

IFPress® NEWSLETTER



Memorable? Meaning depends on context ... (pgs. 3 & 4)

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Context Effects in Surveys of Subjective Experience

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TECHNICAL REPORTS

2022

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2021

- 24(3)** Optimal Rotations for Incomplete
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- 24(1)** Generating Optimal Sample Presentation Orders

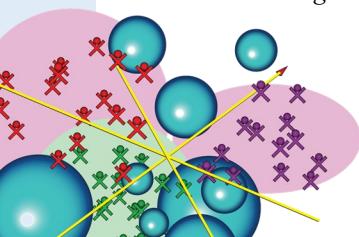
2020

- 23(4)** Unfolding Financial Markets
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To download previously published technical reports and papers from our website, become a colleague at www.ifpress.com.



The Institute for Perception, founded in 1992, is a full-service research consulting firm offering comprehensive client services to assist in the development process of new and improved products and marketing concepts.



President's Message

Context Effects

Our technical report in this issue concerns how the interpretation of a consumer descriptor depends on context. The context of interest is that created by the product, or image in an ad setting, when a respondent uses a descriptor. The report shows how this effect can be modeled and accounted for with the simultaneous mapping of two different interpretations of a common descriptor in a product testing study. This issue often occurs, and it can affect the identification of liking drivers in a category appraisal, in understanding ad takeaway, or in studying the multiple interpretations that an expert panelist may have for an attribute when evaluating products. The report explains that any survey with multiple attributes can be very efficiently mapped using the methods described.

Please consider coming out to The Greenbrier in White Sulphur Springs, WV in November to attend our R training workshop followed by our Drivers of Liking® course. Details are given at the end of the newsletter. You can also attend virtually. These courses are designed to help attendees to improve their analytic skills and to give them insights into how to identify and use liking drivers for any type of product or service.

Best Regards,
Daniel M. Ennis
President, The Institute for Perception

WHAT WE DO:

- **Client Services:** Provide full-service product and concept testing for product development, market research, and claims support
- **Education:** Conduct internal training, external courses, and online webinars on product testing, advanced analytics, and advertising claims support
- **IFPrograms®:** License propriety software to provide access to new modeling tools
- **Research:** Conduct and publish basic research on human perception in the areas of methodology, measurement, modeling, and prediction

WEBINAR CALENDAR:

SEPTEMBER 15, 2022..... Thursday at 2:00 PM ET, 75 minutes
◆ Selecting the Right Sensory Method: A Step-by-Step Guide

DECEMBER 15, 2022..... Thursday at 2:00 PM ET, 75 minutes
◆ R for Sensory Scientists: Part 1 - Foundations

EVENT CALENDAR:

NOVEMBER 8-11, 2022..... at The Greenbrier, White Sulphur Springs, WV and live streamed virtually

◆ R Training - November 8
◆ Drivers of Liking®: Principles and Applications - November 9 - 11

Detailed information and registration for all courses and webinars are available at www.ifpress.com

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To Contact Us... mail@ifpress.com

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7629 Hull Street Road • Richmond, VA 23235

WEBINAR: September 15th at 2:00 ET**Selecting the Right Sensory Method:
A Step-by-Step Guide****Taught by: Dr. Benoît Rousseau**

In this webinar, we will review a series of steps needed to conduct successful methodological comparisons. Of particular importance is the use of Torgerson's method of triads, analyzed using Thurstonian models, to select pairs of samples that will represent small, medium, and large sensory differences to ensure meaningful conclusions. Real industrial examples will be used to illustrate theoretical and practical applications.

This webinar is intended for a general audience of sensory professionals, market researchers, and product developers.

Attendance only (\$269) Recording only (\$289) Attendance & Recording (\$359)

► **REGISTER ONLINE** at www.ifpress.com/webinars



The selected student will receive a \$1,000 award and a complimentary invitation to attend any Institute for Perception course. We will be accepting applications for the 2022 Institute for Perception Student Award beginning in September 2022.

All entries must be postmarked or emailed by Saturday, JANUARY 21, 2023

For complete details and application form, go to: www.ifpress.com/student-award

(We invite you to visit our website, www.ifpress.com, to see all of our full-service consulting capabilities.)

PROJECT MANAGEMENT

We provide full-service market research including all aspects of a project from design to data analysis and custom results reporting.

We conduct market research for clients in a variety of industries including foods and beverages, personal care, home/pet care, pharmaceuticals, cosmetics, and digital services using our global testing network.

Analyses

In addition to standard statistical tools, we have extensive experience in developing and employing advanced statistical analyses and emerging computational tools. These include machine learning methods and predictive modeling, unfolding such as Landscape Segmentation Analysis (LSA)[®], advanced TURF and other segmentation methods and methods to design optimum product bundles of consumer-relevant drivers.

Study Designs

We use our proprietary experimental design expertise to minimize bias by using optimal rotations in sequential monadic designs.

Reports

Our reports provide insights for varied audiences of business teams in informative and insightful formats. We tell the story of your research findings.

WEBINAR LIBRARY

► **ORDER RECORDINGS AT** www.ifpress.com/webinars

Sensory Difference Tests

Replicated Preference Testing to Diagnose Consumer Segmentation

Introduction to Thurstonian Modeling – 1 & 2

Advances in Tetrad Testing

Precision of Measurement in Sensory Difference Testing

How to Calculate Consumer Relevant Risk using Sensory Difference Tests

Preference without a Significant Sensory Difference

Developing Consumer Relevant Action Standards for Sensory Difference Testing

Discrimination Testing with Batch-to-Batch Variability

Derived Preference and Difference from Applicability Scoring

Capitalizing on Historical Consumer Data

Developments in Discrimination Testing for Sensory Equivalence

Sensory Discrimination Testing

Advertising Claims Support

Supporting Numerical Superiority Claims

Claiming Equivalence, Unsurpassed, and Superiority Simultaneously

Issues in Supporting "Up-to" Claims

Supporting Count-Based Sensory Advertising Claims

Drivers of Liking[®] and Landscape Segmentation Analysis[®]

Mapping Techniques to Link Consumer & Expert Data

Maximizing Consumer Insights by Contrasting Blind and Branded Test Findings

Unfolding Financial Markets

Preference Mapping vs. LSA[®]

Capitalizing on Historical Consumer Data

Drivers of Liking[®] with Incomplete Block Designs and Missing Data

Combinatorial Tools

Finding New Opportunities using Graph Theory

Introduction to TURF

Introduction to Graph Theoretic Tools

eTURF 2.0: TURF Solution for Datasets of All Sizes

Large TURF Problems: Finding Custom Solutions

Design Issues in Product Tests and Surveys

The Science of Answering Questions

Developments in Applicability & CATA Scoring

Removing Experimental Biases in Sensory and Consumer Research Data

Sequential Product Testing

Innovation

Invention and Innovation

Machine Learning

Consumer Segmentation via Machine Learning

Action Standards for Machines and Humans in Quality Assurance

Text Analysis of Open-Ends

Turbo-Charging Consumer Analytics – 1 & 2

Daniel M. Ennis

Background: Consumer take-away surveys of advertising messages, product and concept testing, and descriptive analysis are all surveys of subjective experience. It is useful to think of them in this way because similar principles are involved that underlie research in these three areas. For instance, it is well recognized by experts and attorneys who work on advertising messages that context plays an important role in influencing the language used and the interpretation that consumers take from an ad. An advertising perception survey, where a consumer is exposed to a TV ad or label and records their experience or answers questions about it, is a survey of subjective experience. Similarly, a consumer may interpret the meaning of a sensory attribute quite differently depending on their experience while evaluating a product. The product creates a perceptual context in which the evaluation occurs. This idea also applies to descriptive analysis when, for instance an experienced or expert panelist evaluates a product on a series of attributes. In this technical report we will evaluate novel tools to better understand the multiple meanings of a sensory attribute depending on the context in which the evaluation occurs and provide an analytic method to account for them.

