Role of knowledge and cultural variations in public perception of riverscapes with and without wood

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1. Problem statement and hypothesis

During the First International Conference on Wood in World Rivers, held in Oregon (U.S.A.) in October 2000, participants indicated that strong regional contrasts appear in the appraisal of riverscape quality, particularly in the perception of large wood (LW) deposited in the channels (Gregory *et al.*, 2003). Over the last three decades, there has been an increasing scientific interest in LW and scientists have recognised the hydraulic, geomorphic and biological role of wood in temperate river systems (Triska, 1984; Sedell *et al.*, 1988). Although LW re-introduction has been promoted in different areas, such as in North America, Australia, Switzerland or Germany, such measures are not accepted by managers and users in other countries (Boyer *et al.*, 1998; Gerhard and Reich, 2001). In order to understand the reasons for some spatial variations in LW public perception amongst different geographic areas in the world and notably in Europe, we have analysed the social, cultural and historical context of the question. One of our aims, described in this contribution, was to evaluate the visual and emotional impact of riverscape on the motivation to improve streams and rivers.

2. Material and methods

The survey is based on a questionnaire and a set of 20 photographs, which represent watercourses running through various physical and humanised environments. Half of the scenes are characterised by river and stream sections obstructed by wood while the 10 others are free-flowing, without LW. To evaluate the overall scenic attractiveness of each picture, respondents rated four perceived values of the 20 colour photographs (namely aesthetics, naturalness, danger, and need for improvement) on Visual Analog Scales ranging from 0 to 10 (Gift, 1989). The questionnaire included also two qualitative variables for characterizing the perception of danger and the motivation for improving riverscapes. The study was performed using the same protocol in eleven geographical areas (France, Poland, Sweden, India, Russia, Germany, Italy, Spain, China, Oregon (U.S.), Texas (U.S.)), which have been selected because they reflect a potential diversity of socio-cultural environments. With a low variability in age classes, the student community is a very interesting experimental population for international comparisons and students' responses were presumed to represent knowledge of non expert groups (Brown and Daniel, 1991). Similar disciplines were surveyed in each of the areas concerned. More information about methodological aspects is presented in Piégay *et al.* (in press).

3. Social acceptance of in-channel wood

The results show that the presence of in-channel LW modifies students' perceptions (Figure 1a). The respondents considered riverscapes with LW to be less aesthetically pleasing, more natural, more dangerous, and needing more improvement than those without LW. When considering the perceived danger (Figure 1b), the participants evaluate the scenes with wood as being more dangerous in terms of water quality and affecting leisure activities. Moreover, the students consider that the riverscapes without LW require much more improvement than those without (Figure 1c). With LW presence, there is an increase in the perceived need for cleaning the channel and improving the landscape quality.

The results highlight a negative perception of LW by respondents which influences their attitudes towards river management (Gregory and Davis, 1993). Some archetypes affect the valorisation of landscape scenes, making clean water the vital fluid, the nurturer of life, and the pre-eminently pure element where LW evoke the human death and seems to be an intolerable body polluting the maternal and divine element (Bachelard, 1942; Durand, 1969).

4. A cultural cross-view for wood management in watercourses

The comparative geographical analysis demonstrates some substantial cultural differences amongst the geographical areas (Figure 2a). Particularly, Asian students show a great motivation for improving watercourses, whereas respondents from other countries (German, Oregon, or Sweden) show a more conservationist attitude towards streams and rivers.

Many factors can explain the geographical variability. For instance, the motivation for improvement (Figure 2b) seems to vary according to the familiarity with LW, the combination of forest cover and density of population, the history of land uses (agricultural tradition in Western Europe or forestry in Oregon and Sweden), the technocratic management of watercourses (France and Russia) and the necessity of development (China and India).

5. Conclusion

Public awareness of environment has increased very significantly in the most developed countries since the last decades. Nevertheless, values, feelings and beliefs may trigger the decision-making of LW removal throughout the world. Modified channels appear to be those that are most acceptable to the public. The consequences of the negative perception of LW may explain why wood reintroduction in streams and rivers is still infrequent, even as an experimental stream restoration technique.

