One of the hardest reservations to get in the world is for dinner at El Bulli, in northeast Spain, the world's most creative restaurant and by many considered to be the best. The chef, Ferran Adria, essentially the founder of molecular gastronomy, has added new dimensions to the experience of food. Largely by changing the physical form of food with high technology, using foams, gels, and the like, coupled with an exquisite aesthetic sense of what works for the human palate, Adria has created a panoply of new food experiences. There were 34 of them in a 6-hour meal one of us (PR) had the pleasure of consuming a few years ago. This extraordinary sensory experience does not need to be marketed, since reservations are essentially unattainable. (It is not true that El Bulli is so popular that nobody goes there anymore!) This new wave in cooking, spreading around the Western world, gives us an integrated multisensory experience, with a special focus on the texture of foods and textural contrasts. The smells, tastes, flavors, feels, sights, and sounds of food provide an enveloping experience. One example from El Bulli: a glass containing at the bottom a steaming hot, aromatic extract of pine nuts. The hot liquid sits at the bottom of a glass, the top of which is coated in a layer of ice. When you sip it, you get all the aroma that comes from a hot aromatic substance paired with the cold temperature that normally suppresses aroma: a new and unexpected experience. Molecular gastronomy sets the stage for a discussion of sensory marketing.

When it comes to senses, much of psychology has been focused on exploring vision and hearing. Vision and hearing can legitimately be thought to be our most important senses, as indicated by the devastation...
caused by blindness and deafness. The eyes and ears—both distance receptors—constitute our principal way of finding out about the world around us. It is quite easy to generate stimuli in vision and hearing, and the very fast response time of the system allows for exquisite temporal control of stimuli, such as flashes of light. In their reasonably “raw” forms, excluding that very small subset of all visual and auditory experiences that we might call art and music, light and sound are affectively neutral. They serve principally to inform about what is going on in the outside world. The other senses are often characterized as the “minor” senses (Table 19.1). Three—taste, smell, and contact/haptic—sensations constitute the core of the food experience. Since eating is a major activity of humans, the third most time consuming (including preparation of food), and the single most economically important: activity of humans, the senses that contribute most to the appeal of food are perhaps not so minor after all, and certainly worthy of study. Unlike sights and sounds, most tastes, smells, and feels (skin sensations) are positive or negative in valence. Although there is important participation from sight and sound, the major aspect of eating is mouth sensations, which are a combination of taste, smell, and a number of haptic modalities, including irritation or pain, contact, and hot or cold. The mouth is a highly innervated organ, and along with the hands, the only sense organ that actually manipulates the stimulus. What we perceive is food objects, a blend of taste, smell, and haptic inputs. Indeed, flavor is a seamless combination of taste and smell. The distinctive qualities of most foods are conveyed by odor carried from the mouth to the nose, via the retronasal route, but the sensation is experienced as coming from the mouth. Hence, the surprise when people discover that when they have a head cold that blocks the sense of smell, food loses much of its taste. When we eat, we do not experience modalities, we experience “mouth objects.” These objects change their properties—textures, temperatures, flavors—as we chew them, and they produce a dynamic range of sensations in the period of a few to many seconds that we might describe as a bite, a unit of eating.

The experience of a bite of chocolate may last for minutes: In the first stages, the sight of the wrapped chocolate, the smell as it is unwrapped, the feel of the chocolate in the hand; then, the bite itself. The initial firm impact, the growing aroma as the chocolate warms in the mouth and coats the inner surfaces, the change in texture from firm to a thick, silky liquid, the slide down the throat, and the enduring after-flavor. A bite of chocolate is a minisymphony of experiences.

Individuals differ in their acuity with respect to the various senses involved in eating, as they do in audition and vision. In particular, there are many different bitter receptors in the mouth, and at least a few are known to be absent in some individuals based on the presence or absence of specific genes. Olfactory acuity varies widely, and the olfactory sense deteriorates more with age than many other systems, such as the taste system.

