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Exploring the Landscape of Modern Academic Psychology: Finding and Filling the Holes

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Like any other domain of human activity, psychology has its fads and fashions. One consequence of fads is an overconcentration of resources on specific problems or approaches, which leaves other important problems or approaches (holes) underappreciated and understudied. This article is primarily about different factors (such as negativity bias, polarization of positions, focus on internal causes of behavior, dedication to a narrow view of what science is) that result in holes and about explorations of some of these holes that have interested the author. Psychologists should look more in the holes left behind by current enthusiasms.

Keywords: food, fads, disgust, culture, evolution

hole (*n*). A hollow place, cavity, excavation—*Oxford English Dictionary*

Psychology appears to progress by removing the obstacles it has placed in its path.—William Stern

The progress of Western academic psychology in its first 100 plus years is impressive, but the enterprise has some shortcomings that may have limited advances. My claim is based on a fact of human nature, or at least of modern enculturated humans. Just as we tend to cluster in cities and

Editor's Note

Paul Rozin received the Award for Distinguished Scientific Contributions. Award winners are invited to deliver an award address at the APA's annual convention. A version of this award address was delivered at the 115th annual meeting, held August 17–20, 2007, in San Francisco, California. Articles based on award addresses are reviewed, but they differ from unsolicited articles in that they are expressions of the winners' reflections on their work and their views of the field.

towns, we tend to cluster around ideas, particular objects, and particular activities. I describe this with the term *fads* (meaning no derogatory implication). Fads have both positive and negative implications for the progress of psychology. I focus on the costs of fads in this address, looking at the holes that are the necessary consequence of creating piles.

There are two kinds of holes. Primary holes are those made for their own sake. Oil wells and the mouth are good examples. Secondary holes are the byproduct of some other activity. Mountains imply valleys, piles imply holes, topics that get great attention imply others that are ignored. The holes in psychology are of both forms but are primarily secondary. That is, in most cases, they result from limited resources and attention, as a result of the development of major foci of interest. In a few cases, as with the active rejection of the study of mental events by behaviorists, there are motivated holes.

The plan of this address is to first discuss fads, or what leads to the creation of holes, and then to discuss the virtues and shortcomings of working on holes. I then, as a *hole filler*, review a number of the forces within psychology that have produced holes and the work I have done with my colleagues to fill some of the types of holes I enumerate.

Fads

Fads themselves have not been a major focus of psychological interest, although they are surely a prevalent part of the modern world. Fads, under the term *crazes*, have received attention in sociology, with a definitive analysis by Smelser (1962). Smelser's focus was appropriately to define the necessary and sufficient conditions for the occurrence of a craze. The focus in this address is on the forces that promote fads within psychology. The two major fads in the history of psychology, psychoanalysis and behaviorism, offered attractive alternatives to what came before them. The problem arose when the enthusiasm of their practitioners led them to believe that other approaches should be abandoned. Success in these enterprises produced holes.

Perhaps the major cause of fads is perceived or real opportunity. Brain scanning and cognitive neuroscience provide a current example. Many are attracted to this methodology and correctly see both that it allows psychologists to answer questions that they have long pondered but could not approach and that prospects for employment and funding in this area are good. A graduate student might reasonably choose this area of research. But the advantage disappears if a majority of graduate students make this choice, because that results in excessive competition and more people than good problems to study. The parallel with growth versus value stocks is apt. Growth stocks, in general, do have greater potential for growth than value stocks.

But, the more people who purchase them, with the associated rise in price, the less potential they have for the individual participant (Rozin, 2002).

A second cause of fads is social influence. Humans like to do what others are doing, particularly prestigious others. As more and more people, particularly elites, adopt a custom, or a line of research, it becomes more attractive.

A third cause is active promotion. In the business world, marketers find ways to make their products more attractive and appealing, with devices such as introductory offers, advertisements, and testimonials. In academic psychology, promotion is more subtle and is conveyed by enthusiasm of prominent psychologists, conferences, and journals. As the fad grows, there is easier access to funding and publication.

To the degree that fads capitalize on real opportunities, they have adaptive value in the enterprise of advancing psychology. Furthermore, some of the resulting holes may represent things that are truly unimportant or things that are extremely difficult to study. But some may be unintended consequences of fads. It is those holes that are of interest here.

Studying Fads or Holes

Fad participants get a great deal of social support and friendlier reviewers for articles and grants. The advances in knowledge allow for more elegant studies and more sophisticated methodologies. However, fads incline researchers to tunnel vision, where prior studies become the grounds for present studies, rather than the actual problem that motivated the work in the first place.

