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Reprinted from IFPress (2001) 4(1)2,3

Drivers of Liking® for Multiple Segments

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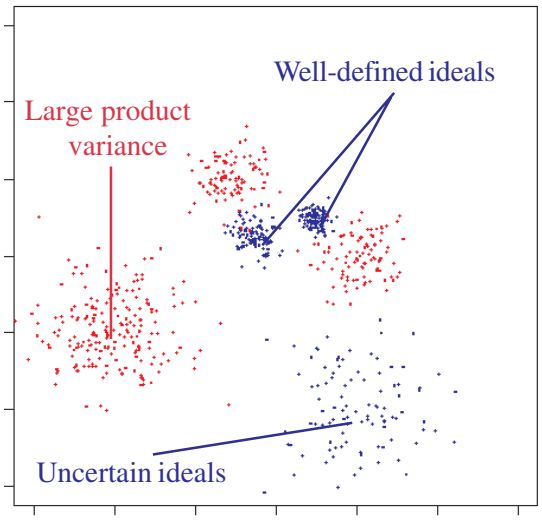
Background: When considering product differences that drive consumer liking, it is helpful to imagine a space described by sensory characteristics in which each product has a location. In this space a person's ideal product may be found, so that if we understood this space we could predict the person's degree of liking for each product. By looking into this space we would also notice that each product and each ideal does not exist as a point, but as a cluster of variously similar points as illustrated in Figure 1. Some people clearly know what they like - their ideals are tightly clustered together; others are more uncertain – their ideal points form a larger cloud of points. Individuals do not have absolute ideal points; the ideal points vary momentarily depending on variables such as mood, time of day, and recent consumption experience. Similarly products do not have exactly determined positions. Products are represented by clusters of varying size due to differences in momentary perception.

Figure 1. A product (red) and individual ideal (blue) point space.



Since some people like similar things, collections of individual ideal clusters may form what we generally describe as market segments. These segments may have simple demographic markers, such as age or gender. The markers may be more complex and derive from sensory experience, such as identification based on liking for sweet products. From the size of these collections of ideals, we could assess the potential of products that appeal to particular segments. If we could describe this space using reliable information about product characteristics, the result would be of immense value in product development and marketing. The vision of creating and exploring this space has stimulated considerable research[1,2,3,4,5].

This report is an introduction to mapping individual ideals in relation to product positions in a sensory space. The resulting maps can be used to guide product development and marketing to provide products that satisfy clearly defined groups of consumers.

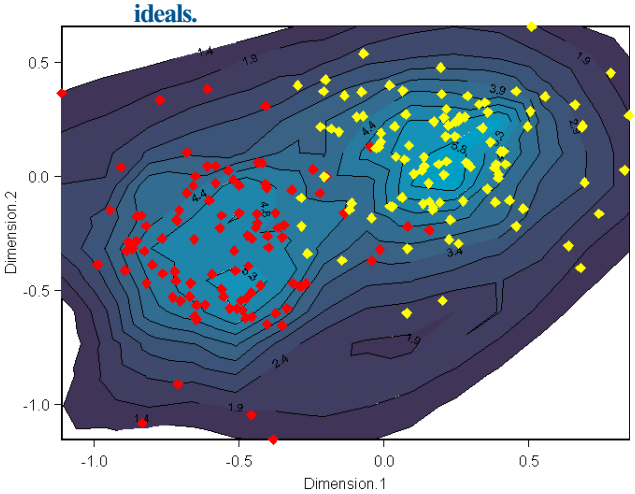
Scenario: You work for a company that produces orange juice, and would like to apply the above ideas to a selection of ten orange juice brands and prototypes. From descriptive analysis of these products, you know that the products differ in a number of respects. Some attributes on which they differ include sourness, pulpiness, sweetness, peely, burnt flavor, and bitterness. You would like to know whether there is a market for a relatively bitter orange juice product. In a recent consumer test, 200 consumers (composed of a demographically balanced set of 100 regular coffee drinkers and 100 non-coffee drinkers) evaluated the ten orange juice products on a 9-point liking scale.

Group vs. Individual Ideals: In our Summer 1999 newsletter, we discussed the development of maps of a sensory space using preference data and a probabilistic ideal point model. The model was probabilistic because products and ideals were treated as distributions. In that report, we explained how preferences for products among a group of consumers could be displayed using a single ideal point distribution for the group. In our Spring 1998 newsletter, we demonstrated how liking ratings from a group of consumers could be used to find the drivers of consumer liking for the group. In both of these cases, it was assumed that the consumers belong to a homogeneous group represented by a single cluster or distribution. This assumption is justified if there is little evidence for segmentation. In this report we take the level of analysis deeper. Using liking ratings, our goal is to produce a map of products and individual ideals in which each consumer is represented by his or her own distribution. From this map, it is possible to identify collections of consumers that share similar ideal locations. The technique to achieve this goal does not use any sensory information from the products or any descriptive information about the consumers. The analysis relies entirely on liking ratings. Sensory and consumer descriptive information is used to describe the dimensions and the segments uncovered in the analysis.