Although it is sort of absurd to ask individuals how important vision or hearing is for them, it is quite reasonable to ask about the importance of smell, and we have done this (Wrzesniewski, McCauley, & Rozin, 1999). For example, inquiring of both Belgian and American college students, we asked what was the worst thing to lose: the sense of smell, hearing in one ear, or the big toe on one foot. About half of respondents thought losing the sense of smell was most threatening. Of course, many did not realize that food would lose most of its “taste” without a sense of smell. We developed a measure of the importance of odor to individuals and found wide variation. Most of it was not attributable to olfactory acuity (also assessed by self-report), but rather to the value placed on olfactory sensations: food aromas, perfumes, the smells of the natural world, and so forth.

Gestalt psychology was a major movement in psychology in the middle of the 20th century. Originating in studies of perception, it emphasized the importance of context. The role of context cannot be exaggerated, but it is still often ignored in research in psychology, perhaps because context makes things complicated. It requires expanding the universe of concern beyond what laboratory experimenters want to do. It means considering a sensory experience in terms of its immediate precursors and successors. The chocolate bite is not captured in a momentary flash of sensation. The melt-in-the-mouth process is critical. Part of the experience of a bite of an egg roll is the change in sensation as one bites into different components, of different crispness and different flavors, each producing a momentary

TABLE 19.1 The Human Senses

<table>
<thead>
<tr>
<th>Sense</th>
<th>Distance/ Surface/Internal</th>
<th>Valence</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vision</td>
<td>Distance</td>
<td>Neutral</td>
<td></td>
</tr>
<tr>
<td>Hearing</td>
<td>Distance</td>
<td>Neutral</td>
<td></td>
</tr>
<tr>
<td>Haptic*</td>
<td>Surface</td>
<td>Negative/neutral/positive</td>
<td>Incorporative</td>
</tr>
<tr>
<td>Smell</td>
<td>Distance/ internal</td>
<td>Negative/positive</td>
<td>Dual/incorporative</td>
</tr>
<tr>
<td>Taste</td>
<td>Internal</td>
<td>Negative/positive</td>
<td>Incorporative</td>
</tr>
<tr>
<td>Visceral</td>
<td>Internal</td>
<td>Negative</td>
<td></td>
</tr>
<tr>
<td>Muscle</td>
<td>Internal</td>
<td>Negative/neutral</td>
<td></td>
</tr>
<tr>
<td>Equilibrium</td>
<td>Internal</td>
<td>Neutral</td>
<td></td>
</tr>
</tbody>
</table>

*Including touch, irritation, temperature sense, and pain.
Furthermore, most chili likers do not enjoy the disembodied burn of chili, the social organization of eating, and the order of courses. Howard Schutz is their interpretation that changes.

It is the irritation signal from their mouth. Like all perception, evaluating food (or clothing, movies, cars or any other product, for that matter) involves a blend of bottom-up and top-down processes. So far as we know, people who like the burn of chili pepper and people who do not are getting the same sensory component, more than any other feature of the food, bestow the experience a person has.

A piece of chocolate may taste delicious until one discovers that it was harvested with child labor or contained detectable insect residues. A subtly flavored fish paté may be perceived as exquisite at a fine restaurant but tasteless at a local diner. Wansink, Payne, and North (2007) report that the same wine is judged to be lower in sensory quality if it has a label that indicates that it comes from North Dakota as opposed to California. Some people who claim to love Coke and hate Pepsi cannot tell them apart in taste tests. Chicken in a sauce flavored with chocolate (one variety of Mexican mole) may be found distasteful because of the known mixture of chocolate with a savory food, rather than because of a detached judgment of the oросensory experience. Many people think bottled water tastes superior to tap water, when they in fact cannot tell them apart. But it is important to realize that to the Coke-lover, Pepsi-hater, who cannot tell them apart, Coca-Cola drunk from a properly labeled bottle does taste better than Pepsi (if Coca-Cola had realized this, they would not have produced the new Coke). The taste experience of a food, the liking for the food, includes the broad context in which it is consumed. It includes the immediate social context; the reactions of those one is eating with influence the experience a person has.

