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# Sensominer A Package For Sensory Data Analysis With R

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Information Quality  
 A More Informative Approach  
 New Approaches to Classic Methods  
 Food, Health and Safety in Cross Cultural Consumer Contexts  
 Principles and Practices  
 Nonfood Sensory Practices  
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*Sensominer A Package  
 For Sensory Data  
 Analysis With R*

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## JAX BELTRAN

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*Information Quality* Woodhead Publishing  
 The olive oil market is increasingly international. Levels of consumption and production are growing, particularly in "new" markets outside the Mediterranean region. New features of product optimization and development are emerging, and along with them new marketing strategies, which benefit from a clear understanding of the sensory aspects of foods, as well as adequate sensory techniques for testing them. Recently developed sensory methods and approaches are particularly suitable for studying the sensory properties of olive oils and their function in culinary preparation or in oil-food pairing. Each chapter of Olive

Oil Sensory Science is written by the best researchers and industry professionals in the field throughout the world. The book is divided into two main sections. The first section details the appropriate sensory methods for olive oil optimization, product development, consumer testing and quality control. The intrinsic factors affecting olive oil quality perception are considered, as well as the nutritional, health and sensory properties, underlining the importance of sensory techniques in product differentiation. The agronomic and technological aspects of production that affect sensory properties and their occurrence in olive oil are also addressed. Sensory perception and other factors affecting consumer choice are discussed, as is the topic of olive oil sensory quality. The second part of this text highlights the major olive oil producing regions of the world: Spain, Italy, Greece, California,

Australia/New Zealand and South America. Each chapter is dedicated to a region, looking at the geographical and climatic characteristics pertinent to olive oil production, the major regional olive cultivars, the principle olive oil styles and their attendant sensory properties. Olive Oil Sensory Science is an invaluable resource for olive oil scientists, product development and marketing personnel on the role of sensory evaluation in relation to current and future market trends.

### **A More Informative Approach**

Woodhead Publishing

"This book focuses on the practical aspects of modern and robust statistical methods. The increased accuracy and power of modern methods, versus conventional approaches to the analysis of variance (ANOVA) and regression, is remarkable. Through a combination of theoretical developments, improved and

more flexible statistical methods, and the power of the computer, it is now possible to address problems with standard methods that seemed insurmountable only a few years ago"--

*New Approaches to Classic Methods*  
Columbia University Press

Multiple factor analysis (MFA) enables users to analyze tables of individuals and variables in which the variables are structured into quantitative, qualitative, or mixed groups. Written by the co-developer of this methodology, *Multiple Factor Analysis by Example Using R* brings together the theoretical and methodological aspects of MFA. It also includes examples of applications and details of how to implement MFA using an R package (FactoMineR). The first two chapters cover the basic factorial analysis methods of principal component analysis (PCA) and multiple correspondence analysis (MCA). The next chapter discusses factor analysis for mixed data (FAMD), a little-known method for simultaneously analyzing quantitative and qualitative variables without group distinction. Focusing on MFA, subsequent chapters examine the key points of MFA in the context of quantitative variables as well as qualitative and mixed data. The author also compares MFA and Procrustes analysis and presents a natural extension of MFA: hierarchical MFA (HMFA). The final chapter explores several elements of matrix calculation and metric spaces used in the book.

*Food, Health and Safety in Cross Cultural Consumer Contexts* Woodhead Publishing  
*Textual Statistics with R* comprehensively covers the main multidimensional methods in textual statistics supported by a specially-written package in R. Methods discussed include correspondence analysis, clustering, and multiple factor analysis for contingency tables. Each method is illuminated by applications. The book is aimed at researchers and students in statistics, social sciences, history, literature and linguistics. The book will be of interest to anyone from practitioners needing to extract information from texts to students in the field of massive data, where the ability to process textual data is becoming essential.

**Principles and Practices** Lavoisier  
Written by experts in the field of table olives, this book is a source of recent research advances on the characterization and processing of table olives. Research papers are provided relating to the characterization of their composition of volatiles and the sensory profile; mineral composition and bioavailability; changes in bioactive components (chlorophylls) by

processing; and new strategies to reduce sodium and additives for stabilizing the organoleptic properties and avoiding defects in table olives. Other research papers are included in relation to microbiological and chemical changes in table olives during spontaneous or controlled fermentation employing different cultivars, and the optimized use of starter cultures for the improvement of the different fermentative processes. In addition, this book includes an overview of the main technologies used for olive fermentation, including the role of lactic acid bacteria and yeasts characterizing this process, and of the processing and storage effects on the nutritional and sensory properties of table olives.

