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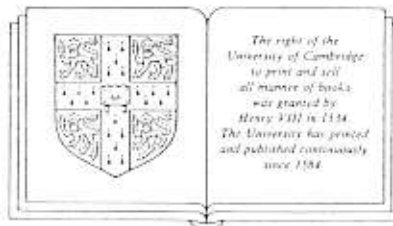
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The laws of sympathetic magic

A PSYCHOLOGICAL ANALYSIS OF SIMILARITY AND
CONTAGION

Paul Rozin and Carol Nemeroff

For some years, the first author and our colleague April Fallon have been investigating the emotion of disgust (Rozin & Fallon, 1987). We consider this emotion to be food-related at its core, and define it, in accordance with Angyal (1941) as "revulsion at the prospect of oral incorporation of an offensive substance." In our investigations with subjects in the University of Pennsylvania community we noted that offensive objects that elicit disgust, such as cockroaches, worms, or human body excretions, have potent contaminating properties. When they contact an otherwise edible food, they tend to render it inedible, even though there is no sensory trace of this contact. Furthermore, replicas of disgusting substances, even when known to be made of edible materials (e.g., a realistic fly made of candy), are often rejected as food. Our puzzlement about these expressions of the potency of disgust objects was resolved, in a sense, with the discovery that they were prototypical instances of the laws of sympathetic magic, as described in Frazer's *The Golden Bough* ([1890] 1959). Engaged by the fact that these widespread disgust responses in American culture fit with "beliefs" supposedly common only in traditional cultures, we began an investigation of the operation of the laws of sympathetic magic in everyday life, in disgust and other domains (Rozin, Millman, & Nemeroff, 1986). This research prompted us to think through the meaning and significance of the laws of sympathetic magic. This chapter presents some of the first fruits of this work.

The laws of sympathetic magic

The laws of sympathetic magic are descriptions of a consistent pattern of beliefs, thoughts, and practices observed across a wide range of

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traditional cultures. Their widespread occurrence suggests that they may constitute laws of human thought. Three laws of sympathetic magic, contagion, similarity, and opposites, were originally described by E. B. Tylor ([1974] 1871) in *Primitive Culture*, and were substantially elaborated by Sir James Frazer ([1890] 1959) in *The Golden Bough*, and Marcel Mauss ([1902] 1972) in *A General Theory of Magic*. The explication of the laws that follows is based on the writings of all three of these authors, with our own interpretations and extensions. We discuss only the laws of contagion and similarity.

The law of contagion holds that things that have once been in contact with each other may influence or change each other for a period that extends well past the termination of contact, perhaps permanently. This effect can be summarized as "once in contact, always in contact." It is illustrated in the domain of disgust in U.S. culture by the enduring offensiveness acquired by foods that have been in contact with a cockroach, and in the interpersonal domain by the enhanced value of objects that have been in contact with celebrities. The transfer of properties – which can be psychological or physical attributes, or intentions – seems to be accomplished through transfer of an "essence." Animate objects seem particularly potent sources or recipients of essence but inanimate objects may also be sources or recipients. The essence, now in the recipient, remains in some sort of nonphysical relation to the source. This allows for the possibility that action taken on the recipient can affect the source (what we call backward causation [Rozin, Millman, & Nemeroff, 1986]). Thus, it is common practice in sorcery to obtain a personal residue (e.g., fingernail paring) from the victim, scorch the residue, and hence harm the victim.

The law of similarity holds that things that resemble one another share fundamental properties ("the image equals the object"), or that superficial resemblance indicates deep resemblance or identity. It is illustrated in the domain of disgust by the reluctance of many people to consume what they know is a tasty food if it is fashioned to look like a disgusting object (e.g., a large insect, or body excretions). As with contagion, the image has some sort of contact with the source, such that action on the image can affect the source ("like produces like") – another example of backward causation. An example of the latter is sticking pins into a replica of a person as a means of causing harm to that person.

Tylor, Frazer, and Mauss thought of the laws of sympathetic magic as laws of thought. They recognized the parallel between these laws and the laws of association of the British empiricist philosophers (Hume, [1748] 1959; J. S. Mill, [1843] 1963; see Warren, 1921, for a review). These philosophers and their contemporaries put forth a set of laws of association of ideas; most prominent among these were the laws of contiguity, similarity, and opposites. According to Mill, the law of contiguity holds that "when two impressions have been frequently

experienced (or even thought of) either simultaneously or in immediate succession, then whenever either of these impressions or the idea of it recurs, it tends to excite the idea of the other" (p. 852). The focus in the law of contiguity is on temporal coincidence, as opposed to spatial coincidence for the law of contagion. Mill explained the associative law of similarity as "similar ideas tend to excite one another."

It is not surprising that two sets of candidates for universal laws of thought should be similar. However, they are far from identical. Tylor, Frazer, and Mauss recognized one fundamental difference between the two sets of laws: The laws of association are limited to the domain of thought; they operate only within the head. The laws of magic project these laws into the real world; that is, the physical world is held to be organized along principles similar to the laws of thought. The idea that one can harm an enemy by burning his hair does not follow from the laws of association (although gaining emotional satisfaction from it might). Another fundamental difference pertains only to the laws of contagion and contiguity. Whereas contiguity speaks to any type of proximity, with temporal proximity in the forefront, contagion refers explicitly to spatial contact. As a result of these and other differences, the laws of association and the laws of sympathetic magic often suggest different topics of investigation.

The scope of the laws of sympathetic magic and association is very large. The ideas of similarity and contagion/contiguity arise repeatedly in ethnographies and in studies of human thinking, and seem to hold a position among the more important aspects of human thought.

The motivation to explore this topic comes from two sources. First, the pattern of thought suggested by the laws of sympathetic magic is not known to psychologists, and hence not integrated into theories of thinking. Although the laws are widely known within anthropology, there has been little analysis of them from the psychological point of view (but see Freud, [1913] 1950, and Piaget, 1967, for some discussion). Second, the laws give rise to an intriguing contradiction. They are generally thought to be "primitive," and yet we find many examples of their operation in educated adults in Western-developed cultures. Furthermore, one of the laws, contagion, does not seem to be operative in young children (at least in the domain of disgust; Fallon, Rozin, & Pliner, 1984), which is an unlikely state of affairs for a supposedly "primitive" notion.

This essay explores the psychological underpinnings of two of the laws of sympathetic magic, the range of situations in which they operate, and their development within the individual.

Contagion

For convenience in exposition, we designate the contagious entity an *essence*. We use the verb, *to contaminate*, to refer to contact between an entity capable of transmitting essence and some other object. Un-

fortunately, contaminate has a negative connotation, but we use it in a neutral way, with the designation "positive contamination" when the effects are explicitly positive. In any situation to which the law of contagion applies, there is a *source* of contagious effects, and a *recipient* of these effects. Often there is a *medium* that serves to transfer the effects from source to recipient.

DIMENSIONS OF CONTAGION

In examining the structure and foundation of contagious beliefs, we have found it useful to isolate two dimensions of contagion (Rozin, Nemeroff, Wane, & Sherrod, in press). One dimension deals with forward versus backward action, and the other with positive versus negative effects.

Forward versus backward contagion. In forward contagion, or forward causation, an essence from the source reaches the recipient, either directly or via a medium, and exerts some effect on the recipient. This sequence resembles, but is not identical with, microbial contamination, in which the source might be a diseased person, the medium might be water or an implement that contained germs from the source, and the recipient might be a person who contacted the medium. The effect of this might be that the microorganism induced a disease state in the recipient. In a contagion situation, the source is usually, and the recipient is almost always, a person. An essence from the source reaches the recipient by direct contact, or through a medium (such as a piece of hair, or a food cooked by the source). In backward contagion, the generally accepted causal arrow is reversed, leading to a result that is not compatible with microbial infection. The essence is again transferred to the recipient, although in the backward cases, the recipient often actively seeks the contagious item. The item is usually possessed rather than incorporated by the recipient. The recipient now operates upon the essence (usually causing some "damage" to it) with the intent that the source itself will be similarly damaged. Backward contagion, in a negative context, is the basis for a common form of sorcery. In a positive context, it is often the basis for love spells that cause the source to feel desire for the recipient who has acted on his or her personal residue.

Positive versus negative contagion. In the anthropological literature, contagion is more often associated with negative effects, and is closely tied to the concept of pollution. However, as pointed out forcefully by Meigs (1978, 1984), there are abundant examples of positive contagion, that is, situations in which the transferred essence has a desirable effect on the recipient. Meigs's ethnography of the Hua of Papua New Guinea is replete with examples of transfer of positive effects among people in positive relations to one another. Meigs appropriately points out that substances (e.g., body residues) are not inherently negative or

positive; rather, it is the context, the relation between source and recipient, that determines their value. Thus, among the Hua, it is beneficial to consume food cooked by someone in a positive relationship to the recipient, and a food is enhanced if it is spat upon by such a person. Similarly, food offerings in a Hindu temple are enhanced in value because the gods are presumed to partake of the offerings before they are returned to the donor (Breckenridge, 1986). More generally, amulets, talismans, and the laying on of hands are examples of positive contagion. Examples of positive contagion occur in U.S. culture, as in the valuation of possessions of one's ancestors, or the enhancement in value of clothing previously worn by a loved one (see later discussion in the chapter on the extent of contagion beliefs in U.S. culture).

Although positive contagion is a reality, negative contagion seems to be both more common and more salient, even among the Hua, perhaps the reigning champions of positive contagion. There is no salient opposite to the concept of pollution (although in ancient Greece, there was a term, *katharmos*, that stood for the opposite of pollution [*miasma*] [Parker, 1983]). The strength of this bias is well illustrated by a Nebraska car mechanic who pointed out that "a teaspoon of sewage spoils a barrel of wine, but a teaspoon of wine does nothing for a barrel of sewage." Stevenson (1954) captures this same relation, with respect to Hindu India, in his claim that "pollution always overcomes purity." Our survey of contagion beliefs in U.S. culture, while uncovering many examples of positive contagion, generally reveals a higher incidence, and greater potency for, negative contagion.

The negative bias may be related to the potency of harmful microorganisms that surely are the most salient form of physically based contagion in the natural world. Only some antibiotics and psychoactive drugs in the natural world have the powerful positive potency, in trace amounts, to match the negative potency of harmful microorganisms. In general, it may be the case that negative biological (and perhaps, social) forces have an urgency that requires high vigilance and urgency in response. There appears to be a negative bias in learning and in emotion, as well as in contagion, perhaps for this same reason; one cannot afford to learn slowly about imminent dangers, like predators or poisons (Rozin, 1986; Rozin & Fallon, 1987). Interpersonal bonding and attitudes to kin, both common arenas for positive contagion, do not have the same urgency.

CONTAGION AND THE TRANSMISSION OF ESSENCE

At the core of the idea of contagion is the existence of a contagious entity. Some authors (e.g., Mauss, [1902] 1972) refer to this entity as *mana*, but this term has many connotations, some of which extend well beyond "contagious entity." Meigs (1984) uses the term *vital essence* to describe the entity. In this discussion, the term of choice is *essence*.

The question we ask is, in the light of the actual practice of contagious magic and beliefs about contagion, what are the presumed properties of this essence and how is it transmitted? In particular, to what extent can the essence be considered to be (or to function as) a trace of a physical substance? And to what extent is essence analogous to a microbe? We are currently exploring this possibility through in-depth interviews with adults in U.S. culture. What follows results from our discussions and review of the literature.

In most practices and belief systems, essence seems to pervade the source. We describe this as the holographic principle. Thus, one lock of hair seems to contain the essential nature of the person from which it comes, just as each part of an animal contains the essential nature of the animal (a point commented upon by a number of authors; see, e.g., Werner, 1948). Crawley (1902) points out that any part of a person, or anything that has been in contact with him, is believed to retain this connection, and when acted on, to affect its owner. This illustrates the metonymic principle that the part can stand for the whole. Although the essence presumably contains all of the characteristics of its source, including the physical and mental properties of the source and the source's intentions, only a limited set of these properties may be operative in any contagious interaction. Thus, among the Hua (Meigs, 1984), and in many other cultures, it is often the intention of the source that is transmitted by the essence; foods contacted by people in a positive relation to the recipient cause improvement in the recipient, whereas foods contacted by people in a negative relation to the recipient cause harm to the recipient. In such cases, the particular personal attributes of the source are irrelevant; the outcome is general beneficence or harm.

Essence has a number of characteristics that suggest that it is a physical substance. Most critically, it is passed on by physical contact. Furthermore, in many cases the effects of an essence in a recipient, or its transmissibility in a medium, can be ameliorated by the same operations that would be effective against a physical substance: For example, washing is partly effective in rendering contaminated clothing more neutral. Washing with water was the principal means of purification (ridding a person of pollution) in ancient Greece (Parker, 1983). We do not yet know the extent to which other operations, such as maceration or burning, have similar effects on physical substances and essence. We also do not know the extent to which the effectiveness of a medium as a transmitter of essence is related to its ability to transmit physical substances. So, for example, are moist or rough media more susceptible to transfer than dry and smooth ones? In Hindu India, earthenware vessels are considered more likely to convey pollution, on account of their porosity, than cooking vessels of smoother and harder composition (Stevenson, 1954). Furthermore, among Oriya Brahmins and other groups in India, cotton is more pollutable than silk (Shweder, 1987). Similar distinctions are made in the kosher dietary rules, for example, between earthenware and glass vessels (Grunfeld, [1972])

1982). Many traditional means of removing a person's pollution (e.g., washing, purging, wiping, fumigating in ancient Greece) would operate upon physical entities (e.g., would reduce microbial contamination). One can imagine a physical transmission of essence that is nonmaterial, as in the transmission of energy. Thus, when a hot rock is placed in water, the temperature of the water changes without there being any transfer of rock-substance to the water. On this model, transformations that might not affect substance would be predicted to affect essences.

There are also a number of senses in which essences seem to be nonphysical. On the whole, contagion does not necessarily seem to be dose dependent (unlike microbial illness or other physical models). That is, very small amounts of essence seem capable of passing the full effect to the recipient. A number of operations, such as washing, which should rid an object of all traces of a foreign essence, are only partly effective in eliminating the effects of the essence. Furthermore, the permanence of some contagious effects, though consistent with what is known about physical substance, strain the physical limits a bit. As one subject in an interview spontaneously commented, with respect to a much-laundered shirt that once was worn by a despised person, X: "Once on X, always on X." To the extent that ritual is effective in removing pollution, there is a strong suggestion of a nonphysical entity. Although the Hindu practice of purification by ingestion of the products of the sacred cow (milk, ghee, curd, urine, dung) (Simoons, 1974) could be conceived as acting on physical entities, it is more compatible with a nonphysical model. The most nonphysical feature of contagion is backward causation. Unlike the tight physical link between source and recipient represented by the critical role for contact in forward contagion, backward causation is a prime example of action at a distance (a state abhorred by natural scientists, but one that they conveniently put aside in considering gravity, a perfect example of such action).

The reader is invited to explore the physical status of essences, for him or herself (it varies across people, within U.S. culture), by conducting a simple experiment. Consider a sweater that was owned and worn by Adolf Hitler. We presume most readers would be uncomfortable about wearing such a sweater, even after it was laundered. Now ask what manipulations on that sweater could make it neutral: heating, unraveling and reknitting, burning, being worn for a period of time by a greatly loved or admired person? Note that the latter manipulation, which some may find effective (notwithstanding that it might contaminate an admired figure), can be accounted for by both physical and spiritual interactions.

ESSENCE, ODOR, AND CONTAGION

There is a relation between essence, viewed as a physical substance, and odor. Both can constitute individual, unique, and invisible carriers of identity. An individual's odor can be left behind, as a residue to be

incorporated by others, as can his or her essence. If one simply adduces to odors the possibility of carrying personal characteristics and intentions, then odor becomes a special case of essence. Crawley (1902) in reviewing a large number of instances of contagion, concludes that there is a belief that one's body odor may contain one's properties. The Ilahita Arapesh of New Guinea believe that odor is the distillation of physical, and more importantly, moral essences (Tuzin, 1986). For them, smell is the medium of moral recognition, and knowing a person's smell is to experience shared substance with them. Odor became an important, and highly threatening, carrier of personal properties and disease in the beliefs of 18th-century western Europeans, leading to a great interest in masking with pleasant odors, disinfection, and ventilation by the end of the 18th century and a tendency to rid oneself of odor-retaining things (Corbin, 1986).

The point is that odor shares many properties with essence, and may be, at some level in development or cultural evolution, the origin of ideas of contagion.

THE SOURCES OF CONTAGION

Any object, and any part of that object, is a potential source of contagion, but most sources of contagion are living things; plants, nonhuman animals, or humans. For the case of humans, it is often the personal relation between source and recipient that critically determines the degree and sign of contagion. In interpersonal cases, intent is often transferred, as well as or instead of characteristics. For the case of plants and animals, specific properties are transferred. Although there are examples of plants that pass on their properties (e.g., fast growth, femaleness with respect to the shape, color, and texture of the fruit) to humans by ingestion, there are sharp limits to the contagious potency of plants, in almost all cases. That is, they have to be ingested in modest amounts, and slight contact rarely causes significant pollution. Animals are much more potent sources of contagion; animal products are particularly potent sources of pollution (negative contagion). Thus, disgusting substances, which are always contaminating to some extent, are almost entirely of animal origin, cross-culturally (Angyal, 1941; Rozin & Fallon, 1987). The special potency of animals as sources of contagion may relate to their salient properties, and to their similarity to humans. Leach (1964) and Tambiah (1969) have pointed out that, for humans, animals are emotionally highly charged entities.