Just as it is unreasonable to think that Picasso’s great artistic output is a result of extraordinary visual acuity he appreciation of food is only weakly based on matters of acuity. Like all perception, evaluating food (or clothing, movies, cars or any other product, for that matter) involves a blend of bottom-up and top-down processes. So far as we know, people who like the burn of chili pepper and people who do not are getting the same irritation signal from their mouth. It is their interpretation that changes. Furthermore, most chili likers do not enjoy the disembodied burn of chili, but want that burn in association with the flavor of the peppers and the other associated foods.

The context expands further (see Kass [1994] and Rozin [2007a] for discussions of eating in a cultural context). Food is a basic source of nutrition. That is its fundamental function. But in human cultural history, by a process we describe as cultural preadaptation, the initial purpose of food has been expanded so that it serves many other functions. The aesthetic function is obvious. But it also serves a variety of social functions, as with chocolate gifts in a romantic context, as with meeting a new person over a meal, as in discussing family issues over the dinner table. Meals are occasions, sometimes the principal occasions, for social interaction. The much longer than 1-hour duration of a French dinner is significantly more than the time it takes to consume the food. It involves savoring the food, discussing it, and general conviviality. For some minority in Western developed cultures eating is like refueling, but for most it is an anticipated pleasure. Of course, for many women in developed Western cultures, it is an ambivalent experience: enjoying the sensations but feeling bad about taking in calories.

Food also enters into the moral domain, as has clearly happened with alcohol and tobacco in American culture, and more subtly now with stigmatization of obesity and high-fat foods. In other cultural contexts, food in general has moral implications. Within the Hindu caste system, particular foods, and the social status of the preparers of the food, have strong moral implications. Appadurai (1981) describes food as a “biomoral” substance in Hindu India.

The specific powerful influence of culture on the appreciation of food and the evaluation of its sensory properties can be described under the generic term “cuisine.” Elisabeth Rozin (1982, 1983) analyzes cuisine, focusing on the actual dishes, in three components: staple foods, preparation techniques, and flavor principles. Thus, Chinese cuisine focuses on rice as a principal staple, the stir-fry technique, and a flavor principle made up of soy sauce, ginger root, and rice wine. The flavor principles, a quintessentially sensory component, more than any other feature of the food, bestow the ethnic quality on the food. Potatoes made with Chinese flavor principles taste Chinese (even though potatoes are rarely used in Chinese cuisine), and potatoes made with Mexican flavor principles (e.g., chili and tomato) taste Mexican. In addition to the characteristic sensory combinations, derived from staples, techniques, and flavor principles that characterize a cuisine, there are a whole set of additional contexts that are part of the cultural frame of food consumption. These include table manners, the utensils used, the social organization of eating, and the order of courses.
(1989) describes many of these traditions with the term "appropriateness." Thus, in the United States and many other countries, there are foods particularly appropriate for breakfast and others for special holidays. There are combinations of food that are discouraged, such as many mixtures of sweet and savory substances in most Euro-American cuisines. Whipped cream and meat are each typically desired foods, but not appropriate (or liked) in combination. For similar appropriateness reasons, carbonated milk was a failure on the American market, as was carbonated coffee (coffee soda). So far as we can tell, many of these rules are the arbitrary results of culinary history, although some can be argued to be nutritionally adaptive or enhancing of certain generally appealing aspects of food flavors.

In any particular cuisine, certain foods and flavors find very restricted uses, and others are widely employed. In Italy, garlic is appropriate on almost any savory food, as is soy sauce on almost any savory food in China. Coffee, on the other hand, in almost all cultures that consume it, is narrowly restricted to a hot beverage context; it is rarely used as a flavoring and virtually never in savory foods.

