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The Food Domain

Paul Rozin, University of Pennsylvania

In *The Hungry Soul*, Leon Kass (1994) artfully displays his background as both a scientist and humanist in describing the cultural evolution of eating in Western culture from prehistoric to biblical to modern times. His thesis is that eating evolves from a purely biological/nutritive activity to an elaborate set of activities in which the nutritive component is far from dominant. Sitting opposite one another, face-to-face, eating with knife and fork, incorporating food delicately, while conversation exits from the same hole that is ingesting. Disgust is not elicited, though each mouth is filled with a disgusting mass, not visible to the partner who is looking right at the mouth. This demonstration of the exquisite skill of adult eating illustrates how modern eating is a manifestation of civilization, and how the failure to elicit disgust at eating is a sign of being civilized. As Kass notes, "We eat as if we don't have to, we exploit an animal necessity as a ballerina exploits gravity." (p. 158). "In humanized eating, we can nourish our souls even while we feed our bodies." (p. 228). Eating is preadapted to serve many other functions in human culture, including aspects of sociality, refinement, and morality.

The anthropologist Anna Meigs conducted an ethnography of the Hua, a culture in the highlands of New Guinea (Meigs, 1984). Hua thinking about food is deeply influenced by their concept of "*nu*" (vital essence). Each individual has an essence, which incorporates some of their major features, and is passed to others via physical contact, most notably food. Food contains the *nu* of those who gathered it, prepared it, and served it. *Nu* can have positive or negative effects. The Hua are very concerned with protecting men's masculinity in the period around puberty. Just before puberty, men are sequestered in special living quarters. To be protected from the feminizing effect of fertile women's *nu*, for the pubertal years, they are not permitted to consume any foods that have touched a fertile woman. Their food must be grown, prepared, and served by men, or by pre-adolescent or post-menopausal women. This culture is clearly deeply concerned with the contagious, deeply social, influences among people, and food is a major vehicle through which this is negotiated.

Each of these paragraphs presents an important, psychological, and social perspective on food and eating. Most social psychologists, on reading them, would find them interesting and relevant to their field. Yet, these phenomena or perspectives are not familiar to most social psychologists and are referred to in few if any books on social psychology. How could that be?

One simple and reasonable account is that social psychologists are very occupied with a set of other concerns. A second reason has a clear historical root. There are many ways to divide a discipline, but for purposes of organizing a field and its textbooks, one organization usually becomes dominant. For psychology, dating from William James' *Principles of Psychology* (1890), the

organization has been principally by mental processes. Subareas within this frame are things such as memory, perception, thinking and learning. As it evolved, the purity of this particular categorization was compromised, since divisions such as development, social and abnormal do not neatly qualify as processes, let alone mental processes, but psychology continues with a modified, hybrid mental process orientation. The mental process organization is particularly strained in social psychology, which includes some prominent "behavioral" areas, such as cooperation and aggression. However, there does not seem to be a strong impetus to cover all of the relevant domains of life, such as eating, protection (including clothing) and religion.

There are, of course, other possibilities. One refers to domain in the real world. So physics is divided into optics, mechanics and things like that. Anthropology and zoology have adopted a life domains division, with food and eating, shelter, and sex as common components. Life domain organization would include issues such as development and social under each domain. There is no "right" division, but psychology's division tends, by its nature, to downplay the domains of life, including food and eating. The process organization has led to the aim, especially in learning, of discovering general processes, applicable to all domains. History has shown that this process approach definitely has merits, but it causes serious inattention to domain-specific properties.

It is ironic that within psychology, what is probably the most advanced area, sensation and perception, is organized by the equivalent of domains, such as vision, hearing and taste. The organization could have been: stimulus gathering, transduction to neural activity, coding of stimulus attributes, neural representation of stimulus intensity and quality, etc.

When attention does focus on the food/eating domain in psychology, or social psychology, the interest has been focused on one aspect of the area: food intake and its consequences, including body weight (Rozin, 2020). This goes back to the early 20th century and the development of the concept of homeostasis. Homeostasis provided a wonderful physiological and psychological model for food intake, mediated by hunger, and water intake, mediated by thirst. There was no corresponding implementable model for food choice. There were no candidates for specific hungers for about 40 nutrients that were clearly defined and experienced. Regulation of food intake research, largely on rats and mice, dominated the field, and linked to a common and important disorder: obesity. It had the promise, with its clear physiological base, of being something universal. Animal models were predominant, ignoring the complex cultural elaborations of eating, and issues such as impressions, norms, and manners. (see the initial Kass quote). Social psychology picked up the focus on food intake, so that most of the modest amount of food research in the field, much initiated by Stanley Schachter, was about obesity and food intake. For non-psychologist social scientists, or lay people, amount of food intake is a small part of the food world..

THE FOOD/EATING DOMAIN

The food/eating domain is sufficiently important to justify serious attention by social psychologists. This importance has been amply documented in other food/eating review chapters (Rozin, Cohen & Ruby, 2017; Rozin & Todd, 2016) and will only get brief attention here.

Food choice includes the hunting or gathering of food, preparation, serving, and eating of food. All of these activities include a set of associated tools and technologies. Food selection is probably the major force in animal evolution, which is why two major classes of mammals (carnivora and insectivore) are named for their food habits. Food choice is also one of the major forces in human

biological and cultural evolution: tool making, cooking and domestication of plants and animals are major features in human history. In traditional cultures (most of the world's population) , food is the largest category of expenses. In most cultures, the amount of time devoted to food (obtaining, preparing and eating it) is the third highest (following sleep and work) (Rozin, Cohen & Ruby, 2017).

Within the framework of explaining the transition from traditional to modern eating that is taking place around the world, a group of investigators representing four disciplines (anthropology, nutrition, psychology, and sociology) and ten countries (Brazil, China, France, Germany, Ghana, India, Japan, Mexico, Turkey, and the United States) developed a scheme to categorize the basic aspects of food and eating (Sproesser et al., 2019). Analysis of the literature and discussions among the group members led to two divisions: *what* is eaten and *how* it is eaten. Under *what* are six subdivisions: ingredients, processing, preparation, temporal origin (in historical time), spatial origin (e,g., local or global), and variety. Under *how*, there were also six subdivisions: temporal aspects (e.g. regular meals, snacks), spatial aspects (e.g., at home, away), social aspects (e.g. with family, alone), meals (e.g., dessert at end, soft drinks with meal), appreciation (e.g., showing appreciation, wasting food) and concerns (e.g. about quantity and quality). This taxonomy gives a sense of the complexity of understanding diet: in all 12 subdivisions, there are social and/or cultural influences or consequences.

Preadaptation: The Extension Of Food/Eating Activities And Adaptations Into Other Domains

Preadaptation is an important general process in biological and cultural evolution that accounts for many "new" features or traits (Bock, 1959; Mayr, 1960). The basic idea is that a feature that evolved for one purpose can be co-opted to serve another. This allows for novelty to emerge not just from a mutation-like process, but from borrowing of an existing structure, or its genetic program.

Adaptations in the food system may become useful in other areas. For example, disgust, an emotion that arose to guard the body in the food system, became co-opted for many other functions, including social rejection. Food and food exchange, serving basic nutrition functions, became elaborated to function in other systems and have multiple meanings. The extended meanings are illustrated by two scales measuring the meanings of food, One, with a more psychological orientation, identifies five non-nutritional meanings of food: aesthetic, health, moral, social, and spiritual (Arbit, Ruby & Rozin, 2017). Identity is probably an additional meaning. Another approach, also psychological but focused on segmenting categories of humans in their relations to food, identifies three features: importance of food in life, responses to innovativeness/novelty in foods, and ethical responsibility (Brunsø, Birch, Memery, Temesi, Lakner, Lang, Dean, & Grunert, 2021). This instrument derives from a much broader set of dimensions from a widely used food-related lifestyles scale (Grunert, 2020). .

Food Setting The Stage For Different Social Orientations

Another set of issues that have to do with origins reflect the fact that food-related features, particularly those related to food production, can have important influences on social organization, and hence psychology. A striking recent example is based on the fact that growing rice involves a great deal of cooperation, much more than growing wheat. In China, the North has a wheat culture,

whereas the south is more reliant on rice. Talhelm and his colleagues report that Northern Chinese show a more independent and autonomous social orientation, compared to a more interdependent/communal orientation in Southern Chinese. They relate this social orientation difference, a fundamental dimension in cultural psychology, to social values promoted by wheat versus rice farming (Talhelm, Zhang, Oishi, Shimin, Duan, Lan, & Kitayama, 2014). This type of cultural-geographic approach to origins is also a salient part of Nisbett and Cohen's (1996) account of the culture of honor in the American southeast, deriving from a ranching as opposed to farming base.

General Principles That May Originate From The Study Of The Food World

Because food makes such frequent demands upon most animals, it is a convenient domain for studying processes that are not fundamentally about food. So much of learning psychology, both in classical conditioning (think of Pavlov's dogs) and instrumental learning (think of the Skinner box) were carried out within the food system. So much of life involves food, and it is so basic, that many basic adaptations begin there. Two general principles emerge from work on food. The idea of moralization originated from observations of how food took on moral significance (Rozin, 1999). The idea of negativity dominance was inspired by the fact that the negative potency of something like a cockroach, in converting an appetizing food into a disgusting entity, is not even remotely matched by anything that can convert a cockroach to something appetizing (Rozin & Royzman, 2001).

Special Features Of The Food World

The food domain, like any domain of life, presents special, sometimes unique challenges. The natural distribution of food resources requires particular strategies to maximize results, including specializations in navigational and memory systems. This leads to a whole area of research under the heading of optimal foraging (Stephens, Brown, & Ydenberg, 2007). Particularly for meat-eating animals, there is a major challenge in capturing prey. There are many anatomical/functional specializations that support this activity, in animals as different as spiders, anteaters, and lions. In some species, including humans, capture of prey involves a high degree of social coordination.

With respect to evaluation of the quality of foods, generalist animals can connect an ingested food with the physiological consequences that occur hours later. This long-delay learning ability is manifested only in the food domain, in response to the fact that the digestive system imposes a delay between ingestion and most physiological consequences.

With respect to humans in particular, adaptations respond to the demands of a generalist diet. There are cultural adaptations, including a role for tradition in developing ways to enhance or detoxify natural foods (e.g., cooking) and to preselect those foods that are most nutritious and not dangerous. Two features of humans that have special implications in the social domain are a widespread belief that one takes on the properties of what one eats ("you are what you eat") and belief in a principle of contagion. Each has a section below. Both are quintessentially social because, for humans, most foods are touched by other humans in food gathering, preparation, serving, and in some cases, shared at the time of ingestion. It is likely that contagion originated in the food system, although the belief is active in other domains, for example, for clothing.

The meal is a universal social event built around food. For some modern families, in some countries, dinner is the principal time where the family is actually together. Furthermore, in traditional societies in which hunting provides part of the diet, large animals as food strongly encourage sharing.

Food/Eating In Social Psychology

In the past, major social psychologists took at least two "bites" into the food world. During World War II in the United States, with food shortages and rationing, the federal government set up a committee on food habits. Its aim was to find ways to encourage greater utilization of potential foods that were not commonly eaten by Americans, such as organ meats. Kurt Lewin, an eminent social psychologist, headed this committee and was the senior author of the report

Lewin (1943) combined extensive interviews and experiments to create and evaluate ways to change habits. He recognized that the major determinant of what is eaten is what is served, and in 1943, it was usually the mother in the home who made this selection. In one experiment, in one condition, homemakers were exposed to an expert lecture about the virtues of an unfamiliar food (e.g., beef kidneys), including how to prepare it. In a second condition, the expert conferred with a group of subjects, and the group came to a decision, to try the food. The dependent variable was actual servings of the food in the home over the next few weeks, which were much higher in the group-decision condition.

Programmatic study of eating by people identifying themselves as social psychologists began with Stanley Schachter's research on obesity. Ironically, it was not cast in social psychological terms. Instead, Schachter proposed that people of normal weight ate in accordance with the homeostatic principles already described by the physiological psychologists of the day; eating varied as a function of the individual's states of nutritional deficit and surfeit. Whatever the biological processes controlling these states were, they were experienced as hunger and satiety. Schachter termed these feelings *internal cues*. Obese individuals, in contrast, were predicted to be largely unresponsive to internal cues; eating was more controlled by so-called *external cues*, cues related to food and eating, but unrelated to nutritional status (Schachter & Rodin, 1974). Among these were whether or not it was perceived to be mealtime, the mere sight of food, the palatability of the food, and portion size. Schachter also suggested that "what other people are doing" should affect eating in those who were obese to a greater extent than in those of normal weight.

Schachter's "externality" theory of obesity met with mixed experimental results (Rodin, 1981). Part of the problem was that normal weight subjects were heavily influenced by external cues. Schachter's approach was characterized by clever experiments designed to set up reasonably natural eating situations in the laboratory, with appropriate manipulations of amount and quality of food served, and with confederate models.

Schachter had four graduate students who began their careers studying human food intake and obesity. Richard Nisbett did some early important work in this area (e.g., Nisbett, 1972; Nisbett & Storms, 1974) with respect to the externality theory of obesity, suggesting that obese individuals are often dieting, and that it may be their chronic hunger rather than obesity *per se* that produces obese-normal differences in externality. As would be obvious to anyone familiar with social psychology, Nisbett moved away from obesity, and made many major contributions to other areas of the field.

Judith Rodin's early work was on the externality theory of obesity (summarized in Schachter & Rodin, 2014) and was able to refine the theory, and ultimately reject it as a simple distinction between obese and normal weight individuals (Rodin, 1981). Some of her subsequent work on human eating (e.g., Rodin, Silberstein & Striegel-Moore, 1984) will be discussed in the next section. In her later career, Rodin was one of the leaders in establishing the field of health psychology, studying issues such as self control and the promotion of healthy behaviors. The other two students of Schachter, C. Peter Herman and Patricia Pliner, devoted their entire careers to a continuation of the Schachterian experimental approach directed to understanding normal human eating

SOCIAL INFLUENCES ON EATING: STUDIES FROM WITHIN THE FRAMEWORK OF SOCIAL PSYCHOLOGY

Starting in the 1970s, a disciplined, experimentally oriented social psychology of eating developed, centered at the University of Toronto: C. Peter Herman, Patricia Pliner, and Janet Polivy represent the natural blooming of a germ planted by Schachter. Polivy added a clinical perspective and linked the work with Schachter's original interest in obesity. These three people did much of their work in collaboration.

Unlike the case for Schachter, whose major thrust in understanding obesity involved a cognitive theory and empirical tests of it, the research of Herman, Pliner and Polivy is quintessentially social. Their contribution constitutes a major part of what we know about social influences on eating, from an experimental perspective, principally from research on Canadian college students. Herman, Polivy, Pliner and their former student, Lenny Vartanian, have written an excellent book *Social Influences on eating*, published in 2019, which summarizes what is known. Much of this section is a summary of their book.

As mentioned in the book, and also by Rozin (2020), while food intake was a major concern in psychology, it was carried out largely with rats. Rats do not have much social life in their small individual cages, and social factors in eating were thought of primarily as irritating noise. The homeostatic model has not been very successful in explaining human food intake. It definitely operates in humans, but social and cultural factors are usually more important. For example, two totally amnesic people, who could not remember at all what had happened more than a minute ago but were otherwise intact, were each given three identical full lunches of foods they liked (Rozin, Dow, Rajaram, & Moscovitch, 1998). The meals were separated from the next meal by some minutes. The two amnesics readily consumed the second full lunch, and at least started, in some cases completed, the third. Minimal homeostasis here, and no memory for having just eaten. Faced with a palatable, normal size meal, they ate it. Their intake was controlled primarily by social factors, the norm of what it is appropriate to eat.

Herman et al.'s (2019) model of human food intake puts social influences at the center. Their theory of normal human eating is that humans faced with palatable food will try to maximize their intake without eating appreciably more than is appropriate, as represented by internalized cultural norms or immediate information, such as models (what others in the situation are eating). Homeostatic factors act primarily in more extreme conditions of deprivation or surfeit, conditions that are not often encountered by most people in most countries. Throughout the work in this area by the University of Toronto group (Herman et al., 2003, 2019) and a British group led by Higgs (Higgs &

Thomas, 1916), there has been a strong emphasis on the power of social influences, primarily descriptive norms of appropriateness.

Food choice (as opposed to intake) was obviously heavily influenced by culture, and was not susceptible to a homeostatic model. Also, for food choice there is not that great dependent variable, body weight (Rozin, 2020). As a result, human food choice remained a backwater in psychology until the last 30 years. After working for some time with Herman and Polivy, Patricia Pliner veered off and primarily studied human food choice, using both experimental social psychology techniques and questionnaires. Her work included special attention to reactions to novel foods. The work of Pliner and some others on food choice is integrated with the description of human eating in this section, and is summarized in Herman et al., 2019. They point out that at least three social processes influence eating: modeling, impression formation and management, and social facilitation
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Modeling

The basic finding is that the amount that college students eat is affected by the amount others eat in their environment.. The frame for these studies is a situation in which there is a task that does not dictate an amount to be eaten. Often, it is a taste test, in which participants rate how much they like some foods, with abundant amounts of each food available. These are between-subject, single-session experiments. The norms or model are presented by either a confederate or information casually made available: data sheets inadvertently left out or wrappers or other material cues about how much the last person consumed. The foods are usually snacks. With this type of design, models or norms have a substantial influence on the amount consumed. The initial demonstration of this, out of Stanley Schachter's group, was by Nisbett and Storms (1974).

Under many circumstances, the amount consumed by a model is a better predicter of the amount consumed by a participant than the state of deprivation of the participant (e.g., Goldman, Herman & Polivy, 1991). There is an asymmetry: models eating a small amount have a bigger influence on an eater than models eating a larger amount (Vartanian, Sokol, Herman & Polivy, 2013).

There are three manifestations of social influence. Most generally, the model (or evidence of the eating of a model) influences the eater's consumption in the direction of the model (but usually less extreme than a fairly extreme model). Second, the eater matches the consumption of the model. Third the eater actually mimics the eating behavior of the live model, bite by bite (Hermans, Lichtwarck-Aschoff, Bevelander, Herman, Larsen, & Engels, 2012).

Presumably, in the absence of any evidence of what others have eaten, a person has some representation in their head of cultural norms. It is difficult to create a situation in which this is not true, but in some studies, people consume a liquid diet through a straw, and cannot see the depleting levels in a container. These are conditions used to successfully demonstrate the control of homeostatic factors (Stellar, 1967). Solo eaters, consuming soup, consume more when the bowl is contrived to drain slowly, and less when it seems to drain rapidly. This, monitoring of amount eaten, seems to trick people into following what appears to be a norm, as opposed to using their energy deprivation as a guide to eating (Wansink, Painte & North, 2005). Similarly, in the amnesia study described earlier, the implication is that the memory of how much has been recently eaten, rather than internal signals, determines intake.

Modeling works for different types of food. Most of the foods used have been snacks or desserts (reviewed in Vartanian, Spanos, Herman & Polivy, 2015). The body size of the confederate matters, with obese models having less influence (e.g., McFerran, Dahl, Fitzsimmons & Morales, 2010). There is mixed evidence on whether the modeling results are based on informational or normative social influence, or perhaps both. For example, desire to affiliate does not consistently correlate with how effective the model is. When measured, participants' judgments about what is appropriate (informational social influence) are influenced by the model's behavior (Vartanian et al, 2013), but it is not clear why the participant should be uncertain about appropriate amounts after decades of eating experiences. Maybe the experimental set up is novel, so there is uncertainty. There is some evidence for normative social influence (e.g., positive correlations between need to affiliate and effectiveness of models), but modeling effects occur in the absence of physical models, so whose positive opinion is being sought?

There are many open questions about why modeling is effective. The well-controlled protocols in the modeling studies allow for conclusions about the effectiveness of certain variables, but the narrowness of the contexts limit generalizability. The great majority of studies primarily use White young adults, with single models, and well-defined units of sweet or savory snacks. There may be no studies with multiple models combined with full meals. One study with multiple models suggests that the modeling effect is reduced when the multiple models vary a lot in their intake: This is not informative about what an appropriate portion is.

Three recent reviews of modeling, in addition to Herman et al. (2019), summarize the literature in the form of a meta-analysis. Because of differences in inclusion criteria, one included 69 studies (Cruwys, Bevelander, & Hermans, 2015), one 38 (Vartanian, Spanos, Herman, & Polivy, 2015), and one 15 (Robinson, Thomas, Aveyard, & Higgs, 2014). Almost all the reviewed studies involved undergraduate subjects, and the clear majority measured intake rather than choice. A few conclusions emerge from the reviews. Modeling is a robust phenomenon, surprisingly unaffected by live versus remote sources of the relevant information. Effects tend to be bigger for women and bigger if the source of norm information comes from either a personally relevant or admired group. Properties of the subject (other than gender) linked to effect size are inconsistent. A major question, often addressed in the four review sources mentioned: What is the mechanism of social influence? This is a deep question for all of social psychology, treated in the later discussion of the process of learning about foods and norms.

Just as food intake studies in psychology have focused on curbing appetite and reducing obesity, in recent decades, food choice studies have often centered on encouraging greater intake and preference (and liking) for "healthy" foods, often exemplified by fruits and vegetables. In general, among adults and children, vegetables are not rated as the most palatable foods, so there has been an effort to increase vegetable preference. A fair amount of this work is on children, with the general idea that habits established in childhood are likely to continue into adulthood.

Especially in working with children, it is preferable to utilize real foods and direct measures of ingestion (actually choosing to eat and then eating A or B). There were early and valuable studies by Duncker (1938) and Marinho (1942), supporting a positive effect of modeling, but much of the definitive work on both food intake and food choice in children has been done by the American developmental psychologist ,Leann Birch. She used simplified tasks to measure preference, including rank ordering of a few choices of real foods, with subsequent consumption of the preferred food. In Birch's (1980) classic study, nursery school children had their preferences assessed for nine vegetables. In subsequent sessions, all carried out in the nursery school, a target

child for whom food A was low in preference, was seated at a table with 3 or 4 children who had a high preference for A. Preference ranking for the target food rose substantially, and this effect was still present 8 weeks later. More recent studies support this finding, sometimes using video presentations with stories and appealing characters (e.g., Horne et al., 2004). Apparently, children are more influenced by older children as models (e.g., Duncker, 1938), but there is no evidence that adult models (e.g., teachers) are more influential than peers.

Positive effects have been reported for modeling in adults. For example, in one study, the choice was between a healthy snack and an unhealthy snack, with the measure being which was preferred in a subsequent taste test. Choice of the healthy snack was much more frequent when it was modeled (evidenced by wrappers "left out" from a previous participant; Burger et al., 2010). Some other modeling effects show less substantial results. Modeling effects (measured as amount of a particular food consumed in these studies) were more robust if the food in question was palatable (sweet, high in calories). Most of the participants in these studies were North American college undergraduates. Although many modeling studies have been done with "healthy" and "unhealthy" foods, some have explored other dimensions. Thus, if a model consistently chooses the unfamiliar food in a paired familiar-unfamiliar choice, the participant is more likely to do so as well, when facing the same choices (Hobden & Pliner, 1995).

Other types of norm information can replace the presence of specific models. Several studies, in the laboratory (Robinson, Fleming & Higgs, 2014) or in a cafeteria setting (Mollen et al., 2013) recorded choices between two foods, that were actually consumed. Generally, signs invoking descriptive norms (emphasizing the popularity of a particular food) were effective in increasing choice of that food, whereas signs presenting injunctive norms (what one should do) produced no enhancement in preferences (at the same level as participants not exposed to any signs). Generally, influence effects showed reliably for individuals who had a low preference for the target food. If the norm information referred to a positively regarded group with which participants share an identity, it was more likely to influence behavior (Stok et al., 2012).

One account of the basic modeling finding is that it provides information about appropriateness. The assumption is that people are motivated to behave in a culturally appropriate way. Some choices are indifferent with respect to cultural norms, as for example choosing a chicken wing or thigh, in which case modeling should be less effective, and some evidence supports this. A second factor, relevant only to the food choice situation, is that the model provides reassurance that the food is safe to eat. This would obviously refer primarily to unfamiliar foods but given that many health effects of particular foods manifest only after years of high levels of consumption, the model could easily be construed to be either ignorant or unconcerned. The effects of food on body weight fall between the immediate and long-term effects. A third possible factor is reassurance that the food does not taste bad. This can be most effectively relieved by observation of the model's reaction to tasting the food.

We do not know the limiting conditions for the effects reported. Very few studies evaluate subjects some time after the manipulation. That makes for more difficult studies and it is hoped that if something causes a change in intake or preference, repetitions of that situation many times may have a lasting effect. Of course, sometimes even a single instance can have a lasting effect. If a model gets a person to try a food that the person thought would taste bad, and the person actually likes it, a permanent change may have been accomplished. And given that multiple samplings of a food tend to increase liking, a few or more modeling instances might be very effective over longer time intervals.

Besides the limitation of the common use of single instances and immediate tests, the literature is primarily about North American undergraduates, primarily women. Generalization of results to students in other WEIRD (White Educated Industrialized Rich Democratic) countries is likely, but that still leaves questions about the great majority of people, who are from non-WEIRD countries and those adults above college age.

Consumption Stereotypes And Impression Management

Food consumption and choice typically occur before an audience. The family is probably the most common audience, but especially in WEIRD countries, eating also occurs in the presence of friends, a selected public in restaurants, or a more general public on the street. There is ample opportunity to develop consumption stereotypes, that is, judgments of others based on their food intake or food choice. *How* foods are eaten, a potentially informative feature of eating (think of a messy eater) has been studied very little in the experimental social psychology of eating. Consumption stereotypes allow for impression management, to confirm or disconfirm those stereotypes for an individual eater.

This section will begin with the food intake findings, followed by the results on food choice. In most research, amount eaten is indicated by direct observation, live or by video, or indirectly, via food diaries or evidence from wrappers or other post residues of consumption. In addition, there is a bodily feature, heaviness, that is a rough indicator of consistent patterns of high or low caloric intake. To establish and understand impressions, three things are assessed. First, the facts about the basis for stereotypes, such as that women actually eat less than men. Second, the beliefs that constitute the stereotypes, e.g., that women eat less than men. Third, the demonstration that these beliefs motivate impression management.

A number of studies have shown that a college-age woman who eats large meals is rated more masculine and less feminine than one who eats small meals (meal composition is held constant) (e.g., Vartanian, 2000). For various judgments of traits, gender of target and rater matters in some cases, as does body size of the target. Also, intake of the target relative to the self may matter. For women, rated likability of the target was higher if the target ate more. This result may derive from more satisfaction of the subject that her intake was appropriate. Women usually eat less in the presence of age-appropriate men, presumably to create a more feminine impression (Mori, Chaiken & Pliner, 1987). In support of the idea that impression management is the motive for eating less, North American undergraduate women eat less when observing themselves in a mirror (Pliner & Luppa, 1978). In general, there are not many studies on impressions based on intake, and there is some inconsistency in results.

For food choice, Haire (1950) presented shopping lists for students planning a party. One critical item is varied between two lists, in a between-subjects design. For example, Nescafe instant coffee (versus Maxwell House regular) conveys thrifty and not planful. Oakes and Slotterback (2001) got impressions of different foods by name versus nutrient profile, in terms of ratings of “good” or “healthy”. They found fat level was the feature most determinative of a food being classified as healthy or unhealthy. Generally, Americans have poor knowledge of nutrition, so judgments of “healthy” are often faulty (Rozin, Ashmore & Markwith, 1996). This will affect impressions, of course.

Stein and Nemeroff (1995), working with American undergraduates, varied the healthiness of the diet typically consumed, but kept everything else in the impressions material the same for all groups. Thus, any differences in impressions between groups had to be attributable to the typical diets, since eveything else was identical, Perhaps not surprisingly, the healthy food eater was rated as more likable and more feminine. The healthy food eater was also rated as more moral. The link between health and morality has a long history. On the other side, the "non-healthy" eaters are not negative on all dimensions; one study reports that they are rated as less boring and more fun (Barker, Tandy, & Stookey, 1999). Few studies test accuracy, a critical aspect of impressions, e.g., whether healthy eaters are actually more feminine or more moral.

Some literature on impression management addresses gendered impressions. As noted, women eat more of foods rated as "feminine," with the parallel effect for "masculine" foods and men (Rozin, Hormes, Faith & Wansink, 2012). Both men and women students who eat "masculine foods" (e.g., meat) are rated more masculine, and more feminine if they eat female foods (e.g., salad) (Mooney & Lorenz, 1997). On a questionnaire, when ordering from a menu, men (North American undergraduates) are less likely to order a small cut of steak when it is described as a lady's cut (White & Dahl, 2006). This effect is larger when the situation is described as public (as opposed to private), and is also larger for individuals who score higher on a measure of self-presentational concern. Along the same lines, Gal and Wilkie (2010) demonstrate that men prefer masculine "named" foods more than "feminine named" foods, an effect that is greater when masculinity is threatened, and reduced when cognitive resources are challenged. Finally, young adult men face a conflict, because eating lightly is positive but feminine; most men, faced with this conflict, eat lightly when doing impression management (Pliner & Chaiken 1990).

Appropriate norms have a major effect in impression management and in the control of food intake. Portion size is a major determinant of intake and is a clear example of an appropriateness norm about the right amount to eat as a function of type of eating occasion. For example, in many countries, one eats less and is offered less at breakfast or snacks than at dinner. Also, recall of amount consumed recently is a major influence on how much is consumed (Herman et al., 2019; Rozin et al., 1998). A previous snack should inhibit eating less than a previous meal. This is usually confounded by amount previously eaten (snacks involve less food), but two studies unconfounded this. Individuals who consume a snack of dinner foods eat less at a later eating occasion than individuals eating the same number of calories as snack foods (e.g., popcorn) (Capaldi, Owens & Privatera, 2006). Individuals eating small portions of food in the context of a snack (e.g., standing up) eat more food in a subsequent eating occasion than those eating the same food in the context of a meal (Pliner & Zec, 2007).

There is a question about how important impression management is in terms of either amount or healthiness of foods. Results of a self-report study with German adults who rate the importance of different factors that cause them to choose foods, indicate that social influences rank lowest among 15 categories of events (Renner et al., 2012).

Social Facilitation Of Amount Consumed

People generally eat more, often substantially more, when they are in social settings. This robust effect was reported by John de Castro, who demonstrated it in a number of contexts and revealed some of the limiting factors (de Castro & de Castro, 1989; de Castro, 1997). There are two features of socially facilitated eating. One is that within a reasonable range, the greater the number of

participants in a meal, the more per capita intake goes up, with the biggest per capita rise appearing in the jump from 1 to 2 participants. The second feature is that social facilitation is more substantial and more reliable if the eaters have a close relationship: family or friends.

Much of de Castro's work on this phenomenon has been directed to explanations. Work by de Castro and others has eliminated some reasonable accounts, such as that it is caused primarily by social facilitation of hunger, arousal, or emotion. (Hungry or aroused eaters eat at a more rapid rate, which is not true of socially facilitated eaters.) People tend to eat more when distracted, but distraction cannot account for the phenomenon. De Castro and others came to the realization that the principal cause is that social meals (among those with a relationship) take longer. With more time at the table, and abundant food, more is consumed. Of course, the presence of abundant food is a necessary prerequisite to see the social facilitation effect which means in experiments, abundant food must be offered to the solitary consumer control.

A particularly clean demonstration of a controlled duration effect in a laboratory meal setting, employed groups of 1, 2 or 4 American adults, presented with the same food for either 12 or 36 minutes (Pliner et al., 2006). As expected, more food was consumed in 36 minutes than 12 minutes, in all (1, 2 4) groups. But critically for the duration account, amount consumed at either fixed time interval was about the same for the three different group sizes.

Apparently, people anticipate eating more in groups, because they order more when about to eat in a group. A record was kept in a restaurant in Italy of how big an eating group was, and how much was ordered. More food was ordered, per capita, the bigger the party (Cavazza, Graziani & Guidetti, 2011). Leftover amounts were small and not different (per capita) for the different groups. So there is social facilitation of both ordering and ingestion.

Gender Differences In Food And Eating

Discussions of food and eating, particularly in North American culture, engage gender issues. This is apparent in the discussion above of the social psychology of food and eating. Some of the most substantial behavioral and attitudinal differences between females and males occur in the food domain. For example, in the United States, anorexia nervosa occurs with a prevalence 5 to 11 times as high in females as opposed to males (Udom & Grilo, 2018). A geographically dispersed large sample of American undergraduates in the year 2000, reveals that 65% of females are "concerned about being overweight" at least some of the time, compared to 33% of males, and 41% of females, as opposed to 18% of males are "currently on a diet" (Rozin, Bauer & Catanese, 2003).

The understanding of the relationships between North American women and their bodies constituted a major thrust of Judith Rodin's research in the1980s. In a classic review paper in 1984, entitled "Women and weight: a normative discontent", Rodin, Silberstein, and Striegel-Moore presented a sequence of evidenced claims that formed the basis for subsequent research, and engaged many important concepts in social psychology. The claims are presented here in sequence, with the understanding that in the article, each was followed by evidence and discussion.

"Obesity is a strongly stigmatized condition"; "Being attractive is extremely important in our society"; "The female sex-role stereotype prescribes preoccupation with and pursuit of beauty"; "Being thin is a central feature of contemporary ideals of female attractiveness"; "The contemporary beauty ideal of 'thinness equals attractiveness' prescribes a body weight that for most women is unrealistically low due to biological factors"; "Women's repeated weight-reduction attempts serve

to disregulate their metabolic systems and make attainment of the thin ideal even more unlikely"; "Females internalize society's message that they should care a great deal about how they look"; "Women possess highly differentiated concepts both of their own bodies and of the ideal female figure, and discrepancies between the two invoke self-criticism"; "Women's pursuit of thinness is a form of competition and achievement behavior"; "Weight has come to be a metaphor for women"; "Women's concern with weight seem not to diminish as they cast off other sex-role traditions" ; "Shame is a salient emotion in women's relation to their bodies". (Rodin et al.,1984).

Recent meta-analyses confirm that womens dissatisfaction with their bodies (in contrast to men) continued until close to the present time (2023) (Grzymisławska, Puch, E. Zawada, & Grzymisławski, 2020; He, Sun, Zickgraf, Lin & Fan, 2020). However, there is evidence that over the last 30 years, the female concerns are lessening, while much lower male concerns have remained stable through about 2016 (Karazsiz, Murnen & Tylka, 2017).

A number of interesting social psychological issues, all following from Rodin's classic paper (Rodin et al., 1984) are worthy of mention.

The stigma of obesity, and often associated discrimination, is substantial, broad based (e.g. in personal relations, employment, the media) and not declining over recent decades (Puhl, Himmelstein & Pearl, 2020). Stigma has been a topic of interest in social psychology, and overweight and obesity (or perceived overweight and obesity) have some distinctive properties. Unlike many stigmatized features, one "wears" one's weight. Also, in popular judgments, one is responsible for one's obesity, so it is perceived to be a failure of self-control. This view is typically shared with respect to themselves by people who perceive themselves to be too fat. Ironically, recent data suggests that experience of weight stigma is associated with poor control of food intake, lower levels of exercise, and measures of increased psychological and physiological stress. There is evidence that there is a causal link between stigma and maladaptive responses and that some of these effects result from internalization of the judgments producing the stigma (Puhl et al., 2020).

There seem to be two components to female body dissatisfaction and dieting. One is the sense that one is overweight, and the second is that this is important and requires action (e.g. dieting). (Cash, 2010; Rozin & Fallon, 1988). A study of body attitudes and dieting in American college students and their parents reveals a clear feeling of overweight in male and female parents, but only the female undergraduates (Rozin & Fallon, 1988). Females of both generations diet, because of the confluence of dissatisfaction and the feeling that this is important. The male parents, however, though dissatisfied with their weight are not inclined to diet, because it just isn't that important.

Rodin et al (1984) note that there is a competitiveness among women with respect to achieving and maintaining thinness.. Although being attractive to males is an acknowledged motivational force for dieting in females, it is notable that the ideal body shape of American female college students and their parents is thinner than what the females judge to be most attractive to their male age mates (Rozin & Fallon, 1988). In support of the importance of other women in female feelings about their body shape, there are some experimental results that show that with respect to body shape, men are less influenced by models than are women (Pliner & Chaiken, 1990).

The greater concern by females about their physical appearance, including body shape, is almost certainly related to the fact that, cross culturally, physical appearance is more important in male than female mate selection. There is also evidence that females are generally more nurturant than males, something documented in the food domain by greater concern expressed by American females than males about the quality of the diet in those they are close to (Rozin, Bauer & Catanese,

2003). Females across a wide range of (23) countries are more likely than males to be dieting, more concerned about healthy eating, and more likely to report eating a healthier diet. Dieting accounts for some but not all of the healthier eating. Of course healthier eating might be reflected in appearance, but it is likely that some of the motivation for healthy eating, in self and others, is related to greater nurturance and concerns about wellness.

Summary

The work reviewed in this section certainly confirms that several basic phenomena and principles of social psychology clearly operate in the domain of food and eating. This includes modeling, impression formation and management, norms, as well as social facilitation. In explaining their behavior, people show an overreliance on internal accounts (e.g., hunger) and inadequate appreciation of social influences (Spanos et al., 2015; Vartanian, Herman & Wansink, 2008). This effect is especially clear for judgments about the self rather than others, and for social influences represented by appropriateness norms. The major gender differences, which also have a predominantly social basis, have been documented almost entirely in Western-developed countries. It will be of great interest to determine how globalization impacts gender differences in traditional cultures. The thin ideal is a relatively recent event in the Western/developed world, and there are indications that it is penetrating the countries in the less developed, traditional world via adoption in the upper socioeconomic classes.

MEALS AND COMMENSALITY

In the *The Hungry Soul*, Leon Kass proposes that although the meal is a nutritive event, it has been elevated to a display of civilized discourse, at least in certain parts of humanity. Similarly, the distinguished sociologist, George Simmel, in an article on the sociology of the meal (1910/1997), notes that the sociological structure of the meal links "the exclusive selfishness of eating"…" with a habit of being gathered together such as is seldom attainable on occasions of a higher and intellectual order. Persons who in no way share any special interest can gather at the common meal – in this possibility, associated with the primitiveness and hence universal nature of material interest, there lies the immeasurable sociological significance of the meal." "The meal "arranges itself in a more aesthetic, stylized, and supra-individually regulated form." (pp.130-131)

Kass, in accordance with Simmel, emphasizes the refined table manners of eating, as it accomplishes a "dirty" biological function. (The French director, Bunuel, in the *Phantom of Liberty*, conveys a scene at a French dinner party in which defecation is the refined, at-the-dinner-table, social event, and eating is done in a private "bathroom." The absurdity of this is a source for much amusement). In a similar fashion, anthropologist Jack Goody cites the Prophet Muhammad: "Eat together, and do not eat separately, for the blessing is with the company." Goody further contrasts eating with excretion, observing: "Public input, private output. Eating alone is the equivalent of shitting publicly." (Goody, 1982, p. 206). The French philosopher Michel de Montaigne, downplaying food against company, puts it this way: "One must be careful not so much of what one eats as with whom one eats. There is no dish so sweet to me, and no sauce so appetizing as the pleasure derived from good company" (cited in Fischler, 2011, p. 531).

Some of all this has the sense of being limited to upper classes, but, absent the full set of refinements, the lower-class meal still is a quintessentially social event. In the 21st century United

States, the meal is probably the major occasion for expressions of family solidarity and family verbal exchanges. And the meal, in the form of a feast, is at the center of celebrations. The meal is often a part of the early (and later) stages of romantic involvement. The restaurant, as a locus for a meal away from home, is a social place which is a more and more popular part of the human experience. General discussions of the meal from a psychological perspective can be found in Meiselman (2000) and Pliner and Rozin (2000).

The meal is virtually universal in the human world, and it is typically a highly structured event (Douglas, 1971). It goes way back in human pre-history (Jones, 2008). Eating in defined temporal periods is characteristic of most non-grazing mammals, but it is not typically accompanied by refinements, conversation and sharing. Extended periods of peaceful sharing of food is an unusual event for most non-human mammals (Jones, 2008). Julier (2013) documents the centrality of food in American social life, from family events to entertaining of others. In many families there are two types of main meals, as documented by Cappellini and Parsons (2012). The weekday meal is thrifty and usually exclusive for members of the immediate family, whereas weekend (often just Sunday) meals, or celebratory occasion meals are more extravagant, and open to guests.

