AESTHETICS AND SAFETY IN TRAFFIC ENVIRONMENTS

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ABSTRACT

Road aesthetics, an area of great interest to engineers, architects and landscape architects, is relevant from a traffic safety point of view, since it influences road users’ perception and behaviour. A possible relationship between aesthetics and safety is described through interdisciplinary research within arts and aesthetics, environmental psychology and traffic safety. This work has revealed less tangible areas of road design in which both architects and engineers may find potential support when planning for an aesthetically positive road environment taking into consideration human characteristics.

Keywords
Aesthetics, preference, risk, perception, traffic safety, gestalt psychology.

SUMMARY

The process of road design involves many tug-of-wars and wills between architects and engineers, and the drafting of the final blue print of an aesthetically positive road environment should be that which entails a minimum of disadvantages from a traffic safety viewpoint, or offers some safety improvements. The main challenge is to know when the concept of aesthetics would improve safety and when aesthetic elements may jeopardise the user’s security.

Assuming that a possible relationship between aesthetics and safety can be found by interdisciplinary research (Linderholm & Minya, 1997), this study considers principles from arts and aesthetics, environmental psychology and traffic safety. The idea of such an interdisciplinary investigation is that the field of traffic safety would benefit by absorbing knowledge from these areas, and the position of professionals concerning why, when and how to use aesthetics in traffic environments will be improved.

Due to the interdisciplinary character of the study, and also because of the novelty of the research area, it has been developed as a four-stage study. The results of each stage contribute to the establishment of hypotheses for the next stage.
Stage I: Aesthetics and safety from the drivers’ point of view – a qualitative inquiry

The first stage attempts to describe what a beautiful or ugly road environment looks like. Based on the comprehension that professionals have other aesthetic values than laymen (Nasar, Purcel, 1990), the aim of this stage is to study the concept of road aesthetics from the users’ point of view. Through qualitative inquiry, patterns for a beautiful and an ugly environment, and a general structure describing traffic environments from both aesthetics and safety viewpoints, are developed. The results show that, according to the users, there are four kinds of traffic environments: beautiful/safe; beautiful/dangerous; ugly/safe and ugly/dangerous. A general conclusion of this stage is that attractive road environments make drivers feel better, but not necessarily safer.

Stage II: Aesthetics and speed choice – a behavioural study

In order to validate the model from the first stage, but also to elucidate whether aesthetically positive experiences may influence drivers’ actual behaviour in a positive way, the second stage investigates whether drivers generally show different behavioural aspects in aesthetically different environments. Since speed seems to be the strongest positively-correlated factor to traffic safety (e.g., Englund, et.al., 1998), the second stage ascertains whether the choice of speed is well correlated with the visual perception. Speed measuring, in an environment with possibilities of manipulating aesthetics, shows that aesthetics tends to induce changes in drivers’ behaviour in a positive direction.
Behavioural study - Before the cherry trees in blossom

Behavioural study - During the cherry trees in blossom

**Stage III: Driver and pedestrian assessment of road traffic environments – a validation study**

Since certain aesthetic elements may be distracting for the drivers, the attempt in the third stage is to measure the users’ assessment of beautiful and ugly road environments. However, measuring drivers’ experiences in motion meant exposing the drivers to unnecessary risks, so it became necessary to investigate whether it was possible to measure pedestrians’ experiences and to use them as a proxy for the drivers’ viewpoint. Using a “semantic model for describing perceived environment” (Küller, 1991), the produced results show that it is possible to use the experiences of pedestrians to interpret the environment from the drivers’ viewpoint. The results also show interesting significant differences between the beautiful and the ugly road environments.
Stage IV: The Gestalt laws in infrastructure design – an attempt to analyse and design road traffic environments

Considering aesthetics, the design of a physical environment is very often based on professionals’ personal assumptions and not necessarily on users’ characteristics. What is more, road traffic environments may even contradict human characteristics (Rumar, 1982).

Users must not only recognise objects, but also locate them in the context of three dimensional space, to know how far away they are, how fast they are moving, and also the importance of these objects in an environment (Kaplan, 1989). Since Gestalt rules may give information about how individuals tend to recognise and organise objects, knowledge about such information may also be useful in the process of road design.

The last stage is, therefore, an attempt to improve professionals’ (both architects and engineers) abilities to fit together with the help of some Gestalt rules (Koffka, 1935), both aesthetics and safety requirements in the process of road design. In trying to prove the Gestalt laws’ usefulness, the last stage consists of a two-step procedure. The first is to analyse the road traffic environment from the users’ viewpoint, according to the Gestalt laws. The second is to create a road traffic environment by using information from the analysis. The analysis, as well as the creation of the road-traffic environment, is conducted with regard to both aesthetics and safety. Since the methodology is based on the acknowledgement of the Gestalt laws, one limitation of this study is that the laws of contrast, figure-ground, similarity, nearness and simplicity are accepted from a perceptual viewpoint. The proposal is done for a tunnel and shows why some aesthetic elements in traffic environments (e.g., in tunnel design) may contradicting e.g., orientation in space, that is human characteristics.
In very different stages, this study increases professionals’ understanding of why, when and how to use aesthetics within traffic environment design (Drottenborg, 1999).

REFERENCES:


