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9. “New” natural materials

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Semantic surfaces

Perfect imitation of nature is frequent in contemporary range of materials and surfaces for architecture and interiors. Natural effect finishes record high sales, despite criticism from architects and designer, especially due to a hundred-year-old ethic debate on definition of “honest” materials, widely supported by Modern Architecture cultural heritage and in particular by the moral influence of Adolf Loos writings on ornament.

On the other hand, market and users do not feel the urgent need to find direct correspondence between the semantic qualities and the actual structure of materials, as it was normal in the near past. The natural “look” nowadays, conveys the feeling of a sustainable beauty, with a somewhat looser link between external aspect and constituent material, given the mastery of modern design and technology to reproduce natural materials.

The concept itself of authenticity seems to be questioned and expresses an intellectual orientation, often subjective, while the widespread preference for the so-called natural materials is mainly based on their aesthetic and sensorial superiority.

Neuroscience – through experimental evidence – could investigate the reaction of our neurocognitive system to the perception of natural versus “in imitation” materials in different conditions.

As said above, production and sales state a higher preference for products that reproduce wood and stone in primis, but many other example could be named. Thanks to digital technologies aesthetic features of artificial materials can perfectly mimic those of natural

ones and in the most recent industrial products they include also some “imperfections” and a number of different veins, textures and patterns (within the same product) that give them a “casual look” even more precisely delineated than that we can find in the original ones, a sort of ideal identikit of the very essence of the material that they intend to mimic.

The mood for wood

The present project suggests an unreleased series of experiments - to be done in laboratory - that consist in recording and comparing brain reaction in selected groups of people that look and touch real WOOD surfaces and their imitative artificial reproduction.

In general terms, some sets of scientific experiments would be done in order to observe the human brain reaction when exposed to hedonic perception of natural wood and wood perfectly reproduced in laminates and ceramics. During data recording participants are asked to observe and evaluate along visual analogue scales the characteristics of finished surfaces and material samples. Experiments would be important to test the response in case the participants DO NOT know whether the wood “effect” is genuine or an imitative industrial product. Finally other sets are to be repeated after participants get accurately taught about precipuo and intrinsic features of material samples used during testing.

In particular, the series of experiments is to be developed in:

EXPERIMENT 1

First experiment explores the reaction of participants to the vision of real WOOD samples (e.g. boards for floorings or walls finishes) where WOOD is used to build up the scene. Constituent materials are either “artificial” (laminates and ceramic) or “natural” (e.g. solid wood and veneers). Thus, their exterior aspect is either “artificial” or “natural” and visual stimuli are either “surfaces” (e.g. a floor) or “objects” (e.g. sample of wood).

The experiment is repeated in two groups of 25 participants: naïve and experts. This gives rise to a 2x2x2(x2) mixed factorial design (group: between, all other factors within).

Wood surfaces and boards are presented continuously for 30 seconds, during which Skin conductance response (SCR) is continuously recorded. At the end of the 30 seconds participants receive a signal indicating which type of material they are looking at (natural/artificial), while SCR is recorded.

Hypothesis: the mismatch between the feeling given by the visual object and the knowledge about its constituent material gives rise to increased level of SCR. An opposite pattern is expected for “experts”.

EXPERIMENT 2

Equal to Exp 1, but now the information about the constituent material of the visual stimulus are given by tactile manual exploration of a real surface (Crossmodal matching).

EXPERIMENT 3

Procedure is identical to Exp 1, but now the information about constituent material is given before the actual visual stimulation. An opposite pattern is expected for “experts”.

Hypothesis: The fluctuation of SCR may be reduced in the mismatch situation, given a higher level of arousal in the mismatch situation.

EXPERIMENT 4

Equal to Exp 1 and Exp 2, but now participants are presented only artificial wood samples in two different conditions:

- 1) they know it's a "fake" artificial material;
- 2) they don't know it's a "fake" artificial material.

Test sessions are both focused on visual and tactile perception. Normally wood (but the same could be repeated with stone) is associated to a specific touch feel given by texture and, even more precisely, by surface temperature. In the case of wood, latest imitative products are getting very close to original ones, not only laminates, but also in ceramic by special superficial finishes that give warmer touch effects. No significant innovation has been done for the typical wood smell yet, although even industrial "real" wood furniture and parquet flooring have largely missed this characteristic that can still be found only in handicraft limited productions. Nevertheless, further experimental investigations should include smell and acoustic tests.

In general terms, these tests record neural activity in different sensorial situations in groups that are aware of the nature of wood samples and again repeated without providing any clue/information on actual composition. Common people (naïve) and experts (architects, designer, manufacturers) groups are finally to be separately tested and compared. It is of great importance to repeat testing with distinguished groups sharing similar cultural background in order to value the influence of a specific expertise and previous experience. As said above common users and architects express different attitudes towards real or imitative materials: people preferences seems not to mirror conceptual idealization shared by designers community. Nevertheless all humans show a general common positive value in the natural "look and feel" of wooden surfaces, with no socio-cultural distinction or geographical borders. Love for wood seems to be a kind of universal feeling.