There are advantages to working in an area that is not a fad. Much less background reading is required. Early stage research on a problem is much less expensive. Pilot studies are more fun to do. There is little danger that others are doing the same study you are doing and will beat you into print. And perhaps most important, when you do have a finding, it is likely to represent a much bigger marginal increase in the state of knowledge. Studies 1 and 2 usually add more to knowledge than Studies 1,000 and 1,001. However, it is harder to publish or get grants, because it is harder to do elegant well-controlled studies.

There is one serious risk for those working in a fad area. Fads end. Fads create enthusiasm, partly by exaggerating what they can accomplish. Psychoanalysis, behaviorism, and cognitive neuroscience all purport to explain most of human behavior and to be *the* superior approach. This creates adherents but sets the fad up for major criticism and ultimately abandonment. Valuable fads that may realistically promise to explain 20% of the variance sell themselves as accounting for virtually all of it.

The fad cycle, probably in general and certainly in psychology, is oversell followed by overkill. Negativity to psychoanalysis and behaviorism (Robins, Gosling, & Craik,

1999) in modern academic psychology is much greater than these important movements deserve. The overkill is obvious in textbooks. For example, the Freudian emphasis on two critical milestones of development, weaning and toilet training, has been abandoned along with the psychoanalytic approach. A majority of the indices in six major current developmental psychology texts have no entries for either toilet training or weaning (Rozin, 2006)! We have thrown out the baby with the bathwater!

It has been satisfying to me to open up some new areas and perspectives, and some have become areas of substantial interest. The satisfaction has been muted by the fact that I have been almost entirely unfunded for the past 25 years and that the majority of the articles that I have submitted were rejected by at least one journal. (Of 24 references in this article on which I am an author [excluding invited contributions], 13 were initially rejected, some by more than one journal.) Very little of my research referred to in this article had external funding. I realize in retrospect that Curt Richter has been my model, as he uncovered a wide range of phenomena in his long research lifetime (Rozin, 1976a). He looked for big phenomena, documented them, and made a beginning at understanding them.

In the remainder of this address, I review some of the holes in psychology, principally holes I have paid attention to. I organize the holes in terms of the reasons for their existence.

Overkill Holes

When a fad is abandoned, so often are its strengths and advances.

The Hole Hole

Natural holes in the body (of which there are seven, not including the eyes) are of particular importance. The physical self, a central concern in psychology since William James, is delimited by the skin. In the presence of holes, however, the clear demarcation between self and other is blurred. Furthermore, a hole allows for transfer from self to other (outside). Freud placed great emphasis on three holes: the mouth, the anus, and the genitals. With the rejection of psychoanalysis by academic psychology, the holes that psychoanalysis thought important were also abandoned.

Each bodily hole offers both vulnerability and promise. My colleagues and I explored this and found that reactions to holes could be separated into two factors (Rozin, Nemeroff, Horowitz, Gordon, & Voet, 1995). Intrusion sensitivity involves concern about anything breaching the hole. Contamination sensitivity has to do with exactly *what* is breaching the hole. The mouth does not show high intrusion sensitivity but is very high in contamination sensitivity. It doesn't mind things entering, but it cares a lot about

what enters. The anus, on the other hand, is high on intrusion sensitivity (hence the unpopularity of suppositories) but is relatively indifferent about what goes in (low contamination sensitivity). For males, the mouth is by far the most contamination-sensitive hole, but for females, the mouth and the vagina are most sensitive and are about equally sensitive (a surprise to many males).

Excluded Middle Holes (Dichotomization)

Some holes exist because they fall between two piles and are excluded by default. Like other human beings, psychologists try to deal with information overload by simplifying the world. One way is to create dichotomies (like nature and nurture) that exclude the middle ground where most phenomena actually reside.

The Flavor Hole

Flavor is a seamless blend of taste and smell inputs and is perhaps the only case where people misidentify the sense organ that is being stimulated. People refer the odor of foods in the mouth to the mouth and call it taste. Although there is much research on taste and smell, investigators tend to stick with their sensory system, so that taste-smell interactions are little studied. I argued that olfaction was a dual sense, for smelling the world and the mouth (Rozin, 1982). I did some experiments indicating that the same chemical sensed from the outside (orthonasally) and from the inside (retronasally) actually produced very different olfactory sensations.

The Excluded Middle Between Dichotomies

Up until the 1960s, it was a widely shared view in psychology, particularly overt in animal learning, that human function was governed by domain-general laws. As a result of studies of animal learning in the 1960s and 1970s, the idea arose that some features of learning were specifically adapted to the realities in particular domains of life (Garcia, Hankins, & Rusiniak, 1974; Rozin & Kalat, 1971; Seligman, 1970; Shettleworth, 1972). This position, which brought evolutionary thinking into psychology, developed in some investigators into the idea that there were no general principles at all. This rather extreme view was fueled by Fodor's (1983) important work, *The Modularity of Mind*.