As Meigs (1984) has pointed out, body substances have a particular potency in terms of contagion. The potency is primarily on their negative side, leading to suggestions that decay (Meigs, 1984), anomaly (Douglas, 1966), or animalness (since these substances are also produced by animals) may be an important determinant of contagious potency.

The sign and potency of a source of contagion are not simply

properties of the object. Meigs (1984) has provided many examples of how the context (e.g., the relation of a source person to a recipient) can modulate the sign of contagion (for some people for example, in U.S. culture, some body substances that normally induce strong negative contagious effects can become positive in the context of romantic love). Furthermore, the contagious link between the same source-recipient pair may shift over time. Meigs (1984) discusses these conditional polluting relations in some detail. For example, among Oriya Brahmins in India, during the first three days of menstruation a woman is not permitted to touch her children and is not allowed to cook (Shweder, 1987).

CONTACT AND CONTAGION

At its base, contagion seems to be about the incorporation into the self of foreign, friendly, or unfriendly essences. One can conceptualize both the essence and the self in physical terms, but the self has many forms (James, [1890] 1950). In particular, there is the virtually universal view of a soul, a moral, perhaps nonphysical entity, that resides within the body (Shweder, 1987). Essences would seem to be able to make contact with (and perhaps be comprised of) the soul/self.

The bodily self is clearly in intimate relation with the environment, and constantly engaged in exchange of materials. This fluidity involves exchange of inanimate, animate, and interpersonal essences; it is a particularly salient part of life in Hindu India (Kakar, 1982; Stevenson, 1954). Individual persons are constantly, via contact, leaving residues of themselves in the environment, while other individuals incorporate these essences. There is a vast, complex interpersonal exchange set up in this way, which can be described as the shedding of self and the permeability of the person.

Although the ultimate event may be contact of essence with the soul, individuals behave as if the physical body is the critical structure, and contact with it constitutes some form of entry. Thus, in the domain of disgust, Allport (1955) noted the striking phenomenon that while people are not disgusted by their own saliva as part of their body, most are offended by the prospect of drinking a glass of water after they have spit into it (confirmed by questionnaire for U.S. culture by Rozin et al., 1986).

There is something compelling about contact. Simply consider the difference between the presence of a piece of dog feces 1/2 inch from one's hand as opposed to touching one's hand. The skin is a clearcut boundary of the self. Objectively, one can imagine three routes of "contact," that is, entry of substance, into the body. One is surface contact. A second, perhaps a special case of the first, is entry through an orifice, most commonly in the act of ingestion, but also in sexual behavior. A third route of contact is inhalation of odorants, gases, vapors, or dusts. Although most contagious belief focuses on contact and ingestion, odor often assumes an important role (see e.g., Tuzin,

1986, for an example from New Guinea). Odor as a source of pollution assumed a major role in Western Europe from the 18th century onward (Corbin, 1986), and airborne entities, in some sort of vague way, played an important role in 19th-century conceptions of disease transmission (Rosenberg, 1962, 1986). Without intending to slight the airborne route, we focus on the more salient and universal direct-contact route.

There is no question that actual contact greatly enhances contagious effects; this holds for contact with corpses in ancient Greece (Parker, 1983) and the day-to-day phenomena of pollution in India. Both in terms of psychological reactions and the actual invasion of the body by foreign matter, the oral contact/ingestion route seems most highly charged and potent (leaving aside the one competitor for this dubious honor, the vagina). The mouth accounts for almost all of the overt material transaction between the rest of the world and the self. It is, approximately, THE incorporative organ. At the most basic biological level, this incorporation involves the essential acquisition of nutrients, made more emotionally salient by the real risk of ingestion of natural (and later in human history, culturally produced) toxins.

The process of ingestion carries a finality and intimacy that is not equaled by skin contact. Thus, in India, ingestion of a polluting substance is considered more dangerous than contact. Water can be used as purification for skin contact, but internal contact requires ingestion of ghee or the sacred panchgavya (a combination of different products of the sacred cow) (Stevenson, 1954). Daniel's (1984) observation and analyses of interpersonal exchanges in India led him to comment in *Fluid Signs*: "In the human body, the mouth is certainly the most vulnerable orifice, through which not only food substances enter but also evil spirits and the spirit of dead persons. Conversely, when an evil spirit is exorcised, it is believed to leave the body through the mouth" (p. 130).

You are what you eat. Contagion via the oral route is exemplified in the folk saying, "Man ist was Man isst" (you are what you eat). This maxim generally refers to the passage of physical or personality characteristics, as opposed to intentions, and captures a belief that is widespread in traditional culture. It illustrates the potency of the mouth (there is no equivalent saying, "you are what you touch"). The contagious principle is invoked since there is a presumed passage of essence; however, for the case of you are what you eat, there is usually a substantial amount of matter that is transferred, as opposed to a trace. In at least some such cases, there may be marked dose dependence and, in some cases, repeated ingestion is required to produce an appropriate transfer of characteristics.

According to Frazer (1959:573): "The savage commonly believes that by eating the flesh of an animal or man he acquires not only the physical but even the moral and intellectual qualities which were char-

tea). Odor as a source of pollution

acteristic of that animal or man." Frazer illustrates with many examples, including the fact that bushmen avoid the flesh of slow animals, the belief in northern India that if one eats the eyeball of an owl one will be able to see in the dark, or the Australian belief that ingestion of kangaroo will lead to an improvement in jumping ability. Crawley (1902) also offers abundant examples, including the Hottentot belief that consumption of hare will induce faintheartedness, while consumption of lion will produce courage and strength.

