

PSYCHOGRAPHIC QUESTIONNAIRES: A COMPARATIVE REVIEW OF SCALES AND  
STRUCTURES

by

KELLY FUHR

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Major Professor  
Dr. Delores Chambers

## **Abstract**

### **Psychographic Questionnaires: A Comparative Review of Structures and Scales**

In recent years there has been a growing trend toward integrating psychographic profiles into sensory studies with the aim of more holistically explaining consumer segmentation and preferences. With this shift in approach have come questions on the nature of psychographic scales and the theoretical implications of their structure. Given the plethora of existing psychographic scales in common practice, the purpose of this review is to give a concise overview in the breadth of structures, with the aim of helping sensory researchers identify the most appropriate scale for their needs. The review begins with a critical comparison of the three most common scale classes: Likert, Semantic Differential, and Behavioral Frequency, and their relative advantages and disadvantages. Following that, a review of psychographic questionnaire design highlights differences from sensory practices, drawing attention to sources of response bias in specific design typologies which may reduce data quality in a product design.

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# Chapter 1 - Introduction to Psychographics

Psychographics is the study of consumer personality traits in an attempt to understand and predict patterns in consumer behavior (Howe et al., 2013). Broader than simply capturing demographics, psychographic questionnaires quantitatively capture qualitative details of consumers lifestyles, attitudes, values and identity to form a holistic view of the person (Asp, 1999; Demby, 1989). As sensory preference models have become increasingly advanced in their predictive power, there has been renewed interest in understanding how these psychographic questionnaires may be used to further elucidate sensory preference segments. An informed researcher, however, must be cognizant of high degree of variance in questionnaire design, and the real potential for questionnaire-based biases stemming from their history in development.

Psychographics is a term coined by Emanuel Demby in 1965; his definition of the practice is “the use of psychological, sociological, and anthropological factors such as benefits desired, self-concept and lifestyle” to segment consumers (Demby, 1989). The wide-spread adoption of psychographics began in the late 60’s and early 70’s, driven by market researchers like Koponen, who provided the first indicators that psychographic profiles may be better able to differentiate consumer segments than traditional demographics (Sandy & Gosling, 2008)(Howe et al., 2013). Figure-1 below outlines the distinction between the two (Howe et al., 2013). Since that time Psychographics has been a fertile field with a metastatic array of questionnaires developed to quantify different aspects of consumer personality and behavior- frequently referred to as constructs (Widiger & Costa, 2012).

**Table 1: Defining Psychographics vs. Demographics**

Psychographics	Demographics
Attitudes/Values	Age / Gender
Lifestyles	Income
Buying Habits	Ethnicity
Opinions/Interests	Physical location

Since the inception of the field, psychographic scales have largely been held, built, and validated by sociologists and market researchers (Moskowitz, 2009). Their needs and prioritizes

in presenting the data are strongly reflected in the underlying questionnaire design, which has implications for sensory researchers. For instance, while sensory research often treats study participants as potentially interchangeable entities, the emphasis in market research is strongly on the individual (Giacalone, Bredie, & Frøst, 2013). This philosophy is reflected in the length of the questionnaires, which seek, perhaps ad nauseam, to document the intricacies of participant beliefs and behaviors. The AIO, for instance, often cited as “the most widely accepted model of lifestyle segmentation”, in its full form is in excess of 300 questions (Sandy & Gosling, 2008). While the AIO is a relatively lengthy example, it is not uncommon for a given inventory to be between 20 and 30 questions in length. This is particularly striking because psychographic questionnaires are frequently tailored to reflect just one aspect of a consumer’s personality or behavior (Bearden, Netemeyer, & Mobley, 2011). The practical implications of questionnaire length will be discussed more fully in Section 3: Review of questionnaire structures and bias. The reporting style of market researchers, additionally, has strongly influenced the variety and quality of psychographic scales (Moskowitz, 2009). Because market researchers frequently report their results as percentages, i.e. percent agreement, there is a far lower emphasis in psychographics placed on issues of scale usage as a marker of data quality (Moskowitz, 2009). While sensory scientists frequently consider a net effect of scale neutrality a key criteria for scale validity (source), it is important to note that psychographic scales validate on an entirely different set of criteria. What is considered most critical for psychographic scales is that they accurately measure a designated construct to: i.e. a health values survey must show strong correlation between all of the attributes and a total index of health-value to be considered validated (Bearden et al., 2011). There is frequently no check made on the distribution of responses as a validation of scale; in fact, a thorough literature review of papers and books revealed only a handful of psychographic researchers who have investigated the effect of scale on response bias. The net result is that frequently psychographic questions have biases in their task, their language, and their underlying format. Additionally, because questions and scales are typically designed ad hoc, there is a wide range of scale dimensions in common practice, with variation seen in number of categories, presence of word anchors and in valence—even among those scales designed to measure a single construct. For this reason it is important for the sensory scientist to be thorough in reviewing available, validated scales from which to choose.

## Chapter 2 - The Argument for Psychographics

Consumer segmentation is widely studied, and well-established discipline within sensory research; as an approach to product development, it “emphasizes the potential gain in acceptance scores by tailoring a product to distinct” sub-groups in a population (Lawless, 2013). While its application frequently decreases the generalizability of findings to the total market, segmentation widely employed in the analysis of sensory preference data because it produces demonstrably higher measures of model fit (Lawless, 2013). A classic example of this effect is seen in Pangborn’s study of coffee preferences across European countries; contrary to popular opinion at the time, her studies showed that a model based on sensory preference segmentation produced a far better fit of the data than age or country of origin. (Lawless 2013). “Knowing the most differentiated basis on which to profile consumers will be useful in demining who these people are, what they prefer and what the might buy” is the fundamental basis of the application of psychographic profiles to sensory segmentation (Wansink, Sonka, & Park, 2004)

The pull of psychographics for sensory scientists has largely resulted from the failure of traditional consumer profiles to result in meaningful understanding of preference segmentation. It is infrequently true that demographics on their own provide reasonable explanation for sensory segments (Wansink et al., 2004). For instance, Wansink et. Al, in the paper *Segmentation Approaches that Differentiate Consumption Frequency from Sensory Preference* hypothesize that consumption rate is a potentially misleading basis segmenting consumers: without further elucidating information, it is impossible to distinguish between those who consume products because they like them, and those who are simply using them for the sake of convenience (2004). While consumption is capable of distinguishing heavy users from non-users, it is only through psychographic profiling that we can differentiate those who are neutral to a class of products from those who seek them out (Wansink et al., 2004). In building psychographic profiles into standard demographic questionnaires, it is possible to layer additional understanding onto preference segmentation, yielding richer insight to guide product design and communication. An applied example comes from the study of consumer preference for tactile softness (Kergoat et al., 2012). The Affective Intensity Measurement (AIM) scale measures the magnitude of emotional response evoked in participant as a response to affect-laden stimuli; researchers wanted to understand the relationship between emotional processes and the preference for soft-feels among



fabrics. Researchers classified participants into high-AI (meaning they showed exaggerated, positive responses to stimulus with high affect), or low-AI (low-response or boredom) by exposing them to emotional stimuli. When exposed to videos with strong emotional appeals, high AI individuals tend to engage in more personalizing cognitions” meaning they focused on external stimulus as self-relevant (Kergoat et al., 2012). In a discriminant analysis of the sensory segments from this study, it was found that the preference segment of “soft-likers” (who rated soft-feeling fabrics much more favorably than the general population) showed a high degree of correlation with those with a High-AI profile (Kergoat et al., 2012). More so than any other variable in this study, the psychographic profile of high emotional affect was able to shed light on a driver of consumer preference. This may shape not only the product design, but how benefits are communicated to this soft-seeking segment of consumers. It should be noted that another psychographic measure, Need for Touch (NFT) was not nearly as highly correlated in the final segmentation analysis. This is but one sensory application of psychographic measures; however in broad view, the field of psychographics shows a nearly constant influx of new publication. For example, National parks in Canada are studying their visitors to understand the role of sensation-seeking constructs (Galloway, 2002); Gen Y Consumers have been classified as “Experiencers” and “Strivers” regarding their consumption patterns (Howe et al., 2013), and car manufacturers are building optimal consumer archetypes for each of their car formats in the marketplace (Baltas & Saridakis, 2013). The potential for psychographics to broaden the application of sensory insights to the wider market is the drawing lure for sensory researchers into the field.

## **Chapter 3: Review of the Most Common Psychographic Scales**

### **Likert Scales**

Likert Scales, or as they’re commonly referred to in the sensory community, agreement scales, are the gold standard of the psychographics industry. An example analysis from the *Journal of Clinical Health Psychology*, revealed that fully 9 out of 10 behavioral studies used a Likert-type scale (Hartley, 2014). The general construction of the Likert scale has been largely unchanged since it was first introduced by Rensis Likert in the 1930’s (Hartley, 2014).

**Figure 3.1: The 5-PT Likert Scale**

Scale	1	2	3	4	5
Agreement	Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree

Source: (Bearden, Netemeyer, & Mobley, 2011; Friborg, Martinussen, & Rosenvinge, 2006)

Source: (Bearden et al., 2011; Friborg, Martinussen, & Rosenvinge, 2006)

A review of Likert formats performed by Weijters, Cabooter, and Schillewaert at Ghent University found that of 603 studies reviewed, about 30% of which were 5 point Likert scales and 55% were 7-point Likert scales. Their review found that the primary presentation of these agreement scales was with end-point anchors as shown in Figure 2 below: less than 5% of published scales were found to be fully labelled (2010).

**Figure 3.2: End-point Labeled 7pt Likert Scale**

Strongly Disagree—1—2—3—4—5—6—7—Strongly Agree

Source: (Bearden et al., 2011; Hartley, 2014)

Their study evaluating the influence of scale length on response style, found that the 5-pt scale and 7-pt scale were equivalent in capturing consumer opinion (Weijters et al., 2010); this finding is notable in that it corroborates for psychographic scales what has independently been shown by sensory scientists (Lawless & Heymann, 2010). Likert scales are favored in Psychographics in part because they are less mentally taxing than other tasks (Friborg et al., 2006). However, even knowing the broad classification of scale type, it is important to note that there is no complete standardization in terms of response scale format, so in choosing a psychographic scale, it is important to read the word-anchors (Weijters et al., 2010). Scales with non-standard word anchors may not differentiate well, risking both generalizability and comparability with other studies (Weijters et al., 2010). One drawback of Likert scales is that they are particularly prone an effect known as acquiescence bias: the tendency to respond to respond in the positive to any attribute that sounds ‘good’ irrespective of content (Bearden et al.,

2011; Friborg et al., 2006; Kulas & Stachowski, 2013). This tendency has been found to be most pronounced in questionnaires with only positively-worded attributes (Friborg et al., 2006). There are recommended procedures to reduce this tendency, which are discussed further in Chapter 5.

### Semantic Differential Scales

Semantic differential scales are not a format of scale typically employed by sensory scientists. The end points are anchored by statements rather agreement. The Personal Inventory II is a psychographic profile that contains 7pt numerical scales with end-point anchors: unimportant to important (Bearden et al., 2011).

**Figure 3.3: Semantic Differential Format Comparison**

Likert Format	Scale						
1. <i>I feel that my future looks promising</i> 2. <i>It is easy for me to think of good conversational topics</i>	<b>Not At All True</b>			<b>Very true</b>			
	1	2	3	4	5	6	7
	1	2	3	4	5	6	7
Semantic Differential Format	Scale						
1. <i>I feel that my future looks</i> 2. <i>To think of good conversational topics is</i>	<b>Uncertain</b>	1	2	3	4	5	6 7 <b>Promising</b>
	<b>Easy for me</b>	1	2	3	4	5	6 7 <b>Difficult for me</b>

One potential bias that can be typical in semantic differential scales is that they lack balance; there are not an equal number of agreement/disagreement categories. Represented as a scale that presents with 1 category for unimportant, and 6 categories with varying levels of importance may bias participants to say that they do find the attribute important (Lawless & Heymann, 2010). However, semantic differential scales have been shown have higher construct reliabilities and capture more variance than Likert-type scales (Friborg et al., 2006). In fact, in a side-by-side comparison of the methods with the same profile, data from the semantic differential scale had universally better measures of model fit (Friborg et al., 2006). This is because semantic differential scales reduce the tendency of significant side-loadings common in Likert-type scales (Friborg et al., 2006) The format shift in semantic differential scales encourages participants to use response scale more evenly than is typically found in Likert or Behavioral frequency scales, resulting in lower measures of model misspecification (Friborg et al., 2006). It should be noted, however, that semantic differential scales increase “complexity

and cognitive load on respondents, which has the potential to weaken the psychometric quality of the results” (Friborg et al., 2006; Weijters, Cabooter, & Schillewaert, 2010). Semantic differential scales therefore should be treated with caution for long attribute lists, as the cognitive load may compound fatigue effects.

## Behavioral Frequency Scales

Behavioral frequency questions are another scale typology that are rarely used in the sensory setting. An example from the Handbook of Marketing Scales is the Temporal Focus Scale (TFS) (Bearden et al., 2011).

**Figure 3.4: Temporal Focus Scale**

Never	1	2	3	4	5	6	7	Constantly
-------	---	---	---	---	---	---	---	------------

Source: (Bearden et al., 2011)

The Temporal Focus scale is a 7-pt unipolar numerical scale, asking participants to rate how often they engage in various activities where 1= never and 7= constantly. Where the psychographic construct is behavior-based, rather than attitudinal, behavioral frequency questionnaires have less ambiguity in their wording resulting in higher degree of information capture (Marfeo et al., 2014). One applied example comparing Behavioral Frequency and Likert scales comes from the study of how people recall their own level of happiness (Diener, Sandvik, & Pavot, 1991). Participants were asked to rate how frequently they felt happy as well as how intensely happy they felt during past events (Diener et al., 1991). The results showed that people are more accurate at recalling frequency of positive emotions than the intensity of the emotion, which tends to be over-estimated in retrospect (Diener et al., 1991). A similar study of behavioral health functioning tested the reliability of Likert and Behavior-Frequency questions within the Work Disability Functional Assessment Battery (WD-FAB) (Marfeo et al., 2014). It was found that frequency scales had moderately higher reliability than Likert scales, meaning that consumers had more consistent responses within a single construct (Marfeo et al., 2014). However, in an examination of the distribution of the scale usage, it was found that that agreement scales were more discriminant (Marfeo et al., 2014). This finding more or less corroborates the results found by Wankink, Sonka and Park in their study of soy consumption

and preference (2004). Their study of consumer involvement in the soy category found that for certain attributes, such as cooking habits, frequency questionnaires were more predictive of consumer behavior. However, this effect was not valid across all attributes, and in their discussion, the authors concluded that on the whole agreement questions were better differentiators (Wansink et al., 2004). If the existing comparative literature is reviewed as a body of evidence, a reasonable inference is that while behavioral frequency may in some instances be more appropriate than Likert scales, the net effectiveness is situationally dependent. One recommendation proposed by Marfeo et al (2004), in their discussion of the health history example, is that the optimal questionnaire would have both behavioral (i.e. behavioral frequency) as well as attitudinal, Likert-type questions in its composition.

## **Chapter 4: The Importance of Scale Neutrality: Social Desirability Bias**

Social desirability bias has been defined as the tendency of participants to purposefully amend their response style such that they score low on attributes describing socially undesirable characteristics (i.e. selfishness) and high on desirable characteristics (i.e. altruism) (Bearden et al., 2011). There has been extensive published literature devising procedures and scales for quantifying social desirability bias, but the applied recommendations are generally not considered a criteria of validity in scale design, thus the application is not widespread (Barger, 2002; Bearden et al., 2011; Hays, Hayashi, & Stewart, 1989; Manning, Bearden, & Tian, 2009; Nederhof, 1985; Paulhus, 1991). An aware sensory researcher, therefore should be cognizant of this tendency and select for scales which are less likely to elicit response bias from a sensory perspective. An applied example can be taken from the Health in Consciousness Scale (HCS); a 9-question survey devised by Stephen Gould and published in the *Journal of Consumer Affairs*, participants are asked to rate from 0-4 how well each statement describes them (Bearden et al., 2011; 1988). The attributes are all positive in nature: “I’m very involved with my health” and “I’m generally attentive to my inner feelings about my health” and consumers are asked to respond with one of five category responses: 0= statement does not describe you at all, 1= statement describes you a little, 2= statement describes you about 50/50, 3= statement describes you fairly well, and 4= statement describes you a lot (Bearden et al., 2011; Gould, 1988). While

there are 4 categories of agreement, there is but one category for disagreement. From a sensory perspective there is ample evidence that uneven scales such as this example have the potential to increase response bias among participants (Lawless & Heymann, 2010). A reasonable compensation from a sensory perspective would therefore be to either search for a similar questionnaire with a more balanced task, or utilizing the same attribute list, substitute a bipolar, even scale, thereby increasing neutrality of the task. One caveat to the later proposal might be that it would require some effort to be made to evaluate the validity of the resulting profile (Herbert L. Meiselman, 2012; Sandy & Gosling, 2008). It has been shown that psychographic questionnaires developed ad hoc frequently have far lower validity than standard profiles, and thus creation of a new measurement tool should be treated with caution (Sandy & Gosling, 2008).

## **Chapter 5: Questionnaire Design Typology and Response Bias**

The myriad of existing developed, and validated psychographic questionnaires is both a boon and a burden to the research community. While sometimes difficult to navigate, the existence of overlapping questionnaires which map onto similar, if not identical, constructs allows for a degree of leeway in questionnaire select. There is frequently the ability to select from several validated alternatives, which owing to their differences in structure will have varying degree of response bias errors. Specifically, common sources of response bias in psychographic questionnaire design stemming fatigue, contrast effects and ambiguity in attribute wording, can usually be avoided by selecting the against specific psychographic design typologies.

### **Typology I: The Lengthy Questionnaire**

One unmistakable delineation between psychographic and sensory research is the length of the task. A common guiding design principle among the sensory community is one of parsimony: only those attributes which are relevant are included in the questionnaire, and redundancies are reduced as much as possible (Lawless & Heymann, 2010). Psychographic scales, on the other hand, are fundamentally developed to measure nuances of a concept (Bearden et al., 2011). It is expected in psychographics that multi-dimensional concepts may require a longer attribute list to fully frame (Bearden et al., 2011). In a review of 93 psychographic personality tests included in the Handbook of Marketing scales, the median

number of attributes was 16, with a range of 4-44. It is additionally believed that “empirical redundancy” the practice of repeating attributes with slight word variations leads to higher measures of construct validity (Bearden et al., 2011). The validity of a profile by definition in psychographics is based upon the premise that attributes “should show high levels of consistency i.e. high correlation with between individual attributes and the total set of responses” (Bearden et al., 2011). The burden at the time of scale development is placed on showing correlation between each attribute and a grand mean, which creates a tendency towards redundancy rather than parsimony. The criteria of redundancy-based exclusion is likewise dissimilar from sensory research: Discriminant validity is the term used to describe the “degree to which two attributes designed to measure conceptually similar constructs are related” (Bearden et al., 2011). This criteria of validity is measured by attribute on attribute correlation: those attributes with low correlation together (but maintaining reasonable correlation to the grand mean) are considered discriminately valid (Bearden et al., 2011). An example of two constructs with discriminant validity might be Imaginativeness vs. Creativity (Norris & Epstein, 2011). While both attributes from a cognitive point of view describe distinct variables within a construct, the discriminant validity, measured from a product developer’s point of view is unestablished. Specifically, it has not been established that in applied scenario of segmenting consumers, that both attributes would equally contribute to the fit of the model. In contrast, there is substantial evidence to suggest that asking consumers to evaluate lengthy, heavily nuanced attribute lists is damaging to the discriminant power of psychographic data (Spinelli, et al, 2014). In addition to biases due to fatigue, there is evidence the visual stimulus of seeing long attribute lists can trigger consumers to become less engaged in the task (Giacalone, Bredie, & Frøst, 2013). This effect is one of effort modulation; in scenarios where a large effort is anticipated, consumers will resort to cognitive strategies which are less demanding (Giacalone et al., 2013). The coping strategy is one of disengagement (Giacalone et al., 2013). In contrast, in highly engaged situations, where panelists are asked to explain their choices as they work through a lengthy questionnaire, an opposite, but equally negative effect may take place. In a study on the effect of proximity on consumer response styles, researchers were surprised to find that when they re-posed a question in reversed terms, they had a relatively low correlation among attributes (Weijters, Geuens, & Schillewaert, 2009). In an analysis of interview transcriptions, the researchers found that many consumers when re-presented with a similar question multiple times, different answers were

elicited because participants felt that they were being probed to provide more information on a simple attribute (Weijters et al., 2009). Because nearly all participants could rationalize some scenarios in which the reverse was true, the net effect was a lower discriminatory ability of the tool (Weijters et al., 2009).

There is evidence to show that shorter versions of common psychographic tools are equally able to measure constructs as their longer counterparts. For instance, the List of Values (LOV) scale is a 9-question psychographic profile designed to capture dominant consumer values (Kahle, Beatty, & Homer, 1986). It measures the same constructs as the Rokeach values scale (36 attributes) and the Short Values and Lifestyles Scale (34 attributes). However, LOV has been found to be equally able to predict consumer behavior as both of the longer scales without the culturally dependent statements upon which the other two are based (Beatty, Homer, & Kahle, 1988; Swenson & Herche, 1994). A reasonable exercise is therefore to pursue whether a short version of an existing psychographic scale exists when examining it for potential application to sensory practices.

## **Typology II: The Segmented Questionnaire**

The Consumer Self-Confidence (CSC) profile is a 31 attribute questionnaire divided into 6 labelled sub-groups: Information acquisition, Consideration-Set Formation, Personal Outcomes Decision Making, Social Outcomes Decision Making, Persuasion Knowledge, and Marketplace Interfaces (Bearden et al., 2011). The attributes are laid out in a consistent chronological order and participants are asked to rate how characteristic each statement is of their behavior. This practice, known as creating a segmented questionnaire, is common to the field of psychographics, and driven by industry criteria of validation for new scales (Bearden et al., 2011).