Eating Alone

The inverse of eating together at meals is eating alone. Although this may be becoming more common, at least in WEIRD cultures (Henrich, Heine & Norenzayan, 2010), it remains a noticed behavior, and one which is at least somewhat stigmatized. There is much evidence for this from North America, where "for many, if not most, people a solitary meal is a highly undesirable situation and, in some cases, not a meal at all." (Pliner and Bell, 2009). In a fishing village in Indonesia, being observed to be eating alone elicits shame in the eater. This is described in an article whose title begins: "Never eat alone…." (Fessler, 2005). In Japan, "drinking alone" (*hitorizake*) indicates an individual on the verge of becoming a social nonentity (Tierney & Ohnuki-Tierney, 2012).

Most meals seem to be eaten together; in Western contexts breakfast is most likely to be consumed alone, and dinner most likely to be consumed together, and with family (Sobal & Nelson, 2003). As for associations with eating alone, a large study in Thailand reports that frequency of eating alone is substantially related to being unhappy (Yiengprugsawan et al., 2015).

Family Meals

By 10 years of age, a child has eaten about 10,000 meals, primarily in a family setting (Dallacker, Hertwig and Mata, 2016). There is ample time here for socialization. As well, there would be many opportunities to bond with other eaters, and to develop communal attachments and identities. Suggesting a nostalgic glorification of the family meal in America, Cinotto (2006), in a historical analysis, notes that: "The ideal of the proper family mealtime, originally devised by the Victorian middle class, gained cultural hegemony in modern America, but with the partial exception of the 1950s, only a minority of American families could ever live by it." (p. 17)

A general view among researchers (and perhaps among health professionals and others) is that family meals are good things, and are particularly good for health and family function. There is also a concern that family meals are declining in the Western-developed world. This is probably the reason for a substantial effort to measure the effects of family meals. Three recent meta-analyses on

the correlates (possibly effects) of family meals (Dallacker, Hertwig & Mata, 2016, 2019; Robson, McCullough, Rex, Munafò & Taylor, 2020) suggest weak but positive and significant correlations between the frequency of family meals and a range of measures of physical health, healthy nutrient consumption and family function.

Perhaps the most likely way that frequency of family meals could affect food intake, encourage healthier eating, and improve family function is role modeling (Herman. Polivy & Roth, 2003). More frequent family meals mean more contact at meals with parents, the principal sources of socialization. A few studies have shown that children's nutritional health is better when their parents consume more vegetables (Dallacker et al., 2016, Draxten, Fulkerson, Friend, Flattum, & Schow, 2014).

In the meta-analyses, weak but positive and significant correlates of family meal frequency were having the TV off during meals, food quality, positive atmosphere, and longer meal duration (Dallacker et al, 2016). Correlations between family meal frequency and positive family function are larger than the correlations between family meal frequency and physical health (Robson et al., 2020). Of course, all these effects could result from a third variable that correlates with both family meal frequency and these other features. It is difficult to move from correlation to causation in this setting.

The family meal is surely a focus for socialization of manners, preferences, and attitudes. It is also a prime occasion for socialization of features not directly related to food, such as conversational rules and moral values (e.g. Ochs & Shohet, 2006). An analysis of dinner meals in 40 middle-class White families in the Northeastern United States, based on both interview and direct observation, showed substantial similarity across families. Many of the interactions involved teaching the children, with some interactions characterized as "discipline" (Dreyer & Dreyer, 1973). The pattern of influences in terms of causation is complex. In a Scottish sample of 5 year olds, 76% of the mothers report that mealtimes are usually enjoyable for everyone, and 81% say that meal times usually provide "time to talk to each other" (Skafida, 2013).

The Media/Digitally Modified Meal

The world is being transformed by the power of the media and by the global spread of digital technology. It would be odd if eating and the meal were immune to this, and they are not. The meal "decline" may have been initially fostered by radio, followed by television and now the cell phone and the internet. A US national survey found that 63% of 8–18 year olds said that the television is usually on during meals (cited in Ferdous, Ploderer, Davis, Vetere& O'Hara, 2016). A Mintel survey in 2001 found that three-quarters of British families had abandoned regular meals, and 20% never sat down together to eat (cited in Spence et al., 2019). The basic concern is that the digital advances threaten the core of the family meal: direct interactions (largely verbal) of family members, and marginalization of the food experience. Doubtless, something like this is happening, but there may be a positive side. For example, digital technology can enhance the meal experience (e.g., with appropriate musical background to the foods), introduce a subject for conversation (e.g., from a mutually watched television program), and introduce sociality into the meal of a solitary eater by digitally shared meals (Ferdous et al., 2016; Spence, 2017; Spence, Mancini & Huisman, 2019).

One development of particular interest is what has been called "food porn." One researched example of this is called "mukbang," a Korean term meaning "eating broadcast." This is very popular

in Korea, and interest is growing steadily. A study of this phenomenon (Kang, Lee, Kim, & Yun, 2020) employed analysis of media options and use (as for example from YouTube) and also a survey of Koreans. The principal content of Mukbang involves a solo creator, who communicates with the viewer by overeating. Overeating appeared in 86.5% of cases, and this is a very popular format. Many people ate while watching Mukbang. The authors cited evidence that watching mukbang was associated with a decline in healthiness of diet. This potentially health-threatening activity, is also popular in the United States.

Digital and media advances specifically threaten two fundamental aspects of the meal: attention to the food (which when absent often leads to overeating) and interference with the normal social interaction associated with the meal. They can also lead to the abandonment of the meal as a social occasion.

An interview/observational study of six diverse Australian families, explored the ways that the digital world interacted with meals (Ferdous et al., 2016). A wide range of activities included allowing cell phones at the table but not allowing the initiation of calls, focusing conversation around television programs, forbidding certain media from the dinner table (but often not at other meals), addition of musical backgrounds, particularly at weekend or celebratory meals, and situations in which digital features are integrated with the meal. The meal was often transformed, but not always in a way that destroyed its integrity. The future of meals is surely going to change over coming decades: The importance of the food will probably decline, and interaction with fellow diners will almost certainly decrease, perhaps with supplementation of contacts with others not at the table.

Commensality

Commensality literally means eating at the same table (*mensa*), but a broader definition is "eating with other people"' (Sobal & Nelson, 2003). Grignon (2001) points out that there is an exclusionary side to commensality: who is not invited to dinner. There is a modest literature on commensality: A 2021 review reports 61 studies, with 52 described as qualitative and 9 as quantitative (Scander, Yngve, & Lennernäs Wiklund, 2021). Informed discussions of commensality have been authored by Fischler (2011), Giacoman, (2016) and Sobal (2000).

Eating together can mean a number of things: eating at the same table, eating the same food, sharing the same food, or sharing substance while sharing the same food (consubstantiation, e.g., sharing saliva or personal "essences" transmitted by physical contact. This is discussed later in this section and in the later section on contagion). The discussion here moves from the least intimate to the most intimate interactions.

A range of authors opine that commensality promotes bonding with others at the meal, as well as promoting identification with the group represented by both the food and the participants (e.g., Bloch, 1999; Cappellini & Parsons, 2012:, Dunbar, 2017; Fischler, 2011; Giocoman, 2016; Simmel, 1910/1997; Sobal, 2000). Suggestions of the commensality-bonding link, which seems likely, are much more frequent than direct evidence for it. And convincing evidence for a causal link is absent. Experiment, the best way to establish causation is very difficult, especially because it is a pattern of commensality, as opposed to a single commensal experience, that is likely to be necessary to get an effect, If a causal link could be established, it would then be important to identify which aspects of

commensality might be critical. The next sections explore two candidates, sharing and consubstantiation (shared substance)

Extended discussions of commensality are available, with an empirical base in interviews and observations of family meals in Britain (Cappellini & Parsons, 2012) and interviews with commensal family, work, and friend groups in Chile (Giacoman, 2016). What emerges is the basic idea that commensality encourages interactions, food sharing, and enacting certain norms (such as table manners), all of which, according to the interviewees, encourage bonding and group cohesiveness (Giacoman, 2016). Social interactions including shared food, information, and reciprocity, mesh with the satisfaction of observing and engaging in rituals and norms such as table manners. Giacoman confirms Sobal's (2000) apt suggestion that we are not only what we eat; we are also the people with whom we eat. However, Giacoman cautions that some of the potentially bonding forces he describes can be inverted. Social interactions can become a matter of conflict between parents and children, which happens quite often (perhaps particularly often in American families in battles about eating more "healthy" and fewer "unhealthy" foods). As some authors note (e.g., Giacoman, 2016; Grignon, 2001), commensal activities are particularly positive among friends. These are the only common commensal groups that are voluntarily self-selected, and do not include the conflict-arousing oppositions between children and older generations. Interviewees comment on the sacrifices made to schedule regular gatherings of friends, and one participant referred to a weekly Tuesday friend gathering as "sacred".

Family meals maintain and enrich family bonds, partly through collective participation, such as gift-giving, sharing, sacrifice, reciprocity and responsibility (Cappellini & Parsons, 2012). There is a distinction between thrifty, sacrificing, regular, typically daily meals, and more expansive holiday, Sunday, special-occasion, extravagant meals.

A U. K. national stratified survey (Dunbar, 2017) supports links among social eating at meals, life satisfaction, and the size of the friendship network of people that can be depended on. The latter may well be related to bonding. A path analysis suggests that social meal eating has a causal effect on the other two variables. The idea is that it is a pattern of eating together over many, many meals that produces these effects. Because this presumably results from many meals, it would be hard to demonstrate this effect in an experimental context. Furthermore, if one could demonstrate such an effect, one would want to show that commensality was a particularly potent way of encouraging bonding and identification, over and above gatherings of people in the absence of food. Of course, because gatherings of certain groups of people, like family members, may happen primarily at meals, commensality may matter even if the food itself is not a critical part of the experience.

A social psychological perspective raises two major issues about meals. First, they are frequent and perhaps the major time of social interaction. Fortunately, because they are circumscribed in time, and eating is a fairly public activity, meals are relatively easy to study in the field or under controlled conditions. Second, over and above the fact that the meal is a major focus of social exchange, is there any reason to think that food events are *particularly potent* occasions for bonding and socialization? Work by Dunbar (2017), in which people retrospectively rate and describe features of their last evening meal, suggests that events promoting closeness between individuals tend to involve laughter, more people, and reminiscing. These are features of commensality but do not explicitly involve food.

Is there evidence that there is something special about food and eating with respect to establishing social connections? There are a few linguistic clues. In English, the word "companion" literally translates as one who breaks bread with another, from the Latin "com" (together with) and "panis"

(bread") (Merriam-Webster, 2004). The term "breaking bread" means sharing food in a positive social context. And there is a word in English, "commensal", which means eating together.

Two studies evaluated the social potency of food/eating versus other systems. Third-party observers of pairs of people eating similar foods rated the pair as more trusting of one another, but this effect did not appear for pairs of people wearing similar colored shirts (Woolley & Fischbach, 2016). In another study, Chinese and Americans made third-party judgments that a greater increase in intimacy and trust results from sharing a snack than from sharing stationery, information about news, or a mood (Wang, Huang, & Wan, 2021). Of course, one cannot make a claim that category A is more potent than category C with just a few exemplars. But this is the beginning of a possibly fruitful line of investigation.

As to what might make food special (if it is), the two major candidates, sharing and consubstantiation, will be considered in the next two sections. Dunbar (2017) suggests that given the link between endorphins and bonding, and the finding that endorphins level rises during eating, there may be a neurochemical link between eating and bonding. From an anthropological perspective, Tierney and Ohnuki-Tierney (2012) suggest that

"Food is unique as a metaphor for the self and for social groups through two interlocking mechanisms that assign symbolic power. First, food is embodied in each individual and therefore operates as a metonym by being incorporated as part of the self. Second…… communal consumption therefore renders food a metaphor of "we"—the social group and often of people as a whole. This double linkage—metaphor underscored by metonym—gives foods a powerful symbol for the collective self not only conceptually but also at the gut level." (p. 121).

This power could translate into intimacy in the context of bonding.

Sharing And Feeding

Sharing is a social process. One definition is: "to divide food, money, goods, etc. and give part of it to someone else." Some scholars see sharing as creating and maintaining bonds, connections and identities (Belk, 2010; Fischler, 2011). There are senses of gift in sharing, and when mutual, the bonding is obvious. Belk (2010), a proponent of the importance of the extended self, in an excellent review, says: "sharing in dissolves interpersonal boundaries posed by materialism and possession attachment through expanding the aggregate extended self." (p. 715). By "sharing in", Belk refers to sharing within the extended family, including close non-familial relationships. In his deep analysis of human relationships, the psychological anthropologist, Alan Fiske (1992) identifies "communal sharing" as the most intimate form of four specified forms of exchange, which constitutes part of the enactment of close relationships. Sharing presumably creates and maintains close relationships, and is an expression of them. It is a way of bringing new people into the extended self. Food is a central domain, perhaps the most central domain, of sharing. Sharing often involves material things, and of these, food and money are probably the two most common (Belk, 2010). Sharing, as used in English can mean sharing time together. Thus it is possible to share a meal without eating any food in common. This type of sharing might promote bonding, but in this section, sharing means sharing food.

For food, sharing engages the idea of reciprocity, as in participation in the preparation of food, eating, setting the table, and cleaning up after (Cappellini & Parsons, 2012). Food sharing among adults is not uniquely human. However, in its distinctly human form, it transcends selfishness, and

as Fischler (2011) points out: "what contributes decisively to transmuting eating into an activity of a higher spiritual essence is sharing." (p. 531). Images of sharing healthy food induce more pleasure than images of eating healthy food alone (Malody, 2020).

Adult pairs of strangers who share foods subsequently display more trust in trust games than pairs who eat the same foods from separate containers (Wooley & Feshbach, 2019). There may be a more general principle about sharing. In one study, sharing an experience (tasting chocolate) with another person, without verbally communicating, amplifies the experience (Boothby, Clark, & Bargh, 2014). When the experience is positive (tasty chocolate), sharing enhances the positivity of the experience. When the shared entity is negative (unpleasantly bitter chocolate), sharing makes the experience worse. This could result from the shared expressions which often accompany social eating.

There is strong evidence that (adult) feeding implies and perhaps produces more intimacy than simply sharing. Given the importance of sharing, it would be worthwhile to extend all of these studies and to try to discover critical features of sharing. Because sharing of food often involves consubstantiation, shared substance, it will be critical in the future to specify in detail (for food) whether the shared food potentially contained any residue of the donor (see next section).

A study of third-party judgments of the relationship of a videotaped young man and woman (professional actors) sitting at a restaurant illustrates the importance of sharing, consubstantiation, and feeding in establishing (perceived) intimacy (Miller, Rozin & Fiske, 1998). In a between-subject design, five groups of participants each saw a five-minute video that was identical in all forms except for a ten-second segment. In that segment, the man first offered the woman French fries, and the woman reciprocated by offering the man soup. All offerings were accepted In the first, control condition, no soup or fries are offered, The woman pushes a salt shaker toward the man, and the man pushes a pepper shaker toward the woman. Condition 2. Sharing: The woman offers soup which had not yet been consumed by passing the bowl and having the man use his own clean spoon; The man offers the plate of not-yet-sampled French fries to the woman and she takes one; 3. Sharing with consubstantiation: same as (2) but the woman had already taken some soup, and the male offers a bitten French fry on the plate; 4. Feeding. Same as (2) but the woman puts the clean spoon to the man's mouth, and the man holds an unbitten French fry to the woman's mouth; 5. Feeding with consubstantiation. Same as (3) but the woman put the contaminated (already used) spoon to the man's mouth and the man holds an already bitten French fry to the woman's mouth. . Observers (open ended) reported the probable relationship of the pair and rated the intimacy of their relationship. Sharing increased perceived closeness of the relationship, consubstantiation further increased the closeness and feeding, with or without consubstantiation led to predominant judgments of a romantic relation of high intimacy. So both sharing and consubstantiation had an effect, and feeding was a much surer indication of intimacy than sharing.

Two subsequent similar studies using video stimuli and measures of intimacy with American undergraduates confirmed and extended these findings. One, without consubstantiation, showed increased judgments of intimacy going from no sharing to sharing to feeding (Erwin, 2002). A second used no sharing, and feeding without and with consubstantiation, and showed increased judged intimacy across situations (Alley, 2012). Brito et al. (2023), using European undergraduate subjects, directly tested whether sharing and consuming food as opposed to sharing another entity produced changes in communal sharing relations based on Fiske's (1992) relational models theory. They also obtained ratings of warmth of the other members of the groups of three and whether they would like to continue working with this same group, Even after one instance of sharing, they

found higher scores on all three measures from those sharing food. Looking at the type of food sharing, they found the effect only for sharing drinking water by pouring it from a common source. That is more intimate than all drinking water from different bottles, but it does not directly imply consubstantiation.

A striking "first-person" natural situation shows the importance of feeding, in a courtship situation, with parallels to courtship feeding in birds. The situation was video footage from a television program called "First dates" in which couples meeting for the first time eat a meal together (Hendrie & Shirley, 2019). Feeding was seen in 58 man/woman couples, and these were compared to 49 mixed gender couples who did not feed, selected from the same sample with ages roughly matched. In a post-meal interview, 93% of the feeders indicated they would wish to go on a second date, as opposed to 43% of the controls. Of course, none of the reported studies give any direct evidence that feeding, sharing or consubstantiation causes (as opposed to reflects) intimacy, but they are suggestive.

Consubstantiation

Consubstantiation refers to sharing body substances. In eating, the shared substance is essentially saliva, or the passage of personal "essences" in the prior contact of a person with the food. Consubstantiation has not been considered much in the psychological literature on intimacy or closeness. Indeed, many studies on food sharing do not clearly indicate whether consubstantiation has occurred.

There is one very interesting and very recent study on consubstantiation, and even related to feeding, from the psychological literature in experimental, developmental psychology (Thomas, Woo, Nettle, Spelke & Saxe, 2022). The authors are interested in discovering how infants, toddlers and young children come to recognize that critical subset of persons in particularly close, or "thick"" relations with them (often nuclear family). The children observe food interactions of cartoon characters who share food utensils, lick the same food, eat separate pieces of the same food (no saliva sharing) or share a toy. The children expect saliva sharing to indicate nuclear family members, but not other types of sharing. They also expect a child who is experiencing distress to selectively turn to someone with whom they have shared saliva. The children recognize that shared saliva indicates closeness. Normally, saliva sharing is tightly linked to shared food (or kissing), but the authors show that it is saliva sharing that is critical. A finger placed in a target person's mouth and then in the child's mouth has the same effect as consubstantiated food.

Consubstantiation has been a matter of interest and concern in cultural anthropology for a long time, but it came to attention of psychology largely from work on disgust and contagion from the late 1980s. Many traditional examples of contagion are situated in the food domain. The widespread belief in "you are what you eat" in traditional cultures is a form of contagion.

Consubstantiation is a concrete idea. Almost nobody believes that if you share the air you breathe with other people, you become more like them. Food is a substantial material entity. So if you share the same food at meals, you are sharing the same substance and becoming more similar. And since residues of the cook may pass into the food, those who eat the food made by mother will take some of her into themselves, surely a bonding and identity linking act. Shared food that has contacted other eaters connects to them, by "you are what you eat", and by the sympathetic magical law of contagion. (Both contagion and "you are what you eat" are considered in a later section.). This

emphasizes Sobal's (2000) point that "you are who you eat with." Or as Fischler (2011) notes, "If eating a food makes one become more like that food, then those sharing the same food become more like each other." (p. 533).

There is a social story of great importance in consubstantiation. Anthropologist Maurice Bloch (1999) paints a vivid picture of the material flow of essences in family and some other social eating situations. Food is a conductor of specific properties of its own, and of its producers and cooks.

"Eating the same food unites the bodies that eat together and eating different foods distances them….. As a result, families may be understood as being continually unified not only by biology but also by being commensal units. ….As in the light of kinship, so in the light of food, life is understood as a continual process of bodily mergings and divisions." (p. 138).

