

Serial Position Effects in Recognition Memory for Odors

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Five experiments examined recognition memory for sequentially presented odors. Participants were presented with a sequence of odors and then had to identify an odor from the list in a test probe containing 2 odors. All experiments demonstrated enhanced recognition of odors presented at the start and end of a series, compared with those presented in the middle of the series when a 3-s retention interval between list termination and test was used. In Experiments 2 and 3, when a 30-s or 60-s retention interval was used, participants performed at slightly lower levels, although the serial position function was similar to that obtained with the 3-s retention interval. These results were noted with a 5-item (Experiments 1 and 4), 7-item (Experiment 2), 6-item (Experiment 3), and 4-item (Experiment 5) list of odors. As the number of test trials increased, recognition performance decreased, indicating a strong role for olfactory fatigue or interference in these procedures. A verbal suppression task, used in Experiments 4 and 5, had little influence on serial-position-based performance.

There is a growing literature concerning memory for odors (e.g., Goldman & Seamon, 1992; Herz & Engen, 1996; Larsson & Baecckman, 1993; Murphy, Cain, Gilmore, & Skinner, 1991). However, there still exists a number of areas in which the results from tests of memory for olfactory stimuli appear either equivocal or dissimilar to the results obtained with stimuli from verbal, visual, and auditory modalities (see Richardson & Zucco, 1989; Schab, 1991, for reviews). Such differences have led some to conclude that memory for olfactory stimuli may be different from memory for other stimuli (see, e.g., Baddeley, 1976; Herz & Engen, 1996, for reviews). For example, the immediate recognition of odors is considerably worse than that noted in the equivalent visual or auditory tasks (Lawless, 1978). Also, there is evidence that once encoded, odors are forgotten only to a limited degree (Engen & Ross, 1973; Goldman & Seamon, 1992; Lawless & Cain, 1975; Rubin & Cain, 1984).

A further area in which there appears to be a difference between memory for olfactory stimuli and memory for stimuli from other modalities concerns the effect of serial presentation on subsequent recognition of items. Typically, when a sequence of verbal or visual material is presented, the initial and later items in the sequence are remembered better than those from the middle of the sequence (Baddeley, Papagno, & Andreado, 1993; Glanzer & Cunitz, 1966; Neath, 1993). These effects are termed *primacy* and *recency* effects, respectively. However, no evidence for the simultaneous

emergence of these effects has been found using olfactory stimuli: Some studies have found neither effect (Gabassi & Zanuttini, 1983; Lawless & Cain, 1975) and some studies have found just recency effects (White & Treisman, 1997).

Gabassi and Zanuttini (1983) sequentially presented 12 odors to their participants. They immediately tested recognition of those odors by presenting them along with 12 further odor stimuli. At test, participants had to recognize the stimuli from the original series and give a familiarity rating to all the stimuli. No evidence of primacy or recency effects was noted in this study. A similar lack of a standard serial position function was reported for a sequence of 11 odors by Lawless and Cain (1975), who used a considerably longer delay (11 days) between presentation and test than that used by Gabassi and Zanuttini (1983). White and Treisman (1997) presented their participants with a sequence of five odors. The subsequent recognition test involved the presentation of multiple probes following the list of odors; three probe stimuli were presented, and the participants had to respond by indicating whether the probes came from the preceding list. Using this procedure, White and Treisman found recency effects but no primacy effects for olfactory stimuli. However, a curious aspect of the data reported by White and Treisman was that no primacy effect was noted for their putatively nonverbal, olfactory stimuli. This contrasts with a wealth of data that suggest a primacy effect can be obtained for nonverbal items (e.g., Neath, 1993; Roberts & Kraemer, 1981).

Prior to concluding that no serial position effects can be generated for olfactory stimuli, a number of points need to be considered in relation to the above experiments. It has been shown that memory for olfactory stimuli is highly susceptible to proactive interference effects (Lawless, 1978), and that this effect is particularly pronounced when the interfering cues are other odors rather than visual or verbal material (cf. Asssett & Leslie, 1996; Engen, Kuusma, & Eimas, 1973; see Schab, 1991, for a review). In the experiment by Gabassi and Zanuttini (1983), participants were asked at test to discriminate between 24 olfactory

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Memory For Odors

**Susanne Schmid, Donald A. Wilson,
Catharine Rankin**



Memory For Odors:

Memory for Odors Frank R. Schab, Robert G. Crowder, 2014-02-04 The power of odors to unlock human memory is celebrated in literature and anecdote but poorly documented by science Odors perhaps more than other stimuli are widely believed to evoke vivid and complex past experiences easily Yet in contrast to the frequency with which odors are thought to evoke memories of the past scientific evidence is thus far scant For years voluminous data have been collected on odor sensitivity whereas relatively few studies exist on memory for odors per se Moreover the memory data that do exist are thus far only poorly integrated with the most modern attitudes on human memory The major goal of this volume is to point the way toward a better state of affairs one in which the study of odor memory is legitimized as a proper specialization and is informed by the most promising ideas in the mainstream study of memory This volume explores three tendencies in modern memory theory that have not yet sufficiently penetrated the odor memory work memory coding memory and knowledge and implicit and explicit memory

1981, **Odor Memory and Perception**, 2014-04-23 This well established international series examines major areas of basic and clinical research within neuroscience as well as emerging and promising subfields This volume explores interdisciplinary research on invertebrate and vertebrate models of odor memory and perception as well as human odor memory and perception This book brings together a collection of authors that cut across model systems techniques levels of analysis and questions to highlight important and exciting advances in the area of olfactory memory and perception The chapters highlight the unique aspects of olfactory system anatomy local circuit function odor coding and plasticity The authors are leading authorities in the field Written by the leading researchers in the field of olfactory perception and memory Includes diverse models systems from invertebrates to humans Includes diverse technical approaches to the study of olfactory memory and perception Includes overview of the most recent research advances in this field

The Human Sense of Smell David G. Laing, Richard L. Doty, Winrich Breipohl, 2012-12-06 Often being vastly underrated the human sense of smell plays an essential role in our life e g in food acceptance fragrance appreciation and as a warning device for spoiled food toxic gases and the presence of fire The book provides a multidisciplinary up to date review of the structure and function of the sense of smell and of how it is influenced by the environment and diseases It is divided into the following 5 sections Anatomy Physiology and Chemistry Measurement of Olfactory Responses Development and Senescence Basic Characteristics of Human Olfaction Clinical and Health Aspects of Olfaction

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emotions sadness and other distinct emotions Illustrations include seven color plates Smells, Well-being, and the Built Environment Jieliang Xiao,Francesco Aletta,Antonella Radicchi,2022-05-09 **Handbook of Emotions** Michael Lewis,Jeannette M. Haviland-Jones,Lisa Feldman Barrett,2010-11-03 Widely regarded as the standard reference in the field this handbook comprehensively examines all aspects of emotion and its role in human behavior The editors and contributors are foremost authorities who describe major theories findings methods and applications The volume addresses the interface of emotional processes with biology child development social behavior personality cognition and physical and mental health Also presented are state of the science perspectives on fear anger shame disgust positive emotions sadness and other distinct emotions Illustrations include seven color plates *Learning to Smell* Donald A. Wilson,Richard J. Stevenson,2006-06-06 Publisher description **Taste and Smell Disorders** Allen M. Seiden,1997 Approximately two million Americans suffer from taste smell disorders This much needed book provides complete information on the pathophysiology anatomy biochemistry patient evaluation treatment of chemosensory disorders More than a dozen new topics are covered including **Habituation mechanisms and their impact on cognitive function** Susanne Schmid,Donald A. Wilson, Catharine Rankin,2015-05-08 Habituation describes the progressive decrease of the amplitude or frequency of a motor response to repeated sensory stimulation that is not caused by sensory receptor adaptation or motor fatigue Habituation can occur in different time scales habituation within a testing session has been termed short term habituation whereas habituation across testing sessions has been termed long term habituation Generally the more spaced the stimuli for inducing habituation are presented i e the slower habituation is induced the longer it seems to take to recover the behavioural response to its initial magnitude Habituation is opposed by behavioural sensitization which is thought to be an independent mechanism that leads to an increased behavioural response especially if the sensory stimulus is annoying or aversive Habituation provides an important mechanism for filtering sensory information as it allows filtering out irrelevant stimuli and thereby focussing on important stimuli a prerequisite for many cognitive tasks The importance is demonstrated in mental disorders that are associated with disruptions in habituation e g schizophrenia and autism spectrum disorders The inability to filter out irrelevant information in patients with these disorders strongly correlates with disruptions in higher cognitive functions such as in different types of memory and attention Habituation is also considered to be the most basic form of non associative implicit learning and it can be observed throughout the animal kingdom Based on the importance of habituation for cognitive function and therefore for the survival of an animal it is assumed that habituation mechanisms are highly conserved across species On the other hand there is emerging evidence for a multitude of homo and heterosynaptic mechanisms underlying habituation depending on the modality of sensory stimulation the level of sensory information processing where habituation occurs and the temporal composition of sensory stimulation Eric Kandel used the sea hare *Aplysia* in order to study habituation mechanisms of the gill withdrawal reflex however the molecular mechanisms remain largely elusive to date A