There are only two measures for validating scale reliability in the field of psychographics: test-retest, defined as the stability of an individual's responses over time, and internal consistency: the correlation among items or sets of items within a questionnaire (Bearden et al., 2011). By far, internal consistency is the more common, however: less than half of scales in published literature offer test-retest coefficients as evidence of validity (Bearden et al., 2011). It is considered a rule of thumb that inter-item correlation matrices should have a minimal value 0.5, particularly when item to total correlation is assessed. Psychographic researchers have therefore adopted practices



to increase the value of inter-item correlation matrices as a way of padding their scale reliability (Bearden et al., 2011). It has been shown that when related concepts are grouped together inter-item correlations increase, in the field of sensory research this would be termed a context effect (Lawless & Heymann, 2010; Lim, 2011; Weijters et al., 2009). The prevalence of this practice certainly begs the question whether currently applied measures of construct validity would hold true if the questionnaire were to be fully randomized. Indeed, psychographic researchers Bert Weijters and Niels Schillewart have published several papers within the last 10 years recommending remedies to the biases of ‘carry-over’ effects in psychographic questionnaires (Weijters et al., 2010, 2009). Citing a response to the “significant auto-regressive” tendency in consumer response styles, Weijters et al. have found that a minimum of 6 separating questions are necessary to negate the baseline correlation (2009, 2010). The implication is that questionnaires should be fully (or nearly fully) randomized to negate the effects of carryover, which is a practice already well established in the sensory community (Lawless & Heymann, 2010). Unfortunately, this view has yet to be widely applied to the field of psychographics; a much more common remedy is “balancing the scale” (Weijters et al., 2010). Differing substantially from the definition of a balanced scale in sensory research, balanced questionnaires in psychographics contain half of their agreement statements reversed to the negative (Weijters et al., 2010). For instance, “I frequently shop for groceries online” would be reversed to “I do not frequently shop for groceries online”. This practice has been utilized since Likert first introduced agreement scales in 1932, with the intention of enhancing general validity and making respondents “attend more carefully to the questionnaire (Weijters et al., 2009). One review found that out of 9 published studies featuring Likert scales, 4 specifically stated that they reversed some of the terms (Hartley, 2014). However, creating negations of Likert questions is an imperfect remedy; “writing items as negations may introduce new systematic errors as individuals react differently to positive and negative” statements (Friborg et al., 2006). Reversed terms additionally “tend to show lower factor loadings” than their non-reversed counterparts, meaning they do not contribute as well to differentiating among individuals (Weijters et al., 2009). If reversed terms are to be employed, it has been proposed that semantic differential scales are a more stable alternative; because of their structure, one may simply switch the position of the end-point word anchors to reverse the scale without altering the meaning of the attribute (Friborg et al., 2006). The optimal solution from a sensory standpoint would be to find

an un-segmented, fully randomizable variation on a psychographic scale, but in the absence of such, a balanced, semantic differential questionnaire should be looked on as less influenced by reversal-based response biases. In some circumstances, neither is available, and sensory researchers will simply need to be cognizant of the influence context effects may have on their results.

### **Typology III: Ambiguity of Task**

Although Likert scales are far and away the most prevalent type of scale utilized in psychographic research, there have been a number of recently published sources citing concern that they may be particularly prone to ambiguity in wording (Hartley, 2014; Spinelli et al., 2014). James Harley in his paper *Some Thoughts on Likert-Type Scales* cited the tendency of some questionnaires to ask respondents to rate their opinion on questions that contain more than one attribute or descriptor (2014). Interpretation is at stake in this instance: it is not clear which element in the question respondents are agreeing to (Hartley, 2014). In the context of existing sensory practices, the discriminatory power of the data is likely to be lowered as consumers will interpret the task in different ways (Lawless & Heymann, 2010). Spinelli et. al. in the *paper How does it make you feel? A new approach to measuring emotions in food product experience* took aim at ambiguity in Meiselman's EsSence profile, a sensory-derived methodology designed to mirror the attribute statements created in psychographics (2014). The EsSence method asks panelists to evaluate a product using a field of 39 emotion-based attributes derived from published literature and consumer responses (King, Meiselman, & Carr, 2010). Spinelli et. al, showed that one of the major flaws in EsSence is that, like many psychographic questionnaires, attributes are not given sufficient context to be optimally useable by consumers (2014). By presenting attributes as statements or phrases rather than words, the EmoSemio model derived higher correlations between emotional responses and hedonic scores as well as higher measures of attribute discrimination (Spinelli et al., 2014). For instance, in EsSence, the word 'nostalgic' is generally found to be a non-discriminating emotion among products, however when rephrased as part of the EmoSemio questionnaire: "reminds me of my childhood", the phrase was high discriminant (Spinelli et al., 2014). As such, although the EsSence profile contains 40 emotion-based attributes, EmoSemio showed greater predictive power with just 23 statements (Spinelli et al., 2014). In looking at psychographic questionnaires, an informed researcher should be therefore looking for both obvious and latent signs of ambiguity: the EmoSemio case study

demonstrates that the functionality of tool is dependent upon the ability of the language to translate clearly to a consumer audience.