Sensory Pleasure as a Particular Type of Pleasure

Most of what we do, and buy, is motivated by either necessity or increasing pleasure. As wealth increases, the importance of maximizing pleasure grows with respect to meeting basic biological needs. Thus, while food constitutes about 50% of total expenses in developing world countries, it falls to below 20% in the developed world. Of course, there is no complementarity between pleasure and necessity. Food is perhaps the major domain in which the two motivations interact. At least in the developed Western world, where it has been assessed, flavor (read pleasure) is the major determinant of food choice (assuming availability and affordability). Depending on the individual and the culture, other prominent reasons are tradition, convenience, and perceived healthiness. Given the central role of maximizing pleasure in choice, in food and elsewhere, it is very appropriate to discuss pleasure in the context of sensory marketing.

Many of the pleasures of food, that is, of eating food, are rather elemental and raw, and hence can be called sensory pleasures.

According to some frameworks (Rozin, 1999), one can partition pleasures into three types: sensory, aesthetic, and mastery. Sensory pleasures are relatively unadorned, such as the taste of sweet, the aroma of chocolate, the feel of massage, the sensations associated with sexual arousal and orgasm. These pleasures are context sensitive, but in the usual experience, where the context is positive and appropriate, they produce a rather simple enjoyment. Although they show adaptation over short periods, they can be experienced hundreds or thousands of times over a period of months to years without declining. A good piece of chocolate is a sensory pleasure today, tomorrow, and every day of the week for a year. Aesthetic pleasures typically have a sensory root, but are more cognitively elaborated, and more likely to be acquired over a period of time (note that Krishna and Elder's chapter in this volume suggests that sensory pleasures are also cognitively elaborated on; thus the distinction between sensory and aesthetic is a matter of degree and type of elaboration). They are often modality specific, as with the enjoyment of Picasso or Mozart, but the representations in the mind/brain that give rise to these pleasures must be many synapses away from primary sensory cortical representations. In the domain of food, the appreciation of fine wines and other elaborated foods constitute sensory derived but yet aesthetic pleasures. A third source of pleasure comes from the sense of mastery, for example, the accomplishment of being able to perform something challenging (from walking, to riding a bicycle, to playing the piano). But just as aesthetic and sensory pleasures are linked, so too are mastery and aesthetic pleasures. Some types of mastery are not instantiated by skills, but rather by appreciation. As one learns to identify different grapes and vintages in the process of becoming a wine connoisseur, there is a sense of aesthetic mastery.

Sensory marketing relates most directly to sensory pleasure. However, since sensations are at the root of most aesthetic and many mastery pleasures, all three types of pleasure have a place in sensory marketing. A sweet taste may be quite simple and sensory; the experience of chocolate has strong basic sensory roots, but it can move into the aesthetic domain as one becomes sensitive to the subtleties of chocolate aroma and the qualities of the mouth-melting experience and informed about the sources and nature of processing of particular chocolates. The pleasures of Mozart are almost incidentally auditory; it is in large part the internal structure, cognitively appreciated, that provides the pleasure. We will focus principally on sensory pleasures, primarily in the domain of food, as we adopt a temporal perspective.

The Temporal Domains of Sensory Pleasure

An experience can last for a moment, a few moments, or an hour or more, for the case of a meal or an opera. A meal is a natural unit of eating
with age people would have a great deal of experience with their hedonic trajectories and become better at anticipating hedonic changes. In fact, there was no improvement at all consequent on more than 20 additional years of experience with oneself.

The inability to predict the effect of exposure on one's future sensory and other preferences is important for marketing, especially since people are typically unaware of how poorly they perform in this domain. Much of the inaccuracy comes from overconfidence that the present reaction to a new entity will be like the future reaction once it has become familiar. People typically both underestimate adaptation (Loewenstein & Frederick, 1997) and underestimate the positive effects of mere exposure on increasing liking. This causes them, for example, to make long-term commitments to products (such as annual subscriptions to an initially engaging magazine) on the assumption that present responses will be sustained, or to fail to give a new product a second chance if the initial response is mildly negative or neutral.