How Liking Ratings Arise: When a consumer rates a product "7" on a 9-point liking scale, one can interpret this rating as a measure of distance between the ideal value generated by the consumer and his or her perception of the product. The higher the rating, the smaller the distance. Each consumer's ideal varies from moment to moment, as does the perception of each product. A consumer who gives a "9" rating to a product on one occasion, may not do so if presented with the same product again because the product or the ideal may not remain constant. When the same consumer rates multiple products, each rating

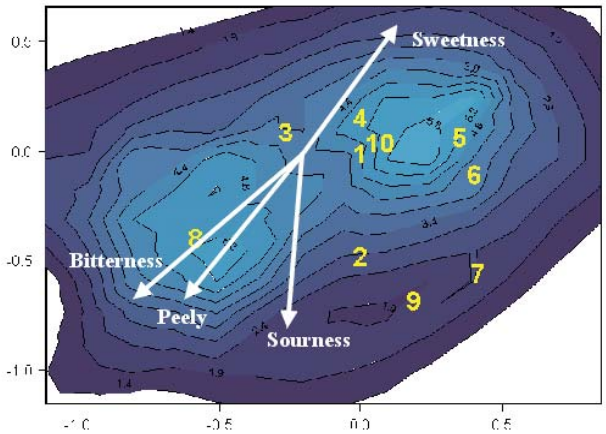
gives information about the location of that person's ideal point distribution. When data from multiple consumers are used, it is possible to locate the positions of products and individual ideal point means.

Figure 2. Scatter plot superimposed on a contour plot of individual ideals.



Individual Ideal Point Maps: Individual ideal point analysis of the orange juice products is shown in Figure 2. This figure is a contour plot with a scatter plot of the ideal points superimposed on the contours. The plots were obtained from an ideal point model of the liking ratings. Although the individual distributions or clusters are not shown, each point in Figure 2 is the mean of a distribution for each consumer. Consumer ideal points are identified by the symbols; coffee drinkers are coded in red, non-coffee drinkers are coded in yellow. From the location of all the ideal point means, a measure of density or congestion of each ideal point mean can be obtained. The contours correspond to the height of the density, which measures how close each consumer's ideal is to others in the map. Figure 3 is a contour plot of the individual ideals along with a scatter plot of the products. Figure 4 is a three-dimensional representation of this contour plot.

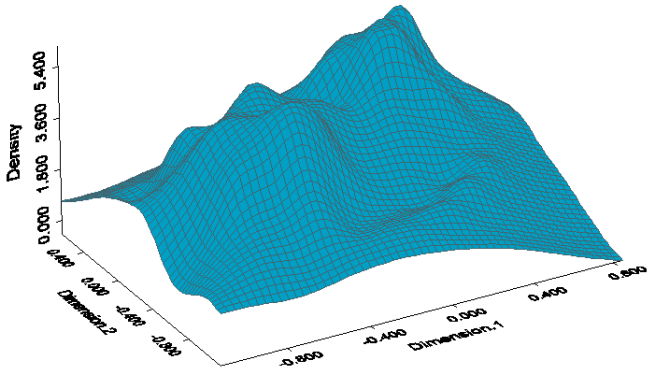
Figure 3. Sensory directions on a contour plot with products.



The direction of descriptive attribute information is also included in Figure 3, so that the dimensions of the space can be identified. Projections of the product points onto the scales shown provide a measure of the sensory intensity of each product on each attribute. The attributes displayed drive consumer liking.

It can be seen from the contour plot in Figure 3 that there are two segments of consumers, one of which is concentrated around product 8, the most bitter product. The less bitter products 1, 4 and 10 are placed near the peak of the second segment. You conclude that the ideal points for coffee drinkers are closer to a relatively bitter orange juice. In addition to preference for bitterness, you also conclude that consumers differ in their preferences for sourness, peely and sweetness.

Figure 4. Surface plot of individual ideal point densities.



Conclusion: Liking ratings, treated as a measure of similarity between products and ideals, can be used to locate product and individual ideal points on a sensory map. Once this map has been constructed, sensory descriptive and analytical data may be added to the map to interpret the dimensions driving individual liking decisions. By constructing an account of liking data at the individual level, this method reveals the existence of latent ideal point segments. Since it relies entirely on liking data to construct the ideal point map, it uncovers the underlying sensory dimensions that drive individual liking. The method has value to researchers interested in identifying ideal point segments, in determining drivers of consumer liking and in locating products on these drivers to maximize consumer satisfaction.

References:

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