## **Chapter 6: Maximizing Predictive Quality on Consumer Behavior**

Gosling and Sandy at the University of Texas have proposed that the predictive power of psychographics is situational; their approach using regression analysis and correlations between psychographic profiles and self-reported purchases found inconsistent and relatively weak relationships (2008). However, this finding does not invalidate the use of psychographics to explain sensory segmentation as long as the clusters are derived from consumer preference (Lawless, 2013). It's perhaps this difference in approach, applying psychographic profiles onto established sensory preference clusters vs. attempting to segment the market based on them that is most distinguished between sensory and market researchers. In this section, three common models will be reviewed in light of their functionality in contributing to understanding consumer preference segments and behavior.

### **The Five Factor Model (FFM)**

The Five Factor Model (FFM), otherwise termed the Big 5, is the most widely studied model of personality structure in the world (Widiger & Costa, 2012). Captured via a 10 question inventory (TIPI), consumers index between low and high on each of 5 personality constructs: Neuroticism, Extraversion, Openness, Agreeableness and Conscientiousness (Bearden et al., 2011; Widiger & Costa, 2012). All of the existing personality scales to some degree measure facets of what is captured by the FFM. The FFM is said to be derived empirically from studies of cultural lexicons (Widiger & Costa, 2012). The International Sexuality Descriptive project translated the Big 5 into local languages in 29 countries into a study of 17,837 participants, and the profile was found to be robust across North America, South America, Europe, Middle East, Oceania, South East Asia, China and North Asia (Widiger & Costa, 2012). However, there is very little empirical evidence to support that the 10-Item Personality Inventory (TIPI) as a standalone survey can be used to differentiate segments of consumer preference as it relates to products. It may be prudent therefore to pair the 5-factor analysis with another measure until a further body of evidence can be developed in an applied product setting.

## **Food Neophobia**

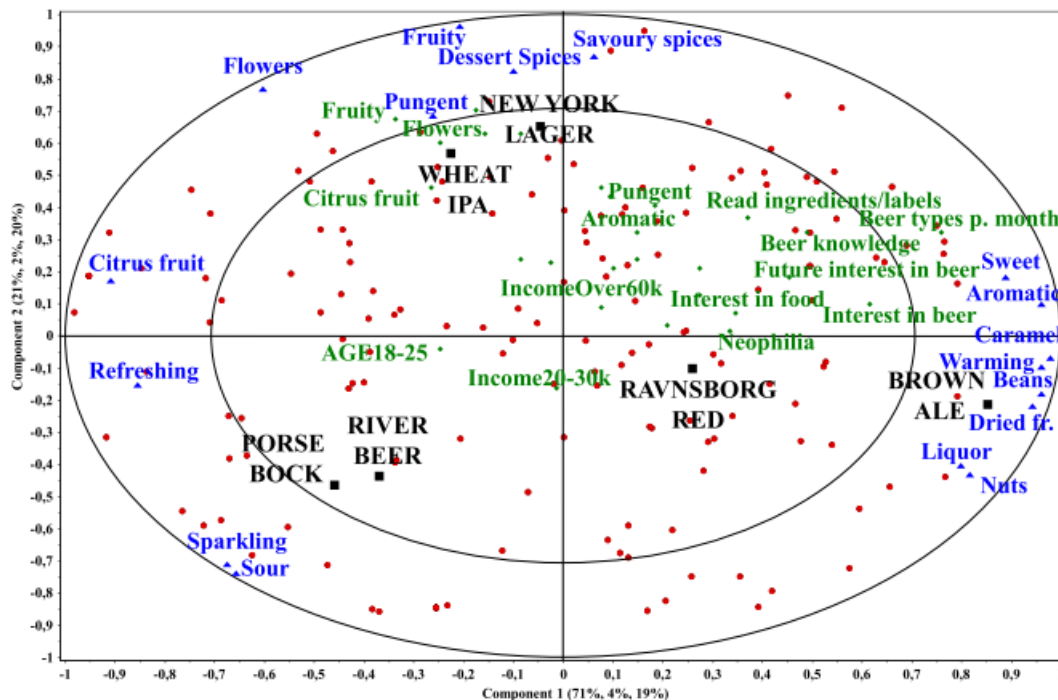
Food Neophobia is one of the few psychographic constructs that has been extensively reviewed by the food science and sensory community. Studies have reviewed the relationship between this psychographic construct and olfactory functionality, food preferences, and eating behavior (Cox & Evans, 2008; Demattè et al., 2013; Henriques, King, & Meiselman, 2009; King, Meiselman, & Henriques, 2008; H. L. Meiselman, King, & Gillette, 2010; Raudenbush, Schroth, Reilley, & Frank, 1998). In journal *Appetite*, Raudenbush et. al, were able to draw convincing parallels between consumers indexing high in food Neophobia and differences in population sniffing behavior (1998). In their study of sniff magnitude, Food Neophobics were demonstrated to have smaller magnitude sniffs, which led to a decreased ability to identify different odors vs. non-Neophobics (Raudenbush et al., 1998). The authors explained this effect as likely the result of learned behaviors in food avoidance, and showed that Neophobia was a better basis on which to segment consumers than other demographics, even gender, in behavioral prediction (Raudenbush et al., 1998). However, other studies on the effect of Neophobia on consumer hedonic rating behaviors have been less conclusive. In their article *Consumer Segmentation Based on Neophobia and It's Application to Product Development* Henriques et. al examined the relationship between food Neophobia and hedonic rating style. Their study classified consumers into two segments based on their responses to the Food Neophobia Scale (FNS): Neophilics and Neophobics (Henriques et al., 2009). While their study did show that Neophobics have lower mean acceptance scores for foods, the rank order between the two groups was not significantly different (Henriques et al., 2009). So while the psychographic classification was helpful in explaining a behavior pattern, it did not necessarily result in a different outcome from a product developer's point of view. This interpretation is additionally in alignment with patterns that have been identified in studies of psychographics and media consumption. Published in the journal of *Psychology and Marketing*, Sandy et. al found that the more general the consumer behavior, the higher the predictive power of the psychographic profile (Sandy & Gosling, 2008). For instance, they found that the number of hours spent watching TV and the networks watched were best explained by psychographic segmentation, however, when it came to which specific shows an individual might watch, demographics held higher predictive value. Food Neophobia, therefore

