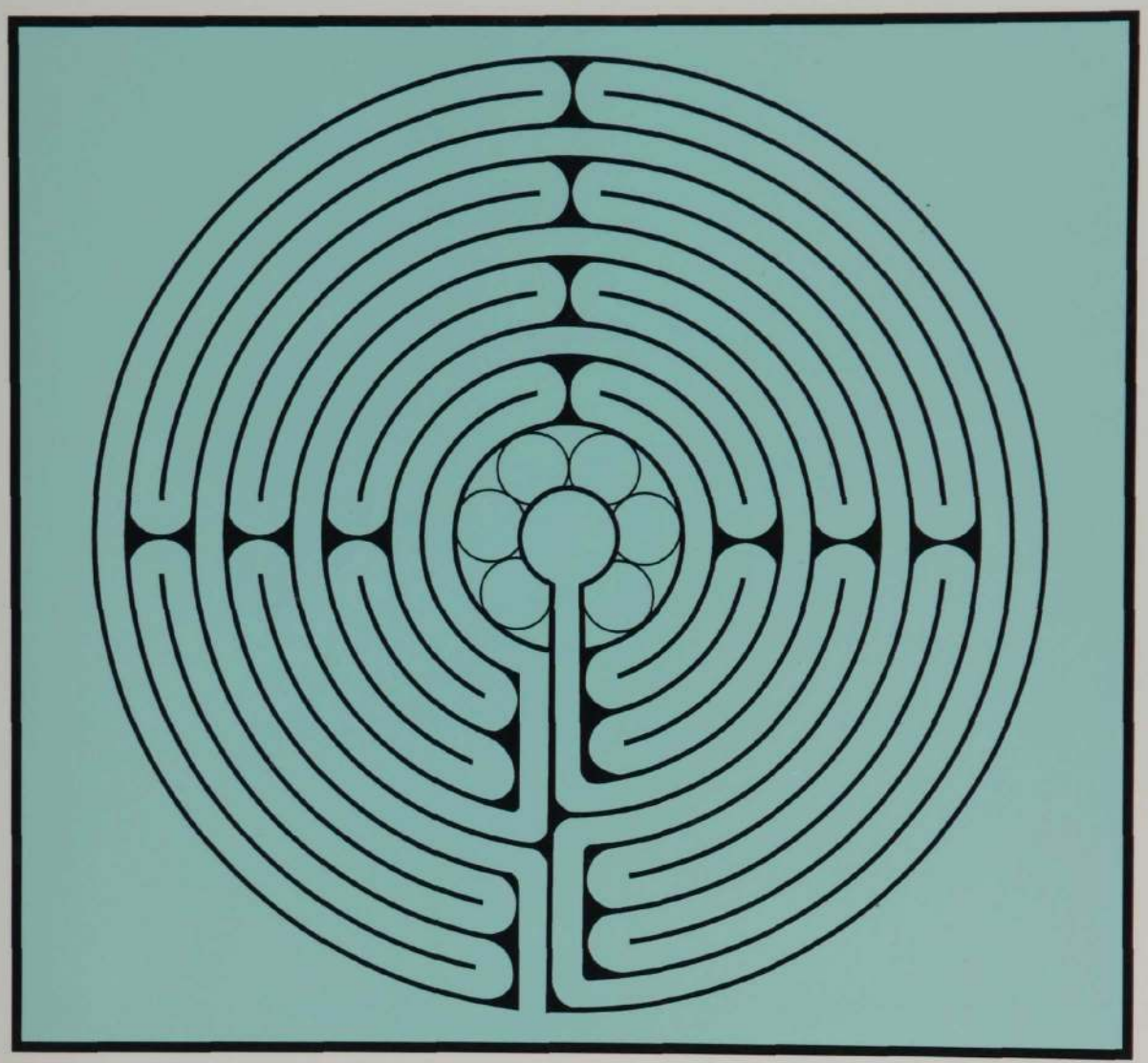
Proceedings of the Nineteenth Annual Conference of the Cognitive Science Society



Stanford University
August 7–10, 1997

Edited by Michael G. Shafto and Pat Langley

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Pleasantness of Odors: Perceptual or/and Semantic Processing?

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Introduction

Pleasantness is considered as the main and most primitive dimension along which odors, unlike visual stimuli, are processed and structured in memory (Engen, 1982). However the question whether pleasantness jugments rely on a perceptual or a semantic processing remains open and rather unexplored. Psychophysical research on the one side tends to establish that judgments of pleasantness dominate odor perception in close correlation with intensity judgments (Doty & al., 1994; Richardson & Zucco, 1989). On the other side, hedonic judgments may be considered as semantic, driven by high-level processes such as learning and expertise (Rouby & Sicard, 1997 for a review). The present investigation was designed in order to evaluate whether decision times for pleasantness judgments were rather similar to early low level judgments of intensity or to late high level ones such as judgments of "dangererousness", which rely on the previous identification of the odor source.

Experiment

Material

A set of single molecule odorants was selected, from preexperimental scoring, in order both to control physical parameters correlated with intensity and to design a balanced sample on plesantness and dangerousness scales.

Procedure

The odorants were serially presented in order to allow comparative judgments for all the pairs of stimuli. The instructions required the subjects to decide whether each odorant was more or less "..." ("pleasant", "intense", or "dangerous") than the previous one, and to press either a red key for a "more" answer or a black one for a "less" answer. The sniff of each odorant triggered the onset of a timer that stopped when the subject gave her/his judgement by pressing one of the two keys.

Subjects

31 students were involved in the experiment, each of them passing the 3 judgments tasks in a random order.

Results

Intensity judgments are significantly faster than both hedonism and danger ones ($F [2,60] = 6,85$. $p.<0,002$). Hedonic judgments are on the average slightly faster - (128 ms) than danger ones ($F[1,29] = 1,05$. $p.<0,31$). However, analyses of deviations from the means show that whereas intensity judgments are very homogeneous (SD = 1185 ms), danger and hedonism distributions are much less sharp (SD = 1340 and 1550 ms respectively) and even not unimodal.

in ms	pleasantness	intensity	danger
mean	2012	1603	1884
S.D.	1550	1185	1340

Table 2: Means and Standard Deviations for decision times on each of the 3 scales, across subjects and odorants.

Discussion

The data confirm that intensity judgments rely on fast perceptual processes, whereas hedonism as well as danger judgments are heterogeneous involving, across subjects, **either** fast decisions **or** more elaborated late ones.

In conclusion, the present results confirm, as was already suggested in David & al. (1997) that hedonic judgments cannot be considered as a simple decision process on a monotononic dimension.

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