.0
medium <i>médium</i>	39.71	<.001	10.37	.001	267.0	.006	+	4.0
with a lot of harmonics <i>avec beaucoup d'harmoniques</i>	51.0	<.001	12.26	<.001	327.0	.006	+	3.5
with a wide spectrum <i>avec un spectre large</i>	39.70	<.001	8.65	.003	270.5	.005	+	4.0

TABLE 3. ROUND ROND

Phrase	$\chi^2$ (2, N=51) <i>Familiarity</i>		$\chi^2$ (2, N=51) <i>Relevance</i>		Wilcoxon signed-rank test <i>Tendency</i>			
	$\chi^2$	p	$\chi^2$	p	T	p	sign	Mdn
rich <i>riche</i>	43.31	<.001	8.65	.003	278.5	.038	+	3.5
little rich <i>peu riche</i>	32.96	<.001	8.65	.003	78.0	<.001	-	2.0
comforting <i>réconfortant</i>	10.37	.003	1.59	.208				
with a dry attack <i>avec une attaque sèche</i>	26.84	<.001	0.96	.327				
with a bouncy attack <i>avec une attaque rebondie</i>	0.02	.889						
with little attack <i>avec peu d'attaque</i>	43.31	<.001	4.41	.04	346.0	.002	+	4.0
hard <i>dur</i>	29.82	<.001	21.35	<.001	0	<.001	-	1.5
pleasant <i>agréable</i>	29.82	<.001	10.37	.001	561.0	<.001	+	4.5
high <i>aigu</i>	51.0	<.001	51.0	<.001	8	<.001	-	1.5
sour <i>aigre</i>	4.41	.036	0.17	.674				
uncomfortable <i>inconfortable</i>	10.37	.001	0.96	.327				
with emergin harmonics <i>avec des harmoniques qui ressortent</i>	36.25	<.001	5.67	.017	68.0	.013	-	2.0
with a resonance close to the f0 <i>avec une resonance proche de la f0</i>	18.84	<.001	2.37	.123				
homogeneous <i>homogène</i>	39.71	<.001	7.08	.008	433.5	<.001	+	4.0
noisy <i>bruité</i>	29.82	<.001	1.59	.208				
with little high harmonics <i>avec peu d'harmoniques aigus</i>	39.71	<.001	16.49	<.001	242.0	.332		
dry <i>sec</i>	32.96	<.001	8.65	.003	0	<.001	-	1.50
with a clear attack <i>avec une attaque franche</i>	47.08	<.001	0.96	.327				
with a lot of attack <i>avec beaucoup d'attaque</i>	47.08	<.001	7.08	.008	44.0	<.001	-	1.50
with a slow decrease <i>avec une décroissance lente</i>	29.82	<.001	10.37	.001				
piano	39.71	<.001	10.37	.001				
sharp <i>pointu</i>	0.96	.327						
brassy <i>cuivré</i>	47.08	<.001	2.37	.123				

ROUND Phrase	$\chi^2$	p	$\chi^2$	p	T	p	sign	Mdn
laid <i>posé</i>	1.59	.208						
with a clean attack <i>avec une attaque nette</i>	51.0	<.001	0.02	.889				
short <i>court</i>	43.31	<.001	0.490	.484				
with a lot of low harmonics <i>avec bcp. d'harmoniques graves</i>	36.25	<.001	24.02	<.001	509.0	<.001	+	4.0
with a soft decrease <i>avec une décroissance douce</i>	26.84	<.001	3.31	.069				
precise <i>précis</i>	14.29	<.001	0.18	.674				
with a lot of harmonics <i>avec bcp. d'harmoniques</i>	51.0	<.001	12.25	<.001	196.0	.438		
<i>forte</i>	51.0	<.001	8.65	.003				
unstable <i>instable</i>	21.35	<.001	0.02	.889				
with a dull attack <i>avec une attaque molle</i>	39.71	<.001	0.96	.327				
aggressive <i>agressif</i>	39.71	<.001	26.84	<.001	0	<.001	-	1.0
sustained <i>entretenu</i>	32.96	<.001	0.17	.674				
breathing <i>avec du souffle</i>	47.08	<.001	1.59	.208				
vibrating <i>qui vibre</i>	26.84	<.001	0.02	.886				
with a short envelope <i>avec une enveloppe courte</i>	7.08	.02	3.31	.069				
bright <i>brillant</i>	51.0	<.001	16.49	<.001	25.5	<.001	-	1.5
soft <i>doux</i>	39.71	<.001	24.02	<.001	725.0	<.001	+	4.0
resonant <i>résonant</i>	47.08	<.001	8.64	.003	329.0	.001	+	4.0
expressive <i>expressif</i>	10.37	.003	3.31	.069				
with a soft attack <i>avec une attaque douce</i>	51.0	<.001	8.64	.003	370.0	.001	+	4.0
pure <i>pur</i>	39.71	<.001	0.96	.327				
with low-medium spectral balance <i>avec un équilibre spectral bas-méd.</i>	21.35	<.001	7.08	.008	457.5	<.001	+	4.0
stable <i>stable</i>	32.96	<.001	0.49	.484				
with little low harmonics <i>avec peu d'harmoniques graves</i>	36.25	<.001	18.84	<.001	97.0	<.001	-	2.0
with a lot of medium-high harmonics <i>avec bcp. d'harmoniques méd.-aigu</i>	39.71	<.001	16.49	<.001	184.0	.054		

ROUND Phrase	$\chi^2$	p	$\chi^2$	p	T	p	sign	Mdn
low <i>grave</i>	47.08	<.001	7.08	.008	316.0	<.001	+	4.0
with a varying dynamic <i>avec une dynamique qui varie</i>	39.71	<.001	4.41	.036	16.5	.002	-	1.5
with a lot of low-medium harmonics <i>avec bcp. d'harmoniques bas-méd.</i>	39.71	<.001	21.35	<.001	674.0	<.001	+	4.0
smooth <i>lisse</i>	29.82	<.001	7.08	.008	223.0	.012	+	4.0
with a lot of high harmonics <i>avec beaucoup d'harmoniques aigus</i>	39.71	<.001	18.84	<.001	41.0	<.001	-	1.5
soft <i>doux</i>	4.41	.035	0.490	0.484				
with a precise attack <i>avec une attaque précise</i>	47.08	<.001	0.02	.887				
without asperities <i>sans aspérités</i>	18.84	<.001	10.37	.001	457.5	<.001	+	4.0
with a hard attack <i>avec une attaque dure</i>	43.31	<.001	4.41	.046	6.5	<.001	-	1.5
rough <i>rugueux</i>	36.25	<.001	8.65	.003	4.5	<.001	-	1.0
without noise <i>sans bruit</i>	5.67	.051	4.41	.035				
with a long attack <i>avec une attaque longue</i>	39.71	<.001	0.02	.887				
timbred <i>timbré</i>	29.82	<.001	8.64	.003	287.0	.023	+	3.5
screaming <i>criard</i>	36.25	<.001	24.02	<.001	0	<.001	-	1
metallic <i>metallique</i>	51.0	<.001	12.25	<.001	0	<.001	-	1
full <i>plein</i>	36.25	<.001	21.35	<.001	498.0	<.001	+	4.5
with little harmonics <i>avec peu d'harmoniques</i>	51.0	<.001	14.29	<.001	111.0	.003	-	2.0
low-medium <i>bas-médium</i>	32.96	<.001	14.29	<.001	502.0	<.001	+	4.0
wide <i>large</i>	29.82	<.001	5.67	.017	245.0	.002	+	4.0