Scenario: You work for a company that markets new flavored non-alcoholic beverages and would like to understand what sensory variables describe and drive liking for a consumer segment of interest to the company. Typically for a product such as this, you collect consumer data and liking along with other variables that may be candidate liking drivers. You also conduct internal expert panel testing to further describe sensory variables that differentiate the products. Your analysis methods include a variety of standard analyses, including factor analysis, to understand underlying sensory descriptor factors, as well as Landscape Segmentation Analysis® (LSA)¹ to unfold liking and determine the liking drivers. You have particular interest in the variable, *flavor strength*, which your analyses have not established as a strong liking driver, contrary to your expectations. It also does not load on factors in your factor analysis that you would expect. You begin to explore areas involving LSA that are novel to you, focusing only on the consumer descriptive data.

LSA Applied to Descriptive Data: In any situation where similarity arises such as between products and ideals or between rating concepts and products, LSA can be applied. When unfolding liking, the similarity of a latent ideal and an actual product is used. When considering descriptive data of sensory attribute ratings, the similarity of a product percept and the concept conveyed by the rating descriptor is used. In this interpretation, a rating of 5 on a 7-point *flavor strength* scale measures the similarity between the product percept and the concept of *flavor strength* in the sensory space. LSA has been shown to be far more efficient in representing descriptive data in a low dimensional space than factor analysis or any form of principal components analysis. The method can be applied to individual products to learn how the sensory attributes are related to one another

because attribute proximity corresponds to correlation. It is therefore possible to see the factors that would result from a factor analysis in the LSA map by the way that the attributes cluster. This type of analysis provides a very efficient way of displaying multiple factors in a 2-dimensional LSA space. Since LSA can be applied monadically or to individual products from a sequential monadic test, studying the similarity of the LSA spaces across products reveals whether there are context effects introduced by particular products. If there are context effects, then when all of the products are analyzed and displayed in one LSA map, unique interpretations of a variable can be extracted that are subject to the context created by the products.

Attribute LSA Analyses: When using LSA to study attributes, the items in the analysis are the concepts conveyed by the attribute wording. Assuming that all of the attribute ratings use the same number of categories, individual perception points for each product and the attribute locations in the LSA space can be determined. Any survey containing multiple items can be evaluated in this manner and it has been shown to provide important insights in a number of areas such as lexicon development². The resulting maps contain locations for each attribute plotted against a background of product perception points displayed as contours to represent perception densities. Figures 1a – 1d show the LSA maps for four of your products taken individually. You see that the attribute structure for three of your products are very similar with *flavor strength* related to *bitterness*, *filling* and *length of aftertaste* and largely unrelated to *sweet* and *fruity*. The fourth product shows a high degree association between *flavor strength* and *sweet/fruity* and little association with *bitterness* and related characteristics. This product is characteristically *sweet* and *flavor strength* reflects that context. For the other three products, *flavor strength* is characteristically *bitter*. Ignoring this fact in an analysis to understand the liking drivers is likely to miss *flavor strength* as a driver since it cannot, as a single variable, accommodate both concepts simultaneously.

Creating Two Interpretations for Flavor Strength: LSA can model missing data. A recent technical report showed it when incomplete block designs were analyzed³. In order to resolve the issue with multiple interpretations of *flavor strength* you include two measures for the attribute. Where a particular variant of *flavor strength* is not involved, the data are coded as missing values. Figure 2 shows the resulting LSA map and the location of the two variants of *flavor strength*. Also shown are two large clusters of perception points which refer to the experiences or contexts in evaluating products 1-3 and product 4. Each cluster shows the high intensity of the unique context-dependent variable, *flavor strength*. Based on these findings, your analysis to uncover the liking drivers for the beverages in this category will need to account for multiple meanings to the *flavor strength* variable as a function of product context, otherwise use of the variable could be misleading as suggested by your initial analyses.



Fig 1a. Product 1

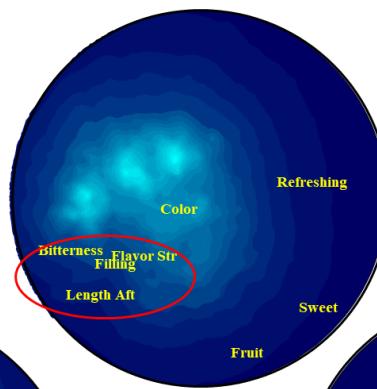


Fig 1c. Product 3

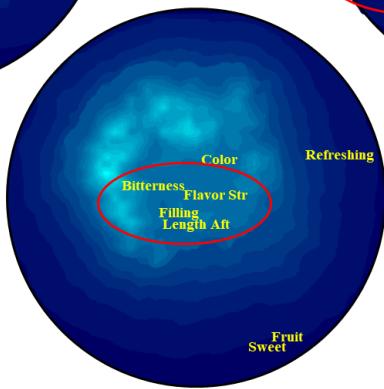


Fig 1b. Product 1



Fig 1d. Product 4

Figures 1a—1d. Individual LSA analyses on four products. Note the association of flavor strength with *bitterness*, *filling* and *length of aftertaste* for products 1–3 and its association with *fruit*, *sweet* and *refreshing* for product 4. This illustrates the contextual dependence of *flavor strength*.

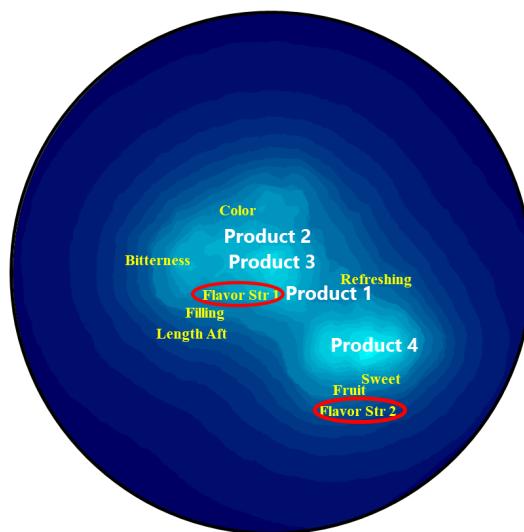


Figure 2. LSA of the complete dataset with two variants of *flavor strength*. One variant is identified with products 1, 2 and 3 and the second with product 4. Note the two dense regions of perception points associated with the two groups of products and that the two variants are widely separated.

Conclusions: Some very commonly used variables, particularly in consumer product testing, may evoke multiple meanings depending on the product context. If not accounted for, these meanings could limit the opportunity to identify liking drivers that may be useful in developing new products. Exploring this research area, initially monadically, will provide an opportunity to consider how attribute variables cluster. If an attribute's associations are not consistent across products, there may be a product-specific context that should be accounted for. This can be accomplished by considering product-specific interpretations of the original attribute and included in an overall analysis of the multiple products that were present in the design.

References:

1. Ennis, D.M. (2001). Analytical approaches to accounting for individual ideal points. *IFPress*, 4(1), 2-3. In Ennis, D. M. (2022). Ennis, D.M. and Rousseau, B. (Eds.) *Tools and Applications of Sensory and Consumer Science*. pp. 84-85. The Institute for Perception: Richmond, Va.
2. Ibid. pp. 140-141.
3. Ennis, D.M. & Rousseau, B. (2022). *IFPress*, 25(2), 3-4.



November 8th at The Greenbrier in White Sulphur Springs, WV and also live-streamed virtually

With advances in computer and data science and the enormous opportunity to share software applications, one statistical software application has stood out as a real game-changer. That software tool is called R. R is an open-source resource that provides access to tools by some of the greatest minds in statistics and data science. These tools include all the basic statistical methodologies but also cutting-edge methods that are only now developing in academic and industrial centers around the world. Learning how to use R effectively creates in the user enormous potential to approach routine and advanced tasks with ease.