A more reasonable evolutionary view would be that features that would be adaptive across the various domains of life would become generally available. For example, given the nature of causation in the world, forward rather than backward association would be favored in any domain. On the other hand, learning about contingencies over long delays would be appropriate for learning about the effects of food, but not for learning about most other entities. It is likely that domain-specific adaptations could spread gradually from one domain to another, when there would be an

adaptive value and a possible developmental pathway. Many abilities or capacities might be neither domain specific nor totally general. I made this proposal briefly in 1971 (Rozin & Kalat, 1971) and much more explicitly in 1976 (Rozin, 1976b).

On the basis of my work with my students and colleagues in two holes—learning about foods in animals (Rozin & Kalat, 1971) and learning to read in children (Rozin & Gleitman, 1977)—I proposed that adaptations that arise in particular domains can be accessed in other domains under certain conditions (Rozin, 1976b). I argued further that one feature of development was accessing something that was originally domain specific for a new purpose. I suggested that the Piagetian decalages were an example of this. Another idea, based on my work on reading with Lila Gleitman, was that phonological segmentation, an evolved part of the speech generation and speech-decoding module, was accessed in the acquisition of alphabetic reading. The reader has to realize overtly what the brain already knew, that *bat* has three sounds.

Evolution Versus Culture

This dichotomy appears again in an interesting way in some of the issues that engage evolutionary with cultural psychologists. These are two very promising and growing perspectives in modern psychology, both of which I am pleased to have been an early adherent of. Of course, it is not evolution *or* culture, but rather evolution *and* culture. There are two important senses of this convergence. First, the principles of cultural evolution overlap heavily with the core evolutionary ideas that are the foundation for evolutionary psychology. Evolutionary psychologists should welcome this as an extension of their domain, their core idea of natural selection (constructively proposed by Richerson & Boyd, 2005). Second, cultural and biological evolution occur simultaneously; they co-evolve (Durham, 1991).

My idea about increasing accessibility of domain-specific adaptations as a feature of development and evolution finds a sister idea in cultural evolution. A major feature of biological evolution, especially concerning major changes, is preadaptation (Mayr, 1960). The claim, well documented in biological evolution, is that an entity that evolved for one purpose, that is, for activation in a particular domain, can be applied to other domains. The mouth evolved for breathing and eating but is co-opted by the speech system.

Preadaptation has an even larger role in cultural evolution. What limits preadaptive advance in biological evolution is pathway constraints. If there are circuits in the retina that process information that might be useful in other domains, there is a problem of either getting neural access to them or transposing the genetic program that creates them to another neural location. In cultural evolution, when it is realized that some adaptation in one domain is useful in another, the transfer is relatively easy. Realizing that the

arithmetic being used to keep track of one's possessions can be used much more widely or that one can reduce the memory load in a writing system by tracking the sounds as opposed to the meanings in speech can result in rapid expansion of an adaptation. There is purpose in cultural evolution. I discuss examples of preadaptation later, with respect to food and the emotion of disgust.

Negative Bias Holes

Negativity bias (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001; Rozin & Royzman, 2001) documents that negative events dominate positive events.

The Positive Hole and Negativity Dominance

Negativity bias influences psychology research. Clinical psychology is about ameliorating bad things. The result is that there is a massive amount of work about bringing non-functional individuals to a level of modest function but virtually none about bringing people functioning adequately to a more optimal level of function. It is to correct this hole that the positive psychology movement has arisen (Seligman & Csikszentmihalyi, 2000). Raising the level of function of all the normal range people in the world would probably have a bigger net effect on human happiness than focusing only on the most nonfunctional 5%.

Negativity Bias in Journal Article and Grant Evaluation

Negativity bias influences modern psychology in the evaluation of articles and grants. Negative entities are often powerful contaminants of positive entities, but positive contaminants have very little effect on negative things. One brief touch of a cockroach to a favorite food renders it inedible. What can one possibly touch to a pile of cockroaches on a plate to make them edible? Purity is a widely sought goal, but it is rarely attainable.

An excellent piece of research with a methodological shortcoming is often rejected. Psychologists have privileged internal over external validity (Sue, 1999). The appropriate judgment is to weigh the advance provided by the research against the limitations embodied in the shortcoming. Wouldn't psychologists rather have a flawed study that proposes something really new and interesting, with supporting evidence, than a perfect study that offers a very small advance? Would we want to reject the corpus of 40 Mozart symphonies because the earliest ones are childish?

Phobias but Not Passions

There is much research on phobias but very little on what is almost certainly a more common positive opposite, passions. Passions are strong and enduring interests and engagements with something (Wrzesniewski, Rozin, & Bennett, 2003). They include sports and hobbies. Passions help to give life meaning and often constitute the center of social life. They may assume particular importance for peo-

ple who do not enjoy their work or for retired people. We have no idea how passions develop. Passions exemplify intrinsic value; they are engaged in for their own sake (e.g., Deci & Ryan, 1985).