can be considered to result in certain general behaviors, such as hedonic rating style, but may or may not define a sensory segment independent of other measures.

## **Involvement**

Involvement is considered a multifaceted psychographic construct; it is generally described as having 5 major pillars: the perceived importance of the product class, the subjective impact of making a mis-purchase, the symbolic value of the product to the consumer, the hedonic value of the product class, and the consumer's interest level in the product (Bearden et al., 2011; Laurent & Kapferer, 1985). Involvement is of interest to market researchers and product developers because of its proven ability to predict segments and consumer behavior (Arts, Frambach, & Bijmolt, 2011; Bearden et al., 2011; Giacalone et al., 2013). A large meta-analysis of new innovation adoption behavior, spanning demographic and psychographic constructs in 92 studies, the product involvement was found to be the single greatest predictor of new innovation adoption (Arts et al., 2011). An applied example can be taken from a study beer preferences by Giacalone et al. (2013). In an analysis of psychographic and demographic profiles mapped with in a PLSR plot, shown below in Figure 6.1, product engagement (familiarity with beers, interest in beer and purchase of beer) was found to be better explain liking segments than demographics (like age and gender) (Giacalone et al., 2013)

**Figure 6.1: Beer Sensory Profile Plotted with Psychographic and Demographic Variables**



It should be noted that the sensory data in Figure 6.1 above was collected via consumer CATA responses; there is compelling evidence, however, that the profiles created were sufficiently robust and thus the results may be extrapolated to circumstances wherein the sensory data has been derived by other means (Baltas & Saridakis, 2013). As of 2012, there were 23 validated involvement scales in common practice; there is, therefore, ample opportunity for discrimination in selection of scale in this instance (Herbert L. Meiselman, 2012). The Components of Involvement Scale (CIP) published by Lastovicka and Gardner in 1979 has many of the qualities a sensory researcher might look for in a valid scale: it's a bipolar, balanced, 7-pt agreement scale of 22 questions, designed to be tailored to a specific product category (Bearden et al., 2011; Lastovicka & Gardner, 1979).

As an emerging specialization, psychographics applied in sensory research has both detractors and advocates, involvement scales are a piece of the growing body of evidence that gaining a holistic understanding of consumer motivations may be the key to unlocking sensory preference segments. There is clearly work to be done to develop and validate the field; the lack of a bridge between market research and sensory disciplines has resulted in a very clear gap in understanding. A common lexicon and criteria of validity are entirely lacking; looking to the

future it will be necessary to build a new framework and best-practice for capturing psychographic insights which both disciplines may look on as reasonably valid. There is nothing in adapting the scaling patterns of psychographics that should inherently invalidate the existing constructs, what may however breakdown through the process is our own willingness to adapt and change.

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