**Nonfood Sensory Practices** John Wiley & Sons

Provides an important framework for data analysts in assessing the quality of data and its potential to provide meaningful insights through analysis. Analytics and statistical analysis have become pervasive topics, mainly due to the growing availability of data and analytic tools. Technology, however, fails to deliver insights with added value if the quality of the information it generates is not assured. Information Quality (InfoQ) is a tool developed by the authors to assess the potential of a dataset to achieve a goal of interest, using data analysis. Whether the information quality of a dataset is sufficient is of practical importance at many stages of the data analytics journey, from the pre-data collection stage to the post-data collection and post-analysis stages. It is also critical to various stakeholders: data collection agencies, analysts, data scientists, and management. This book: Explains how to integrate the notions of goal, data, analysis and utility that are the main building blocks of data analysis within any domain. Presents a framework for integrating domain knowledge with data analysis. Provides a combination of both methodological and practical aspects of data analysis. Discusses issues surrounding the implementation and integration of InfoQ in both academic programmes and business / industrial projects. Showcases numerous case studies in a variety of application areas such as education, healthcare, official statistics, risk management and marketing surveys. Presents a review of software tools from the InfoQ perspective along with example datasets on an accompanying website. This book will be beneficial for researchers in academia and in industry, analysts, consultants, and agencies that collect and analyse data as

well as undergraduate and postgraduate courses involving data analysis.

*Resistant Starch* John Wiley & Sons  
Differences in olfactory perceptions generated by a set of closely-related odorants were examined by panelists using Free Choice Profiling of the odorant set delivered via GCO. Shifts in odor quality were observed, indicating that two types of human ORs were activated: one group with related odorant-binding specificity, resulting in a gradual shift in overlapping odor character, and a second group of a different perceptual class. Investigation of OSD impact on olfactory perceptions could produce insight into cortical olfactory processing.

*Sensory Evaluation of Food* CRC Press  
*Sensory Evaluation Practices* examines the principles and practices of sensory evaluation. It describes methods and procedures for the analysis of results from sensory tests; explains the reasons for selecting a particular procedure or test method; and discusses the organization and operation of a testing program, the design of a test facility, and the interpretation of results. Comprised of three parts encompassing nine chapters, this volume begins with an overview of sensory evaluation: what it does; how, where, and for whom; and its origin in physiology and psychology. It then discusses measurement, psychological errors in testing, statistics, test strategy, and experimental design. The reader is also introduced to the discrimination, descriptive, and affective methods of testing, along with the criteria used to select a specific method, procedures for data analysis, and the communication of actionable results. The book concludes by looking at problems where sensory evaluation is applicable, including correlation of instrumental and sensory data, measurement of perceived efficacy, storage testing, and product optimization. This book is a valuable resource for sensory professionals, product development and production specialists, research directors, technical managers, and professionals involved in marketing, marketing research, and advertising.

*Bakery Products* Elsevier

The state-of-the-art of multivariate analysis in sensory science is described in this volume. Both methods for aggregated and individual sensory profiles are discussed. Processes and results are presented in such a way that they can be understood not only by statisticians but also by experienced sensory panel leaders and users of sensory analysis. The techniques presented are focused on examples and interpretation rather than

on the technical aspects, with an emphasis on new and important methods which are possibly not so well known to scientists in the field. Important features of the book are discussions on the relationship among the methods with a strong accent on the connection between problems and methods. All procedures presented are described in relation to sensory data and not as completely general statistical techniques. Sensory scientists, applied statisticians, chemometricians, those working in consumer science, food scientists and agronomers will find this book of value.