If one has a passion for one's work, one has a calling. An undergraduate, Amy Wrzesniewski, mobilized me and some colleagues to study callings, and we developed a scale to assess the degree to which a person's relation to work was a job, career, or calling (Wrzesniewski, McCauley, Rozin, & Schwartz, 1997). This trichotomous classification of work came from sociologist Robert Bellah (Bellah, Madsen, Sullivan, Swidler, & Tipton, 1985). Almost all employed individuals who completed our scale fell clearly into one of the three categories. A group of administrative assistants were, in about equal numbers, in jobs, careers, or callings. The results demonstrated that it was not just the occupation but the framing of the work that determined the work-person relation.

Pain and the Pleasure Hole

Negativity bias probably accounts for why pain has received much more attention than pleasure. Partly in relation to positive psychology, pleasure has come in for more attention in recent years. Seminal research by Kahneman and his colleagues (Kahneman, Wakker, & Sarin, 1997), most of it originating in work on pain, has introduced the importance of the contrast between experienced and remembered affect. In terms of lived lives, people spend more time remembering many of the pleasures they have than actually experiencing them. Also, when people recommend a potentially pleasant experience to others, they are of course referring to their memory of the pleasure, not the actual experience of it. Kahneman et al. showed that affective memories distort actual experiences by overemphasizing endings and peaks and neglecting duration. Many important positive experiences are sequences of events, such as plays, concerts, and meals. It seems that little *explicit* attention is paid to the principles of remembered pleasure by those who produce these sequences. My colleagues and I have done a series of studies on art galleries, concerts, and meals (e.g., Rode, Rozin, & Durlach, 2007), which as a group strongly confirm duration neglect, with mixed results on the peak and end principles.

Pleasure, initially tied to satisfaction of basic biological needs in human evolution, becomes attached, by a process of preadaptation, to a wide variety of activities involving aesthetics and humor (Rozin, 1999a). My colleagues and I explored this by asking whether certain sequences of events in music or jokes are more successful (Rozin, Rozin, Appel, & Wachtel, 2006). We documented that an AAB pattern, in which something is repeated twice and then altered, is extremely common in jokes and also in introductory thematic material in both the classical and popular Western musical repertoire. We offered the explanation

that the AAB pattern is the most efficient sequence for creating and then breaking an expectation and showed in one preliminary study that jokes had their maximum effect in the AAB as opposed to the AB or AAAB formats.

Big Pile Holes: Psychologists Are Just Too Busy With Something Going Very Well

Limitations of cognitive and financial resources coupled with the existence of piles virtually guarantees that there will be holes.

Experiment and Hypothesis Über Alles: Excluding Other Science

Psychology has been fighting to be accepted as a natural science for over a century. This is a laudable goal, but it involves rejecting many contributions because they don't meet the standards of science. However, the science that many psychologists who work in the more social science side of psychology think of is a caricature of actual natural (e.g., biological) science.

In their anxiety to be scientific, students of psychology have often imitated the latest forms of sciences with a long history, while ignoring the steps these sciences took when they were young. They have, for example, striven to emulate the quantitative exactness of natural sciences without asking whether their own subject matter is always ripe for such treatment, failing to realize that one does not advance time by moving the hands of the clock. (Asch, 1952, pp. xiv-xv)

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

Experiment is the most powerful method to isolate causes, but experiment is most useful when one already knows the structure of the problem and the likely causes. In psychology, unlike the biological sciences, there is little patience or respect for the important descriptive work that precedes experimentation. It is surprising to psychologists that a large percentage of the studies in molecular biology, the most exciting and rapidly advancing science of recent decades, are not experiments, but rather what psychologists would call *descriptions* (Rozin, 2001). Psychologists consider it low-level work. Biologists value replication, particularly cross-species replication. The equivalent of the latter for psychologists would be seeing if a finding held in a few very different samples of humans (*sampling for heterogeneity*, Cook & Campbell, 1979, chap. 2). Hypotheses, which almost always precede experiments (and many other types of methods as well in psychology), are absent in a majority of work in molecular biology (Rozin, 2001). The four empirical references in what may be the most important conceptual advance in the biological sciences in the 20th century (Watson & Crick, 1953) were motivated by informed curiosity and did not have explicit hypotheses. I

believe that none of these studies, appropriately reformatted as studies in social psychology, would be acceptable in a mainline social psychology journal (Rozin, 2001). They were mere descriptions.