On reflection, "you are what you eat" seems like an eminently reasonable idea (Nemeroff & Rozin, 1989). In the real world, mixture of entities (one version of what happens in ingestion) often gives rise to a product that shows properties of the constituents. Why shouldn't one turn orange after eating a lot of oranges, or become a good swimmer after eating fish? It is only the knowledge of the process of digestion in modern developed cultures that makes this idea implausible. Indeed, transmission of digestible entities can lead to some documented instances of you are what you eat. Virtually all yellow/orange pigmentation in animals traces ultimately to ingested carotenoids of plant origin. In particular, the pink-orange color of flamingoes comes in large part from carotenoids contained in the algae they consume (Gray, 1961; Thomson, 1964). Extensive ingestion by humans of foods containing carotenoids, such as carrots or tomatoes, can result in carotenemia, a marked symptom of which is orange pigmentation of the skin (reviewed in "The Orange Man," Roueché, [1947] 1982).

It is possible that you are what you eat is a universal belief, present in all children, and stamped out of adults through a scientific education. Indeed, according to Keith Thomas (1983), in his survey of the development of attitudes to the natural world in 17th- to 19th-century England: "It was generally accepted that food affected the character" (p. 292).

We pursued this idea by testing whether there is an implicit, unacknowledged belief in you are what you eat among educated American adults (Nemeroff & Rozin, 1989). We used the impressions technique originated by Solomon Asch (1946) to measure this belief. Subjects (a few hundred undergraduate students) read a half-page vignette describing a hypothetical culture. There were two versions of the vignette (unknown to the subjects), which were identical except that in one case, the people were described as eating marine turtle, and hunting wild boar, but only for its tusk, whereas, in the opposite case, wild boar was eaten and marine turtle was hunted, but only for its shell. So the two vignettes differed with respect to what was eaten (and fabricated), and not in terms of other contact with the two animals in question. After reading the vignette, subjects were asked to rate male members of the culture on a number of personality scales, including good swimmer versus good runner, irritable versus good-natured, phlegmatic versus excitable, long-lived versus short-lived. Many of

these traits had been selected to discriminate boar from turtle. We found that subjects reading the boar-eating vignette rated the people in this culture as more boar-like than those rating the turtle-eating culture. We obtained similar findings, with other subjects, using a contrast between an elephant-eating culture and a vegetarian culture that hunted elephants for their tusks. We are in the process of extending these findings, and exploring other interpretations of them.

THE THREAT OF CONTAGION

Given the negative bias that we have already referred to, it is difficult to avoid a negative frame in discussing the consequences of contagion. In this section, we surrender to this impulse, and lay out the threats (as opposed to benefits) of contagion. Negative contagious interactions can lead to any of four types of bad consequences: (1) acquisition of negative physical or personality characteristics; (2) moral degradation; (3) "bad luck"; or (4) illness or death. A dominant theme in the first two consequences is the distinction between humans and animals. We discuss this first, and then another theme that distinguishes these consequences: the moral/physical distinction.

Acquiring animal properties and defending the animal/human distinction. Humans in traditional and modern cultures seem deeply concerned with defining themselves as distinct from all other animals. "We are not animals" is a theme that appears in an important way in many ethnographies (e.g., Ortner, 1973). Animal names as terms of abuse illustrate, as well, the low regard in which animals are held, with respect to humans (Leach, 1964). The human animal distinction plays an important motivating role in the development of sensibilities in Western European culture, as illustrated in Keith Thomas's (1983) *Man and the Natural World*. In previewing his analysis of the development of manners in medieval Europe, Elias (1978, p. 120) comments, "It will be shown how people, in the course of the civilizing process, seek to suppress in themselves every characteristic that they feel to be 'animal.'"

The manifestations of you are what you eat often focus on the acquisition of animalness, which appears both in terms of acquiring specific animal properties and a general moral degradation. Grunfeld ([1972] 1982), in his elaboration of the Talmudic interpretations of the Hebrew dietary laws, says that a major aim of many of these laws is to prevent the transfer of animal instincts into man, by consumption of certain foods. In particular, flesh eating and cruel habits are believed to be transmitted by consumption of carnivorous animals. Grunfeld states: "This is the general principle: The nearer the 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" (p. 8).

In a more modern context, in 19th-century England, one of the

great arguments against vaccination was that the use of cow fluids would animalize humans (Thomas, 1983). Similarly, Gandhi (1949) argued for a vegetarian diet on the grounds that it allayed animal passion, and DesPres (1976) argued that a powerful aspect of the concentration camp horror was to get both the guards and the inmates to think of the inmates as animals.

In their analysis of disgust, Rozin and Fallon (1987) conclude that the widespread disgust expressed at the prospect of consuming animal foods relates directly to the issue of animalness. There is concern both with eating what was once a living animal, and for the possibility of acquisition of animalness. All of these examples simply serve to emphasize the importance of the animal/human distinction, and the power of contagion to blur this boundary.

While humans clearly seek to distinguish themselves from animals, humans also admire animals. This is illustrated by a desire to identify with animals, illustrated by the existence of totems and, in U.S. culture, the naming of sports teams after admired animals. Overall, the human response to animals, and their consumption, is ambivalent, but with respect to contagion, negative features often predominate.

The moral/physical distinction. Our typical college student subject goes through the following sequence when offered a cockroach to eat. It is, of course, rejected. When asked why, the response is usually: "Roaches are filthy creatures that carry all sorts of germs. I could get sick." We respond with: "OK, then, let's consider a sterilized, dead roach. That would have no germs." The subject's response is (often with a certain amount of embarrassment): "Oh, well, I still wouldn't eat it." Experimenter: "Why not, it's perfectly safe." Subject: "Because, because, it's a cockroach!" This exchange represents a shift from a health-threatening ("physical") to a symbolic/moral reason. It illustrates a fundamental conflict in accounting for rejection of contaminating or contaminated entities that occurs both historically and in development. There is a confusion between physical/health and moral/symbolic accounts, and a tendency to frame or rationalize the threat in terms of bodily harm. Thus, Elias (1978), in his analysis of the rise of modern table and other manners in medieval Europe, concludes that the original motivation for suppression of belching, eating from a common pot at the table, or spitting at the table, and the like was social/moral – that is, it established a distinction between upper, more civilized, and lower classes. These manners were later justified in terms of sanitation. Similarly, the Hebrew dietary prohibitions such as the pork taboo arguably have a moral basis (Grunfeld, [1972] 1982), but have been justified, incorrectly in most cases, in terms of health (e.g., prevention of trichinosis).