There is uncertainty in lay beliefs and among scholars about the degree to which certain foods are better conductors of essences than others, and what properties (valence, gender, other specific attributes) can be communicated. But many humans believe that the cook is "in" his or her food, and that grandma's food may be better just because she made it.

Consubstantiation is clearly illustrated in the food attitudes and practices of hundreds of millions of traditional Hindu Indians (Appadurai, 1981; Marriott, 1968). Food sharing rules here are explicit. Within the family, the hierarchy of members is reflected in who can consume foods already sampled, "contaminated" by others. Marriott (1968) says that it is possible to recover much of the structure of traditional Hindu society, especially the caste structure, by looking at food exchange rules. The purer upper castes cannot consume most foods processed or cooked by people of lower castes, whereas there is no problem with lower castes consuming foods touched by upper castes.

What is absent from all this fascinating material is a clean demonstration that consubstantiation binds, in what ways, and the mental rules that accomplish this. But it is virtually certain that consubstantiation binds, unifies, and differentiates. The powerful ties of kinship probably share much, psychologically, with the ties produced by consubstantiation. In some cultures; a woman who nurses infants who are not her biological children establishes something like a kinship relationship to them.

Conclusion

A lot of social connectedness and differentiation follows from eating together, sharing, and consubstantiation. The psychological principles governing this, only partly understood at present, should constitute a part of social psychology, and will probably aid in the understanding of relationships outside the domain of food. It will be important to separate the effects of eating at the same table, eating the same food, sharing the same food, and sharing substance (consubstantiation).

FOOD, EATING, AND CULTURE

There is a massive literature on culture, food, and eating. Considering religion as a type of culture, the literature expands even more. The food worlds of different cultures vary enormously. The fact that cuisine is an aspect of importance for world travelers testifies to this. Cuisines vary in their staple foods, food preparation techniques, and characteristic flavors that they put on savory foods

(flavor principles; E. Rozin, 1982), as well as in the social arrangements of eating, how eating is accomplished, and the roles and meanings of food in life. If you wanted to find out as much as you could about the food world of a person with a single question, the best question to ask might well be: What is your culture?

Most of the research in this area is carried out by cultural anthropologists using ethnographic techniques. Unlike in psychology, the work is largely descriptive and focuses on what is eaten, and how it is eaten (as opposed to how much is eaten). The general approach and major findings are summarized by Tierney and Ohnuki-Tierney (2012). Anthropologists, faced with the enormous variety of food worlds, naturally are inclined to nurture accounts, focusing on ecology, history and traditions in specific groups. Of course, the ecology and universal aspects of human nature constrain the varieties of food worlds. The nutritional constraints in terms of energy and nutrient requirements are considerable, and evolutionarily oriented anthropologists have used an adaptationist approach, like evolutionary psychologists, to explain many phenomena. Marvin Harris and Solomon Katz, among others, have put forth many accounts of how human biology shapes food traditions (e.g. Harris & Ross, 1987; Katz 1990; see also Rozin & Todd, 2016). Supportive of a role for "human nature" as a determinant of food-related behavior is the near-universality of meals, cuisines, social organization of eating, and gender role differences in food activities. And there are well documented universal and genetically determined taste biases, such as sweet preference and bitter aversions that shape human life in the food domain.

The major focus of the research on food and culture is the description of the role of food in daily life and on special celebratory occasions, and the links of food with other domains of life. This has been a focal interest of cultural anthropology since before the 20th century. Food acquisition, preparation, and consumption have been major influences on human biological and cultural evolution. Examples include the taming of fire, cooking, and the domestication of plants and animals. Basic features of human life including rituals, taboos, transformations of the environment, sociality, kinship, social differentiation, gifts, manners, and symbolism all involve food/eating influences and prominent examples from the food domain. As well, specific food related events, such as weaning, cooking, feasts, and commensality, are central to understanding humans. Social class and social differentiation, often the focus of sociology, bidirectionally influence the food world and are influenced by it. Within culture, food-related social distinctions, such as the caste system with its elaborate food rules in Hindu Indians are of central importance (Appadurai, 1987; Marriott, 1968). The sociology of food is well summarized by Beardsworth and Keil (1995) and Murcott (2019).

From the perspective of social psychology, two specific issues in food and culture are relevant. One is the food culture of the Hua of Papua New Guinea for whom food has social functions, both more intense and qualitatively different from those functions in Western affluent cultures. A second is a comparison of two very familiar and similar Western affluent countries, France and the United States, which are quite different in the world of food. This work has had a psychological orientation.

Food And The Permeability Of The Self In The Hua

This small group from the New Guinea highlands was introduced in the second vignette that opened this article. The ethnography of the Hua, *Food, sex and pollution*, by Anna Meigs (1984) is must reading for anyone interested in food and the social world. The Hua food world is very different from the Western world, and illustrates some amazing and unfamiliar ways in which food is a quintessentially social entity. Meig's ethnography is deeply psychological and very thorough

with respect to foods habits and practices, and reveals ways of thinking about food that give us insight into our own food practices. Just as the traditional principles of sympathetic magic (contagion and similarity) have been shown to be operative in Americans, some of the Hua views are probably also present, at some level, in citizens of affluent Western countries. Meigs cites many Hua-North American parallels.

This description is based on Meig's (1984) ethnography, supplemented by two of her other papers (Meigs, 1978, 1987). It is in the interpersonal domain that Hua beliefs produce a dynamic view of food that transforms the social world and the way food is understood. The Hua believe that a vital essence called *nu* is present in all living things. *Nu* embodies not only basic vital properties, but carries gender "information" and particular properties of an individual (including ancestry) and personal affiliations. *Nu* is transferred from one individual to another by a variety of means, the most potent being ingestion and physical contact (consistent with the law of contagion). There is a general flow of *nu* from older to younger individuals, starting with things such as the semen of the father and the milk of the nursing mother. This transfer, in the Hua view, accounts for the aging process, because in this process, the older generation loses *nu*. Food is perhaps the major way in which *nu* is transferred. The avoidance of any food prepared by a fertile female for young men going through puberty, described in the introductory vignette, exemplifies the feminizing power of female *nu*.

There is one more critical feature of *nu*. Its effect on a recipient depends on the relation between "donor" and recipient. It nurtures health and well-being when the donor and recipient are in a positive relationship, while transfer in a negative relationship produces failure to thrive or illness in the recipient. In a small-scale society, where a person is usually aware of who harvested and prepared a food, this situation sets up a powerful social role for food. The person is permeable, susceptible to food-borne identity and well-being related influences. As Meigs describes it:

> Underlying the Hua understanding of food and food rules is a world view that emphasizes relatedness. All organisms are linked in chains of mutual influence; borders between bodies are permeable; there is a grand cycle of flow by which *nu* circulates through all living beings. Implicit in this understanding is a notion of self and other as involved in a continuous and dynamic process of participation. The self is blended in and through the surrounding world and, conversely, the world is blended in and through the self. Through his or her continual acts of food exchange, both as producer and as consumer, the individual is constituted as part of a physically commingled and communal whole. At the heart of the Hua understanding of food and eating is a statement of understanding about identity and the boundaries of self… Food has a distinctive feature, one that sets it off from the rest of material culture: it is ingested, it is eaten, it goes inside. In a small scale society, moreover, it is and is understood to be the product of the labor of known individuals, the output of their blood, their sweat, their tears. As output of one person and as input to another, food is a particularly apt vehicle for symbolizing and expressing ideas about the relationship of self and other (Meigs, 1987, pp. 354-355).

The Hua provide a different perspective on food and the self. The potent positive side of food is represented by transfer of *nu* via food between persons with positive relationships. Although positive contagion is weaker than negative among the Hua, it is much stronger than it is in most cultures. We can sense some Hua in ourselves in our pleasures at eating grandma's food, and discomfort at eating food made by someone we don't like.

Food And Eating In France And The United States

A specific example of a cultural, psychological approach to food and eating compares France and the United States. These are two wealthy, Western countries, and similar on many demographic measures. Differences in the food world are substantial, and not easily accounted for by demographic factors. The food worlds of the two countries have been analyzed in an historical context (Stearns, 1997) and discussed in a trade book (Le Billon, 2012).

An analysis of French and American food beliefs, attitudes, and behaviors was accomplished in a three-phase study of six countries: France, Germany, Italy, Switzerland, the U.K., and the U.S.A in the period from 2000 to 2006 (Fischler and Masson, 2008). Much of the data presented here comes from the period around 2000. There are no doubt some changes in the last 20 years. A continued exploration of the cultural psychology of food and life in France and the United States has been carried out by Fischler, Rozin, and their collaborators over the last two decades (e.g., Rozin et al., 1999; summarized in Rozin, Cohen and Ruby, 2019).

Much is similar in the food of the two countries, and in the structure of meals. Given the major emphasis on health and eating, especially in the USA in recent decades, there is a particular interest in French-American comparisons in the food domain. Though the diets are similar nutritionally, with France consuming somewhat more saturated fat per capita (Drewnowski, Henderson, Shore, Fischler, Preziosi, and Hercberg, 1996), it is striking that obesity levels in France are about 50% of American levels, life expectancy is slightly higher in France, and heart disease is considerably lower in France (the “French paradox”) (Renaud & de Lorgeril, 1992). This motivates a search for answers to the question: How do the French manage this?

The Food “Mind”

Food is a more important part of life for the French; for example, in contrast to Americans, they prioritize food over comfort in choices (as in choice of hotels based on food versus comfort) (Rozin et al., 1999), and spending more time eating (Rozin, Fischler, Kabnick, Pete , & Shields, 2003; Kahneman et al., 2010) .

The French tend to think of food in a culinary context, in contrast to Americans who think of it more in a nutritional-health context. Thus, French free associations to chocolate refer more to type of chocolate and chocolate dishes, with Americans focusing more on chocolate as a high fat and high sugar high caloric food. Heavy cream is more associated with whipped than unhealthy in the French (74% of French, 42% of Americans). Bread is more associated with butter (as opposed to pasta, a nutritional link) in French than Americans (Rozin et al., 1999).

The French are more inclined to think of food in terms of taste and the experience of eating, while health is a more salient feature for Americans. When asked to spontaneously divide all food and drinks into two categories, the dominant American category is healthy-unhealthy (25%), while the French propose this dichotomy only 7% of the time (Rozin & Holtermann, 2021).

American and French undergraduates endorse, on average, opposite relationships between health and taste. Raghunathan, Naylor, and Hoyer (2006), working with American undergraduates, and Werle, Trendel, and Ardito (2012), working with French undergraduates, did three parallel studies in which they report: 1. Agreement with two statements: "Things good for me rarely taste good," and "There is no way to make food healthier without sacrificing taste.” Mean agreement (on a Likert

scale) is positive for Americans and negative for French; 2. An IAT in which pictures of healthy and unhealthy foods are paired with words denoting tasty or unpalatable, reveals faster reaction times by Americans to unhealthy-tasty pairings, and faster reaction times of French to healthy-tasty pairings; 3. When offered the same food described as healthy or unhealthy, Americans rate the unhealthy foods as tastier, while French show the opposite result.

Medicine is something people take to prevent or cure illness. Food can be thought of in the same way, or as a distinctively different type of entity associated with sociality and pleasure as well as nutrition. Americans tend to see food and medicine on a continuum, with no fundamental difference between them, while the French tend to see them as distinct entities (Fischler and Masson, 2008). When asked to select a metaphor that best represents the relationship between food and the body, the predominant American response (in fixed alternatives) is a factory or car while the predominant French response is a tree (Fischler and Masson, 2008). Finally, when people are asked to indicate their similarity to each of five paragraph descriptions of a persons' relations to food, the French rate themselves more similar to persons for whom food represents joy or sociality, while Americans rate themselves more similar to a person with a health or a dieting focus.(Fischler and Masson, 2008). In spite of evidence that Americans prioritize health as opposed to pleasure in thinking about food, modify their diets more with low fat and low salt foods, and diet more than the French, only 33% of Americans agree that they eat a healthy diet, as opposed to 74% of French (Rozin et al., 1999).

The Food Environment

French portion sizes are substantially lower in restaurants, recipes, and single individual packages in supermarkets (Rozin, Kabnick, Pete, Fischler, & Shields, 2003). Because the main determinant of what people eat is how much they are served (assuming the food is palatable), this alone can account for much of the lower level of obesity in France. Although French portion sizes are notably smaller, the French spend more time eating and spend more money on food (Rozin et al., 2003; Kahneman et al., 2010).

Opportunities for snacking are lower in France; although there are many cafés, restaurants are only opened in rather restricted hours, compared to the United States. The French eat at much more regular times than do Americans. In general, in restaurants and supermarkets, the number of choices is smaller in France, reflecting a stronger cultural-traditional role in what are proper foods and food combinations. Consumer expectations are in line with these environmental differences (Rozin Fischler, Shields, & Masson, 2006).

Of course, the other side of the energy equation is energy expenditure. The French environment facilitates more energy expenditure in the course of daily function (as opposed to dedicated periods for exercise). Although there are no solid data on this point, time spent walking may be higher in France (Kahneman et al., 2010), and there may be more reliance on public transportation (which typically requires some walking), more bicycle riding, and less reliance on cars. These features characterize most Western European countries. The much higher cost of gasoline may be a significant factor in producing more walking and less reliance on cars in France.

More General Differences And Some Principles That May Be Behind Them

One general French-American difference is the greater importance of food (compared to other domains) in France, as evidenced by time spent eating, money spent on food, and the greater willingness to spend money on food as opposed to accommodations. A second is the greater ritualization of eating in France, as indicated by a much narrower range of acceptable times for meals, more adherence to a structured sequence in meals, a greater likelihood that family members will all participate in a meal from beginning to end, and a lower tolerance for distractions during a meal. A third general difference is in the greater attention in France to the experience (tastes) and the food itself, as opposed to the greater concern about health and worry with respect to food in Americans. Yet another major difference has to do with a more communal aspect to food and meals in the French versus a more individualist orientation in Americans. The French family is more likely to eat the same foods at the meal, and there is more cultural agreement about which foods go together in France (e.g., steak goes with French fries in France, but there are more acceptable potato options with steak for Americans: French fries, baked potatoes, mashed potatoes, potato salad). The communal-individualistic distinction may be present for choices in other French-American domains as well (Rozin, Remick & Fischler, 2011).

A particularly interesting difference has to do with Scitovsky's (1992) distinction between comforts and pleasures. Scitovsky argues that Europeans spend more time and money on pleasures (or "joys"), that is on distinct events, and Americans prefer to devote relatively more funds to comforts, which are things that make life easier such as high quality mattresses, air-conditioning, and labor saving devices. Joys are more likely to make life interesting, and contribute more to remembered pleasure: whether a vacation produced numerous positive memories is more related to positive events (joys) than comforts such as the quality of the mattresses or air-conditioning. In both the food and other domains, the French are more inclined to joys and Americans to comforts (Rozin et al., 2011).

A final general difference is between an inclination toward quality among the French versus quantity among Americans. This is related to a distinction between an inclination toward moderation (French) versus abundance (Americans). Stearns (1997) links moderation to aesthetic desires, and hence quality. He notes that the French have emphasized slenderness, fashion, and aesthetics since the 1800s, and still expected to enjoy high-quality food. Therefore, great food without abundance became a goal for them. While the French dedicated themselves to discrimination and moderation, Americans were committed to abundance, or quantity (Stearns, 1997; Levenstein, 2003).

Rozin et al (2011) measured French-American quality-quantity preferences by asking them to "Rate each of the domains or situations below as to the relative importance of quality and quantity for you", using a Likert scale with 1 meaning quality is of the highest importance and 5 meaning quantity is of the highest importance." The eight domains were food, meals, clothing, shoes, tickets, friends, houses and vacations. French means were closer to the quality end than American means in 7 out of 8 cases, with houses the exception. French were significantly more quality oriented for both food and meals.

A comparison of France and the USA must acknowledge a major demographic distinction: France is a predominantly Catholic country while the US is predominantly Protestant. There are some strains of Protestantism that are suspicious of pleasure as a driving force in life. These may have some influence on the greater and relatively unconflicted attitude toward food pleasure in France (Raghunathan et al., 2006).

Individuals, Environments, Institutions, And Traditions

Individuals, environments, traditions and institutions mutually influence each other. Individuals create cultures, but cultures have a major influence on individuals. Rituals are features of individuals that are introduced into their lives by cultural forces. As one illustration of this complexity in the food domain, consider medical practice and wisdom as a way in which a medical institution is shaped by individuals and culture. Payer (1988) has argued persuasively that culture has a major influence on medical practice. This was explored in the food domain by having medical doctors and lay people from five countries (France, Germany, Italy, U.K., U.S.) evaluate 20 different items on the relation of foods or food practices to health (such as the importance of fasting, moderation, regular meals, the healthfulness of wine or dairy products). Doctors and lay persons from the same country showed highly positively correlated patterns of response, but doctors (or laypersons) from different countries showed much lower, sometimes negative correlations (Leeman, Fischler & Rozin, 2011).

Developmental Differences And Socialization

How have the French-American differences described above become socialized? There are ethnographic studies of Italian and American families with children at dinner times at home, with emphasis on conversations about food (Ochs, Pontecorvo & Fasulo, 1996) and subsequent similar studies on French and American families with children, with a focus on fruits and vegetables (Kremer-Sadlik, Morgenstern, Peters, Beaupoil, Caët, Debras and Le Mené, 2015; Kremer-Sadlik & Morgenstern, 2022). They indicate socialization in the different directions already described between French and American adults. The American conversation focuses more on health and nutritional aspects of foods, while the French and Italians focus more on the pleasure of eating particular foods, and their origins, preparation, and quality. Dessert is treated as the most desired food, and used as a reward for eating other foods in American families but not as much in French/Italian families. And a meal is treated as a more organized entity in French/Italian families, with greater attention to fruits and vegetables.

Summary

Table 1 summarizes the French-American differences discussed in this section.

***Table 1*: French-American Differences**

Aspect	France	USA
MIND		
Importance of food in life	Higher	Lower
Food as health vs pleasure	Pleasure	Health
Food associations	Culinary	Nutritional/Health
Unhealthy = tasty	No	Yes
Eating as experience or producing health consequences	Experience	Consequence
Food vs. m	Very different	Similar
Food-body metaphor	Tree	Car-factory
Focus of eating,	Social, pleasure	Health, worry
Perception of self as healthy eater	Higher	Lower
ENVIRONMENT		
Portion size	Smaller	Larger
Fat/salt reduced foods	Unusual	Common
Snack opportunities	Low	High
Number of choices	Low	High
Time eating	Long	Short
Reliance on cars	Lower	Higher
Walking frequency	Higher	Lower
MORE GENERAL DIFFERENCES		
Importance of food and eating	Higher	Lower
Ritualization of eating	High	Low
Experience (taste) vs. health (worry)	Experience	Health
Communal vs individualistic orientation	Communal	Individualist
Comfort vs. joy orientation	Joy	Comfort
Quality vs. quantity	Quality	Quantity
Moderation vs. abundance	Moderation	Abundance
OTHER		
Different food-medical beliefs	Doctors agree with laypersons	Doctors agree with lay persons
Family mealtimes	Focus on food pleasure and quality	Focus on food nutrition and health features

LEARNING ABOUT FOODS

Preferences And Liking

Preferences are of central importance to economics, and have been a matter of some, but not central, concern to psychologists. Of course, businesses depend on them, and in a capitalist system, identifying and catering to preferences is a major route to financial success. To a large extent, preferences owe their origin to social forces. They are often embodied in norms, which have primarily cultural origins, but are also the result of individual experiences that usually have a social component.

Preference is a comparative term, usually expressed in the form "X prefers A to B." Of course, context is extraordinarily important here, such that X prefers a hardboiled egg to a tuna fish sandwich for breakfast but prefers the tuna fish sandwich for lunch. Preferences can be measured directly in a choice situation, but they are also measured in two other ways. For food, one measure

of preference is intake. On separate occasions, if X consumes more of A than B, we often say X prefers A, although this may not be true if the standard is the simultaneous choice of A and B. For example, A may be preferred to B, but consumed in a lesser amount because A is much more satiating than B. A third measure of preference is liking. Liking is easier to measure in humans than animals; it is usually assessed with the use of an hedonic scale. However, it can also be measured with nonverbal expressive behaviors, like a smile or a distaste/disgust face.