These results raise the question as to whether the management of riverine landscapes should acknowledge the commonly-held national perception of riverscape. There is a need to develop a greater appreciation of LW-rich channels that are scientifically and ecologically important, through environmental education that should be considered for river restoration purposes. A complementary study involving French river management officials is in process, in order to establish how knowledge influences the LW perception regarding landscape and risk occurring in watercourses.

6. Acknowledgement

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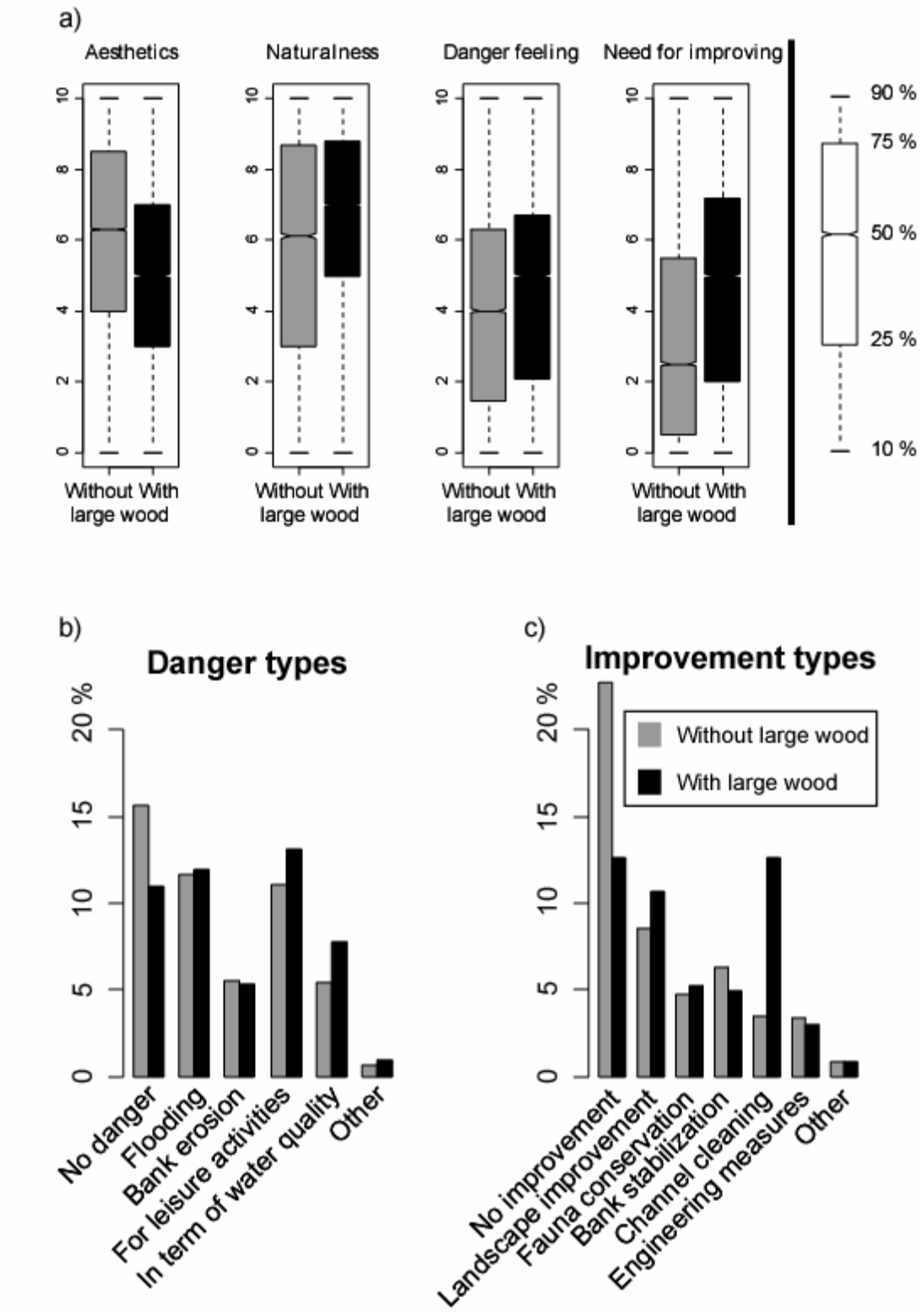

Figure 1 (a) Wood in rivers, a negatively perceived object. The grey boxplots represent the values assigned to the riverscapes without wood and the black boxplots represent the values assigned to the riverscapes with wood. (b) The percentage for each danger type rated by students from 20 riverscapes with and without wood. (c) The percentage for each improvement type rated by students from 20 riverscapes with and without wood.

