



HAL
open science

Characteristics of "resonance wood" as viewed by violin makers or by wood scientists: Part 1 – a survey on the relation between luthiers and their raw material "

Capucine Carlier, Iris Brémaud, Joseph Gril

► To cite this version:

Capucine Carlier, Iris Brémaud, Joseph Gril. Characteristics of "resonance wood" as viewed by violin makers or by wood scientists: Part 1 – a survey on the relation between luthiers and their raw material ". International symposium WoodSciCraft 2014 "Wood Science and Craftmanship: Cross perspective between Europe and Japan", Sep 2014, Montpellier, France. hal-01960541

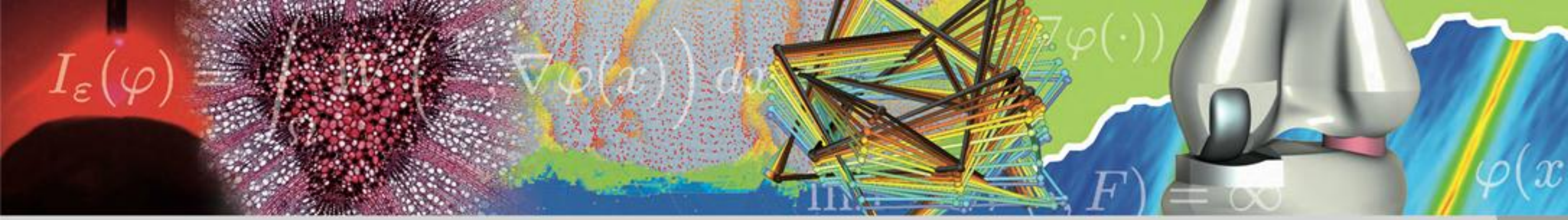
HAL Id: hal-01960541

<https://hal.science/hal-01960541>

Submitted on 8 Jan 2019

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



« CHARACTERISTICS OF "RESONANCE WOOD" AS VIEWED BY VIOLIN MAKERS OR BY WOOD SCIENTISTS: PART 1 – A SURVEY ON THE RELATION BETWEEN LUTHIERS AND THEIR RAW MATERIAL »



CARLIER Capucine¹, BREMAUD Iris¹, GRIL Joseph¹

¹Laboratory of de Mechanics and Civil Engineering (LMGC), CNRS, Université Montpellier 2

1. Introduction

Wood as a raw material of many musical instruments plays an essential role in their acoustic, aesthetic or technical quality, therefore in their identity. Among the many wood used in musical instruments, the term **"resonance wood"** is often used to describe those used for the soundboard of string instruments, and sometimes for their resonator box.

The "resonance woods" for the making of violin family have benefited (spruce for top plates and lesser so "fiddleback" maple for back plates) from more research than other instrument making woods, but the interactions between different disciplines and viewpoints in this field has seldom been addressed.