The General Mental Process Pile Versus the What People Do Hole

Psychology has, since its late-19th-century origins, focused on the understanding of basic mental processes, independent of domain. The domains of life, such as work and eating, politics, sports and other forms of entertainment, religion and sex, receive little attention. In the first 50 years of psychology, introductory texts paid almost no attention to these domains of life, as indicated by section headings or index words (Rozin, 2006). In more recent years, only sex and sleep were given specific attention in introductory texts (Rozin, 2006). There is, of course, some important work going on in psychology having to do with the domains of life. However, these lines of study are considered secondary and not worthy of mention in most introductory textbooks.

The Eating Hole

Eating has its own hole, the mouth. Given its centrality in survival, including adaptations to foraging, prey capture, and food choice, eating occupies a major place in animal evolution. A reasonable case can be made for the idea that many aspects of plasticity and many advances in complex processing had their origins in the identification of foods (Rozin, 1996; Siegal, 1996). Research in this important area in psychology is almost entirely devoted to amount eaten, rather than what is eaten, and focuses on the regulation of food intake, obesity, and eating disorders. None of these foci do more than touch on a major daily activity, a major source of pleasure, and a major part of the social world.

In contrast to basic processes, such as memory or attention, eating is often viewed as just another domain in which these processes manifest themselves. This point was brought home to me when Willa Michener and I tried to publish a study on chocolate craving. We showed that what satisfied chocolate craving was the sensory experience of chocolate, not its pharmacological or other postingestive effects (Michener & Rozin, 1994¹). We sent this article to a general psychology journal, and it was rejected largely on the grounds that it did not address a fundamental human process. It was just a significant advance in our understanding of something that occurs in about 30% of Americans.

As I shifted my interest from food choice in animals to food choice in humans, it became obvious that culture was the dominant force in shaping human food choice. There were, of course, some biological determinants, such as the innate preference for sweet tastes, that had major effects on

the development of food cultures (cuisines) around the world. In the late 1970s, I set out to examine explanations for a very common but puzzling human food phenomenon: the development of liking for foods that were innately unpalatable. This included foods such as chili pepper, black pepper, ginger, tobacco, and a wide variety of bitter or other strong tasting foods.

I started this work by spending some time in a Mexican village, where chili pepper is liked by all adults and is a fundamental part of the cuisine. Studies indicated that there was a hedonic reversal; a sensation that was initially negative became positive (Rozin, 1990). This reversal occurred in everyone in the village by age 7 years, but it never occurred in any of the dogs or pigs, even though the animals ate Mexican food, that is, discarded food in the garbage. This work led to the idea of benign masochism, the idea that humans and only humans enjoy the activation of rejection systems when they are aware that there is no real threat involved. It is a matter of mind over body. The preferred level of chili burn was just about the strongest tolerable level. Reversed preferences for innately unpalatable foods served as a useful example of what seems like a general feature of humanity, which is illustrated by human preferences for thrill rides and risky activities and by interest in fictional dramatic events that induce sadness and crying.

The study of food and food choice becomes intertwined in many ways with the study of human life writ broad. Among the basic biological motivation systems—breathing, excreting, protection, sex, and eating—the eating system stands out as the system most transformed by culture (Rozin, 2007). Breathing, excreting, and even sex are in most respects quite similar in enculturated humans and precultural humans or nonhuman primates. It is for this reason that mate choice has been such a successful domain for evolutionary psychologists. Food has been transformed almost completely by culture. As Leon Kass (1994) pointed out, in the course of Western cultural history, eating has been converted from an animal act to an expression of high civilization. We eat at table, with silverware, with all kinds of rules of eating etiquette. Eating is done at meals, occasions for speaking to one another and socializing. As Kass put it aptly, “We eat as if we don’t have to, we exploit an animal necessity as a ballerina exploits gravity” (p.158).

By a process of preadaptation, eating and food expand their influence outside of the nutritional domain. Food becomes a social instrument, with the meal as a center of sociality and with the involvement of food in courtship and the maintenance of social status. Food becomes a matter of aesthetics, with culinary elaborations. Food becomes entwined in moral systems, in religious practice. Food has an explicitly moral significance, in respect to ritual purity, in Hindu India. In a less striking way, food becomes involved in moral systems in the Western world, as when previously

morally neutral activities, like smoking or eating meat, become imbued with moral significance. I have described this process as moralization (Rozin, 1999b).

Disgust: What Was an Emotional Hole

Much research on emotions is organized around the idea of six basic emotions: happiness, surprise, anger, disgust, fear, and sadness (Ekman, 1992). Among the four negative basic emotions, disgust stands out as having seen almost no research until the past 15 years. In 16 introductory psychology texts published from 1890 to 1958, there are a total of 5 index pages cited under disgust, in comparison with 56 for anger and 85 for fear.

A wide range of potential foods, almost all of animal origin, are considered disgusting, to the point where April Fallon and I designated *disgusting* as a basic psychological category of rejected foods (Rozin & Fallon, 1987). My engagement with disgust, in conjunction with my collaborators April Fallon, Carol Nemeroff, Jonathan Haidt, and Clark McCauley, has led in a number of directions (Rozin & Fallon, 1987; Rozin, Haidt, & McCauley, 1993, in press; Rozin & Nemeroff, 1990). It appears that disgust originated as a specific reaction to harmful foods; no other emotion is known to have such a domain-specific origin. The facial expression indicates oral rejection, as does the concomitant nausea.

A critical feature of disgusting foods is that they are contaminants; when they touch an otherwise edible food, they render it inedible. Following on classical work in anthropology (e.g., Frazer, 1890/1922), we realized that this contamination illustrated the law of contagion in sympathetic magic: once in contact always in contact (Rozin & Nemeroff, 1990). We showed that this sense of contamination, whatever its origin, does not depend on an actual health threat and that it did not exist in young children.

Later research focused on the expanding domain of disgust and illustrated preadaptation. A sense of offense and rejection was capitalized on in cultural evolution and was attached to a wide variety of objects and activities that could be internalized as offensive by the culture by making them elicitors of disgust. Starting probably with toilet training and feces, the range of disgusts in many cultures includes most animal-origin foods, many animals themselves, most body products, sex that is considered to be inappropriate, poor hygiene, body envelope violations, and death. We summarized this set of elicitors as aspects of humans that they share with animals, reminders of the animalness of humans (Rozin et al., 1993, in press). Disgust is in the service of a cultural value of distinguishing humans from animals and leads humans to withdraw from reminders of their animal nature. We argued that disgust served to help humans cope with their own mortality, by distancing them from it.

Disgust expands further, presumably by a preadaptive process, to include offense at contact with strangers and certain groups and as a response to certain types of moral violations. The moral violations are related to what Shweder and his colleagues (Shweder, Much, Mahapatra, & Park, 1997) called the ethic of divinity: violations of purity and sacredness (Rozin, Lowery, Imada, & Haidt, 1999). Disgust is more of a moral emotion in cultures that have a substantial morality of divinity, such as Hindu India.

Consistent with the preadaptation model discussed earlier, contagion, a basic feature of what we call core (food/body product) disgust, is carried along with the expansion of disgust, so that other people and moral violations have contamination properties; for example, most Americans are disgusted at the prospect of wearing Adolf Hitler's laundered sweater (Rozin, Markwith, & McCauley, 1994). The lay American conception of contagious essence is a combination of an essence that has material properties (and hence can be washed away) and one that has only spiritual properties (and hence is virtually indelible). Most people entertain both models differentially for contact with different types of entities (Nemeroff & Rozin, 1994).

Disgust also constitutes a genre of jokes and amusing images and figures in modern media entertainment, such as *Fear Factor*. Looking back to chili pepper, my colleagues and I interpret this as another example of benign masochism: amusement and pleasure in experiencing a negative sensation or emotion in a context in which one is not really threatened.

Disgust has become a much more popular area of research in the past 15 years, with links to phobias (Woody & Teachman, 2000), obsessive-compulsive disorders (Olatunji & Sawchuck, 2005), and specific brain areas (Husted, Shapira, & Goodman, 2006). In my view, none of these important new directions encompass the most interesting thing about disgust, which is its history, from a "get this out of my mouth" to a "get this out of my soul" emotion. That disgust is both primitive and animal and, at the same time, is the emotion of civilization makes it of special interest.

The Preference Hole

Preference is a fundamental aspect of human life and plays a central role in the discipline of economics. It has a great deal to do with how people spend their money and time and is one of the engines of the business world. Psychology should be the discipline that discovers the nature and origin of preferences, but it has very little to say about the types of preferences central to economic behavior: preferences for foods, music, clothing, homes, leisure articles, and so forth. To help fill this hole, my colleagues and I have done some work on food and music preferences.

Family resemblances in preferences, although they confound genetic and early experience effects, are informative

because they establish upper limits for genetic and early experience effects. Surprisingly, correlations between the food or music preferences of young adults (college students) and their parents are quite low, averaging about .15 across different specific foods or genres of music (Rozin, 1991). In the same study, items about values (e.g., attitudes toward abortion) showed substantially higher family resemblances (in the .30 to .60 range). Researchers know very little about the mechanisms of acquisition of preferences.

In food and other domains, rejection or acceptance can be analyzed into different types, motivated by hedonic factors (good or bad sensory experiences), ideational factors (e.g., the nature or origin of something), and instrumental factors (anticipated consequences; Rozin & Fallon, 1980). People avoid high-fat foods because they consider them unhealthy (instrumental), but they avoid lima beans (if they do) because of taste (hedonics). In her doctoral thesis with me, Marcia Pelchat identified, in both animals and humans, a special role for nausea following ingestion in causing tastes to become negative (hedonic shift; Pelchat & Rozin, 1982). Thus, nausea following eating a new food tends to make it taste bad (hedonic change), whereas symptoms such as rashes, headache, or shortness of breath cause an instrumental rejection of the food without causing a change in liking for its taste.