The study of the relations between experienced and remembered pleasure by Kahneman and others (Frederickson, 2000; Frederickson & Kahneman, 1993; Kahneman et al., 1993) has been a particularly fertile area. This research, based almost entirely on hedonically negative experiences, has led to three principles that represent major distortions of experience that occur when the experience is remembered. The hedonic peak (i.e., the most highly valenced point in the experience) and the hedonic state at the end point of the experience have a predominant influence on the memory for the experience (the “peak-end” rule). The peak rule is often apparent, as when a few seconds of discomfort in the dentist chair completely dominates the hedonic memory of a half hour of more or less painless experience. The third rule is described as duration neglect: our memory does not seem to track duration well and tends to remember events and not events. The inability to predict the effect of exposure on one's future sensory and other preferences is important for marketing, especially since people are typically unaware of how poorly they perform in this domain. Much of the inaccuracy comes from overconfidence that the present reaction to a new entity will be like the future reaction once it has become familiar. People typically both underestimate adaptation (Loewenstein & Frederick, 1997) and underestimate the positive effects of mere exposure on increasing liking. This causes them, for example, to make long-term commitments to products (such as annual subscriptions to an initially engaging magazine) on the assumption that present responses will be sustained, or to fail to give a new product a second chance if the initial response is mildly negative or neutral.

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We have extended this work on remembered pleasure into the positive domains of enjoyment of meals (Rode, Rozin, & Durlach, 2007), music (Rozin, Guilhot, & Rozin, in preparation; Rozin, Rozin, & Goldberg, 2004), and art exhibits (Rozin & Taylor, in preparation). We find powerful support for duration neglect; for example, doubling the size of the portion of the favorite food in a meal, which clearly increases experienced pleasure, has no effect on remembered pleasure. On the other hand, we have not found reliable evidence for a peak effect (a particularly
strong effect in an overall evaluation from the favorite paintings in an art exhibit, a favorite musical selection in a "concert," or a favorite dish in a meal. Our own experience suggests a strong peak effect, but we have been unable to find it in controlled laboratory situations. In these studies, we have found about as much evidence for a primacy as an end effect. We still do not know the conditions under which peak, end, and onset come to dominate an experience. We also do not know the conditions that blunt duration neglect, although it is likely that division of an event into distinct segments may be one factor that reduces it (Ariely & Zauberman, 2000).

The disparity between experienced and remembered pleasure has major implications for marketing. At the point of purchase, say in a food store or restaurant, we consult our memory of the food or dish in question, since we do not have direct access to our past experience with it. Hence, the representation of past experiences in memory is the critical base for understanding most current choices. (Obviously, this is not true in cases where a person is actually sampling the choice of foods available or directly comparing items of clothing or pictures.)

Individual and Cultural Differences in ERA Profiles

Individuals vary in the amount of time and importance they devote to experiencing in the moment, rehearsing memories, and anticipating the future (Rozin & Hanko, in preparation). A great meal may last 2 hours, but its memory may be activated for dozens of hours over the following years. And the second visit to the source of the great meal may engage many hours of anticipation. When a person chooses to schedule an anticipated positive event in the near or distant future, he or she is making a choice about whether to increase anticipation, at the cost of having less time to "consume" the memory, or reducing anticipation in order to have more time to remember. People differ in the decisions they make in choices of this sort. So far as our still unpublished data indicate, their pattern of favoring anticipation or memory tends not to be general but rather specific to particular domains (Rozin, Hanko, & Gohar, 2009; Rozin, Remick & Fischler, 2008). Some people, faced with a platter of three foods (say the standard meat, potatoes, and vegetable), consistently eat their favorite food first, others eat their favorite food last, and many do neither. But the people who eat their favorite food first are not more likely to listen to their favorite music first than those who eat their favorite food last (Rozin, Hanko, & Gohar, in preparation).

It is probably true that cultures differ in the importance they bestow on memories versus anticipation (perhaps translatable into the past vs. the future), and it is also likely that the remembered or anticipated balance shifts with age. Older people have the same potential experience anticipating a positive event that will occur in the near future, but will have less opportunity to consume the memory because of a shorter lifespan ahead. The utility of building memories declines with age, even assuming the acuity of memory remains intact! The psychology of savoring and reminiscing, and their tradeoffs, and the parallel psychology of dreading and remembering negative events have many implications for marketing and for optimizing the pleasure of life.