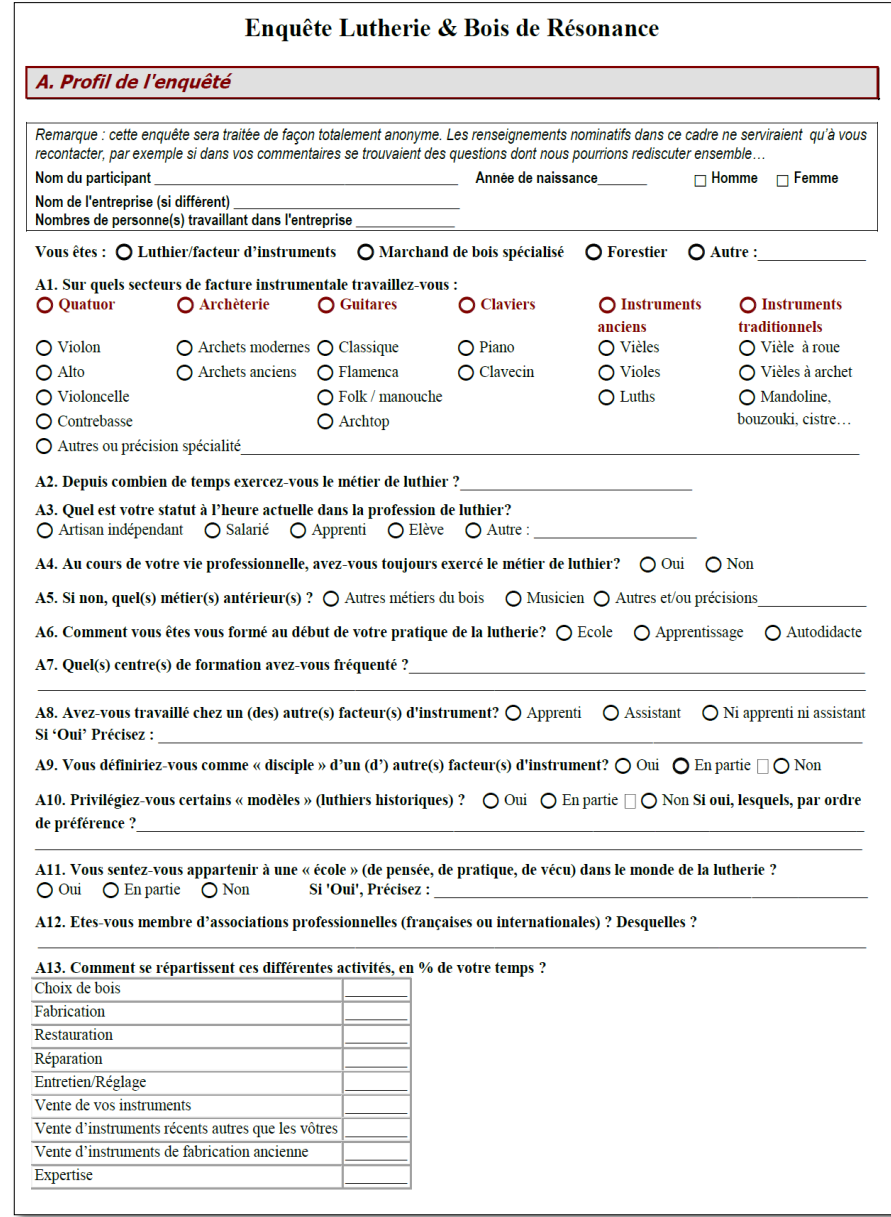
The objective of this study is to improve the understanding of the **interactions** between **physic-mechanical properties** of resonance wood, their **natural variability**, and the actual **expertise of violin makers** in the selection and qualification of their raw material.