Especially since many contaminating entities can be disease vectors, there is a strong tendency, as with the cockroach example, to explain rejection in terms of health risk. But a major case for which such a

shift to physical risk does not hold is modern Hindu India. Traditional Hindus reject foods that have had a certain degree of contact with members of lower castes. The more the lower caste member has been engaged with the food (the more of him that is "in" the food), the more unacceptable it is (Douglas, 1966). As a result, of foods that have been in contact with a lower caste member, cooked foods, which are in fact safer to eat from the point of view of microbial contamination, are less acceptable than raw foods.

FRAMING AND THE LIMITS OF CONTAGION

From a contagion perspective, the world is suffused with essences; footsteps, money, clothing, all foods, and many other items bear the residues of insects and other people, savory or unsavory. The most neutral object may become highly charged (usually negatively) if we contemplate its history. And yet, neither we, nor the much more contagion-sensitive Hua, are crippled by this prospect. How is this managed? (Note that we again revert to negative contagion in this discussion.) We put all but the most salient instances of contagion out of our minds; we frame situations so as to reduce the salience of past history. We do not think that the air we breathe during a ride on public transportation or at a lecture was just exhaled by some of our neighbors (unless it is called to our attention by an unsavory odor). We do not think of the history of the money we handle, or where our dog's face has been as he licks us. We also arrange, sanitize our environment to make personal and offensive linkages less salient. Food is purchased at supermarkets in sanitized packages, as if processed by machine. In this context, it is inappropriate to think about WHO prepared the food. In U.S. culture it is primarily the obsessives who worry excessively about cleanliness and past history, and who become crippled on this account. There have been situations at other times, and in other cultures, where contagion has become crippling. In 18th- and 19th-century France, there was excessive concern over corruption via inhaled air. Disinfection, deodorization, and ventilation came to be of major importance (Corbin, 1986). Fear of sorcery via contagion may become extreme. Frazer ([1890] 1959) reports that among the Betsileo of Madagascar, "blue blood" or ramanga have the job of eating all nail parings and licking up all spilled blood of nobles to prevent sorcery. They follow their masters around in order to dispose of residues.

We have already identified two mechanisms for reducing the effects of contagion. One is disregarding it (framing out) and the other is reducing the salience of contagion in the environment (e.g., by packaging foods in the supermarket). A third mechanism invokes explicit rules, and is probably most common in cultures in which contagion is a more serious threat. Thus, among Hindus in India, the left hand is reserved for toilet functions, and not used in the serving of food or in greetings. (Of course, there are limits to this, since it is hard to believe all cooking is done with the right hand, and then there is, of course,

the problem of left-handers). This left-hand specialization is common in many parts of the Middle East and Africa.

It is within the Hebrew tradition of dietary laws that we see some of the most elaborate treatments of minimal contagion. According to the interpretations of the prohibitions developed in the Talmud and later works (Grunfeld, [1972] 1982), explicit limits on the provenance of contagion are set to prevent cessation of all activity by the possibility of microcontamination. The basic principle, known sometimes as the 1/60th rule, holds that if a nonkosher contaminant (e.g., pork, or a dairy product in meat) falls *accidentally* into a kosher food, the food remains kosher as long as the contaminant constitutes no more than 1/60th of the total volume. This neat rule does not solve all problems, however. Suppose that there are two contaminants, one that constitutes 1/70th and the other 1/90th of the total volume. Together they would activate the 1/60th rule, but, if that is so, then any contaminant, when summed with tiny amounts of other unknown contaminants might also trigger the 1/60th level. This problem was appreciated by the Hebrew sages so the 1/60th rule applies only to the principal contaminant. All others may be ignored. There are other fascinating elaborations of this problem (Grunfeld, [1972] 1982); the point of the example is to illustrate the problem and the most cerebral approach to its solution.

Of course, a rule delimiting significant contamination effects does not directly solve the problem of emotional responses to contamination. Indeed, we (Nemeroff & Rozin, 1988) have shown that kosher Jews commonly reject as undesirable foods that have been contaminated with nonkosher items at sufficiently low levels that they remain technically kosher by the 1/60th rule.

THE REAL-WORLD BASIS FOR CONTAGION

As represented in the interpersonal domain (e.g., the food cooked by X contains X's essence), and especially in terms of backward contagion, the law of contagion seems maladaptive and irrational. However, there are physical bases, or at least physical analogues, to the law (in the forward version). Microbial contamination, as we have mentioned, is a direct parallel to negative, forward contagion, and could arguably be the adaptive basis and origin of contagion beliefs. For an intensely social species like *Homo sapiens*, passage of disease by invisible entities is a major risk.

In an important sense, contagion has to do with the history of entities, in particular, their past contacts. It emphasizes history over appearance in the evaluation of objects. In this regard, contagion is closely related to kinship, where history (genealogy) is the central concern, and a major determinant of the nature of social relations.

As we have shown, analysis of contagion leads to the presumption that a holographic principle is operating, akin to the metonymic principle that the part equals the whole. As contagion usually operates, any

part of a source contains the essence of that source, as if the essence is distributed throughout the source. Although this is clearly untrue for matters such as personality, it is actually the case for the genetic blueprint, since an identical and unique set of DNA molecules is present in all cells of a given person.

THE EXTENT OF BELIEF IN CONTAGION IN THE UNITED STATES

In recent research, we have sought to determine the degree of belief in the law of contagion among educated Americans (primarily, students at the University of Pennsylvania). Our basic technique has been to compare (usually in a questionnaire) an uncontaminated object with this same object after contact with a potent source. In most cases, subjects rate their readiness to consume, wear, or otherwise interact with the object on a 200-point scale, with +100 as "the most pleasant thing you can imagine," -100 as the "most unpleasant thing you can imagine," and zero as neutral.