In this course, you will:

- Learn what R is and how you can make use of it in your daily work
- Use R Studio to write and manage scripts
- Develop facility with the most useful commands and learn how R is structured
- Import data from a wide variety of sources and learn how to clean and manipulate it
- Write your own functions and export results in graphical and numerical form
- Manage multiple projects

TUESDAY

November 8, 8am - 4pm ET

► Welcome and introductions

► Introduction to R

- R and RStudio®
- How to write scripts
- Useful commands

► Data Analysis

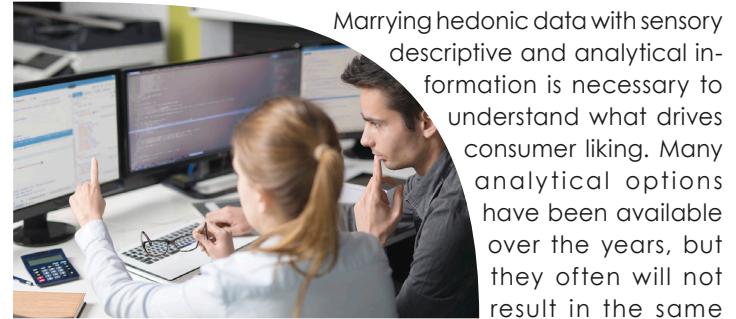
- Importing data
(Including CSV, XLSX, SPSS, SAV, etc.)
- Data wrangling, cleaning, and manipulation
- Functions for statistical analyses
- Packages and libraries

► Scripting and Project Management

- Writing custom functions
- Data Structures
- Visualization
- Data export



November 9-11 at The Greenbrier in White Sulphur Springs, WV and also live-streamed virtually



Marrying hedonic data with sensory descriptive and analytical information is necessary to understand what drives consumer liking. Many analytical options have been available over the years, but they often will not result in the same

conclusions. One analysis might find sweetness to be an attribute driving liking, while another might not. One technique might uncover clear population segmentation, while another might not. How can you choose the most suitable approach? What are each approach's underlying analytical assumptions and how likely are they to deliver trustworthy results and insights? In this course we will review commonly used techniques to understand why consumers like some products and dislike others and identify the strengths and weaknesses of each technique. We will introduce Landscape Segmentation Analysis® (LSA) which is a tool specifically developed to link liking to possible explanatory variables such as sensory and analytical inputs for multiple consumer segments.



Since reliable insights cannot be learned without reliable data, we will also describe experimental approaches that maximize data quality when selecting test products and generating sample presentation orders.

In this course, you will:

- Learn how to select optimal sets of products for a Drivers of Liking® project and generate presentation orders that minimize common experimental biases
- Compare different liking models and understand why they might not always reach the same conclusions, and learn how to select the most suitable approach
- Construct maps with products and consumer ideal points and identify population segmentation
- Uncover a category's drivers of liking using descriptive and analytical data
- Learn how to combine different analytical tools such as LSA and conjoint analysis or decision trees for deeper insights
- Use mapping results to improve existing products
- Conduct product portfolio optimization