Comforts and Joys

Tibor Scitovsky (1992) draws a distinction between what he calls comforts and pleasures. (We think joy is a better word to describe his important contrast, because it implies a shorter time interval, and we use joy to substitute for pleasure.) In his view, comforts make life easier, they are like good mattresses and air conditioning, and ice dispensers on refrigerators. Joys are unique events, such as a meal, a concert, a meeting with friends. He holds, we think with good reason, that comforts are subject to major adaptation effects and are almost invisible as part of remembered pleasure. Joys, because they are unique events, are well remembered. When we reflect on whether last year was good or not, we do not cite our air conditioning, mattress, or automatic garage door opener. We think of the personal family events, the trips, the plays, movies, concerts, sport events, and so forth. Americans spend disproportionately on comforts compared to the French (Rozin et al., 2009) and presumably do not harvest as much remembered pleasure. This important point relates to duration neglect and adaptation and the idea that what we remember is events, preferably events woven into a narrative.

We have instantiated the comfort-joy distinction with its relationship to remembered pleasure in a simple choice paradigm. We ask people whether, when they go to their favorite restaurant, they order their favorite dish or something new (Rozin et al., 2009). We ask the same question about hearing their favorite musical group or traveling. If you opt for your favorite, you will probably have higher anticipation and a better experience, but you will add little to your memory, since the memory is already in place. The memory of eating the same foie gras recipe twice is about the
The Origin of Preferences

Often, when a person prefers object X to Y (e.g., a food or music), it is the sensory properties that determine the choice. They like X more than they like Y. Likings about food in particular are mostly about sensory matters. Where do these sensory-based likings come from? We are remarkably ignorant in this area, about food, music, sports, sport teams, clothing, or anything else. Psychologists have not been that interested in this area of life, which is of fundamental daily importance and a core issue for marketers and economists (for general reviews on the origin of food and other preferences, see Birch, Fisher, and Grimm-Thomas [1996], Booth [1994], and Rozin [2006a, 2007a]).

In the food domain, as omnivorous animals, humans have a very open-ended attitude toward foods and principally acquire most of their food likes and dislikes under the heavy guidance of culture. There appear to be no innately negative or positive odors (Bartoshuk, 1998), but there is an innate aversion to irritant or extreme oral temperature sensations, bitter, and reasonably strong sour or salty tastes. Sweetness is positive, for some, at any level, and for others up to a high level, at which point it declines as sweetness continues to rise (Pangborn, 1980). People rarely come to dislike sweets through experience, but they frequently come to like innately negative oral properties, such as ice cold beverages, bitter foods or beverages (e.g., coffee), or irritant foods (e.g., foods seasoned with chili pepper). Everything we know suggests that this is a hedonic reversal, that is, the sensory input is unchanged, but its valence inverts from negative to positive. We do not know how this happens, but it is very common (Rozin, 1990).

Three processes have been identified that can change the reaction to a sensory experience. One is mere exposure, which at modest frequencies, tends to enhance liking (Zajonc, 1968). A second is evaluative conditioning, the pairing of a relatively neutral sensory experience (say a mild odor) with an already positive (e.g., sweet) or negative (e.g., bitter) experience. The common phenomenon of acquired taste aversions, in animals and humans, is a result of evaluative conditioning and is easily demonstrated in the laboratory as well as by questionnaire (Pelchat & Rozin, 1983). This Pavlovian process has been studied extensively in the laboratory in animals and clearly produces a change in liking for a taste or flavor stimulus. For humans, evaluative conditioning has been demonstrated many times in the laboratory, usually in the framework of increased liking by continued pairing of a neutral taste or situation with an already positive situation (De Houwer, Thomas, & Baeyens, 2001; Rozin, Wrzesnieswski, & Byrnes, 1998). Although evaluative conditioning is surely important in real world situations, it appears to be a rather fragile phenomenon in the laboratory (Rozin et al., 1998). We do not know why. The third and probably most powerful force for creating likes and dislikes masquerades under the general name of “social influence.” We do not fully understand how it works, but it is clear that under some conditions, the reactions of respected others to a food, piece of music, or clothing can change our liking for it (Birch et al., 1996). Advertisers use all three of these pathways to induce liking for their products. But like psychologists, they do not know how to create likings reliably. All three methods can backfire.