Not surprisingly, 46 of 49 subjects reported a drop in desirability of their favorite juice after it was actually contacted by a sterilized, dead cockroach (mean drop in rating on the 200-point scale was 99 points; Rozin et al., 1986). In a more wide-ranging questionnaire study of 140 subjects, interpersonal contagion was explored with four personal sources: a lover, a best friend, a disliked person, and an unsavory person (e.g., a street person) (Rozin et al., in press). Subjects selected persons to meet each description from their own experience before answering the questions about these people. Subjects then answered questions about a number of media before and after they had appropriate contact with each of the sources. The sources and interactions we shall discuss are wearing a laundered sweater previously owned by each of the sources (one sweater per source, all sweaters identical except with respect to their history), taking a bite from a hamburger previously bitten by each of the sources, and using a hairbrush previously used by each of the sources and then thoroughly cleaned.

In general, positive contagion reactions were somewhat (but not strikingly) stronger to lovers than best friends, and negative contagion reactions were somewhat (but not strikingly) stronger to unsavory than disliked persons. Using as a criterion a change of at least 20 points in the rating scale as a result of contact, about 90% of the subjects showed a drop in the sweater rating as a result of contact with the negative persons (unsavory or disliked), whereas only about 20% of the subjects showed an increase of 20 points as a result of contact with a positive person. The corresponding figures for hamburger were 85% negative and 10% positive, while the figures for hairbrush were 79% negative and 5% positive. Thus, across these three common media, negative contagion effects appear in the great majority of the subjects while positive contagion appears in a small minority. We also explored a case of backward contagion, in which one's own hairbrush (which

one will never see again) comes into the possession of each of the four sources. Surprisingly, although the magnitude of the effect was not enormous, there was clear evidence for backward contagion in both the negative and positive directions. Using the criterion of a shift of at least 20 points, from neutrality, about 30% of the subjects showed discomfort at the thought of having their hairbrush possessed by an unsavory or disliked person, and about 37% showed pleasure at the thought of having their hairbrush possessed by a best friend or lover.

The principal findings of this survey were (1) negative forward contagion was ubiquitous; (2) positive forward contagion was clearly present in a subset of subjects; and (3) evidence pointed to both positive and negative backward contagion. Over the range of questions asked in this survey (including more media than indicated above), none of the 140 subjects showed clear signs of contagion beliefs for *all* media, directions (forward and backward), and signs (positive and negative). On the other hand, *all* subjects showed *some* signs of contagion beliefs on one or another of the questions. There was a weak tendency for a person who held one contagion belief to hold another one.

This contemporary survey evidence is supported by a wide variety of findings and observations from Western-developed cultures. Positive contagion is illustrated, in general, by the existence of objects to which people have sentimental attachments. More specifically, Crawley (1902) refers to the European folk custom in which a lover applies a piece of his hair, drops of his blood or sweat, or water in which he has washed his hands, to the garments of the girl whose affection he desires. A recent survey documents the importance of objects with personal histories in the lives of adult Americans; indeed, the authors of the study comment that objects (in particular, photographs) "can acquire an almost mystical identification with the deceased person" (Csikszentmihalyi & Rochberg-Halton, 1981, p. 69).

A recent television commercial in which the well-known football player, Mean Joe Green, gives a thrilled young admirer his towel illustrates positive contagion with respect to heroes. A striking instance of contagion is the great value placed on the ashes of a cremated loved one. In a recent court case in California, a company that disposed of such ashes was sued for 200 million dollars, because, instead of being scattered over the Sierras, the ashes were unceremoniously dumped in a lot (*Sacramento Bee*, 1984). As we commented earlier, kinship loyalty and affection is construable as an instance of contagion; that is, the definition of kinship centers around a continuity of substance, whether or not this continuity is perceptible.

Examples of the operation of negative forward contagion are even more common. Even prior to germ theory, contagion was a popular view of disease transmission. Indeed, during the 18th-century cholera epidemics in the United States, common folk treated the disease as contagious even though the medical profession preferred a moral inter-

pretation of contraction of the disease (Rosenberg, 1962). Many people are reluctant to buy used clothing because of their fear of contagion; in a recent survey, 76% of the sample refused to buy underclothing, and 20% refused to buy used overcoats (O'Reilly, Rucker, Hughes, Gorang, & Hand, 1984).

The most striking illustration of negative contagion beliefs in recent times relates to the current AIDS epidemic. There is a strong response among many people to *any* contact with AIDS victims, in spite of medical evidence indicating minimal risk. This appears to be a powerful belief, which, like other contagion beliefs, is almost dose independent. The current abhorrence of any sugar in foods among some Americans is another possible example of a belief in contagion. The idea seems to be that if sugar is toxic, then even tiny amounts of sugar carry this toxicity (again, the dose-independence principle).

We conclude from these selected examples that even in American culture, where the personal history of objects is often suppressed, contagion plays a substantial role. In modern Hindu India and some other places, that role is much more powerful.

THE DEVELOPMENT OF CONTAGION

Because of its association with traditional cultures, there is a strong inclination to think of belief in the law of contagion as a sign of a "primitive" mentality. However, we will argue on both empirical and theoretical grounds that contagion is a complex and sophisticated concept.

Although contagion beliefs about illness are present in a great many cultures, the salience of these beliefs is often not high. Thus, in his cross-cultural survey of beliefs about disease, Murdock (1980) reports that only 49 of 139 cultures attribute disease to a contagious entity (contact with a polluting substance, such as menstrual blood), and only 31 of these 49 cultures have anything like a germ theory.

The view that contagion is "primitive" predicts that it would be present in young children and would decrease with age and education. The view that it is sophisticated would hold that contagion would be absent in young children. The latter seems to hold. Until the age of about seven or eight, American middle-class children do not show contagion in response to disgusting or dangerous items (Fallon et al., 1984). Although young children reject consumption of "poison" or insects when presented with stories in which contamination occurs, they do not show signs of rejecting a beverage that has been in contact with dangerous or disgusting items for a brief time. Further experimentation, using actual contamination of a beverage with a fly, or an apparently used comb, also indicate that below the age of seven, there is little evidence for disgust-based contagion (Rozin, Fallon, & Augustoni-Ziskind, 1985).