Research activity and experiments are conducted in cooperation with Prof. Angelo Maravita and Dr. Alberto Gallace, members of the Psychology Department at Università degli Studi di Milano – Bicocca.

Primitive or primordial?

Metal, glass, plastic and industrial products in general are relatively recent invention, but stone and wood are part of human experience (both in landscape and in tools) since ancestral times. Moreover, the perceived beauty of natural materials has no peculiar geographic location but can be observed in a worldwide scale and cannot be deputed to a merely functional need although they are a true expression of an ancestral stringent reliance of humanity from natural sources. Philosopher Carlo Sini noticed that " what we name 'nature', what is 'natural' for us from time to time, is nothing but the reflection of the social organization of homo faber: a man that fabricates living practices of language and knowledge, in which he summed up gradually his being sapiens; homo sapiens is the inhabitant and also the product of his technique". In his "La materia delle cose. Filosofia

e scienza dei materiali”, the philosopher describes human body, in practical experience, as a tool, as a mean, as a material for the action (hence, the first material of history).

When we observe natural materials and their surfaces we also see the traces left by processes that transformed them in tools or decorative finishes. These surfaces are not to be assimilated to untouched nature because they always show human action to transform them. Veins, patterns, textures are always the outcome of a combination of organic characteristics and human purposeful action. Passion for natural materials may be referred to the eternal symbiosis with nature as well as to the ancestral actions to adapt environment to our elementary needs for survival. Imitative materials don't actually recall only nature but also the processes that humanity developed to transform them.

Furthermore imitative materials don't overshadow interest for natural ones, that obviously have limited availability, performance restrictions and often higher prices. On the contrary, many of them have been rediscovered in the last few years, like natural stones, a booming business, with new processes that allow greater versatility to match a more “natural” aesthetic effect. New technologies multiply the choice of finishes and innovative superficial treatments control even the color tone. Matt effect, silk, satin, these are just some of the new sensual words that companies are using to identify commercial products. Again technical innovation goes in the direction to stress visual roughness (although with a soft touch) and different shading colors.

The so called “natural” feel has become a new “category “ of the senses and today it is used to describe an aesthetic trend. “New natural materials” can be described by (1) uneven, (2) slightly rough surfaces with (3) muted colors and tones inspired by the landscape. With little surprise these features belong to nature-made materials as well as industrial-made imitative ones. From a merely sensorial point of view, we are witnessing the reformulation – maybe the cancellation - of the already tenuous distinction between natural and artificial materials, which now refers to the expressive characteristics, rather than the substance of the materials.

Are these features enough to define the essence of “natural” with reference to our sensorial system? “Natural” is synonymous of a range of very well defined visual and tactile features. Can we consider them a universal stimuli that meets a dedicated sensitiveness or even a pre-set neural system area? And also can we regard natural materials – or their features – as a universal canon of beauty?

In the last ten years a relevant knowledge has flourished from studies that put attention to idealization of beauty in relation to art, music and literature, precisely identified by the neologism Neuroesthetic, a sub-discipline of empirical aesthetics, pioneered by Vilayanur S. Ramachandran and Semir Zeki. Today interest is extended to human spaces and architecture with a special focus on perception. A deeper knowledge of perception mechanisms can get advantage from scientific research by experimental investigation. To produce remarkable results, this activity has to take in utmost consideration the cultural strong connection with design culture. Principles that guide architectural design apparently depend on cultural and technological issues, nevertheless scientific research open new possibilities to tune future spaces on biological needs and mechanisms, which doesn't mean that a new method or formal language should be derived directly from biology. An unprecedented chance is given to architects to design spaces and their materic features also by distinguishing inner needs by temporary trends. Certainly materials

industry can get advance from these studies, if properly understood and meaningfully interpreted.

Natural materials and surfaces evoke a specific sensorial and semantic feed-back that suggests they could be associated to dedicated biological structures but there's no scientific evidence that proves they are triggers of any kind of human brain pre-set organization, despite empirical observation of a "universal" positive valuation. Data record and classification is the first step of research, not to be confused with the postulate itself. A theoretical schema (if necessary) may be the subsequent output of further studies. Nevertheless one of the major problems of this possible innate knowing is that sensory inputs remain without meaning if not executed in a parallel construction of form and significance.

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10. Sustaining National Identity: Past traditions and their place in contemporary residential design in Dubai

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Dubai is one of the Arab cities that have been developed over an incredibly short period of time from fishing town to global metropolis. One of the most used statements about Dubai is its lack of cultural identity or cultural homogenization. With this amount of dispersion and short history to Dubai (UAE) one questions the impact the statistic (expat 84%) is having on the local (16%) with particular focus on residential design.