multitude of different organisms behaviours and experimental approaches have been used since in order to study habituation but still surprisingly little is known about the underlying mechanisms New insights also come from an unexpected side in the recent past groups that have been studying molecular mechanisms underlying short and long term synaptic plasticity phenomena in different parts of the rodent brain are starting to link these plasticity processes to behavioural habituation The scope of this Frontier Research Topic is to give an overview over the concept of habituation different animal and behavioural models used for studying habituation mechanisms as well as the different synaptic and molecular processes suggested to play a role in behavioural habituation through Original Research Articles Methods Hypothesis Theory Articles and Reviews *Journal of Cognitive Neuroscience* ,1992 **Odor Sensation and Memory** Trygg Engen,1991-11-21 Our sense of smell as Trygg Engen reminds us early in this definitive work has been neglected as a research area This neglect belies the very critical role that the sense plays in human adaptation to the environment through the monitoring of odors Smell is learned through experience and results Engen maintains in a schema of memory system that enables individuals to process and categorize odors There are closer relationships between the individual detecting an odor the circumstances or environment and the reaction of pleasure or aversion than with the other senses When future occasions present the same or similar odors memory will bring back the early experience and directly affect the reaction to the new stimuli Engen sees odor perception as mainly psychological unlike the traditional approach which sees the sense largely as an innate mechanism with a direct physiological basis The research underlying this book is the most current in sensory cognition reminding the reader of the importance of the sense of smell through examples of what deprivation entails The author develops an appreciation of the odor sensing ability mankind has and explores the uses to which that sense is applied The ability to relate past to present perception odor memory and the gradations of odor impact are discussed as well as the engaging questions of fragrances effects on behavior odors and sexuality mother infant bonding and pollution This book is essential reading for all who work in areas relating to sensory perception and cognition **A Treatise on Facts** Charles Church Moore,1908 **The International Encyclopedia of Prose and Poetical Quotations from the Literature of the World Including the Following Languages: English, Latin, Greek, French, Spanish, Persian, Italian, German, Chinese, Hebrew and Others** William S. Walsh,1908 **Psychology and Life** Philip G. Zimbardo,1992 Smell and Taste in Health and Disease Thomas V. Getchell,1991 **The Home Library of Useful Knowledge** Richard S. Peale,1886 *The International Encyclopedia of Prose and Poetical Quotations from the Literature of the World* William S. Walsh,1908 **The American Journal of Psychology** Granville Stanley Hall,Edward Bradford Titchener,Karl M. Dallenbach,Madison Bentley,Edwin Garrigues Boring,Margaret Floy Washburn,1922 Aging Clinical and Experimental Research ,2007

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Table of Contents Memory For Odors

1. Understanding the eBook Memory For Odors
 - The Rise of Digital Reading Memory For Odors
 - Advantages of eBooks Over Traditional Books
2. Identifying Memory For Odors
 - Exploring Different Genres
 - Considering Fiction vs. Non-Fiction
 - Determining Your Reading Goals
3. Choosing the Right eBook Platform
 - Popular eBook Platforms
 - Features to Look for in an Memory For Odors
 - User-Friendly Interface
4. Exploring eBook Recommendations from Memory For Odors
 - Personalized Recommendations
 - Memory For Odors User Reviews and Ratings
 - Memory For Odors and Bestseller Lists

5. Accessing Memory For Odors Free and Paid eBooks
 - Memory For Odors Public Domain eBooks
 - Memory For Odors eBook Subscription Services
 - Memory For Odors Budget-Friendly Options
6. Navigating Memory For Odors eBook Formats
 - ePub, PDF, MOBI, and More
 - Memory For Odors Compatibility with Devices
 - Memory For Odors Enhanced eBook Features
7. Enhancing Your Reading Experience
 - Adjustable Fonts and Text Sizes of Memory For Odors
 - Highlighting and Note-Taking Memory For Odors
 - Interactive Elements Memory For Odors
8. Staying Engaged with Memory For Odors
 - Joining Online Reading Communities
 - Participating in Virtual Book Clubs
 - Following Authors and Publishers Memory For Odors
9. Balancing eBooks and Physical Books Memory For Odors
 - Benefits of a Digital Library
 - Creating a Diverse Reading Collection Memory For Odors
10. Overcoming Reading Challenges
 - Dealing with Digital Eye Strain
 - Minimizing Distractions
 - Managing Screen Time
11. Cultivating a Reading Routine Memory For Odors
 - Setting Reading Goals Memory For Odors
 - Carving Out Dedicated Reading Time
12. Sourcing Reliable Information of Memory For Odors
 - Fact-Checking eBook Content of Memory For Odors
 - Distinguishing Credible Sources
13. Promoting Lifelong Learning

- Utilizing eBooks for Skill Development
 - Exploring Educational eBooks
14. Embracing eBook Trends
- Integration of Multimedia Elements
 - Interactive and Gamified eBooks

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