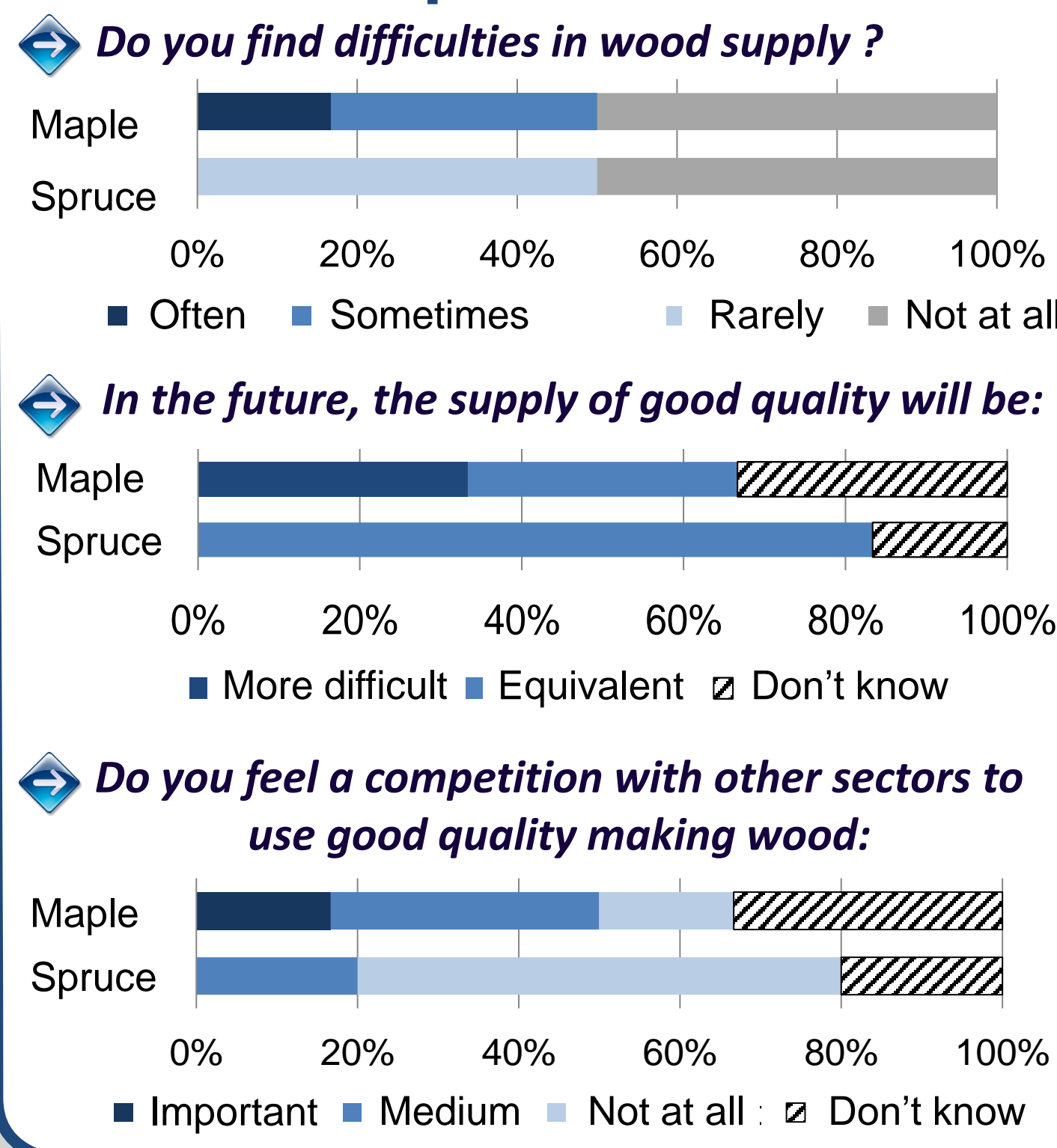
2. Development of a survey

To identify **violin makers' opinions and practices** by both qualitative and quantitative questions

- o **Face to face interview**
- o First step: Luthiers of Montpellier : 11 makers contacted, 9 positive responses
6 complete responses to the 14 pages questionnaire
- o Second step : extension to 3 Iranian makers of traditional string instruments
- o Organized by modules (*Maker's Profile, *Concept of quality, *Wood supply, Wood Criteria Choices for *top plates, for *back & sides, for *bows, *Treatments and varnish, *Relation to scientific and historical research, *Questions and remarks)



3. Perception of the resource depending on the species



Maple « Aren't we going to drain the stock of old trees? »
Spruce « Forests appear to be well managed »