TABLE 4. ROUGH RUGUEUX

Phrase	$\chi^2$ (2, N=51) <i>Familiarity</i>		$\chi^2$ (2, N=51) <i>Relevance</i>		Wilcoxon signed-rank test <i>Tendency</i>			
	$\chi^2$	p	$\chi^2$	p	T	p	sign	Mdn
that rasps <i>qui râpe</i>	16.49	<.001	16.49	<.001	771.0	<.001	+	4.5
friction <i>de frottement</i>	39.71	<.001	18.84	<.001	615.0	<.001	+	4.5
bright <i>brillant</i>	51.0	<.001	1.59	.208				
not spectrally pure <i>pas pur spectralement</i>	12.25	.001	0.96	.327				
organic <i>organique</i>	10.37	.004	5.67	.017				
with little attack <i>avec peu d'attaque</i>	47.08	<.001	5.67	.017				
with a lot of attack <i>avec beaucoup d'attaque</i>	47.08	<.001	1.59	.208				
with little harmonic <i>avec peu d'harmoniques</i>	47.08	<.001	0.02	.887				
resonant <i>résonant</i>	43.31	<.001	0.96	.327				
raw <i>brut</i>	8.64	.007	0.02	.887				
with parasites <i>avec des parasites</i>	43.31	<.001	14.29	<.001	564.5	<.001	+	4.0
rugged <i>accidenté</i>	2.37	.123						
round <i>rond</i>	47.08	<.001	18.84	<.001	7.0	<.001	-	1.5
sustained <i>entretenu</i>	32.96	<.001	2.37	.123				
harsh / bitter <i>âpre</i>	10.37	.001	8.65	.003	386.0	<.001	+	4.0
with frequency variations <i>avec des variations fréquentielles</i>	21.35	<.001	0.49	.483				
noisy <i>bruité</i>	32.96	<.001	5.67	.017	320.0	<.001	+	4.0
soft <i>doux</i>	39.71	<.001	10.37	.001	5.0	<.001	-	1.0
with little vibrations <i>avec peu de variations</i>	18.84	<.001	0.02	.887				
full <i>plein</i>	39.71	<.001	0.02	.887				
unstable <i>instable</i>	21.35	<.001	0.96	.327				
with pulses <i>avec des battements</i>	36.25	<.001	5.67	.017	177.5	.484		
stable <i>stable</i>	32.96	<.001	0.02	.887				
itchy <i>qui gratte</i>	5.67	.035	5.67	.017	457.0	<.001	+	4.5

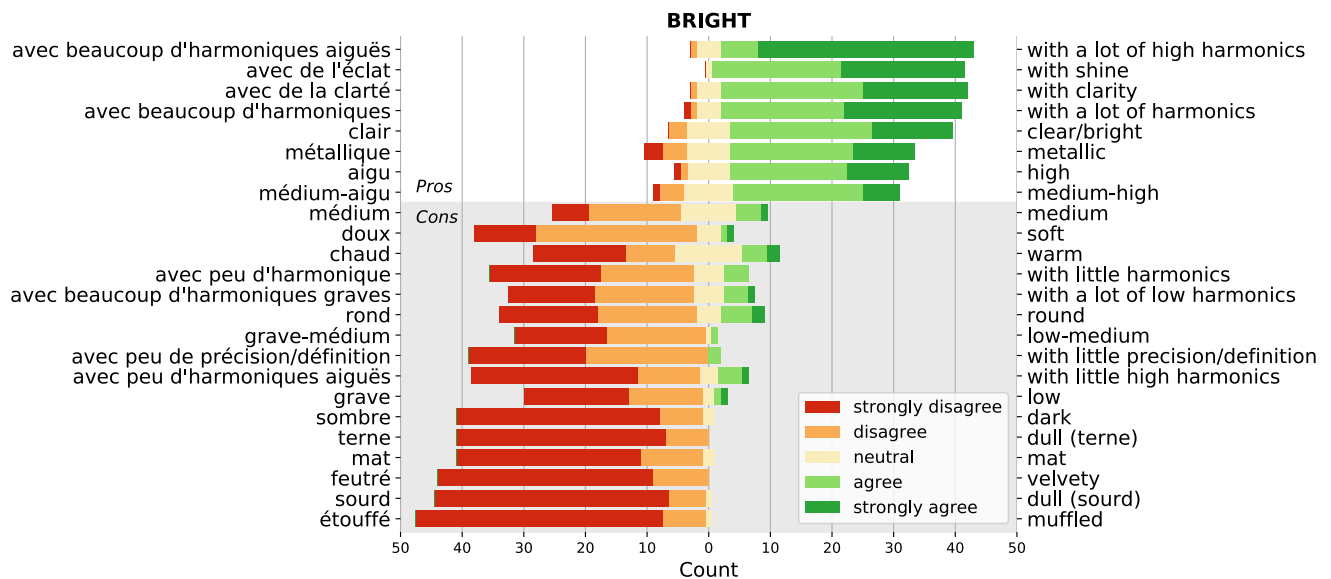


<i>ROUGH</i> Phrase	$\chi^2$	p	$\chi^2$	p	T	p	sign	Mdn
with fast variations <i>avec des variations rapides</i>	24.02	<.001	0.18	.674				
smooth <i>lisse</i>	39.71	<.001	32.96	<.001	0	<.001	-	1.0
with grain <i>avec du grain</i>	43.31	<.001	36.25	<.001	848.0	<.001	+	4.5
with asperities <i>avec des aspérités</i>	24.02	<.001	21.35	<.001	848.5	<.001	+	4.5
that rubs <i>qui frotte</i>	29.82	<.001	21.35	<.001	693.5	<.001	+	4.5
aggressive <i>agressif</i>	43.31	<.001	2.37	.123				
pure <i>pur</i>	39.71	<.001	8.65	.003	42.0	<.001	-	1.5
with a harsh attack <i>avec une attaque âpre</i>	2.37	.123						
grainy <i>granuleux</i>	39.71	<.001	29.82	<.001	847.5	<.001	+	4.5
which gives an impression of non- homogeneous material <i>qui donne une impression de matière non-homogène</i>	7.08	.008	2.37	.123				