There are two special mechanisms that may be involved in the common conversion of aversions into preferences by humans. These reversals (referred to above) include, on the sensory side, coming to like very cold beverages, bitter or very sour or salty tastes, and oral irritants. Going past the sensory level, these include coming to like the experience of fear (e.g., in roller coasters), disgust (e.g., in disgust humor), and sadness (e.g., with sad music or movies). Since this seems to be a unique human experience, the explanation might be expected to invoke uniquely human processes. Mere exposure and evaluative conditioning are clearly present in animals. Social influence has been demonstrated in animals, but is much more powerful in humans. So one possibility, for sensory or other reversals, is the generally powerful effects of elders and peers during development and in adulthood. Pleasure experienced by others in consumption of something may, perhaps by a link with evaluative conditioning, induce preferences, and there are a few demonstrations of this (Baeyens, Kaes, Eelen, & Silverans, 1996).

The second mechanism, which we have called benign masochism, results from a unique human enjoyment of a negative experience that our mind knows is not threatening. It is a matter of mind over body; we enjoy irritant tastes or disgusting experiences because they are negative, our body responds as if they are, but we know better than our body, and this mastery produces pleasure. It is interesting in this regard that we find that for many chili pepper likers, their favorite level of burn is just below
the level they consider too painful (Rozin, 1990, 2007a: Rozin & Schiller, 1980). Humans seem to enjoy pushing the envelope of bearability and getting pleasure out of it.

One can examine sensory likings, as for food, from a developmental perspective. Here the question is what are the relative roles of parents, peers, the media, and particular influential people in establishing likes and dislikes? Common sense looks primarily to parents who contribute genes, predominant control over the environment for the first 5 years of life, and substantial influence for the rest of childhood. It is thus sobering to realize that within cultures, the correlation between the food or music likes of parents and those of their adult children are very low, usually in the range of .15 to .30 (Rozin, 1991). Values, such as attitudes to abortion, show higher parent-child correlations. If the parents aren't the shaping force, what is? Peers are the most likely principal source, although one study that directly tested this for both food and music preferences found a surprisingly small role for peers, either in elementary school or college (Rozin, Riklis, & Margolis, 2004). We can describe the current situation as the family and the peer paradox.

There is one important finding in this area that comes out of the marketing literature and is not widely known in psychology. Holbrook and Schindler (1989) have shown, particularly for music, that exposure to music styles (presumably peer related) during the ages of 15 and 30 is most influential in creating lifetime preferences. We have gathered supporting data for this point, for music and to some degree for food. It is notable that 15 to 30 years of age is a period of peak peer influence. Somewhere in our 20s or 30s, most Americans settle down and have families and withdraw from the intense peer activity and those strong social influences that characterized their adolescence and young adult years. This is a very promising hint about taste formation.

Some Reflections on Sensory Marketing from the Psychological Perspective

So far as we can tell, to a considerable degree, marketing is a branch of psychology, built principally on prior research in social psychology and the psychology of judgments and decision making. Sensory marketing brings in another branch of psychology, namely the study of sensation and perception. The psychology of sensation and perception is probably the most advanced and "scientific" part of psychology. Historically, it has been based primarily on the description of basic phenomena and functional relations, such as the dark adaptation curve and the laws of color mixing, followed by sophisticated theory and experimentation. Social psychology, in contrast, has accomplished much less than sensation and perception, at least partly because what it is studying is much more complex and multidetermined than the subject of sensation and perception. By its nature, it involves more than one person and often requires the consideration of context, which, as we have discussed already, can be extremely difficult.