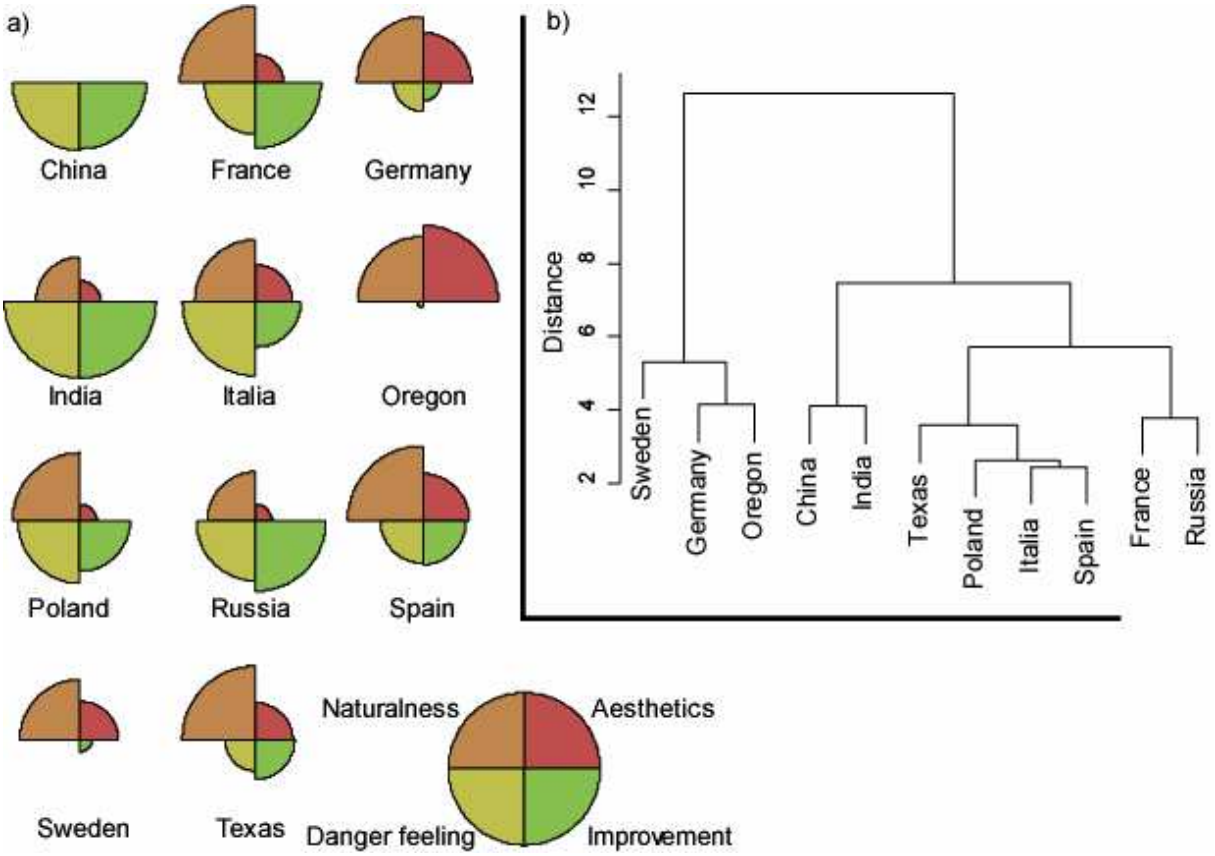

Figure 2 (a) Segment diagrams. Each diagram represents one geographical area. On each of them, four continuous variables (scores for aesthetics, naturalness, feeling of danger and need for improvement) are plotted by a radius whose length corresponds to the mean value attributed by the students of the given area. (b) Dendrogram. A hierarchical cluster analysis has been performed on the mean values of need for improvement (provided by students from 11 geographical areas who scored the 20 riverscapes).