Due to the work of Grill and Norgren (1978), rat facial and bodily movements can serve as reliable indicators of liking, and in the rapidly developing areas of behavioral neuroscience, there is brain activity that is indicative of liking. Although liking correlates positively with preference, the two are often different. For example, most American women probably like chocolate better than skim milk, but on account of weight concern, may prefer (i.e., choose) skim milk.

From the perspective of psychology, liking is more interesting to understand than preference. It is obvious why people will prefer the less toxic choice, or the choice that will look better to others, assuming this information is available, but it isn't clear why we like certain foods, and dislike others. There are a small number of innate determiners here, such as liking for sweet and disliking bitter, but most of the hundreds if not thousands of food likes and dislikes that any person has are acquired. This is why liking is interesting for psychology. Psychology is surprisingly ignorant of how humans get to like almost anything. The acquisition of liking, for food or anything else, is usually a deeply social process.

A Psychological Taxonomy Of Foods

When one considers everything that could conceivably be eaten, one faces a dazzling array of entities. Although potential foods could be described and classified in terms of their chemical contents, as they usually are, from a psychological perspective, a psychological taxonomy is much more appropriate. Such a system was created by Fallon and Rozin (1983), based initially on distinctions made by Americans. The scheme is described here and illustrated in Table 2. First is a division of entities into those accepted as foods, and those rejected. One reason for acceptance or rejection is sensory, amounting to liked or disliked tastes. For those who reject them, beer and lima beans are rejected primarily because of taste, and they are classified as distastes (see Table 2). Things that are accepted primarily on sensory grounds, like chocolate, sushi, or pizza fall in the category of good tastes.

A second feature is anticipated consequences. Things rejected because of anticipated negative consequences, such as allergy foods, food with toxins, or for some, high animal fat foods, are called dangers. On the acceptance side are things consumed primarily because of anticipated positive consequences such as vitamins, or lettuce (for some). These are called beneficials. The third feature is called "ideational", and refers to knowledge about a potential food other than of its anticipated consequences. Thus, paper and sand are called inappropriate, because they are culturally designated as not food, They might or might not taste good, and the consequences of ingestion are questionable. On the acceptable side are things that are classified as food, but their sensory properties or anticipated consequences are not prominent or neutral. For some people, basic carbohydrates like flour or bread fall in this category.

The fourth category is of particular interest, especially on the negative side. These are substances that are strongly rejected on ideational grounds, but unlike inappropriate entities, these are

offensive. Individuals believe that they taste bad and are dangerous to consume, but they actually have no evidence that that is true. Earthworms fall in this category for most Americans. These entities are called disgusts, and are loaded on all three features, but one, ideational, is primary. The disgust category is quite large, and includes for most people almost all potential foods of animal origin. For example, most Americans eat meat of only three of 4,000 species of mammals, and the rest are usually disgusting to consume, Americans eat a lot of meat (tokens) but very few types (almost entirely the muscle of cows, pigs, and lambs). The types seem extensive because these three meats are prepared in very diverse ways. The positive, opposite of disgust contains few if any exemplars, depending on the culture. This category is designated transvalued foods. They are sought after for ideational reasons, and are usually believed to taste better and be beneficial. For Hindus in India, foods that have been shared with the Gods (via a priest) called prasad, are transvalued. Perhaps some of grandma's prepared foods would qualify. In table 2, the secondary role of sensory and anticipated consequences for disgusting and transvalued foods is indicated by placing the plus in parentheses.

***Table 2*: A Psychological Taxonomy of Potential Foods**

	Sensory	Anticipated Consequences	Ideational	Examples
REJECTED AS FOOD				
Distaste	+			Beer, Lima Beans
Danger		+		Allergy, Toxins, High Fat
Inappropriate			+	Paper, Sand
Disgust	(+)	(+)	+	Earthworms, Cow Eyeballs
ACCEPTED AS FOOD				
Good taste	+			Candy, Pizza
Beneficial		+		Kale
Appropriate			+	Cereals
Trans-valued	(+)	(+)	+	Prasad in Hindu India

Note: Based on Americans. + indicates that this is the primary basis for the category. (+) indicates a secondary basis, often not based on personal experience. Adapted from Fallon and Rozin (1983)

The basis for acceptance of good and bad tastes is often personal experiences. When ingestion of a food is followed by nausea, it usually becomes a distaste (acquired taste aversion). Other negative consequences following ingestion usually produce dangers. Acquired likes and dislikes, as will be documented later in this section, usually involve both direct and indirect social influences. Danger and beneficial categorizations may be made on the basis of personal experience, but usually are culturally transmitted, as are appropriate and inappropriate foods. Disgust and transvalued foods usually achieve that status ideationally, without actually being experienced beforehand.

This psychological taxonomy of substances is idealized. Many potential foods represent a combination of categories; thus, many accepted foods are viewed both as good tasting and beneficial, and of course, there are foods like Oreos that have positive (good taste) and, some believe, danger/unhealthy features.

Determinants Of Preferences In The Moment

The sensory liking/disliking category is particularly important because it emerges as the predominant determinant of "preferences," according to self-report. This has been established by a score of studies in many countries using one of two scales. The older and more widely used British scale, the Food Choice Questionnaire, has people rate a wide range of foods on a scale of importance (i.e., not at all important, a little important, moderately important and very important) (Steptoe, Pollard and Wardle, 1995). For 36 items, people respond to the question: "'It is important to me"

At least 10 studies have used this scale across many countries. Across studies, the items reliably sort into 9 factors: *health*, *mood*, *convenience*, *sensory appeal*, *natural content*, *price*, *weight control*, *familiarity* and *ethical concern*. This summary of results includes the original study with British participants (Steptoe et al., 1995) and two others with multi-country representation: Prescott, Young, O'Neill, Yau, & Stevens (2002) sampled Japan, Malaysia, New Zealand and Taiwan, and Markovina et al. (2015) used large reasonably representative samples from a broad range of nine European countries. For affluent European countries (e.g., Germany) and New Zealand, sensory appeal (e.g., liking) emerges as the most important factor. However it does not rank highest in the three Asian countries: Japan, Maylasia and Taiwan. In those three countries, natural and health typically rank highest. Japan is unique in the affluent country subsample, with price, natural, and health as the three most important factors (Prescott et al., 2002). Across the nine European countries (Markovina et al., 2015), sensory appeal is most important in three of the four most affluent countries (Germany, Norway, and UK, but not Netherlands, where it is second), while price (e.g., "is not expensive") is first in four others: Greece, Ireland, Portugal and Spain). Ethical concerns and familiarity tend to be least important in all of the samples under consideration here. The fact that price is number one reflects economic realities, which are important but not psychologically interesting.

The nature and development of sensory appeal raises social psychological issues, and is the subject of the next subsection. There are two issues of concern with the Food Choice Questionnaire. First, there are not questions (and hence no factors) about social influences on food choice, such as fitting in with or impressing others. Second, rating of importance in food choice is a quite reasonable frame for the questions, but it is not necessarily the same as self-reports on what actually determines food choice. One could say, for example, that health concerns are more important than sensory appeal, but sensory appeal might still be a more important predictor of choice. Both of these concerns are addressed by the newer scale, the TEMS (the eating motivations survey).

The TEMS was developed by German psychologists (Renner, Sproesser, Strohbach, & Schupp, 2012). The basic question that frames the items asks participants to reflect on the causes of their behavior: "I eat what I eat .." applied to 45 items such as: "because it tastes good", "because I usually eat it", or "because it is healthy". Responses are on a seven-point rating scale from 1 'never' to 7 'always. Results are available from Germany, USA, India and Brazil (Sproesser, Moraes, Renner, & Alvarenga, 2019; Sproesser, Ruby, Arbit, Rozin, Schupp, & Renner, 2018). Analysis yields 15 factors: liking, need/hunger, health, habit, convenience, pleasure, natural concerns, traditional eating, sociability, price, weight control, visual appeal, social norms, affect regulation, and social image.

The TEMS generates three findings of particular interest. First, liking stands out with a much higher frequency score than any other factor. Second, the high frequency of need/hunger flies in the face of experimental evidence, primarily on North Americans reviewed elsewhere in this chapter and see Herman et al. (2019). This shows hunger is much less important than people think it is as a determinant of how much is eaten, or choice. Third, unlike the Food Choice Questionnaire, which does not include anything about social influences, there are three social factors on the TEMS. They

rank low in frequency, which seems to be an underrating of the importance of social determinants, supported by the experimental data (Herman et al., 2019).

Once again, as in so many areas, self-reports can be inaccurate in some important ways. Note that the Food Choice Questionnaire scale, where people rate importance to themselves, cannot be in error. But the TEMS, because it is supposedly about actual determinants of eating ("I eat what I eat..") can depart from reality, and does in the cases just discussed. Probably, the single most important predictor of what people eat in the moment is availability, which is rarely mentioned by subjects or in the psychology literature, and is determined substantially by cultural/social and economic factors.

The Acquisition Of Likes And Dislikes For Foods

Sensory appeal, or liking, seems to be the major motivator of preference. From a marketing perspective, if consumers like your product, you are a long way to success. And this holds for foods, clothing, music, and almost all other products. There is much yet to be learned about the acquisition of liking for products. Food likes and dislikes form a natural area for a general discussion of the causes of liking.

There seem to be four accounts for liking: innateness, mere exposure, evaluative conditioning, and general social influences. The latter is very vague, and in a way is a residual category, but it is social and it is extremely important. There are a small number of *innate taste* likes (sweet) and dislikes (bitter, and high levels of sour or salt), as well as an innate dislike of oral irritant sensations, and extreme temperatures. There is no well documented innate like or dislike for odors. Liking or disliking for the great majority of oral experiences is acquired.

Regarding *mere exposure*, Zajonc's (1968) classic paper established mere exposure as a route to acquired likes for a wide range of stimuli. The "mere" seems to be critical here, such that exposure itself seems to be the mechanism. Exposure in positive or neutral contexts usually, but not always, leads to liking. This has been clearly demonstrated with tastes (Pliner, 1982). Although the mere exposure paradigm is not inherently social, in fact it is sociocultural forces that arrange for the frequent exposure of widely liked entities.

Evaluative conditioning is a special type of Pavlovian conditioning, in which a change in liking of a stimulus occurs as a result of its pairing with a positive or negative stimulus. It was originally described and analyzed by Levey and Martin (1987), and much of the subsequent research was done in Belgium, using food stimuli, by a group led by Baeyens and De Houwer (reviewed in De Houwer, Thomas & Baeyens, 2001). Evaluative conditioning has a few properties that distinguish it from traditional Pavlovian conditioning. It does not seem to fit the frame of the CS predicting the presence of the US, becuase simultaneous presentation is very effective. It is resistant to extinction, and participants are frequently unaware of the CS-US pairing.

Evaluative conditioning studies almost always utilize human subjects, because the outcome is a change in liking, something difficult to measure in animals. However, the work of Grill and Norgren (1978) on expressive gestures in rats makes it possible to explore liking in animals. Taste aversion learning, originally described by John Garcia and his colleagues (reviewed in Garcia, Hankins & Rusiniak, 1974), is a typically one trial development of an aversion consequent on a pairing of a neutral taste CS with a US (nausea). It has been clearly demonstrated in humans (e.g. Bernstein, 978), where it has been shown that the US is almost always something that induces nausea (Pelchat &

Rozin, 1982). With rats, it has been shown that a taste paired with nausea produces an aversion in which facial and other gestures in reaction to the US indicate an hedonic change (dislike). Importantly, when the taste was paired with electric shock, a rejection also develops, but it is not accompanied by gestures indicating a hedonic change (Pelchat, Grill, Rozin & Jacobs, 1983). This result is in keeping with the human results, which indicate that negative events other than nausea, associated with a taste or food typically produce rejection (dangers), but not a change in liking (Pelchat & Rozin, 1982).

Taste aversion learning is one of the most robust and well documented cases of evaluative conditioning in humans and rats. It has become a major paradigm for investigation of learning in the animal learning literature. This is a case where a finding in the food literature has provided a general tool for psychologists studying the properties of learning.

Positive evaluative conditioning in the food domain in humans has also been shown. For example, there is enhanced liking for neutral tastes paired with sweet tastes (Zellner, Rozin, Aron & Kulish, 1983).

Social Influences On Liking

Evaluative conditioning can be a mechanism through which social learning about foods occurs. There has been a major advance in which social stimuli (human reactions to sipping a drink) have supported a corresponding change in liking. Baeyens and his colleague have called this observational learning, and it is inspired by the findings of Mineka on monkeys. When one monkey observes another's fear response to a snake, the observing monkey shows fear to snakes and avoids them (Mineka & Cook, 1993).

Observational evaluative conditioning was established in two important studies by Baeyens and his group in 1996. In one study, adults observed videotaped sequences of a model (actor) drinking from a glass containing a liquid. The shape of the glass determined whether the actor facially expressed like or dislike. After an acquisition phase, valence ratings revealed higher liking for the shape associated with positive expressions (Baeyens, Kaes, Eelen, & Silverans, 1996). In a second study, with children as participants, during the acquisition phase, children consumed beverages with one of two distinctive, neutral colors and flavors. While they drank each beverage, they watched a videotape in which a model, drank a beverage with the same color as the child was drinking, and presumably the same flavor. The model made either a neutral or negative face, contingent on which flavor the child was drinking. After acquisition, children showed a lower valence rating for the flavor paired with the dislike facial expression. There was no change in valence in another group when the color (but not the flavor) was contingently paired with the dislike expression (Baeyens, Vansteenwegen, De Houwer, & Crombez, 1996). These two observational evaluative conditioning studies suggest a phenomenon that could be a basis for many cases of social influences on liking.

Many studies have shown that, with children as participants, positive peer modeling, whether the modeling is just a demonstrated preference, or is accompanied by positive or negative verbalizations and/or expressions can substantially enhance food preferences (e.g. Duncker, 1938; Marinho, 1942; Horne et al., 2004; Greenhalgh et al., 2009). There is a parallel literature on social referencing, in developmental psychology. In almost all studies, the dependent variable is appropriate increases or decreases in consumption. The models were usually live, but in some cases, models were presented as videos, with a plot including "good" and bad" groups. Generally, the models produced appropriate changes in preference with respect to controls.

With an interest in objectivity and hence avoidance of subjective reports, the studies measured intake or choice, and hence failed to distinguish between liking and preference. The same is true for most studies of social referencing. The exception is work by Leann Birch. Birch's studies use a ranking measure which is based on liking, suggesting that preference measures in the other studies may at least partly measure liking changes (Birch, 1980; Birch, Zimmerman, & Hind, 1980). Unfortunately, the liking/preference distinction is not salient in the research on social modeling in children. Even Birch's studies, which do measure liking, do not highlight the preference-liking distinction. The extensive literature on social referencing has demonstrated preference shifts in many domains. Much of this work has been done with infants, and does not distinguish between preference and liking.

The liking-preference distinction is particularly important in studies on the effects of rewarding the consumption of specific foods. These studies were motivated by the social psychology studies on intrinsic value and the overjustification effect (Deci, 1971; Lepper & Greene, 1978). Three studies on food choice in children demonstrate that rewarding consumption of specific foods usually increases consumption and preference while the rewards are offered, but once they are discontinued, preference drops below pre-reward levels (Birch, Birch, Marlin, & Kramer,1982; Birch, Marlin, & Rotter, 1984; Newman, & Taylor, 1992). Because Birch's procedure seems to measure liking, in the long run, rewards for consuming a food seem to interfere with increased liking, so the procedure is counterproductive. But rewarding consumption is a common procedure used by parents to increase liking (Casey & Rozin, 1989).

Another line of research from the food domain, this time with adults, indicates no effects of reward on liking. Oral medicines, which are like foods, are typically followed by some sort of reward in terms of relief of symptoms. Individuals with heroin addiction are sometimes treated chronically (a few times a week) with oral methadone, an opiate that does not produce highs but that counters or prevents withdrawal symptoms. In one methadone clinic, the methadone is taken a few times a week, sometimes for years, in "Tang," an orange drink. A survey of patients in this clinic indicated that none had developed a liking for Tang (Pliner, Rozin, Cooper & Woody, 1985). A survey of American adults finds that liking for oral medicines is extremely rare (Pliner et al. 1985). In particular , liking for chewable antacids is quite rare, even though they often have distinctive tastes, and produce a rapid decrease in unpleasant sensations. It seems that a medicinal context blocks the acquisition of liking.

The most common social entities, in research and probably the real world, are admired adults, including parents, teachers and heroes, or peers, often older peers. Endorsement of the oral qualities of an entity, positive emotional expressions, or just the example of consuming them can be effective. Almost all studies try to induce preference (liking) increases, usually of "healthy" foods like vegetables. Ironically, although negativity dominance (Rozin & Royzman, 2001) strongly indicates that it should be easier to decrease preferences (presumably of "unhealthy" foods), researchers have not tried to do this, nor do parents (Casey & Rozin, 1989).

How do these social activities generate liking? It is possible that there is a direct effect, with no mediating processes, as seems to be the case for mere exposure. Or it is possible that in some cases, evaluative conditioning is involved. Presumably, the food would be the CS, and some positive experience in the model would be the US. That experience could be the observation of a positive response in others, and/or the induction of a positive experience in the self. Research on evaluative conditioning does not require positivity induced in the self, but this should enhance the process and

the effects. Perhaps the finding that shared experiences are more extreme than solitary ones could also enhance the positive (or negative) outcome (Boothby, Clark & Bargh, 2014).

Sugden (2005) reminds us of Adam Smith's concept of correspondence of sentiments, from his *Theory of Moral Sentiments* (1759/1976). Smith argues that when individuals in a social context become aware that they are experiencing the same feelings as another, this itself is a source of pleasure. And this can be true even if the shared feelings are negative. Sugden amplifies Smith's position, provides evidence for it, and explores its implications. Correspondence of sentiments would produce a positive experience in the self, which could act directly or via evaluative conditioning. `Higgs and Thomas (2016) have directly addressed the issue of how norms become internalized and how liking might develop in the food domain. They postulate that conforming to the behaviors of others is rewarding (making a link with Adam Smith). They recognize limits on this response, having to do with the relevance of the norm, the similarity with the other, or the identification with the relevant group. In the appropriate situation there may be mimicry or matching of behavior. The pleasure of responding to norms is suggested by findings from Nook and Zaki (2015). When individuals in a brain scanner discover that their preference for a food is popular, their preference increases and is associated with increased activity in the nucleus accumbens, an area associated with the neural representation of rewards. The precise ways in which pleasure and social approval increase liking (and the inverse for decreased liking) need much more elaboration.

Models Of Food Intake, Preferences, And Liking

Multiply determined dependent variables such as food intake and food choice have lent themselves to models and diagrams portraying the relevant independent variables and their interactions. For food intake, given the original homeostatic models, most models examined inputs to the brain from various locations on the organism, including mouth, stomach, liver, blood, etc., integrated in the hypothalamus, with the focus on energy regulation. There was some acknowledgement of social influences. Later research, much of it coming from Herman, Polivy and Pliner (summarized above and in Herman et al., 2019), indicated the importance of social variables such as appropriateness norms, the social situation of most meals, and impression management. The model of normal eating that emerges from this puts homeostatic factors more in the background, with social, cultural and cognitive factors dominating the amount consumed in most situations (Herman et al., 2019). The five biggest determinants of food intake on any given occasion are probably availability (controlled largely by economic factors and cultural norms), price, palatability, social norms (including portion size), and the social setting. This is in striking contrast to the testimony of eaters (and biologically oriented motivation psychologists), who nominate hunger as the *major* determinant. Hunger is also an influence, of course, but often less potent than social influences. Of course, strong hunger or high levels of satiety can be major determinants.

The history of "models" for food choice is different, because homeostatic factors were not up to explaining the wide range of choices, and a cultural factor, cuisine, obviously was a major determinant of choice. Once again, as with intake, availability is a major factor. This is largely a cultural factor, determined in substantial part by cuisine, and once again, as with intake, cost, a socio-economic variable. Cultural background issues and economic issues have been of minimal interest to psychologists, even social psychologists, which is one reason there has been much less psychological research on choice than on intake (Rozin, 2000). General models of choice have often divided influences into three categories: the food (e.g., sensory properties), the individual, and

social-economic-cultural factors (Chen and Antonelli, 2020). There are models of food choice that focus on social factors (e.g., Furst, Connors, Bisogni, Sobal, & Falk, 1996).