Parallel to the instrumental–hedonic distinction in preferences is the distinction between instrumental and ideational rejection. Most Americans justify their preference for natural foods on the basis of their health and environmental effects, but research indicates that the primary basis for this preference is ideational; people think natural is inherently better (Rozin et al., 2004).

The Focus on Internal Causation (the Really Fundamental Attribution Error) and Ignoring Environmental Causation

The fundamental attribution error holds, at least for Westerners, that there is a strong tendency to exaggerate the importance of internal as opposed to external factors in explaining human behavior. Psychologists themselves show a fundamental attribution error in the way they examine phenomena. When the question is why people do what they do, psychologists generally seem to fall on the side of internal causation, leaving an environmental causation hole. It is interesting that even in cultural psychology, culture is thought of as almost entirely in the head of the individual, acting from the inside, rather than in the environment and institutions, on the outside.

Nowhere is the fundamental attribution error clearer than in the study of eating. A strong homeostatic tradition in motivation focuses on the ability to detect internal deficits or surpluses and modulate behavior accordingly. However, human food intake is largely under the control of external factors, such as the availability and palatability of

food. In the modern Western environment, where food is almost always available and easy to obtain, palatable, and cheap, the internal controls are overwhelmed. Two densely amnesic individuals, who did not remember that they had just eaten, ate three consecutive lunches, each one served about 10 minutes after the prior lunch was consumed (Rozin, Dow, Moscovitch, & Rajaram, 1998). Palatable and accessible food was sufficient to prompt eating. An important influence on food intake is the cultural norm that one does not eat a meal after just completing one.

It is more challenging to understand the internal than the external causes of human eating. It is obvious that good food prompts eating, but it is not obvious what internal signals make a person hungry. Thus, almost all the work on eating is about internal signals. Recently, a number of investigators came to the conclusion that the major treatable cause of obesity is the food environment. Our work comparing eating in France and the United States indicated that one major reason for lower rates of obesity in France is that the French eat less, and they eat less partly because of an environmental factor, portion size (Rozin, Kabnick, Pete, Fischler, & Shields, 2003). We considered the possibility that people would compensate for smaller portions by eating more portions, but this apparently does not happen. A major reason is a cultural norm to eat one or one serving of most foods, what we have called a *unit bias* (Geier, Rozin, & Doros, 2006).

Convenience Holes

Many holes exist because they are hard to explore; it makes sense, in many conditions, to take the easier route. (This is a point that has fortunately not influenced cultural anthropologists.)

The 99% of Humanity Hole

Psychology concentrates its research on a very small subset of its subject matter: the less than 1% of humanity in American undergraduate programs or, more broadly, the approximately 7% of humanity from the Anglo world. There is no question why academic psychology relies on undergraduates. They are convenient. For studies of perception or information processing, undergraduates are probably a good proxy for *Homo sapiens*. The opponent process theory of color vision and the phi phenomenon probably work in the same way in American undergraduates and Indian farmers. But as psychologists move to studying whole human beings, as in developmental or social psychology, the American undergraduate has much more limited generalizing potential. This criticism has been voiced before (Sears, 1986) and in a most precise form in a recent article by Arnett (2007). With the advance of cultural psychology in the past two decades, this point has been brought home with some force.

The Multidisciplinary Hole

Everyone admires interdisciplinary work in principle, but most academics I know regularly oppose it when it is instantiated in a particular person that their department might hire. Interdisciplinary people, by their very nature, know less about each of the disciplines they span than individuals who reside only in one discipline. This is especially problematic if the interdisciplinary person links with one of the fields that psychologists consider less prestigious, a field in the social sciences. Generally, psychology departments stand quite isolated from anthropology, sociology, political science, and economics.

The Ethnopolitical Conflict Hole

While Martin Seligman was president of the American Psychological Association, he encouraged greater involvement by psychologists in the study of ethnopolitical conflict, one of the major world problems of the 21st century. One result of this was the Solomon Asch Center for Study of Ethnopolitical Conflict (originally at the University of Pennsylvania and moving to Bryn Mawr College in 2007). Clark McCauley and I were the founding directors.

We realized that most of the knowledge and understanding in this area resided in other social science disciplines, particularly political science, and we assembled a group of scholars that spanned the social sciences. The center developed in two areas where psychology could make a contribution: the causes of conflict, which are linked to social psychology, and the consequences of conflict, which are linked to clinical psychology and manifest themselves in tens of millions of displaced persons. In four biannual summer institutes, the center trained 75 individuals from all over the world, primarily at the postdoctoral level, to understand ethnic conflict from a multidisciplinary perspective.