Perhaps because social psychology stands at the less accomplished edge of psychology, it has the most potential. There is more to find out. But it is also the most insecure about its natural scientific status and has responded to this by the development of incredible sophistication in the design of experiments and the use of sophisticated statistics to analyze the results. It is focused on the hypothesis-experiment model of science. The art of sophisticated experiment, including proper controls, careful exploration and elimination of alternative explanations, and manipulation checks, has reached a new high in the field. But this has come at a price. Unlike physics, chemistry, biology, and the psychology of sensation and perception, social psychology has paid little attention, and assigns little prestige, to the first stages of science: accurate description of the social world, the identification of fundamental invariances (either within or between cultures), and the description of the fundamental functional relations in the social world (the equivalent of the dark adaptation function, or Boyle’s law in physics). It has focused on the sophisticated testing of hypotheses without first identifying the fundamental things that are to be explained. Erving Goffman, among others, did this, just as Darwin did it for some branches of biology (Haig, 2005; Rozin, 2001, 2006b, 2007b).

This critique of modern social psychology is not original to us: it was stated clearly in 1952 by the great social psychologist of the 20th century Solomon Asch:

Before we inquire into origins and functional relations, it is necessary to know the things we are trying to explain. (Asch, 1952, p. 65)

If there must be principles of scientific method, then surely the first to claim our attention is that one should describe phenomena faithfully and allow them to guide the choice of problems and procedures. If social psychology is to make a contribution to human knowledge, it is to do more than add footnotes to ideas developed in other fields, it must look freely at its phenomena and examine its foundations. (Asch, 1952, p. xv)

The result of this focus on hypothesis testing has been great sophistication in studying the mechanisms of laboratory findings. The findings may or
may not have generality within the laboratory (that is, they may be fragile and dependent on a limited selection of parameters), and they may or may not map onto the real world. The result is that the great majority of experiments are done on American college students. No doubt their visual systems work in the same basic way as that of adults around the world. But their social world, as they enter this peculiar period of life that is a transition between home and independent life, particularly in the United States, is very different from most social worlds of other humans (Arnett, 2008; Rozin, 2001, 2006b). The American college undergraduate is not as good a model for *Homo sapiens* as the fruit fly or *Escherichia coli* is for genetics.

The result is that the premier journal in the field, the *Journal of Personality and Social Psychology* (JPSP), is difficult to read and is about narrowly defined laboratory phenomena and the mechanisms or causes of them. It is not about the phenomena of the social world, and it is not about the domains of life (Rozin, 2007b).

Sadly, in our view, marketing, at least the part that is built on psychology, has adopted the JPSP model, and this can be evidenced in its premier journals. We are hopeful that by integrating the psychology of sensation and perception into marketing, sensory marketing will also turn our attention more to describing the basic phenomena in the world of marketing, as was true in the history of sensation and perception. Description, generality, replicability, and documentation of functional relations should be central in the field. Showing that color matters in food selection is more than doing an experiment on the fact that color (often represented by two different colors) influences food choice in college students. We have to be very careful not to make the mistake of finding a repeatable laboratory paradigm, dependent on the selection of a particular set of parameters from a wide range of possibilities, and analyzing it to death.

From this perspective, it seems most auspicious that sensory marketing brings to bear a great fund of knowledge in sensation and perception and a set of methodologies that are at once highly sophisticated, often quantitative, but soundly based on basic empirical relationships. In its history, sensation and perception went through a period when the Gestalt model, which privileges context, played a central role. It was out of that tradition that Solomon Asch wrote what we consider the great book of the field, *Social Psychology* (1952), which is still very much worth reading. Our challenge in marketing and in social psychology is to be as rigorous as we can be, while at the same time keeping an eye on the real world. We must carefully consider whether what we are modeling in the laboratory is something that is out there. Simplifying is a powerful tool and the heart of experimentation. But too simple borders on the meaningless. Studying human responses to sugar in water has limited value, and studying frozen moments of human facial expressions, while very important and productive, leaves out much of what goes on in the world.

References