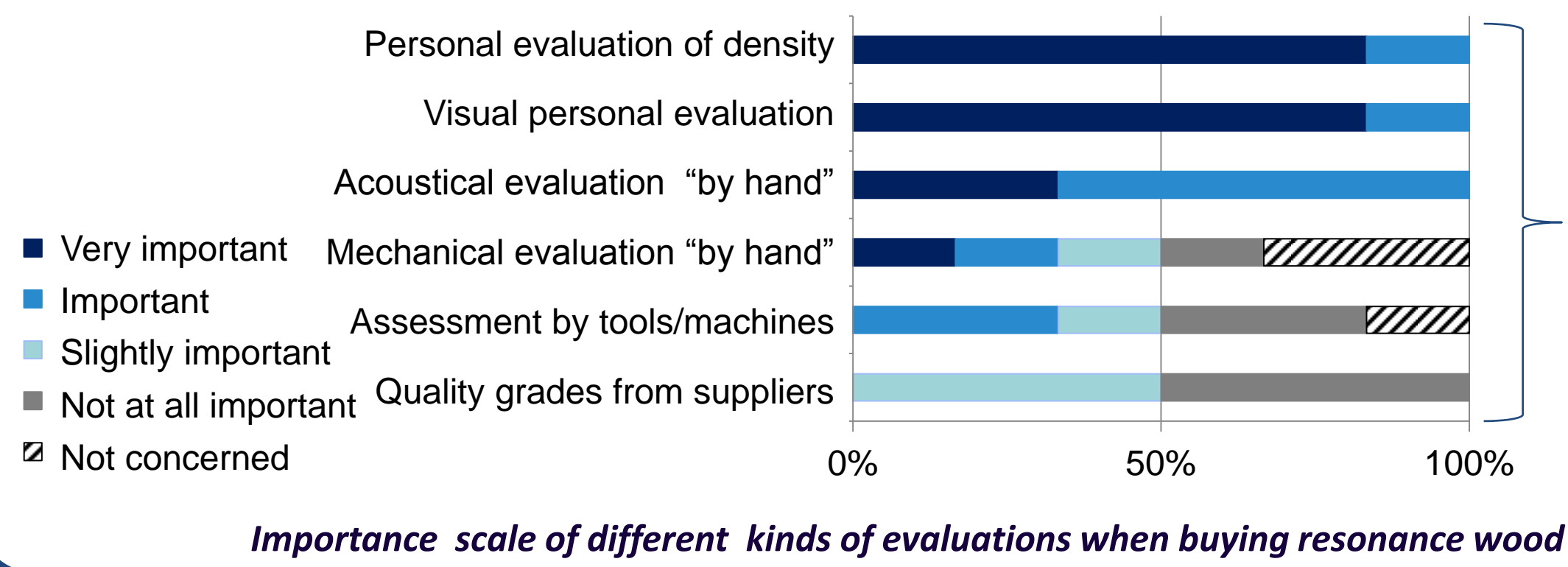
The geographical origin of the species seems to be more crucial to choose the maple than the spruce according to the makers.

Prime provenance:

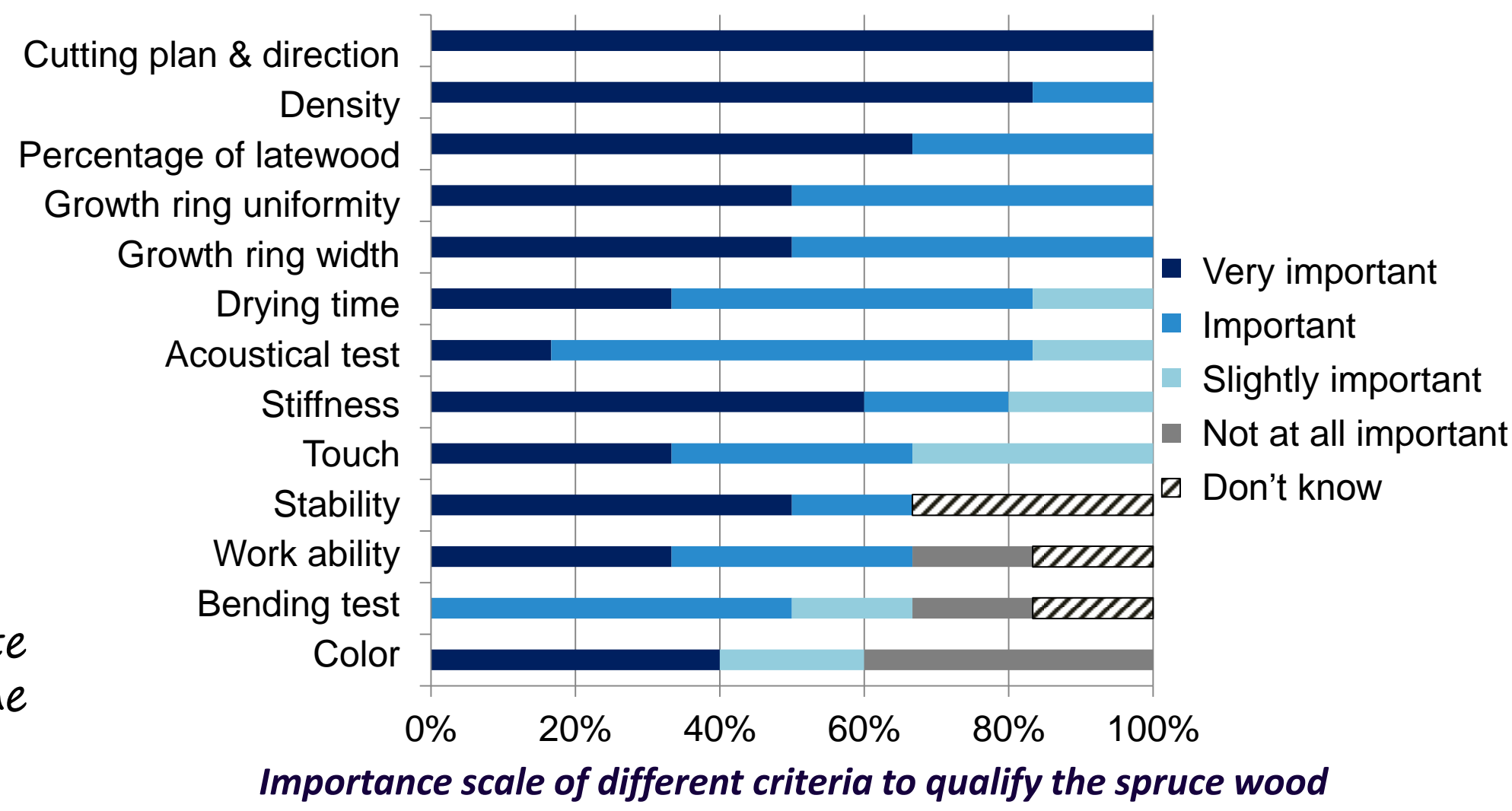
Maple : First from the Balkans and then Germany and France (Jura)
Spruce : Especially Italy (Val di Fiemme in the Dolomites), sometimes Swiss Alps