**Plant Breeding Reviews** CRC Press  
Sensory and Instrumental Evaluation of Alcoholic Beverages introduces the value of sensory analysis to the alcoholic beverage industry through the detailed lens of sensory analysis techniques. From traditional methods, to the most modern rapid methods, this book presents comprehensive insights and applications. Analytical methods for identifying and assessing the flavor compounds present in the beverages are included that address both volatile and non-volatile techniques, along with rapid methods of assessment. Case studies highlight the testing of different types of alcoholic beverages running the entire gamut of methods and the appropriate subset of methods. Also included is information of data analyses with the appropriate R-codes to allow practitioners to use the book as a handbook to analyze their own data. Uniquely focused on alcoholic beverages and their assessment Includes real-world information for practical application Presents a full range of methodologies, providing key comparative insights  
*Évaluation sensorielle - Manuel méthodologique (3e éd.)* SAGE Publications

Sensory scientists are often faced with making business decisions based on the results of complex sensory tests involving a multitude of variables. Multivariate and Probabilistic Analyses of Sensory Science Problems explains the multivariate and probabilistic methods available to sensory scientists involved in product development or maintenance. The techniques discussed address sensory problems such as panel performance, product profiling, and exploration of consumer data, including segmentation and identifying drivers of liking. Applied in approach and written for non-statisticians, the text is aimed at sensory scientists who deal mostly with descriptive analysis and consumer studies. Multivariate and Probabilistic Analyses of Sensory Science Problems offers simple, easy-to-understand explanations of

difficult statistical concepts and provides an extensive list of case studies with step-by-step instructions for performing analyses and interpreting the results. Coverage includes a refresher on basic multivariate statistical concepts; use of common data sets throughout the text; summary tables presenting the pros and cons of specific methods and the conclusions that may be drawn from using various methods; and sample program codes to perform the analyses and sample outputs. As the latest member of the IFT Press series, Multivariate and Probabilistic Analyses of Sensory Science Problems will be welcomed by sensory scientists in the food industry and other industries using similar testing methodologies, as well as by faculty teaching advanced sensory courses, and professionals conducting and participating in workshops addressing multivariate analysis of sensory and consumer data.

*Multivariate Analysis of Data in Sensory Science* CRC Press

Multiple factor analysis (MFA) enables users to analyze tables of individuals and variables in which the variables are structured into quantitative, qualitative, or mixed groups. Written by the co-developer of this methodology, Multiple Factor Analysis by Example Using R brings together the theoretical and methodological aspects of MFA. It also includes examples of applications and details of how to implement MFA using an R package (FactoMineR). The first two chapters cover the basic factorial analysis methods of principal component analysis (PCA) and multiple correspondence analysis (MCA). The next chapter discusses factor analysis for mixed data (FAMD), a little-known method for simultaneously analyzing quantitative and qualitative variables without group distinction. Focusing on MFA, subsequent chapters examine the key points of MFA in the context of quantitative variables as well as qualitative and mixed data. The author also compares MFA and Procrustes analysis and presents a natural extension of MFA: hierarchical MFA (HMFA). The final chapter explores several elements of matrix calculation and metric spaces used in the book.

*Measurement of Food Preferences* John Wiley & Sons

Analyzing Sensory Data with R CRC Press  
**Sensory Evaluation Practices** CRC Press

Sensory characterization is one of the most powerful, sophisticated, and extensively applied tools in sensory science. Descriptive analysis with trained assessors has been traditionally used for

sensory characterization. Due to the cost of time and money required for its application, several novel methodologies, which do not require training, have been recently developed and are gaining popularity as quick and reliable options for gathering sensory information. These methodologies enable the study of consumers' perceptions of the sensory characteristics of products. However, information on these techniques is scattered in scientific journal articles, which hinders their application and creates a need for a book to assemble the details of the latest advances. Novel Techniques in Sensory Characterization and Consumer Profiling provides a comprehensive overview of classical and novel methods for sensory characterization of food and nonfood products. The book presents the history behind descriptive analysis, describes the most common novel methodologies and detailed information for their implementation, and discusses examples of applications and case studies. It also includes an introduction to exploratory multivariate analysis, addressing the theory and application of some of the most useful multivariate statistical tools applied in the analysis of consumer profiling data sets. Most of the data analysis is implemented in the statistical free software R, making the book accessible to readers unfamiliar with complex statistical software. Chapters examine a range of techniques including the ideal profile method, just-about-right scales in consumer research, free choice profiling, flash profiling, and repertory grid methods. They cover emerging profiling methods, such as sorting, and projective mapping or Napping®. Other techniques less frequently used for sensory profiling are also considered: the application of open-ended questions for sensory characterization, polarized sensory positioning, and the consumer-friendly check-all-that-apply questions. In addition, dynamic sensory characterization methods, useful for studying temporal aspects of in-mouth sensory perception, are described. The final chapter provides a critical comparison of the methodologies discussed, their advantages and disadvantages, and general recommendations for their application.  
Introduction to Robust Estimation and Hypothesis Testing John Wiley & Sons  
As we move further into the 21st Century, sensory and consumer studies continue to develop, playing an important role in food science and industry. These studies are crucial for understanding the relation between food properties on one side and

