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0521790581 - Olfaction, Taste, and Cognition

Edited by Catherine Rouby, Benoist Schaal, Daniele Dubois, Remi Gervais and A. Holley

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## OLFACTION, TASTE, AND COGNITION

The human organs of perception are continually being bombarded with chemicals from the environment. Our bodies have in turn developed complex processing systems that manifest themselves in our emotions, memory, and language. Yet the available data on the high-order cognitive implications of taste and smell are scattered among journals in many fields, with no single source synthesizing the large body of knowledge, much of which has appeared in the past decade.

This book presents the first multidisciplinary synthesis of the literature in olfactory and gustatory cognition. The book is conveniently divided into sections, including linguistic representations, emotion, memory, neural bases, and individual variation. Leading experts have written chapters on many facets of taste and smell, including odor memory, cortical representations, psychophysics and functional imaging studies, genetic variation in taste, and the hedonistic dimensions of odors. The approach is integrative, combining perspectives from neuroscience, psychology, anthropology, philosophy, and linguistics, and is appropriate for students and researchers in all these areas who seek the authoritative reference on olfaction, taste, and cognition.

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# OLFACTION, TASTE, AND COGNITION

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## Preface

This book arises from an acknowledgment: the lack, as far as we know, of a book dedicated to the cognition of chemical senses.

Although recent discoveries in the field of molecular biology raise the hope of a future understanding of the transduction and peripheral coding of odors and tastes, it seems to us that they imply a risk: to make us forget that in the other extreme of knowledge, that of maximal complexity, the evolution of cognitive sciences allows an epistemologically fruitful reformulation of information-processing problems.

Unlike the other senses, olfaction and taste do not have a learned discourse dealing with elementary aspects, that is, sensory processing, as well as the most abstract aspects, that is, symbolic processing. The purpose of cognitive science is to orient these processings into a continuity, and particularly to try to find out to what extent higher-order processes interact with the sensory level in order to produce sufficiently reliable representations of the world. We are still quite unaware of the nature of gustatory and olfactory representations, as compared with what we know about vision and audition, for example.

Faced with this relative ignorance, our prejudice was the following: If odors and tastes are ill-identified cognitive objects, then none of the available potential resources should be neglected: Expert and naive people, as well as “savage” and “civilized” ones, conscious knowledge and emotions, biology and social sciences – all of those can contribute first to an assessment of our knowledge, and then to confrontation of its inadequacies. This inter-disciplinary point of view first gave rise to a meeting held in Lyon, in June 1999: the European Symposium on Olfaction and Cognition, which tried to coordinate knowledge from several scientific disciplines with that from perfumery professionals. The other aim of that meeting was to publish a book, conceived not as a handbook gathering all the validated knowledge but as a book reflecting the questions

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and the divergences running through this field of knowledge, whose complexity biology and chemistry still cannot explore thoroughly.

This book is meant for all those studying taste and olfaction. We hope that it will foster other debates and other novel collaborations between neuroscience and social science.

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C. Rouby, B. Schaal, D. Dubois, R. Gervais, A. Holley

## A Tribute to Edmond Roudnitska

This book is dedicated to Edmond Roudnitska, who was an artist, a creator of perfumes, and a writer. The organizers of the symposium from which this book originated feel that his work is one of the best illustrations of the relationship between olfaction and cognition.

Through his olfactory creations, which constitute landmarks in the relatively short history of the perfume industry, he was among the handful of people who helped elevate olfactory composition to the rank of an art. Beyond sheer sensorial pleasure, his great perfumes<sup>1</sup> convey to enlightened perfume lovers purely aesthetic emotions fueled by reference to the history of perfumes, leaving connoisseurs marveling at the balanced combinations of olfactory elements similar to a bold architectural construction, and finally bringing to the emotions this cognitive component without which no art is possible.

Another aspect of Roudnitska's work is of particular interest to scientists researching the cognitive component of olfactory perception: It consists in writings,<sup>2</sup> in which he expresses his views regarding perfume creation. Perfume creators, in accordance with a tradition of secrecy, rarely communicate about their work. Roudnitska, however, communicated about his art with remarkable freedom and pertinence. Throughout his books and articles, which clearly reveal pedagogical intent, he presents the results of a rigorous thought process going well beyond practical applications and leading to perceptive examination of the components of creation. One does not need to extrapolate or translate his thoughts to recognize many of the themes of modern cognitive research. The acuity of his analysis, combined with well-thought-out practice, finds its direct reflection in the fields of perception, learning and memory, attention, mental imagery, and the relationship between emotion and cognition.

This tribute to Edmond Roudnitska is an acknowledgment of our indebtedness. This profoundly rational spirit, who was confident that scientific research could enlighten any endeavor and someday facilitate the art of perfume creation, was



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also a generous man. Through creation of the Fondation Roudnitska he enabled many young researchers to progress in their knowledge of olfaction, and we thank him for this.

André Holley

### Notes

1. Among E. Roudnitska's creations, let us mention "Femme" for Rochas (1944), "Diorama" for Dior (1948), "L'Eau" for Hermès (1951/1987), "Diorissimo" (1956) for Dior, "Eau sauvage" (1966) for Dior, and "Diorella" (1972) for Dior.
2. *L'Esthétique en question*, Presses Universitaires de France, Paris, 1977; *Le parfum*, Presses Universitaires de France, Paris, 1990; *Une vie au service du parfum*, Thérèse Vian, Paris, 1991.

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