4. Wood choice by violin makers

All makers buy their wood from a **specialized supplier**, whom they trust and never choose directly in the forest. To choose their tonewoods, they mainly assess **density and visual criteria**



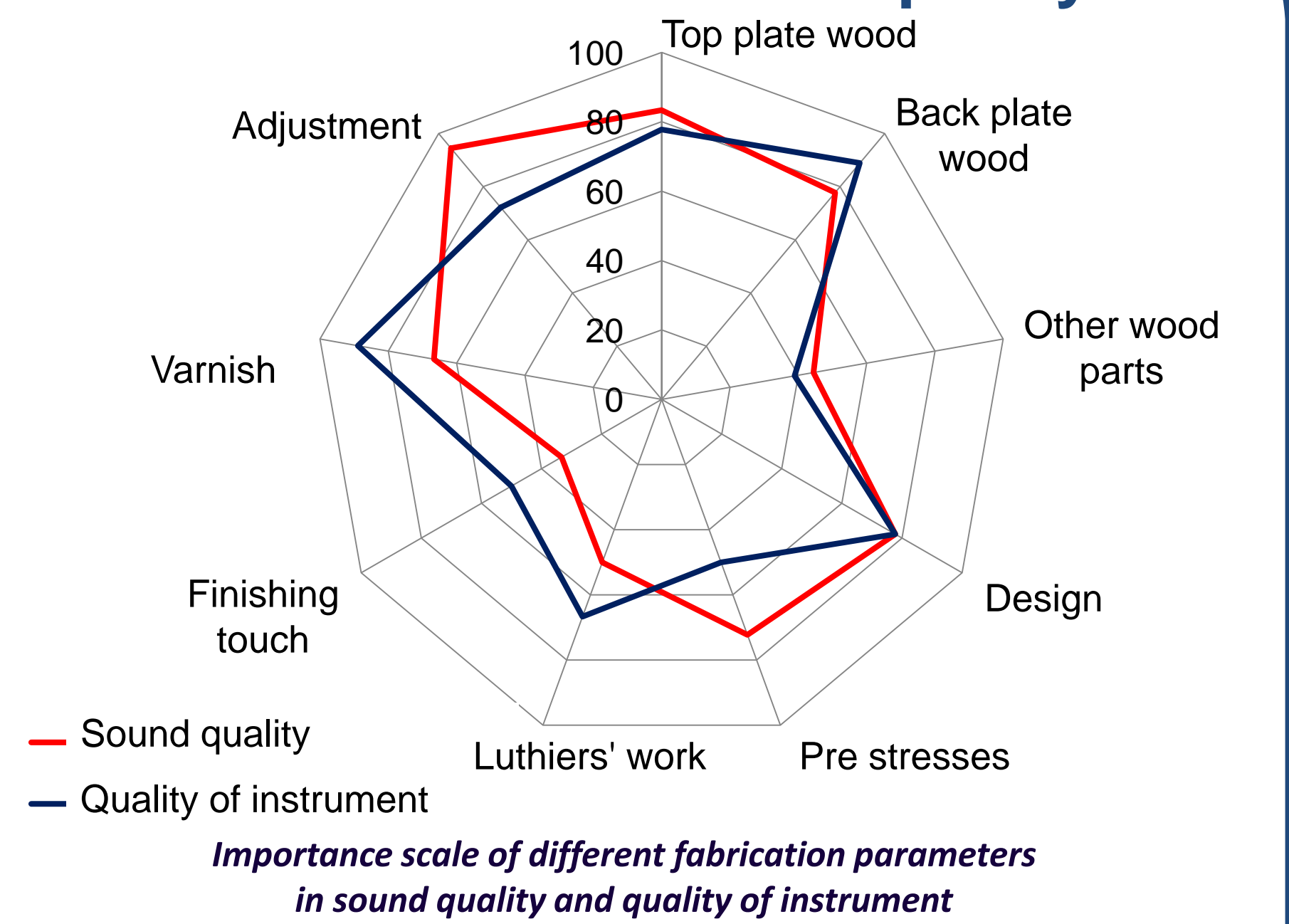
Violin makers trust their suppliers but pay little attention to grades posted...
⇒ Necessity to integrate the suppliers in the survey



Main criteria to qualify the **spruce wood** are: cutting plan, density, percentage of latewood, growth ring uniformity and width.

For **maple**, ring width seems to be the most important criteria for luthiers. Density, cut and drying are also very important. Unlike spruce, color appears more crucial for maple.

5. Wood in instrument « quality »

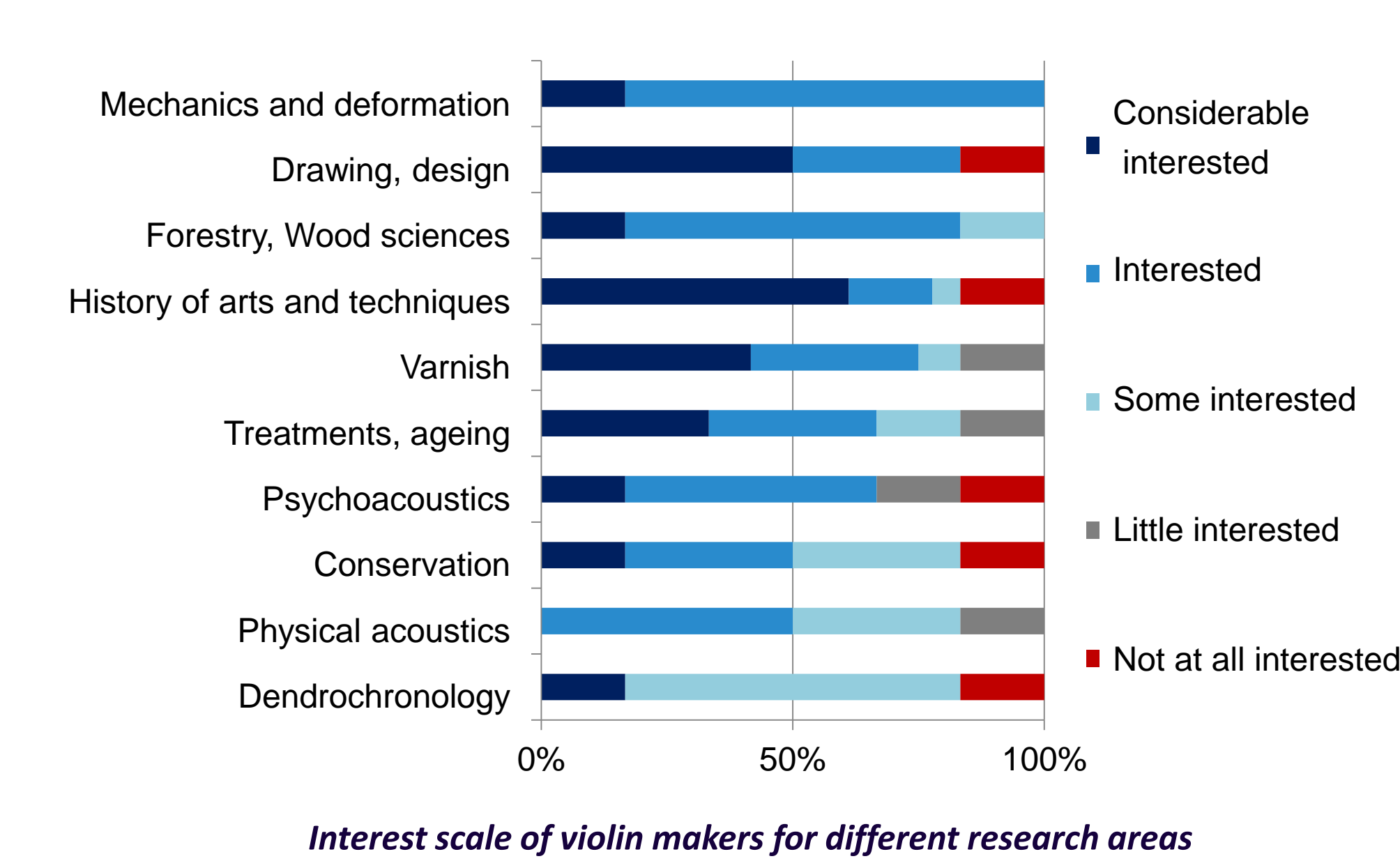


To clarify this concept of quality, the makers defined a good instrument by using :

- **Physical criteria**, "powerful", "with timbre" and "easy to play"
- a **notion of pleasure** "sensation of evidence", "instrument unanimously appreciated", "that pleases the one who plays"

Resonance wood choice appears for craftsmen to be a determining factor in sound quality of the instrument.

6. Relation to research and sciences

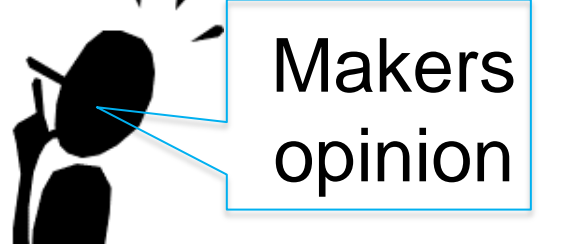


- o Makers rely mainly on **empirical approaches**, and also **historical** for their practices, but report a lot of interest in the scientific approach of resonance wood.
- o Their interests are mostly related to the history of art and techniques, to the drawing, varnishes and to the mechanics and wood science.
- o 2/3 luthiers are interested in the development of simple tools usable in a workshop if they permit a better knowledge of the wood.

7. What about some « clichés » ?

⇒ Some assertions

- 'Today's luthiers are at least as competent as those of past centuries'. **80% Agree**
 - Quality of resonance wood was "better" in the 18th century. **100% Disagree**
 - Ancient luthiers had more access to "good" resonance wood than current luthiers. **100% Disagree**
 - Manufacturing a good bow with medium quality wood is possible. **100% Disagree**
 - Manufacturing a good violin with medium quality wood is possible. **2/3 Agree**
 - Musicians, luthiers and public can differentiate instruments of ancient masters from those of best modern craftsmen just by listening. **80% Disagree**
 - "Old masters" had a "secret", **2/3 Agree**
- o The opinion of violin makers is clearly more pragmatic than the « clichés » vehiculated by general public and media on their profession!!