Food choice has been studied within the framework of Ajzen and Fishbein's Theory of Planned Behavior, particularly by a group of British investigators, including Richard Shepherd (e.g., review by Shepherd, 1999). For example, in one study, variation in intention to purchase organic foods in Finland, Italy, and U.K. was substantially accounted for by moral and other attitudes and social norms (Arvola et al., 2008). This work deserves more attention than is provided here.

DISGUST: FROM ORAL TO MORAL BY PREADAPTATION?

Disgust As An Emotion

Disgust is an emotion, and emotion falls under the purview of social psychology (see Rozin, Haidt & McCauey [2016] for a review). Disgust is a quintessentially basic emotion (Ekman, 1992) because it is universal, has a characteristic facial expression, a specific physiological signature (nausea) , a specific associated behavior (withdrawal), a characteristic subjective experience, and a distinctive set of elicitors and appraisals.

Disgust was described in some detail by Charles Darwin, in *The expressions of emotions in man and animals* (1872/1965). It received little attention for more than 100 years, with the exception of a book by Kolnai (1929/2004), and one notable 1941 paper by the psychoanalyst, Andras Angyal. Angyal defined disgust as: "Revulsion at the prospect of oral incorporation of an offensive object" (p.395). An addition to Angyal's definition is that disgusting entities are contaminating. If they touch a desired food, they render it inedible (Rozin & Fallon, 1987). This core disgust, and its relation to oral pathogen threat, is well established and well documented (see Curtis, Aunger, & Rabie, 2004;. Curtis, Oaten, Stevenson, & Case, 2009; Rozin & Fallon, 1987;). The classical odor of disgust is the decay odor of death, often a result of microbial contamination.

Most core disgust elicitors have a decay component in them (Curtis, Aunger & Rabie, 2004), and the psychological contamination feature of disgust, particularly dose insensitivity, is particularly adaptive for avoidance of pathogens. Unlike toxins, pathogens can multiply. Nausea is a common consequence of ingestion of pathogens. Finally, almost all disgusting foods are animal products. These are much more likely to be bearers of pathogens. Animals are more like humans than plants are, so the same pathogens are more likely to thrive in both. Disgust has been proposed as basically and originally about pathogen avoidance (Curtis, 2013; Tybur, Lieberman, Kurzban & DeScioli, 2013), whereas the food origin has also been emphasized (Rozin & Fallon, 1987; Rozin et al., 2016). Both are probably true: many pathogens enter the body through feeding.

Disgust is different from the other basic emotions in several ways. In its "core form," disgust is about eating and about the avoidance of oral pathogens. It is the only emotion based on a basic, biological motivation system: food/eating/hunger/nausea. The facial expression of disgust is functionally, an expelling of food from the mouth and a closing off of the nostrils. Nausea, the characteristic consequence of disgust, is a bodily response that terminates ingestion and stimulates vomiting. In English, the word "disgust" means bad taste. Disgust is more closely tied than any other basic

emotion to specific sensory systems; taste, smell and flavor all directly involved in eating. One of the brain areas typically excited when one experiences disgust is the insula, which is richly connected to the olfactory system. Related to these points, it has been noted that disgust has a less abstract appraisal system than other emotions (Royzman & Sabini, 2001).

It is much harder to diminish a disgust response than it is to reduce responses to other emotions. Joy, sadness, fear, and anger can be diminished or even reversed by explanations: disgust is relatively non-cognitive (Royzman & Sabini, 2001). After people have explained their aversion to drinking juice that had a cockroach dipped into it by saying "cockroaches are disease vectors", they are presented with a harmless, sterilized dead cockroach that is dipped in fresh juice. There is no risk in consuming that juice, but their disgust is barely reduced, to their surprise and embarrassment. Their response is often: "It's just disgusting." Rational accounts are often lacking. It is much easier to reasonably and correctly explain why one is angry, sad or afraid. Why is feces disgusting? It is just food processed by the gut?" A little further in this section, a similar quality will be noted in moral disgust.

The facial expression of disgust is based on the facial response to bitter substances. That is a rejection face, but bitter things are not offensive like disgusting things; they just taste bad (they are distastes, not disgusts, and are not contaminating). The rejection of bitter substances, and the face made to them are innate, but disgust is acquired, somewhere between 2 and 4 years of age. and what is roughly the bitter face accompanies it. The bitter face is preadapted for a different type of food rejection. Disgust may begin with learning in conjunction with toilet training. If contamination sensitivity is taken to be a necessary feature of disgust, it does not fully appear until age 4 or 5 in Asian Indian and American children (Hejmadi, Rozin & Siegal, 2004).

Feces is the universal disgust, and probably the first disgust. This, of course, fits nicely with approaches that emphasize microbial infection as the basis of core disgust. So does the fact that one's own feces is less disgusting (and less infective to the self) than the feces of other people, or that human feces is particularly disgusting.

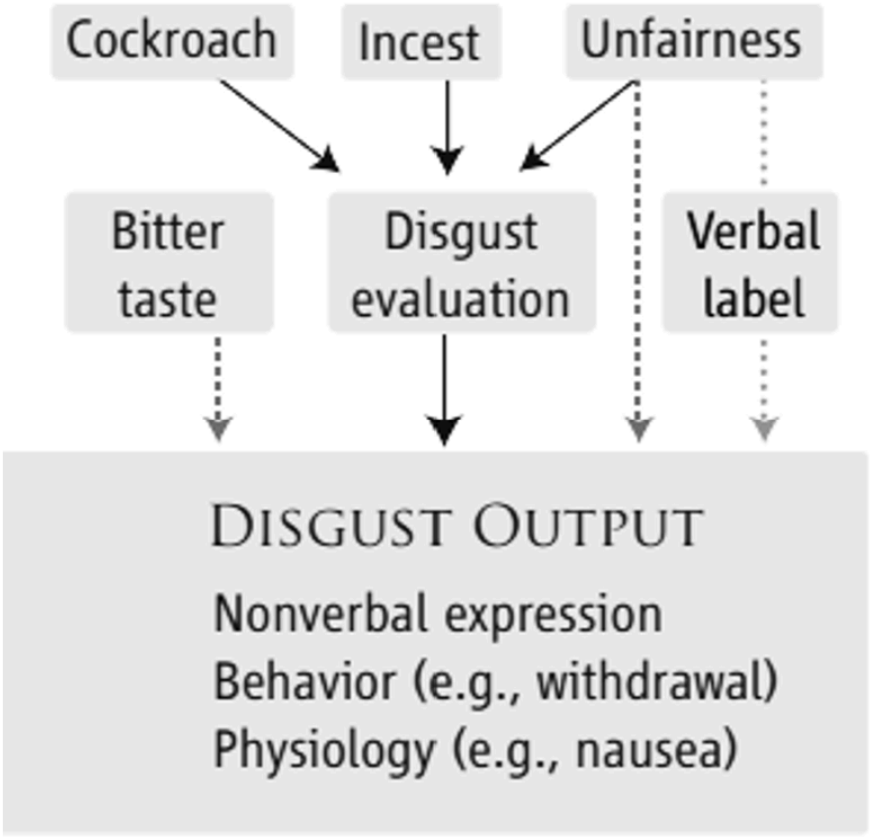
Disgust And Civilized Eating

As illustrated by the description of human eating at a dining table by Kass (1994) that opens this chapter, eating, a biological function, has been highly elaborated in culture history. The fundamental animalness and messiness of eating is suppressed. We are not animals, and our eating rules and behaviors show that. We don't stick our face into the food, and many of us use eating utensils. We do not spit at the table, and we do not take food from the plates of others. We have made a thing of not displaying the disgusting aspects of eating, an impressive feat, given that our mouth is filled with disgusting masticated food. Eating, at least in public, is a highly practiced and cleansed form of animal eating. Noiseless, nothing seen in the mouth, nothing falls out of the mouth, and there is no visible food on the lips or the areas around them. All of this happens while opposite others are gazing at our mouth, and we are speaking out of the same hole! We are virtuous eaters, and we learn to do this, according to Kass, in the service of civilization. It is odd that one of the main signs of our civilization centers on one of our messy animal properties. This has not happened much with our other bio-motivational systems, e.g breathing, excreting or sex. Reducing or eliminating elicitors of disgust in eating and other domains (e.g., in excreting in private) is a critical mark of civilization.

Preadaptation And The Expansion Of Disgust

The elicitors and meanings of disgust have expanded remarkably by the process of preadaptation, to include many social situations. The link with eating here is that it is the cultural-evolutionary origin for important interpersonal and moral issues. The Ekmanian output (1992) side of disgust—the expression, physiology, behavior and the mental experience (qualia)—has conservatively remained about the same, but this output has been attached to a wide new range of elicitors and appraisals (Figure 1). If Americans or Japanese are asked to name disgusting things, most reports are neither foods nor obvious sources of pathogens: some strangers, people from some groups, incest, axe murders, corruption, dishonesty, etc.(Haidt et al., 1997). What is going on here? Understanding the organization and meaning of a wide range of disgust elicitors represents a major task for the field.

***Figure 1*: Mapping of an Expanded Set of Disgust Elicitors**



Note: Unfairness could be a regular elicitor of disgust from appraisal onward, linked to the disgust output system without the appraisal, linked to the disgust output system via being labeled as "disgusting", or completely independent of the disgust system, whether labeled as "disgusting" or not. Adapted from Rozin et al., 2009.

Rozin, Haidt and McCauley proposed four categories of disgust (reviewed in Rozin et al., 1993, 2016). Given their focus on food as the core of disgust, the initial category (presumably first in evolution and development) is a subset of foods, primarily most potential foods of animal origin. The second category is "animal nature reminders." Based on the well documented cultural disposition to believe that humans are not animals, and are better than animals, disgust serves to get people to reject or

withdraw from reminders of humans' animal nature. This basic human cognition is illustrated well by the culture-historian, Norbert Elias, who wrote that "people, in the course of the civilizing process, seek to suppress in themselves every characteristic that they feel to be 'animal' " (p. 120; see also Miller, 1997). Death is a property humans share with animals that is particularly upsetting, as emphasized in Becker's (1973) *Denial of Death* and terror management theory (Goldenberg et al., 2001). Animal nature reminders include death, excretion, body envelope violations (exposing the wet insides of the body), poor hygiene, and certain types of sex. There are serious arguments against the coherence of the animal reminder avoidance category. One is that many animal reminders are not disgusting (Royzman & Sabini, 2001).

The third category of disgust is *interpersonal*, and refers to many disgust elicitors that are undesirable, but not necessarily immoral: people, including strangers, and people from certain disliked groups including some ethnicities.

The fourth category is a subset of moral violations that constitute moral disgust, to be discussed in a later section.

Tybur, Lieberman, Kurzban, and DeScioli (2013) have proposed a different organization of disgust, within a more biological evolutionary framework. According to this view, there are three types of disgust which they name, alliteratively, microbes, mating and morals. Each identifies a major domain of life, where the function of disgust is clearly to promote survival, through avoidance of certain potentially harmful entities, persons or activities. The microbe domain overlaps substantially with the food category of the Rozin et al. model. Rozin et al. focus more on cultural themes, such as the widespread human belief that they are not animals, and conceives of the expansion of disgust as primarily a feature of cultural evolution. The Tybur et al. view focuses more on biological risks, and more on biological as opposed to cultural evolution.

The microbe category could include both animal reminder and interpersonal disgust. Many of the interpersonal elicitors (e.g., strangers), are more likely to harbor dangerous pathogens. Building on this idea, Schaller and colleagues have developed the idea of the behavioral immune system (reviewed in Schaller & Duncan, 2016). Avoidance of infection is a main part of this system, and they note that this avoidance, usually involving disgust, is enhanced by higher trait concern with infectious disease vulnerability, and local situations, such as higher baseline infection rates. They link this system to stigma, prejudice, and xenophobia.

So the Tybur et al. (2013) theory subsumes the first three Rozin et al. categories under microbes, and adds a mating/sex category.

Moral Disgust

The final category of disgust in both systems is immorality. Moral disgust has become an area of particular interest in moral psychology in the last decade (see a recent edited book on moral disgust (Strohminger & Kumar, 2018)). It will only be summarized here because, although it probably has a food origin, and moral issues have much do with food in a place like Hindu India, most of the concern about moral disgust is not about food, but rather whether disgust is really, in some manifestations, a moral emotion.

For Tybur et al. (2013), disgust elicitors include all immorality, including things like unfairness, corruption, and dishonesty, in the service of improving group function. This broad view of moral

disgust is encouraged by the fact that in English, the word "disgust" is applied very broadly, to the point where it sometimes seems to mean just "bad".

Rozin et al.'s invocation of a relation between disgust and immorality is narrower and is based on Shweder's categorization and analysis of world moral systems (Shweder, Much, Mahapatra, & Park, 1997). This analysis claims three moral systems. The first is *autonomy*, based on harm and fairness. This is the principal moral theme in the Western-developed world. The second is *community*, based on respect and hierarchy. The third is *divinity,* based on sacredness and purity. An empirical and theoretical case has been made that these three themes, or CAD by their first letters, correspond to the three basic other-moral emotions, contempt (for community violations), anger (for autonomy violations) and disgust (for divinity violation). It was noted that the moral schemes align by first letter with their corresponding emotions, hence the "CAD triad" theory (Rozin, Lowery, Imada & Haidt, 1999) .

The elevation of disgust (and contempt, which has nothing special to do with food) as full- scale moral emotions was not popular in some parts. Some have argued that only anger is a truly moral emotion, and that harm, generously construed, is at the base of all morality (Royzman, Atanasov, Landy, Parks, & Gepty, 2014; Gray, Waytz, & Young, 2012, Schein, Ritter, & Gray, 2016). This is an unsettled matter. CAD also raised other issues, including whether the overlap of disgust and morality might be limited to body violations (which is different from divinity violations), or just pathogen-related moral violations (Royzman et al,, 2014). Lee and Ellsworth (2013) argue for two types of disgust, with physical disgust related to fear, and moral disgust related to anger.

Some have argued that moral disgust is focused on the body and body violations (potentially related to divinity; e.g.,Russell & Giner-Sorolla, 2013). They hold that "moral disgust, in the context of bodily violations, is a relatively primitively appraised moral emotion compared to others such as anger, and that it is less flexible and less prone to external justifications. (related to a point made by Royzman and Sabini , 2001). Russell and Giner-Sorolla report a particularly interesting result: In survey responses, voluntary and informed consumption of "meat" made from human- muscle-based- stem- cells by a person (a weak form of cannibalism) produces more anger than disgust. But if that same consumption was unintentional, the response is more disgust than anger. This beautifully illustrates their idea that disgust appraisals are simpler and are less likely to take context (intention) into account. Accidental consumption of forbidden foods is a moral matter in Hindu and kosher Jewish practice, because whether intake is intentional or not, the body is spiritually polluted. It does not matter much how the pollutant got there.

Along related lines, for those people who consider suicide immoral, suicide is not considered in the harm-moral framework, but as a disgust evoking tainting of the soul (Rottman, 2014). Divinity violations are important in the traditional world. The CAD moral theory emerged from research in Hindu India (Shweder et al., 1997). These issues have entered the American political world, where divinity violations (such as opposition to consensual homosexual sex) are more salient in conservatives than liberals (Haidt, 2012; Inbar, Pizarro & Bloom, 2009). As well, disgust in a moral sense has been related to important social/legal issues (Nussbaum, 2009).

Figure 1 represents the alternatives discussed for moral disgust. Body related moral violations (e.g., incest) are generally believed to fall within the disgust system, even though the link to pathogens is questionable in this case. Other moral violations can also be a part of the system, could just share the output system (but not the appraisal), could simply be linked to disgust by the verbal link, or could be unrelated to disgust.

There is serious discussion now about whether moral disgust is really a type of disgust, e.g. that it shares the output (facial, physiological, behavioral, mental and brain systems) with core disgust. James Russell and his collaborators have questioned whether the facial expressions are the same (Widen, Pochedly, Pieloch, & Russell, 2013), the physiological signatures, and even, in some languages, the name of the emotion (Kollareth, Shirai, Helmy, & Russell, 2021). Along with others, they see anger as the fundamental moral emotion, and propose "that the relation between disgust and immorality is largely coincidental, resulting from (a) using the word *disgust* to express anger with or even dislike of immoral acts and (b) the presence of incidental elements capable of eliciting disgust." (p. 951) (Kayyal, Pochedly, McCarthy, & Russell, 2015).

Royzman and his colleagues have confirmed that nausea and other aspects of "moral dyspepsia" are a major feature of core disgust, and are present in response to third party exposure to incest (Royzman, Leeman & Sabini, 2008). But there is at present, no evidence for the presence of gastric components for "non-bodily" instances of moral disgust. There is some overlap in the neural structures involved in both, but how much overlap, and what overlap is needed to establish some sort of homology or shared identity? Finally, there is dispute about the status of Shweder's proposed three types of morality, or Haidt's elaboration of that, in contrast to a more all inclusive harm model (Royzman et al., 2014; Gray, Waytz & Schein, 2012, Schein, Ritter & Gray, 2016)

Summary

Tybur et al. (2013) and Rozin et al. (1993, 2016) agree that the expansion of disgust has taken place within the framework of preadaptation (sometimes called exaptation or cooptation). Tybur et al. have adaptive accounts,, particularly microbes, that suggest an underlying motivation for the expansion, which definitely has an appeal. But it is also possible that the accretion of disgust elicitors simply results from cultures attaching disgust to a range of things that offend. The underlying principle is just that what is offensive is disgusting: rotting food, burning the American flag, selling body organs, rats, death, and bad people. Just like the underlying principle to explain the great variety of things in a waste basket (old bank statements, advertisements, used tissue paper, used chewing gum) is that people wanted to throw them away.

Besides the fact that emotions fall within the purview of social psychology, there are special things about disgust that make it relevant to enduring interests in the field. Disgust has to do with many things: negative: stigma, prejudice, interpersonal aversion, the borders of the self, and the staining or polluting of the self. Disgust has become very popular as a topic for research in the last few decades, in neuro-, clinical-, social-, cultural- and evolutionary-psychology. According to APA PsychInfo, "disgust, disgusted, disgusting" appeared in the title of peer reviewed psychology documents 32 times in the 1980-1989 decade. In the 2010 to 2019 decade, that number was 1126 (ratio of 35.3; the comparable ratio for fear/fears is 5.5). There were two books written about disgust before 1950 In the last 30 years, the first book was Miller's *Anatomy of disgust* (1997), and since then there have been nine more. Contributing factors to the increase of interest in disgust may be that disgust has clear biological roots and a clear cultural elaboration, is easy to elicit (as a stimulus or prime) in ecologically appropriate and ethical ways (even in a scanner), relates particularly to the chemical senses (giving it a distinct brain localization), has a clear physiological signature (nausea), has a wide range of sensitivity across individuals measurable by a few different scales (e.g., Haidt, McCauley& Rozin,1994; Olatunji et al., 2007; Tybur, Lieberman & Griskevicius, 2009). is interesting to researchers and to the public, and is even amusing (think disgust jokes). The puzzling fact that cleanliness is linked to morality presents fascinating problems that may be linked to disgust and

contamination (Kelly, 2013). Disgust has come a long way from feces to morality, or perhaps, from oral to moral, or from guardian of the body to guardian of the soul (Rozin et al., 2009).

CONTAGION

One of the defining features of disgust is that disgusting entities are contaminating. Reactions to contacting them are explained by the magical law of contagion. That same law, as illustrated in the discussion of the Hua, explains much about how people react to contact with other people.

The magical law of contagion asserts that people believe that when a person (source) makes contact with an object (a medium), some essence of that person, a residue, is transferred to that medium. When, on a later occasion, another person, a recipient, contacts the medium, the source essence is transferred to the recipient. The essence is assumed to be "active" and has specific effects on the recipient, that are related to the properties of the source or the relation of source and recipient. This is a schematic description. The source need not be a person but could be an object, like animal excrement or a natural gem, and the medium is not always necessary: The recipient can make direct contact with the source. Essences have a long life, so any medium, like a fork in a restaurant or a chair in a waiting room can have a historical library of personal essences. Therefore, as a modern, urban person negotiates the world, they make contact with millions of other people's essences. What could be more social?