human liking and buying behaviour on the other. This book by a group of established scientists gives a comprehensive, up-to-date overview of the most common statistical methods for handling data from both trained sensory panels and consumer studies of food. It presents the topic in two distinct sections: problem-orientated (Part I) and method orientated (Part II), making it to appropriate for people at different levels with respect to their statistical skills. This book successfully: Makes a clear distinction between studies using a trained sensory panel and studies using consumers. Concentrates on experimental studies with focus on how sensory assessors or consumers perceive and assess various product properties. Focuses on relationships between methods and techniques and on considering all of them as special cases of more general statistical methodologies. It is assumed that the reader has a basic knowledge of statistics and the most important data collection methods within sensory and consumer science. This text is aimed at food scientists and food engineers working in research and industry, as well as food science students at master and PhD level. In addition, applied statisticians with special interest in food science will also find relevant information within the book.

Individual Differences in Sensory and Consumer Science John Wiley & Sons

Mathematical and Statistical Approaches in Food Science and Technology offers an accessible guide to applying statistical and mathematical technologies in the food science field whilst also addressing the theoretical foundations. Using clear examples and case-studies by way of practical illustration, the book is more than just a theoretical guide for non-statisticians, and may therefore be used by scientists, students and food industry professionals at different levels and with varying degrees of statistical skill.

Neurogastronomy CRC Press

The discovery of resistant starch is

considered one of the major developments in our understanding of the importance of carbohydrates for health in the past twenty years. Resistant starch, which is resistant to digestion and absorption in the human small intestine with complete or partial fermentation in the large intestine, is naturally present in foods. Resistant Starch: Sources, Applications and Health Benefits covers the intrinsic and extrinsic sources of resistant starch in foods, and compares different methods of measuring resistant starch and their strengths and limitations. Applications in different food categories are fully covered, with descriptions of how resistant starch performs in bakery, dairy, snack, breakfast cereals, pasta, noodles, confectionery, meat, processed food and beverage products.

**Textual Data Science with R** John Wiley & Sons

Full of real-world case studies and practical advice, Exploratory Multivariate Analysis by Example Using R, Second Edition focuses on four fundamental methods of multivariate exploratory data analysis that are most suitable for applications. It covers principal component analysis (PCA) when variables are quantitative, correspondence analysis (CA) a

Investigation of Odorant-specific Sensory Deficits Using Gas Chromatography Olfactometry Woodhead Publishing

This book provides comprehensive coverage of the numerous methods used to characterise food preference. It brings together, for the first time, the broad range of methodologies that are brought to bear on food choice and preference. Preference is not measured in a sensory laboratory using a trained panel - it is measured using consumers by means of product tests in laboratories, central locations, in canteens and at home, by questionnaires and in focus groups. Similarly, food preference is not a direct function of sensory preference - it is determined by a wide range of factors and

influences, some competing against each other, some reinforcing each other. We have aimed to provide a detailed introduction to the measurement of all these aspects, including institutional product development, context effects, variation in language used by consumers, collection and analysis of qualitative data by focus groups, product optimisation, relating preference to sensory perception, accounting for differences in taste sensitivity between consumers, measuring how attitudes and beliefs determine food choice, measuring how food affects mood and mental performance, and how different expectations affect sensory perception. The emphasis has been to provide practical descriptions of current methods. Three of the ten first-named authors are university academics, the rest are in industry or research institutes. Much of the methodology is quite new, particularly the repertory grid coupled with Generalised Procrustes Analysis, Individualised Difference Testing, Food and Mood Testing, and the Sensory Expectation Models.

**Research on Characterization and Processing of Table Olives** John Wiley & Sons

Sensory analysis is an important tool in new product development. There has recently been significant development in the methods used to capture sensory perception of a product. Rapid Sensory Profiling Techniques provides a comprehensive review of rapid methods for sensory analysis that can be used as alternatives or complementary to conventional descriptive methods. Part one looks at the evolution of sensory perception capture methods. Part two focuses on rapid methods used to capture sensory perception, and part three covers their applications in new product development and consumer research. Finally, part four explores the applications of rapid methods in testing specific populations.

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