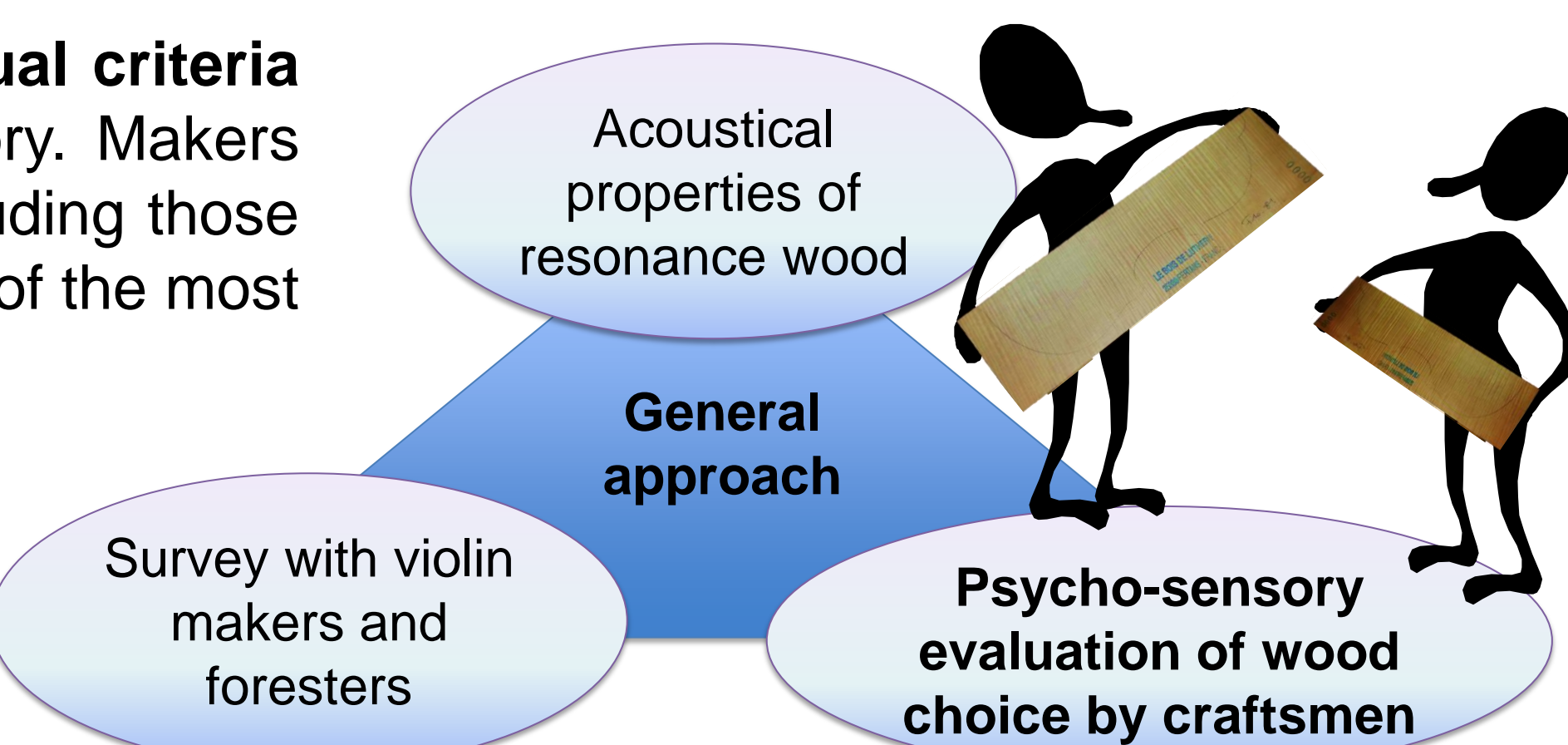


8. Conclusion and perspectives

Empirical choice by violin makers are based on **perceptual criteria** that can be visual, tactile, physic-mechanical and auditory. Makers report a lot of **interest on several field of research** including those on resonance wood. They considered the wood to be one of the most determining factors in sound quality of the instrument.

⇒ Perspectives

- To **broaden** our survey to a **national and international scale**
- A more detailed study to assess the respective contribution of different fields of perception is needed



⇒ Acknowledgments

The authors gratefully thank the violin makers of Montpellier for their time, help they granted us and their participation in the survey.
The support of INSIS-CNRS (PhD Grant) is gratefully acknowledged. The PHC Gundishapur and the help of Aida Se Golpayegani and Iranian makers is much appreciated.