The law of contagion was originally described by three anthropologists around the turn of the 20th century: Edward Tylor (1871,1974), James Frazer (1890,1922), and Marcel Mauss (1902,1972). Sympathetic magical beliefs, which included contagion, were supposed to be irrational beliefs characteristic of "primitive" (now called traditional) individuals or groups. In 1986, the robust operation of the law of contagion was demonstrated in what some believe to be the highest form of human life: Ivy League college students (Rozin, Millman & Nemeroff, 1986; Rozin, Nemeroff, Wane, and Sherrod, 1989). The demonstration involved both hands-on findings in the laboratory (such as rejection of fruit juice that had briefly contacted a sterilized cockroach) and survey results: For negative contagion, the effects were large and almost every participant showed them. Most of the subsequent studies, but not all (see below), were carried out with Americans.

The Properties Of Contagion

Magical contagion effects seem to be universal in adults. They have been demonstrated in adults from many countries, including some hunter-gatherers and subsistence agriculturalists (Apicella et al., 2018). They are not present in children below 4 years of age in both India and the United States (Fallon, Rozin & Pliner, 1984; Siegal, 1988; Hejmadi, Rozin & Siegal, 2004). Further studies indicated that magical contagion had the following features.

1. *Physical contact* is almost always present when contagion occurs, but it is neither necessary nor sufficient (Huang et al., 2017; Kim & Kim, 2011; Morales et al., 2018). It is not explainable as an association that is accomplished by contact, though that can occur. There is a transfer of essence over and above any associative effects (Fedotova & Rozin, 2018). The contact principle is obviously an important feature in terms of transmission of infection.
2. *Dose insensitivity*. Tiny amounts of material transfer, for example, very brief contact, usually produces a large response. Less than a second of contact between a dead cockroach and a liked juice

renders the juice disgusting and inedible (Rozin et al., 1986; Nemeroff & Rozin, 1994). Substantial increases in dose have a minimal effect on the response.

3. *Permanence*. Passage of time, including intervals as long as months or years, does little to degrade the potency of contagious contact. Marcel Mauss (1902) described this as "Once in contact, always in contact".
4. *Transfer of spiritual essence*. In many cases of contamination, the negativity transferred to the contaminated entity remains even though all possible particles of the contaminated entity are removed, for example by repeated filtering or rinsing. Spiritual magical contagion may be indelible; no physical manipulations can eliminate it. However, it can sometimes be neutralized by opposite valence spiritual contagion, as when the negativity of Hitler's sweater may be moderated if it is subsequently worn by Mother Teresa (Nemeroff & Rozin, 1994).
5. *Backwards contagion*, In the anthropological literature, the classical examples of magical contagion involve the possession of a residue of a person, A (e.g., hair, fingernail parings) by that person's enemy (person B). Person B then does harm to the residue of person A (e.g., burns it). This is believed to harm person A. The residue is believed to contain the essence of person A, and harming the essence harms the person. This is reverse causation, or backwards contagion. Backward contagion beliefs have been established in most, but not all, American adults, though the effects are much smaller than forward contagion (Rozin, Dunn & Fedotova, 2018).
6. *Negativity dominance*. Magical contagion effects can be positive or negative, in both cases consistent with the idea of passage of essence. However, negative contagion effects are more common and more potent (Rozin & Royzman, 2001). A drop of sewer water can spoil a delicious dessert, but a drop of a delicious dessert does nothing for a cup of sewer water. Notably, the word "contaminated" stands for an entity that has negative contagion, but there is no English word for an object enhanced by positive contagion. The Hua of New Guinea have elaborate positive contagion beliefs., but even there, negative contagion is more potent. There is high valuation by some Americans of clothing or possessions of admired others, which illustrates strong positive contagion. General observations across many cultures, along with the results of surveys, suggest a greater potency for negative entities in contagion (reviewed in Rozin & Royzman, 2001), but there has never been a proper test of this claim with comparably valenced "contaminants."

Contagion And Infection

Magical contagion is a feature of the disgust response to foods and other entities, including people from other groups and immoral people (Rozin, et al., 1986, 1989). Many scholars believe that the emotion of disgust, and the associated magical contagion principle, evolved in humans as a protection against microbial contamination (e.g., Curtis, 2013; Oaten, Stevenson & Case, 2009; Tybur et al., 2013).

About three decades ago, with AIDS as a major threat, the operation of magical contagion beliefs in reactions to AIDS was assessed (Rozin, Makwith & Nemeroff, 1992; Nemeroff, Brinkman & Woodward, 1994). In both studies, with American undergraduates, negative feelings toward contact with sweaters that had been worn or forks that had been used, by men with AIDS (versus healthy men) were measured. Evidence showed the negative responses that would be predicted, demonstrating the presence of physical contact, permanence, dose insensitivity, and backwards contagion.

Positive Contagion

Positive contagion definitely exists, but it is reliably weaker than negative contagion and for many potential sources, it is absent in many people (Rozin et al., 1989; Rozin & Royzman, 2001). Common sources of positive contagion for Westerners are family heirlooms, possessions of personal heroes, romantic partners, and celebrities. The desire for authentic objects may be mediated by positive contagion. Auctions prices of celebrity possessions are higher to the extent that the object touched the celebrity (Newman & Bloom, 2014).

As with negative contagion, some positive contagion cannot be neutralized by physical cleansing; it seems to be non-material or spiritual. For example, the personal value of one's grandmother's ring cannot, for most persons, be erased by any kind of cleaning (Nemeroff & Rozin, 1994). Positive contagion may be part of an explanation of why so many humans are passionately dedicated to the land of their ancestors (Rozin & Wolf, 2008). Most of the food one consumes was touched primarily by kin, such that food and many other exchanges would serve, by contagion, to build strong in-group connections.

Contagion And Essence

There is some relation between DNA and essence, both embodying representation of attributes. However, the relational aspect of essence, where the valence of essence depends on the relation between source and target, is not representable in DNA. Much of the literature on magical contagion is about negative contagion and involves poor health or poor well-being transmitted by direct or indirect contact with negatively valenced entities. Valence seems to be the most commonly transmitted feature, but there are examples of transfer of gendered attributes (e.g., among the Hua) and perhaps other attributes of the source (see following section on "you are what you eat").

It is possible to explain some contagion effects by associative principles: Hitler's sweater and grandmother's ring are clearly associated with Hitler and grandmother respectively, giving rise to, respectively, negative or positive feelings. But there is much more to contagion than association. For example, most people are more upset about holding Hitler's English dictionary in their hands than holding a brand new copy of Mein Kampf. The latter is surely more associated with Hitler, but the former was touched by him (Fedotova & Rozin, 2018).

Contagion probably originated, as did disgust, as an adaptation to avoid ingestion of food or water containing harmful microbes. But along with expansion of disgust by preadaptation, so the domains of contagion expanded by the same preadaptive process.

Living With Negative Contagion

Negative contagion is a major belief in the modern Western mind. In the course of a day, a person touches and eats many things. Most have a history of contacts with microbes, strangers, or undesirable or immoral people. Think of money, or seats on public transportation. One could easily be overwhelmed with disgust and fear, and not wish to leave home. How do humans manage to function, especially those who are high in disgust and contagion sensitivity? The simple solution is to just not think about the history of the objects you encounter, e.g ., where the money in your hand has been. Adaptation is a powerful process in humans and other animals, and this can lead to "getting used to" forks in restaurants or seats on public transportation.

There are also explicit ways to cope with being immersed in a world of negative contagion. The Hebrew Talmudic scholars were concerned with the potentially crippling effects of negative contagion from their forbidden foods. Pork is a disgusting and polluting substance, and ingestion of it is forbidden. But how can one be sure that the wind has not wafted some micro pork particles from the pork chops on a neighbor's grill? Suppose a tiny piece of pork falls into an otherwise kosher beef stew? Suppose a drop of milk falls into an otherwise kosher beef stew? (According to kosher laws, one cannot consume both dairy and meat in the same meal).

The rabbis thought their way out of this conundrum. If something non-kosher falls into a kosher dish *by accident*, and if it constitutes less than 1/60 of the total volume, the dish remains kosher. Fine... but wait. Suppose two non-kosher things (or perish the thought, n things) fall into the kosher dish. The first is 1/70 of the volume, so the dish remains kosher. Now the second non kosher thing falls in, and it is 1/80 of the total. But the two contaminants together, surpass1/60, and we are now back facing the problem of the sum of tiny epsilons. There is a solution. Only the principal contaminant counts; one can then forget about all the epsilons (Grunfeld, 1972). This is a remarkable solution, but it doesn't work for all kosher Jews. Some cannot follow this rule. If they know that *any* pork fell into a kosher food, they are disgusted and won't eat it. Feelings can trump rules (Nemeroff & Rozin, 1992).

Conclusion And Summary

Psychological contagion is a deeply social mental process. The mental representation of the contagious essence has implications for understanding the human social world. Nemeroff and Rozin (1994) suggested three mental models for contagious essence: 1. A material entity that can spread, like a germ; 2. A material entity that is likea physical residue, that does not reproduce itself, or 3. A non-material entity. The latter would be part of the account for spiritual contagion. Nemeroff and Rozin (1994) gathered evidence for the existence ofa ll three models, with more than one often present in the same person. An interesting more recent study on celebrity contagion suggests that valued artifacts that had contacted celebrities contain "essences" that do not reproduce. New parts added to an artifact post celebrity contact do not show much enhancement in value (Marchak & Hall, 2017). Much more has to be discovered about essences, including their relationship to widespread human essentialist beliefs.

Disgust and contagion (actually, the laws of sympathetic magic) were both introduced or reintroduced into the psychology literature at the same time (1986-87). As mentioned in the prior section mentions of disgust exploded by 2010 -2019 in article titles, but "magical contagion" or "sympathetic magic" are only mentioned a few times. Magical contagion deserves a lot more attention because of its social implications.

"YOU ARE WHAT YOU EAT"

Consideration of food in a social context must take account of a unique principle: "You are what you eat" (YAWYE). This important principle, which can be implicit or explicitly acknowledged, often in conjunction with implicit or explicit beliefs about contagion, is necessary to understand food as a social entity. The common sharing of food amplifies the action of these principles. These two principles, YAWYE and contagion, affect understanding of the relation of the eater to food, the role of food in identity, the psychological effects of diet, and the way that food acts as a binder and a

separator of human beings. These principles have a special relation to food and eating, and make these activities particularly potent forces in human sociality and cognition.

Humans interact with many objects in their world, but interactions with food are special. Food-human interactions are particularly intimate and potent, because these objects are ingested and become part of the self. And of necessity, these interactions occur very frequently. The core of this interaction is the mouth, the organ of ingestion. Food transitions from the external world to the internal world in the mouth. It is the last stage of ingestion at which food can be easily voluntarily rejected, and is an emotionally charged structure/aperture, the route through which almost all matter enters the body (Rozin, Nemeroff, Horowitz, Gordon & Voet, 1995).

The YAWYE principle states that the person takes on some of the properties of the foods ingested. It is a belief with intuitive roots, and is also supported by experience. People have many opportunities to observe that when two entities are mixed, the resultant entity shows properties of both of its original components. Think of mixing pigments, or mixing foods. So when a body is “mixed” with foods, it is natural to think that the body takes on some of the properties of the food. The intuition becomes much more powerful when it is linked to the principle of contagion. Tiny residues in the food from the persons who foraged/hunted for it, prepared it, and served it can pass their properties via ingestion. Not only are you what you eat but you are who made your food and shared your food. This promotes similarities in those who share foods, and the binding of those who share foods.

Historical Perspective

Historically, and in traditional cultures today, YAWYE is explicitly recognized. Ethnographies frequently describe instances illustrating an explicit belief in YAWYE (e.g., Crawley, 1902; Frazer, 1890/1959; Meigs, 1984), though they rarely designate them with the precise term ”YAWYE”. For example, Meigs (1984) noted that the Hua of Papua, New Guinea say that if one eats a fast growing food, one grows fast (Meigs, 1984.) The Hua generally believe that foods can induce in the consumer properties of the foods. Among the Tairora, also of Papua, New Guinea, YAWYE is an important part of the folk theory of personality development. Mother's milk is seen as a principal route through which the mother passes her properties on to her children (Watson, 1983). Many of the Hebrew kosher dietary laws are explained as safeguards "necessary to avoid an undue strengthening of the animal nature in man resulting from the consumption of meat, that is, of animal substance" (Grunfeld, 1972, p. 8).

The modern scientific view of digestion is that a wide array of very different looking foods are all reduced to a common set of molecules in the gut, such that these components are the only parts of a food entering into the body via absorption. Glutamine is the same molecule whether it comes from beef, wheat, or asparagus. Though we eat foods, we absorb molecules. This radical reconfiguration of the fate of food was preceded by well over a millennium of beliefs, at least in Western societies, in which food retained some of its identity in the body.

The Gaelenic model (2nd century, C.E., Shapin, 2014) which prevailed in the West over this period, was based on two principles. One was that foods and the body were made up of four humors with four qualities: hot, cold, moist and dry. The four humors embodied these qualities: blood (hot and moist), yellow bile or choler (hot and dry), phlegm (cold and moist), and black bile or melancholy (cold and dry). Each of these components had a corresponding temperament: sanguinary, phlegmatic, choleric, or melancholic (respectively). What one ate directly affected one’s personality,

with health a result of a good balance of these components. Illness was a result of an imbalance of the humors and was treated by changing diet to reduce the imbalance. So one's fundamental emotional and cognitive make-up was at the end of a causal chain that began with what one ate and drank (Shapin, 2014). This is an indirect embodiment of YAWYE. There was thought to be a balance maintained by a regional diet for those living there (Shapin, 2014). The second part of the Galenic system was analogical reasoning, linking, among other things, foods to dispositions (Shapin, 2014). For example, in the "doctrine of signatures" in the 16th and 17th centuries, links were asserted between the shape of a plant or plant part and a corresponding human organ. Shapin tells us that in Shakespeare's *Taming of the Shrew*, Petruchio attempts to tame the shrewish Kate, reducing her choleric nature by denying her the hot and dry food and encouraging the cold and moist.

YAWYE as a saying was "coined" twice in the 19th century. In France, Brillat-Savarin (1825/2002), the famous French gourmand, penned: "Dis-moi ce que tu mange, je te dirai ce que tu es" which translates as "Tell me what you eat, and I will tell you what you are". Later, in Germany, Ludwig Feuerbach (1850) originated a linguistically appealing version: "Der Mensch ist, was er ißt" which translates as "Man is what he eats" (Shapin, 2014). The origin of the saying is rather late in history, given the ubiquity of the belief. The late origin is confirmed, for the English language, by relative frequency plotted for "YAWYE" from 1800-2019 with Google NGram. There are no mentions until after 1880, and there is a sharp rise in relative mentions by about ten times in the 50 years between 1960 and 2010. This does not reflect greater interest in the original meaning of the term, but rather a broader set of meanings, including "food is important". YAWYE is popular in the academic literature, with a Google Scholar search of 19,200 mentions (as of October, 2022). It even occurs in the title of articles. Of the first 20 articles with YAWYE in the title, in only four cases was the article really about YAWYE in the narrower sense of the term.

YAWYE And Eating Animals

A major group of YAWYE mentions has to do with ingestion of animal foods leading to aggressiveness and violence. Desiderius Erasmus's Adages (1539; cited in Shapin, 2014) included '"Wythout meate and drynke the lust of the body is colde" and "The beste way to tame carnal lust, is to kepe abstinence of meates and drynkes." In the late seventeenth century, the English pacifist writer Thomas Tryon reckoned meat-eating, and specifically the eating of bloody meat, to be a cause of a violent society. The violence disposition was fostered by the ingestion of the meat, not the killing of animals (Shapin, 2014).

YAWYE, when applied to animal foods, directly implies the imparting of animal characteristics to humans. Animals, as opposed to plants, are usually the target of application for the YAWYE principle. This is probably because animals are more similar to humans and because animals have salient characteristics that seem more likely to be transmittable to humans. Along just these lines, in delineating which animals are prohibited and which are allowed according to Biblical law, Grunfeld (1972, pp, 8-9) suggested a general principle: "the nearer an animal is to the vegetable world in its habits and composition, the less likely it is to arouse the animal nature in man, and its meat becomes the more suitable for human consumption." Among Americans reluctant to consume meat, 14% agree with both of the statements that eating meat: "makes me behave more like an animal" and "causes undesirable changes in people's personalities" (Rozin, Markwith & Stoess, 1997).

Origins Of The YAWYE Belief

If the notion that YAWYE is widespread, what is its origin? One possibility is, simply, its reasonableness. It has an intuitive appeal that is in line with our experience. Indeed, in some cases this does occur. For example, with the ingestion of large amounts of fat, one becomes fat. Ingestion of very large amounts of carotene (for example, through carrots or tomatoes) can lead to an orange skin pigmentation; and ingestion of garlic can be followed by garlic aroma in the breath, in the sweat, or in mother's milk.

Within this frame, it seems inappropriate to consider YAWYE as a "primitive" or irrational belief. It is more properly considered rational but usually false, according to the facts of digestion as understood by educated 20th-century members of Western scientific cultures. Note that the findings that lead to a theory of digestion are themselves highly abstract and nonintuitive. Alternatively (or perhaps additionally), YAWYE can be considered as a derivative of the law of contagion, as described in the last section. YAWYE just deals with much larger amounts than contagion usually does.

Meanings Of YAWYE

As a result of the development of the science of nutrition, and the shift from qualities to constituents, the modern, educated person would not normally believe YAWYE. However, such a person would agree with the idea that a healthy person eats healthy foods That is a different version of YAWYE. YAWYE can mean very different things, and it is used by different people, at different historical times, to mean different things. In the original and most interesting form, it means that people literally take on some property of the food they ingest.

A second form is that people take on properties of the foods they eat by analogy, so that, for example, red foods encourage female characteristics. It is these first two meanings that concern us in this section. A third version is that some human imposed modern categorization of a food, such as "healthy foods," gives rise to a corresponding effect, i.e., healthy people. A fourth meaning, very common in modern usage of the term, is that food affects people. This is to say that food is important. Modern academic articles that have YAWYE in the title usually mean this.

Evidence For A Belief In YAWYE In WEIRD Populations

Several studies on Americans report that the foods consumed, typically healthy versus non-healthy, affect or co-occur with personality and other properties such as sociability, attractiveness, warmth, and morality (e.g., Barker et al., 1999; Stein Nemeroff, 1995). However, these studies do not illustrate YAWYE in accord with our first two meanings, above. For the narrower, closer correspondence between the source and recipient, there may be no "tests" of belief in YAWYE within traditional cultures, but many examples are offered by ethnographers. One exception is a controlled demonstration with American college students. (Nemeroff & Rozin, 1989) that used an implicit measure, namely, the Asch impressions technique. Students read a one-paragraph description of natives of a (fictional) traditional Pacific culture that described various features of the culture. A critical sentence in the description read by half of the respondents was "Wild boar and various kinds of fish constitute their main foods. In addition, they hunt marine turtle for its shell but do not eat it." The other half of respondents read the same general description except that the two sentences listed above were changed to "Marine turtle and various kinds of fish constitute their main foods. In addition, they hunt wild boar for its tusks but do not eat it" Respondents were then

asked to rate members of the culture on a number of roughly opposite traits, on an eight-point scale. For example, one of the pairs was frivolous = 1 to serious = 8. The list of 11 traits included some pairs pre-tested to distinguish turtles and boars, e.g., good swimmers – good runners. Note that respondents did not know that there were two versions of the paragraph, and did not know that food was the only different item in the two forms. Boar eaters were rated as significantly better runners than turtle eaters, and were higher on the boar feature in almost all cases. Note that this difference could not result from the type of hunting that was done because both groups hunted both animals. A similar study was done with elephant eaters and vegetarians in which both groups herded elephants and grew crops. Similar results were found in this second study. Thus, implicitly, the American college students showed some agreement with YAWYE.