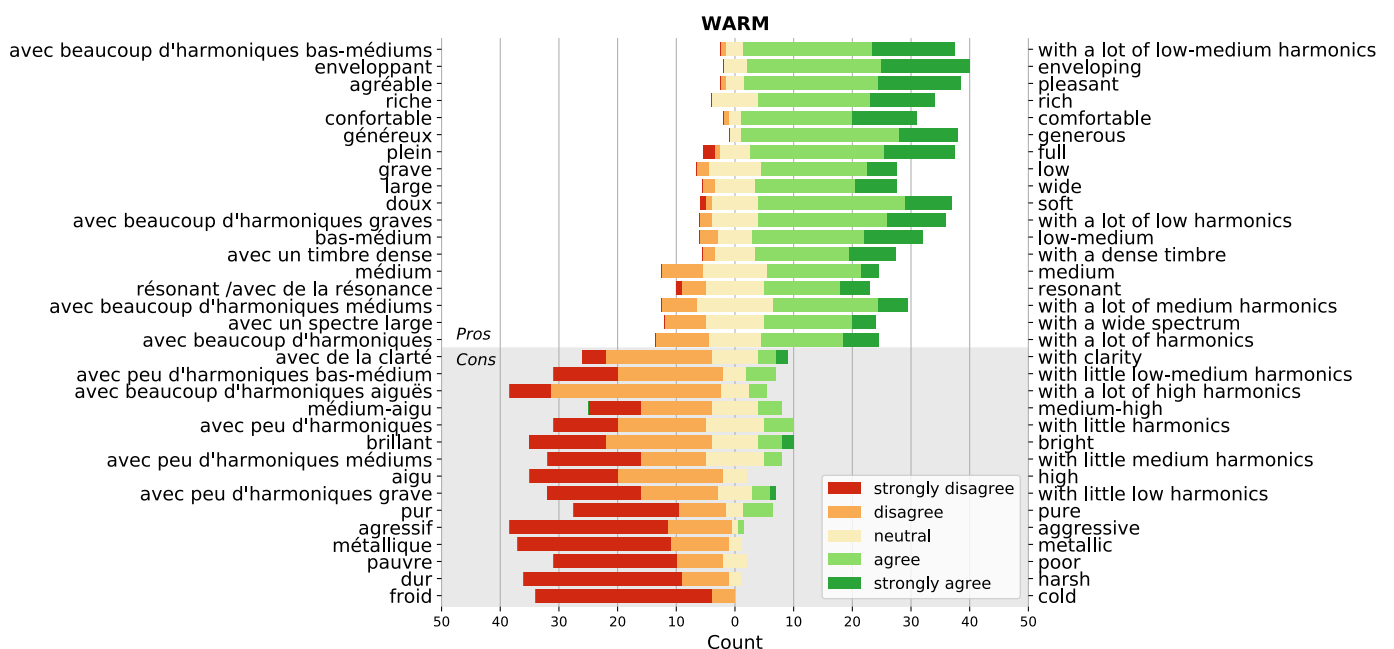
*bcp.* : beaucoup  
*méd.* : médium

## Translations for the results of Study 2

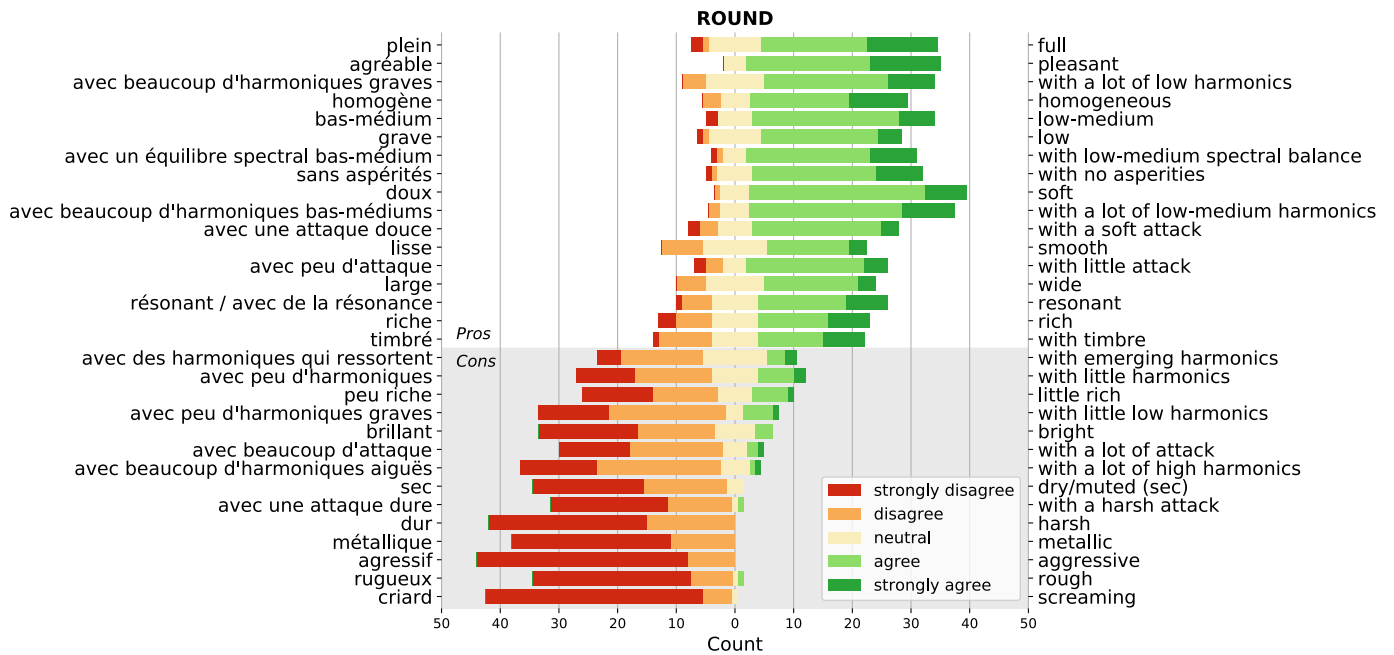
Four figures presenting the relevant results of the online survey (Fig. 2), with the associated French translation, as they were presented to the participants during the survey.



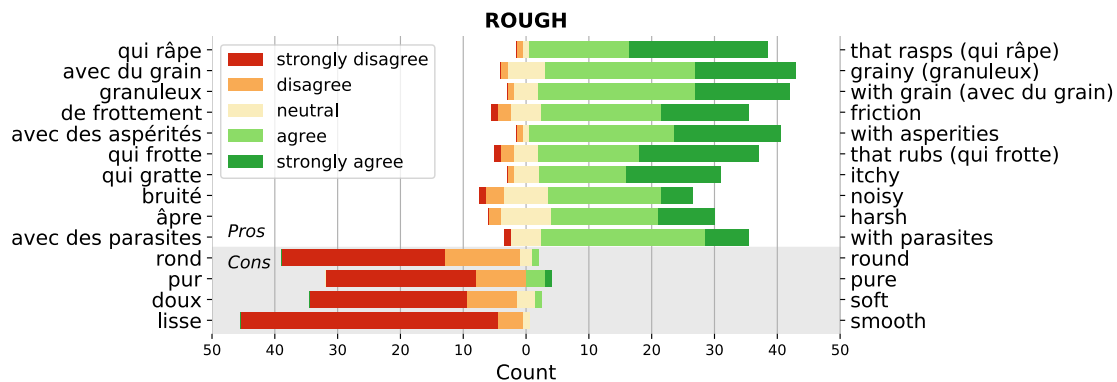
**Figure.** Relevant descriptions and distribution of answers on the Likert scales obtained through the online survey for Bright with translations. The grey area gathers the descriptions in mismatch with the attribute.



**Figure.** Relevant descriptions and distribution of answers on the Likert scales obtained through the online survey for Warm with translations. The grey area gathers the descriptions in mismatch with the attribute.



**Figure.** Relevant descriptions and distribution of answers on the Likert scales obtained through the online survey for Round with translations. The grey area gathers the descriptions in mismatch with the attribute.



**Figure.** Relevant descriptions and distribution of answers on the Likert scales obtained through the online survey for Rough with translations. The grey area gathers the descriptions in mismatch with the attribute.