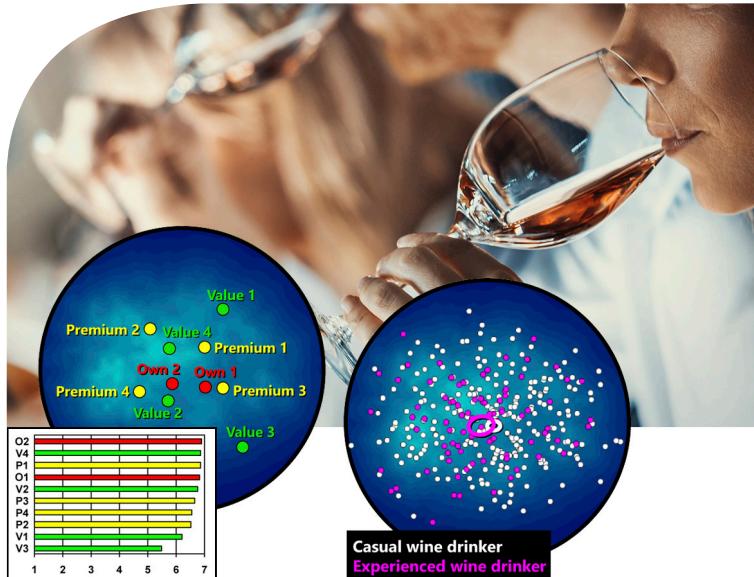
IFPROGRAMS® AND R SOFTWARE

The course instruction includes software to perform analyses and exercises. Prior to the course, you will be sent information by email to install R and RStudio® to be used on Tuesday, and IFPrograms® to be used Wednesday-Friday. To introduce you to the capabilities of IFPrograms®, you will also receive a complimentary 3-month trial of the Professional version used for an extensive collection of sensory and consumer data related analyses. For a detailed listing of IFPrograms® features and licensing, please visit www.ifpress.com/software. (Note: IFPrograms is not required to apply course principles.)

WEDNESDAY

November 9, 8am - 4pm ET

- ▶ Introduction of the two course projects:
 - Chocolate chip bitterness reduction research (**Project 1**)
 - Cookie ingredient change (**Project 2**)
- ▶ Why link consumer and sensory data?
- ▶ Overview of the sensory and Drivers of Liking® (DOL) spaces
- ▶ How to approach a category appraisal (*IFPrograms® exercises*)
 - Product selection using graph theory
 - Method comparison to generate sample presentation orders (random, Williams Squares, CR&S)
 - Multiple day effect, complete vs. incomplete block designs
- ▶ Two common analytical mapping options (*IFPrograms® exercises*)
 - Factor analysis (**Project 1**) and external preference mapping (**Project 2**)
 - Assumptions and potential limitations of the two techniques
- ▶ Review of the background to mapping consumer hedonic data: modeling liking, biplots, unfolding
- ▶ Introduction to Landscape Segmentation Analysis® (LSA)
 - Successive analytical steps
 - Modeling approach
- ▶ Applications of LSA principles to **Project 1** (*IFPrograms® exercises*)
 - **Project 1:** LSA on consumer data
 - Product space generation
 - Investigation of the drivers of liking space
 - Illustration of weak and strong DOLs
 - Comparison to previous factor analysis results



FOR YOUR CONTINUED STUDY...

To enhance your continued study, you will receive a printed manual with all presented slides and a copy of our current books, *Tools and Applications of Sensory and Consumer Science* and *Thurstonian Models: Categorical Decision Making in the Presence of Noise*.

THURSDAY

November 10, 8am - 4pm ET

- ▶ Applications of LSA principles to **Project 2** (*IFPrograms® exercises*)
 - **Project 2:** LSA on consumer data
 - Product space and DOLs
 - Color coding of consumers based on segmentation
 - Investigation of demographic effects
 - Comparison to previous external preference mapping results
- ▶ A comparison of LSA and internal preference mapping
 - Contrasting assumptions and outputs
 - Three-dimensional solution example
 - The “Cube”
 - Application to 27 real-world category appraisals
- ▶ A comparison of LSA and external preference mapping
 - Illustration of differential consumer fits
- ▶ Diagnosing the need for a three-dimensional solution
 - Application to an orange juice example (*IFPrograms® exercises*)
- ▶ Going beyond the Drivers of Liking® space 1: Predicting new product success
 - Conditions for successful predictions
 - Applications to Projects 1 and 2 (*IFPrograms® exercises*)