Disentangling "You Are What You Eat" (YAWYE) And "You Eat What You Are" (YEWYA)

Demonstrations of belief in YAWYE are confounded because there is another belief, "you eat what you are" (YEWYA), that almost always makes the same predictions. So a culture that is better at running (or more aggressive) might do more boar hunting. It is very likely that YEWYA holds most of the time. So whether French food makes the French more French (YAWYE), it is surely the case that the French eat a lot of French food. How can one establish a pure belief in YAWYE? One possibility, at least in traditional cultures, is to ask people directly. Another, in a more experimental framework, is to try to equalize exposure to two foods, only one of which is eaten. That is what Nemeroff and Rozin (1989) did by comparing boar eaters to boar hunters who did not eat boars. Some further questions in their study eliminated a possible confound, which is that respondents did not believe that boar eaters do much more boar hunting than do boar hunters who do not eat boar.

Another approach is to examine situations in which some people are involuntarily exposed (hence not YEWYA) to a particular food or set of foods for a period of at least weeks, ideally months or more. So vegetarians, because of allergies, might have to eat a high animal food diet, or because of weather changes, a group must abandon their favorite foods (on grounds of unavailability). Only YAWYE would predict food-related changes in people with "forced" exposure. One sort of qualifying study is really a study on whether YAWYE is actually correct. Weinstein and de Man (1982) assigned subjects to eat a vegetable or meat breakfast for eight consecutive days. They found negative emotionality to be higher in the meat eaters. This could be a result of subject expectations (YAWYE belief) or because of an actual change in behavior (actual truth of YAWYE), or because meat breakfasts put the eaters in a poor mood. Unfortunately, negative emotionality is not an obvious animal property, so even on the generous interpretation, this study does not qualify as assessing in the first sense, of passing relevant qualities. But it is a start.

There are other variants of YAWYE such as "You are what admired/close others around you eat" (even if you don't eat it). These and other possibilities are left for future researchers.

YAWYE, Contagion, And Interpersonal Influence

Possibly, YAWYE is an example of the magical law of contagion, in which substantial amounts of the critical material are transferred, and in which food is the medium of transfer. Both of these qualifications (substantial amounts and food route) should make contagion effects more potent.

Contagion usually involves tiny amounts of the critical substance, and physical contact as opposed to ingestion. Because people rarely eat other people, the way they may incorporate other people is that other people's essence transfers to food by contact, and when ingested, expresses features of another person. Thus, the hunter/foragers, preparers, or servers of food may be a source of attributes or valence effects in the eater.

MEAT AND VEGETARIANISM

Meat Is Very Positive

Meat is a special and important food category. Meat plays a critical role in human evolution. Furthermore, cooking, one of the major advances in human evolution, had three very specific positive effects on meat: it killed parasites, it made meat easier to chew, and it had major, mostly enhancing, effects on its flavor (Wrangham, 2009). Meat has many meanings, such as a metaphor for might and masculinity, or a meaning of centrality or foundation (e.g., the meat of the argument). Across the world, meat is probably the favorite food category, the most expensive, and the most associated with high status. People find the taste and texture of meat (after cooking) very pleasing. Meat, along with milk, is the most nutritive natural food; it is a complete food because the nutritional composition of animals is very close to the composition of humans. Of all types of natural foods, meat requires the most skill to obtain because hunting is hard.

According to the evolutionary anthropologist, Marvin Harris (1985, p. 22) "..all over the world… people honor and crave animal foods more than plant foods and are willing to lavish a disproportionate share of their energy and wealth on producing them." According to Twigg (1983 pp. 221-222), "Meat is the most highly prized of food. It is the centre around which a meal is arranged. It stands in a sense for the very idea of food itself." Meat is one of the most positive things in the life of the human omnivore.

Meat Is Very Negative

And yet, meat is by far the most tabooed category of foods (Simoons, 1961; Fessler & Navarette, 2003). The distinguished cultural geographer, Frederick Simoons (1961), in his classic work on meat, *Eat not this flesh*, states: "Of all the group food avoidances, those which pertain to foods of animal origin, particularly flesh, are accompanied by the strongest feelings, are most frequently incorporated into religious observance, and are supported by the most severe sanctions" (Simoons, 1961, p. 107). Meat is the only food category for which there have been many organized and successful attempts at prohibition.

Meat is a principal vehicle for the transmission of infectious diseases. Because animals are more similar to humans than are plants, there are more micro-organisms that can inhabit both humans and nonhuman animals. Meat, from either wild or domesticated animals, involves killing animals, something that at least in modern times, makes some people feel uncomfortable and even guilty. As noted, only one basic emotion has its origin in a particular domain of life; the emotion is disgust and the domain is food. More specifically, disgust is a negative emotion, and the foods that elicit it are almost always of animal origin (Angyal, 1942; Rozin & Fallon, 1987). Disgust has much to do with

disease and death. Much more than vegetable foods, animal foods decay rapidly and in doing so, emit the foul odor of decay and death, the odor that reliably elicits disgust.

Meat And Ambivalence

Few things in the human world are a conglomeration of many good and bad properties. Meat is one, and it is a prime example of ambivalence. Its most salient positive property, its flavor, is a feature with immediate impact on ingestion, opposed by more abstract and distant negative features such as its origin in killed animals and beliefs about the long-term effects of ingestion on health and personality. Avoiding meat represents, for some, an exercise in self-control of the immediate impulse to consume in order to reap the long-term advantages of restraint. These opposite meat properties are captured by the anthropologist Stanley Tambiah, in a paper entitled "Animals are good to think and good to prohibit" (1969). He might well have replaced the word "think" with "eat", and "animals" with "meat".

Some psychological features enhance the power of meat, raising the possibility that meat is a charged substance, more likely to be affected, negatively or positively, than foods of plant origin. Another possibility is that meat is predisposed to change its consumers only in the negative direction. One relevant feature that illustrates the predispositions of meat is "you are what you eat."

Meat (animals) possesses more features that might be transferred to humans by ingestion than plants do. Features such as speed, aggression, stealth, and loudness have no plant parallels. Note that some of these features may be positive and some negative. A widespread belief across many cultures holds that eaters of animal products become more animal like. This could include positive features such as intelligence and negative features such as violent behaviors. There appears to be no compilation of instances of "you are what you eat" beliefs across culture that would allow one to determine whether most instances refer to animal foods, but it seems likely.

With respect to contagion, it seems that most of the most potent contagious entities, transferring valence or specific properties, have to do with animals. Blood is a property of animals, and is often seen as a seat of passions which are believed to be very transferable (Twigg, 1983). In Macbeth, almost all of the witch's brew is of animal origin, such as poisoned entrails, eye of newt, and toe of frog. Indeed, it would be hard to predict, based on YAWYE, what changes might occur in humans who ate a lot of corn, or spinach. In one relevant study using unfamiliar foods, participants were offered the same unfamiliar food which was described as either of animal or plant origin. When it was described as of animal origin, people were more reluctant to sample it (Pliner & Pelchat, 1991)

Meat As A Symbol: Meat And Masculinity

Animal food products may be more likely than plant products to be endowed with symbolic properties. Not only are taboos primarily of animal foods, but totems usually refer to animals. Careful tests of these ideas would involve compilation of relevant references from ethnographies, perhaps accompanied by controlled laboratory studies. Fiddes (1991), in a book devoted to meat, describes it as a "natural symbol," and presents evidence that meat eating often represents human mastery over nature. In many cultures, this is a recurrent theme associated with the idea that humans are superior to other animals. Coupled with YAWYE, this should encourage humans to avoid eating meat. The imparting of usually negative animal properties to those eating meat is

mentioned in some ethnographies and in some justifications for vegetarianism. Given the popularity of meat, this remains a puzzle.

Meat is, perhaps, the most gendered food category. Men do almost all the hunting and most of the butchering. They eat more meat than women, and the best cuts of meat (however defined) go preferentially to high status men. The idea that meat is a male symbol, or is at least associated with masculinity, has arisen many times (e.g., Adams, 1990). This idea was taken seriously, and used as an example to explore what would constitute evidence for a symbolic relationship (Rozin, Hormes, Faith & Wansink, 2012). Six lines of evidence were assembled. First, ratings of the maleness and femaleness of different foods revealed that greater maleness was only a property of mammalian muscle foods. Mammalian viscera such as liver or kidney, or muscles from, chicken, or fish were not rated as more male.

Second, in gendered languages, “meat” and examples of it, such as “beef” or “sausage” are more commonly assigned the male gender. Third, in the US, men show stronger preferences for meat than women do. Fourth, Americans believe that high levels of meat in the diet predict maleness. Fifth, the incidence of vegetarianism is higher in women, across a number of cultures. Sixth, using the IAT, types of meat are more rapidly identified when the alternative category is masculine (as opposed to feminine) first names. Vegetable exemplars go more readily with feminine first names. The results here were quite robust (Rozin et al., 2012). This set of findings, plus the extensive cultural data summarized above, suggests a link, perhaps symbolic, between meat and masculinity.

Vegetarianism And Inklings Of Meat Avoidance

Vegetarianism is a minority designation in all reasonably large countries, with India highest at above 25%. Many authors point to evidence of conflict and ethical or health concerns about meat among omnivores. Among Americans, where vegetarianism is adopted by about 5% of people, a much higher number of meat eaters, about 30%, can be identified as “conflicted omnivores” (Ruby, Rozin, Gendelman, Li & Peelish, 2023). These individuals endorse statements such as “I feel bad about consuming meat”. Albert Einstein, who became a vegetarian, said "I have always eaten animal flesh with a somewhat guilty conscience." This conflict between beliefs and behavior has been described as the “meat paradox” (Loughlan, Haslam & Bastian, 2010), and Rothgerber (2020) has noted this as a salient example of cognitive dissonance, with a disparity between behaviors and belief. How does the conflicted omnivore manage to consume so much meat?

There are explicit arguments that people use to justify their meat consumption. One set has been described as the four Ns: meat is Nourishing, Nice (tasty), Normal (majority behavior) and Necessary (for health) (Piazza et al., 2015). One way to reduce dissonance is to become vegetarian, or at least reduce meat intake. A number of other strategies have been documented, including avoiding reminders of the animal origins of meat (retailers in the US support this by not having hanging carcasses in public view, and selling fur-free cuts of mammal meat in plastic wrappers), avoiding videos or print material about livestock practices and slaughter, dementalizing domestic food species as not being conscious or able to experience suffering, avowing the idea that humans ”made” domesticated food animals, and believing that mastery over nature is an admirable human feature, and even derogation of vegetarians (Kunst & Hohle, 2016; Loughnan, Bastian, & Haslam, 2014; Rothgerber, 2013; Ruby & Heine, 2012). If and when these compensatory events fail, a person is on the path to vegetarianism.

The Path To Vegetarianism

A case can be made that vegetarianism is the basic state of humans. Most primates are primarily vegetarian (leaving aside insect consumption), and the "most authoritative source", the Hebrew bible, makes this absolutely clear: "God said, 'Behold I have given you every herb bearing seed which is upon the face of all the earth and every tree in which is the fruit of a tree yielding seed; to you it shall be meat.'" (Genesis 1: 29, sixth day of creation). Adam and Eve were actually vegan. However, most scholars agree that meat was a longstanding part of the hominid diet

In general, with the possible exception of India, vegetarians are more likely to be women and more inclined to support liberal values; they constitute 5-9% of individuals in Western, developed countries (Ruby, 2012). Very approximately, half of all vegetarians in the world are Hindu Indians. This vegetarianism is quite different from the Western varieties: it is tightly tied to religion, and is motivated by ascetic and spiritual concerns, in particular the sacredness of animal life. Almost all Hindu vegetarians, unlike Western vegetarians, were raised as vegetarians and never tried meat (Ruby et al., 2013). The concern with animal welfare and the effects of rearing livestock on the environment, prominent in Western vegetarians, are muted in Hindu Indian vegetarians,. The Hindu vegetarians are more concerned with meat as spiritually polluting, and have a higher valuation of Shweder's divinity moralities (Shweder et al., 1997) than Inian omnivores. There is very little research on the psychological aspects of this type of vegetarian: for example, do they find the meat of sacred animals disgusting?

About 7% of humans are vegetarians, and the number is growing, particularly in Western-developed countries. Vegetarianism offers psychologists interested in attitude and behavior change an excellent domain in which to study some basic social psychological principles.

Oddly, there are very few studies of the natural history of becoming a vegetarian, one major exception being a study by Amato and Partridge (1989), which forms the principal basis for the descriptions of the process here. These authors surveyed the natural history and current practices, and attitudes of over 200 primarily American vegetarians. They found that there are three components to being a vegetarian: *behavioral* (the actual foods consumed and avoided, and in some cases, the organizations joined), *cognitions (*beliefs and attitudes), and *affective* changes (foods liked, disgust, contamination sensitivity to meat, and meat craving). Most vegetarians begin with a modest level of meat reduction; the first total rejection in the US is usually for beef (sometimes baby mammals like calves/veal before beef), which then extends to all mammals, then birds, and then fish and shellfish. Omnivorous humans usually find mammal muscle meat most desirable, and in traditional cultures the most prestigious. The most sought-after meats are the first for vegetarians to reject.

Because most vegetarians (and vegans) go through stages of meat rejection, one can ask what motives a person might have to begin on the path to vegetarianism, and how these might change as a person continues on the path. These motives are discussed here in the order in which they may have arisen historically.

The oldest reason is *spiritual* and has to do with the belief that at least some animals are sacred. Killing an animal is a major sin. Ironically, though an animal is sacred, eating it is polluting. Consuming the sacred could be taken to be an elevating act, but of course eating is destroying. Reincarnation is a recurrent theme in Hinduism and Buddhism, and that means that an animal may

have a human history or future, and so eating it borders on cannibalism. In the Hebrew religion, the sacredness of animals is not an issue; rather, the avoided animals are undesirable and polluting.

Perhaps the second oldest motive has to do with *a compassionate feeling* about animal killing or mistreatment. The Hindu and Buddhist principle of *ahimsa* (non-violence) includes not harming animals. Opposition to killing and eating animals, based on compassion, is present in the writings of Pythagorus, Plato and Gautama Buddha.

Another very old belief, derived from "you are what you eat", is that consumption of animals *makes one animal-like*. (discussed in the last section). (Oddly, in this frame, it is not suggested that consuming plants makes one plant-like.) Given the common view that humans are superior to animals, becoming animal-like would be negative. Particular perceived animal features such as aggression could lead to an (factually incorrect) association between animals and war. And there are of course, positive animal features such as speed, defense of the young, and nurturing the young (notably for mammals). It is possible that much of the aggressive/violence link to animals actually refers to the human acts of hunting and killing.

Beginning in the 19th century, concerns about the *unhealthiness* of animal foods began (Spencer, 1993; Wharton, 1994). In the mid 20th century, this view got some support from medical research on saturated fats and cholesterol . Preserving the *environment* is the last entry among the movements and motivations to reduce meat consumption, The foundations for this position began to be salient in the later 20th century, in the face of climate change and environment degradation, and the rise of the sustainability movement. Central to this is the fact that raising animals for food (not hunting) is hard on the environment, because the amount of water, food and land to generate an animal calorie is much higher than to generate a plant calorie. Two other motivations that have produced meat avoidance for thousands of years are *disliking the taste* of meat and the *high cost* of meat. Of course, the latter leads to involuntary vegetarianism. There is no exclusivity in the listed motivations, such that most vegetarians have multiple motives, although there is often both one principal motive, and one original motive. They are often the same (Rozin, Markwith & Stoess, 1997).

The older (compassion, spiritual) and newest (sustainability) motivations are moral, while health, the principal other one, is nominally not moral. This allows for a study of the effects of moral (as opposed to non-moral) motivation on vegetarian attitudes and feelings. One study comparing vegetarians whose original motive was moral versus non moral reports that the moral vegetarians were more likely to find meat disgusting, and were more likely to have more motives for their vegetarianism (Rozin et al., 1997). This suggests potent effects of moral motives, which would require further exploration. Some omnivores and others on the path to vegetarianism or veganism may face a dissonance between meat eating behavior and beliefs about it. Vegetarians may experience this dissonance when questioning their consumption of eggs and dairy. An ironic somewhat reversed dissonance can be experienced by some vegetarians and vegans when they discover that Adolf Hitler was a moral vegetarian (Arluke & Sax, 1962).

The transition to vegetarianism at various stages has been analyzed successfully within the framework of the transtheoretical model of change (Bryant, Prosser & Barnett, 2022). The idea of a progression to vegetarianism or veganism is an oversimplification. There are many reversals for some along this path. Although no data record the incidence of these reversals, they occur at all stages, and sometimes involve slipping back a stage (e.g., from vegan to vegetarian), or occasionally a return to full omnivore status. A striking historical reversal involves Benjamin Franklin, as documented in his autobiography (Franklin, 2005). The teenage vegetarian author of the quote

"Flesh eating is unprovoked murder," upon observing little fish in the stomach of bigger fish, became an omnivore.

Summary

Meat, vegetarianism, and veganism offer many opportunities to social psychologists. There are so many motivations and dissonances. There is the opposition between short-term hedonic approach motives and longer-term health and moral motives. There are gradual and sudden changes. These events are not uncommon. There are issues involving category and group membership, including the perceptions of oneself and others: stigma, self-assurance, moral superiority.

In recent decades, under the motivation of promoting sustainable eating, there has been a concerted effort to reduce the intake of meat. In addition to just reducing meat intake (the old solution), there are three new opportunities. One, eating insects, has always been a human activity, but serious efforts are being undertaken to introduce this to the Western developed world. Insects are a good source of nutrition, and in particular, animal protein. Killing insects does not generate compassion concerns in most people and insects are very sustainable. The problem is substantially psychological: Most Westerners find them disgusting. A second opportunity is plant-based imitation meats, which are now in markets, even in major fast food chains, and they are getting cheaper. They are sustainable, and unlike insects, they taste like meat. The third opportunity, cultured meat made from cultured muscle cells is real meat that does not involve killing animals, and is kind to the environment. Currently, cultured meat is very expensive. Insects are natural, while plant-based and cultured meat are products of technology. Together, these alternatives will probably result in a substantial reduction in meat consumption.

There is a major role for psychologists in studying the promotion and acceptance of these new alternatives. They also offer an excellent opportunity to explore attitude change. Titles of psychology journal articles containing the word "meat" have risen from 5 in the decade from 1980-1989 to 238 in 2010-2019 (APA PsychInfo). Comparable values for "vegetarian" are 2 to 68. For comparative purposes, in the 2010-2019 decade, "stereotype" appears in the title of 1862 papers. Meat and vegetarian are moving along, but there is a long way to go.

CONCLUSION

This chapter is a first effort to present food and eating to a social psychologist audience. It is a big area, extending across disciplines, and of course, this review is incomplete. An attempt has been made to present much of the material that is of interest to social psychologists. In some of these areas, the experimental and statistical sophistication of social psychologists has been absent or almost absent, and the field needs it. Many social psychologists might find findings that capture their imagination and are ready to be analyzed from a social psychological perspective. In some areas, more descriptive studies need to orient researchers more interested in experimental analysis.

The food world is undergoing massive change now, as elements of the modern Western diet, such as pizza, cookies, and soda compete with traditional foods in the developing world. In recent decades, a concern about sustainability has added what for some is a strong new moral concern. The rise in meat consumption in the developing world is occurring at the same time as an incipient drop in meat consumption in the developed world. Attitudes to the major entry of technology in

the food world (e.g., genetically engineered foods) produce fears, even moral outrage, but sometimes enthusiasm. Think about 3-D printed lasagna. The family meal may be in decline which may threaten family bonds and a major locus for socialization. There is much for social psychology here, in a matter of major public import.

So much has not been covered or covered too briefly in this review. Examples are food socialization, formation of food attitudes in general, attitudes to genetically modified foods, to natural foods, to food risks, person perception in terms of food habits and beliefs such as vegetarianism, and the modeling and prediction of food intake and choice in a multivariate context. There is a relatively new disciplinary player in psychologically oriented studies of food and eating. It is the academic discipline of marketing. Marketers do not need to be convinced to study an area which accounts for a substantial proportion of human expenditures.

The food world is central to human life and human biological and cultural evolution. As such, it should be an important part of social psychology. There are some aspects that have unique psychological properties, such as the link between eating and social exchange of all sorts around the meal, and the special relations between food, contagion. and the self. The food/eating domain also offers excellent opportunities to study basic social processes like attitude change. The centrality of the food eating domain is well illustrated by a feature of the favorite culture of this chapter, the Hua of Papua New Guinea. The Hua word for "everything " is *" no 'ado' na",* literally, "that which can be eaten and that which cannot" (Meigs, 1987).

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ENDNOTES

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