There are probably about two thirds as many displaced persons as schizophrenics in the world, and the number is growing. Although clinical psychology pays great attention to schizophrenia, minimal resources are devoted to understanding displaced persons. The main problem for these unfortunate individuals is with the environment, the disruption of their normal lives. Interventions have to reconstruct lives and the social fabric, provide safety, and unite families. Perhaps one reason clinical psychologists may not be that interested in displaced persons, aside from the fact that this is not a major internal American problem, is that psychology is oriented toward fixing people, not environments. It is the same fundamental attribution error discussed earlier. Fixing environments seems like low-level work. It is not.

Other questions addressed by individuals affiliated with the Solomon Asch center include the following: What are the dynamics of extremist groups? Why is ethnic identity such a powerful force and how is it mobilized? Why do

people care so much about their national land? Why do between-group hatreds span many generations? How do the public and governments respond to terrorist threats? What factors promote or discourage genocide? Many papers and a number of important books have emerged from the work of the center (e.g., Chirof & McCauley, 2006; Chirof & Seligman, 2001; Lustick, 2006).

My own research involvement in the understanding of ethnic conflict has been modest. I was interested in the fact that in many ethnic conflicts, individuals of Group A detest those of Group B because B's ancestors purportedly did something terrible to Group A's ancestors, often centuries before. Why blame or be averse to the descendants, who were not alive at the time of the relevant event? I began a project to explore this, working in collaboration with a very talented undergraduate, Lina Cherfas, and colleagues (Cherfas, Rozin, Cohen, Davidson, & McCauley, 2006). We demonstrated clearly that there was wide variation in aversion to contemporary Germans in Jewish Holocaust survivors and in Jewish college students. At one extreme in both cases were people who could not stand any traffic with anything German, including the grandchildren of Germans alive in World War II, Volkswagens, or other contemporary German products. At the other extreme were people totally comfortable with such things and with aversions only to the Nazis that were directly involved in the Holocaust. For the Holocaust survivors, all of whom had extraordinary Nazi-related trauma in their past, the range of aversion was astonishing. We felt it important just to document it, and we also explored some possible accounts for such different reactions (Cherfas et al., 2006). One had to with *German essentialism*. Those who agreed with statements like "once a German, always a German" (i.e., a German essence transmitted by some combination of genes and culture) were more inclined to show a broad aversion. Conceptually, this could provide the needed link for explaining aversion to the descendants of those who carried out an atrocity. This was just a beginning study, of the type that I have done many times. It showed a big effect without an obvious explanation and provided some suggestive evidence for causal links. We had great difficulty in publishing this short article.

A Note on Some Other Holes and Some Recent Progress

The psychology of the middle of the 20th century paid little attention to two major areas outside of psychology that had much to offer it, evolutionary biology and cultural anthropology. I have played some role in bringing these perspectives to the fore, and there are now flourishing subdisciplines of evolutionary and cultural psychology within our discipline. Of course, like all other successful movements, they promise to explain more than they can, but they can explain a lot.

One reason that such enterprises have been late entries into psychology is that other disciplines were already devoted to the approaches in question. Let the biologists study evolution, let the anthropologists study culture, let the economists study preference, and let the sociologists study social class or religion. However, understanding the phenomena involves interactions across the disciplinary perspectives, and unnecessary holes result. This happens as well within psychology, so that, for example, the idea that there are other minds, a core feature of social psychology and a full chapter in Asch's (1952) *Social Psychology*, essentially resides only in developmental psychology.

One ignored area, religion, has recently gained some attention from within psychology. The interest has been focused primarily on religion in general and on religiosity, which for Americans means Christian religiosity. Adam Cohen, in recent work, has pointed to important psychological differences in religions, having to do with the importance of belief versus practice (Cohen, Siegel, & Rozin, 2003) and the moral status of thoughts (Cohen & Rozin, 2001). It is probably of psychological significance that Judaism and Hinduism are religions of descent, with ancestry defining membership, whereas Islam, Christianity, and Buddhism are religions of assent, with membership determined by adoption of a set of beliefs.

Conclusion

I have addressed only a few of the many holes. Holes are usually not empty but are underexplored, and there are many investigations, even in the holes I have cited, that space has prevented me from citing. I think more people should be filling holes. Filling means, at first, observing and reading rather than experimenting and being open to the findings of other social sciences. Political science, anthropology, and sociology are more open to finding out what is happening in the world. Psychology has some powerful techniques for analyzing problems, but it is important to first locate and define the problem.

Psychologists should not try to eliminate fads. Piles are good, but so are holes. We should value opening up important new areas for research and should encourage informed curiosity, careful observation, and concerns about the major problems facing the world.

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