FRIDAY

November 11, 8am - Noon ET

- ▶ Going beyond the Drivers of Liking® space 2: Creating optimal product sensory profiles and portfolios
 - Portfolio optimization strategies: Maximizing consumer satisfaction and maximizing First Choice (*IFPrograms® exercises*)
 - **Project 1:** Maximizing consumer satisfaction with one or two products
 - **Project 2:** Maximizing First Choice based on own products and main competitor
- ▶ Next level learning: Using incomplete block designs
 - Situations where a complete block design is not possible
 - Generation of rotations for incomplete block designs
 - Comparison of outputs between complete blocks and incomplete block scenarios (*IFPrograms® exercises*)
- ▶ LSA applications to other types of consumer generated data using IFPrograms software (*IFPrograms® exercises*)
 - Applications of LSA in the beer category
 - Measuring brand effects on consumer landscape using 10 white wines
 - Motivations for product consumption
 - Moisturizing and refreshing properties of soap bar images
 - Usage occasions
 - Food concept preferences of children and adults
- ▶ Review of course principles and conclusions

REGISTRATION

R Training

Tuesday, November 8, 2022

R Training only, in-person or virtually.....\$495

Drivers of Liking®

Wednesday, November 9 - Friday, November 11, 2022

In-person attendance at The Greenbrier... \$1,890*

Live stream attendance virtually \$1,575*

*Includes complimentary R Training on the first day. For academic and multiple registration discounts, contact us before registering.

Register Online: www.ifpress.com/nov-2022-courses

Fee includes:

- ▶ Printed manuals of slides and software exercises
- ▶ A printed copy of our book, Tools and Applications of Sensory and Consumer Science and a PDF download of our book: Thurstonian Models: Categorical Decision Making in the Presence of Noise
- ▶ Food and beverage refreshments each day, plus lunch and dinner on Tues. - Thurs. for attendees at The Greenbrier
- ▶ A 3-month free trial of **IFPrograms®** Professional version

Register online at www.ifpress.com/courses where payment can be made by credit card. A fee discount is available for students and multiple registrations. If you qualify for a discount or need information about payment by invoice, please contact **Shannon Denton-Brown** at mail@ifpress.com or call 804-675-2980 before registering.

LOCATION: The course will be presented at The Greenbrier® in White Sulphur Springs, WV. Nestled in the Allegheny Mountains, this gracious hotel is renowned for its hospitality and service.



LODGING: Lodging is not included in the course fee and participants must make their own hotel reservations. A block of rooms is being held at The Greenbrier at a special rate of **\$205** (plus resort fees & taxes). To make a reservation, please call **1-877-661-0839** and mention you are attending the **Institute for Perception** course (**Note:** the special rate is not available through online reservations.) To learn more about The Greenbrier, America's resort since 1778, visit their website at www.greenbrier.com.

TRANSPORTATION: The Greenbrier Valley Airport (**LWB**) in Lewisburg is only a 15 min. shuttle ride from the hotel. Direct flights to LWB are available on United Airlines from Chicago O'Hare (**ORD**) and Washington Dulles (**IAD**). Other airports include Roanoke, VA (**ROA**, 1hr. 15 min.), Charleston, WV (**CRW**, 2 hrs.), and Charlottesville, VA (**CHO**, 2 hrs. 15 min.).

CANCELLATION POLICY: Registrants who have not cancelled two working days prior to the course will be charged the entire fee. Substitutions are allowed for any reason.

The Institute for Perception

These courses have been developed for technical and supervisory personnel involved in all aspects of sensory and consumer research.

The concepts covered have valuable applications in product development, quality assurance, marketing and advertising claims departments of consumer product companies.

THESE COURSES WILL ALSO BE PRESENTED VIRTUALLY

If you are unable to attend in person, these courses will also be live streamed virtually. If you attend virtually, you will be sent a link by email with instructions on how to join the meeting with the speakers and other attendees. All supporting materials will be mailed to you before the event, so please register early to allow for sufficient shipping time.

SPEAKERS

For detailed biographical information, please visit www.ifpress.com/nov-2022-courses



Dr. Daniel M. Ennis

The Institute for Perception
- President



Dr. Benoît Rousseau

The Institute for Perception
- Senior Vice President



William (Will) Russ

The Institute for Perception
- Computational Market Researcher and Lead Programmer



Anthony (Manny) Manuele

Molson Coors Beverage Company
- Retired Vice President of Global Brewing, Quality, Innovation, and Technical Governance

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Food Scientist®

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