It is conceivable that our failure to observe disgust contamination results from a weakness in the child's disgust response, rather than an

absence of contagion. Contagion may appear earliest in a domain other than disgust. Anecdotal reports of strong attachments of children to particular toys or dolls, or blankets, have a contagion aspect (that is, *their* blanket has *them* in it, and is different from any other similar-looking item). Anecdotal reports of children who refuse to eat a food if it has touched a disliked food on their plate are suggestive of contagion, as are some "contagion" transfer games such as Cooties (Opie & Opie, 1969), or a form of "pollution tag" played by children in the Orissa region of India (Shweder, 1987). We know of no firm evidence concerning the ages at which such games are regularly played.

As indicated in the discussion of essence above, the cognitive basis for contagion is, in fact, quite sophisticated. Most centrally, essence is invisible, and perhaps, insensible. Thus, the principle of contagion is built on the premise that things are seldom what they seem, or that appearance is not equal to reality. As we will indicate in the discussion of the development of similarity, the equation of appearance and reality, which we take to be the basis of similarity, is indeed a simple and "primitive" aspect of mentation. (The appearance-reality confusion is present in American children until the early school years [Flavell, 1986; Keil, 1986].) This being the case, contagion, as its opposite, cannot be simple and primitive.

The notion of essence, or its equivalent, may presume a notion of the particulate nature of matter and the idea that these particles are not visible. Before the age of seven, children have very limited conceptions of the particulateness of matter (Smith, Carey, & Wiser, 1985), and the nature of the process of dissolving (disappearance of matter through particulation; Piaget & Inhelder, [1941] 1974). Furthermore, germ theory does not appear in an articulated manner before seven years of age (e.g., Bibace & Walsh, 1979; Nagy, 1953).

It is particularly surprising that contact, which seems a most elemental notion, does not seem to have a specially important role. Thus, it is not until about seven years of age that children focus on contact as a major source of disease transmission (Bibace & Walsh, 1979), even though younger children have a definite sense of disease transmission by proximity without contact.

Contagion, by its nature, depends on the conception of a continuing history of persons and objects, since otherwise the past contacts of an object would not be relevant to one's current commerce with that object. It is critical that one realize that this food or item of clothing is the *same* one that had a particular contact in the past. Although some conception of the continuity of objects over time is surely present in even the youngest humans, there are limitations to the range and domain of such continuity ideas in early childhood. Before the age of six, children do not usually recognize the continuity of a child with the adult that it will later become (Guardo & Bohan, 1971).

If contagion is an acquired belief, how is it acquired? It is unlikely

that children are explicitly instructed in this domain. However, there are many opportunities to observe adult behavior that would reveal adults' belief in contagion, so that contagion might be acquired implicitly, as is the case for many aspects of culture. We suggest that one route to acquisition is learning that odor is an enduring characteristic that can represent a presence in the absence of appearance cues. A person's possessions may carry his odor, which in this sense, serves as a sign of the contagion history of these possessions. It is conceivable that children first learn about contagion by attending to odor, as opposed to just appearance. Indeed, among the Ilahta Arapesh of New Guinea, odor is the major vehicle and sign of contagion (Tuzin, 1986). Alternatively, contagion may be a natural and inevitable outgrowth of cognitive advances in the understanding of matter.

The law of similarity

According to the descriptions and analyses of Tylor, Frazer, and Mauss, the law of similarity holds that the image equals the object. That is, things that show a superficial resemblance, which in most cases amounts to looking alike, also have a deep resemblance. Furthermore, because like produces like, or like acts on like, action against an image can influence the object that it corresponds to. That is a form of backward causation. Indeed, a particularly common manifestation of similarity occurs in the sorcery practice of attempting to harm someone by damaging his image. Perhaps as a result of the dominance of the visual sense in humans, similarity is almost always evaluated in terms of visual resemblance. In this respect, it is appropriate to summarize the law of similarity as "appearance equals reality" (where appearance is a distinctly visual word).

It does not seem necessary to invoke the concept of essence to explicate the law of similarity. Of course, one could say that the image, by some mysterious process, contains the essence of the source (object). Under such circumstances, the backward causation belief that occurs in sorcery could share a mechanism with backward causation by contagion.

As with contagion, similarity can invoke positive or negative response, depending on the nature of the object (source). Forward and backward "causation" both occur. Forward causation describes the satisfaction or discomfort, potential benefit or harm, resulting from intimacy with a replica of a valued or offensive entity, and backward causation describes feelings that sources will be influenced if action is taken on their images.

Belief in the law of similarity is widespread in traditional cultures, and is documented at length by Tylor, Frazer, and Mauss. A particularly interesting recent example is the reluctance of members of some traditional cultures to have their picture taken, on the grounds that

something of them will be taken away when the developed replica leaves their community in the hands of a tourist or researcher.

It is possible to infer from the appearance-equals-reality claim the more inclusive claim that if two entities resemble one another on certain attributes, they also have a deep resemblance (resemblance in visible traits is one special case of this). In a sense, the attributes of an entity may instantiate the entity (something akin to the holographic principle mentioned in the discussion of contagion). One particularly salient attribute of an object is its name. There is widespread reverence for names of respected entities, along with a feeling that to defile the name is like defiling the entity it refers to. The name is perceived as an integral part of its referent, perhaps something that partakes of its essence. Piaget (1967) refers to this view as nominal realism (referred to as word realism by Werner & Kaplan, 1963). Nominal realism is normal in children in the Western cultures Piaget studied, up until the age of six. The name of an object is perceived as an integral part of the object, and the carrier of all the object's properties. Hesse (1962) points out that name and object are equated commonly in Western culture, as can be seen in the prohibition on mentioning the name of "God" in Judaism. There are widespread examples of nominal realism in traditional cultures, often manifested as a prohibition on speaking the name of someone who has recently died.

THE REAL WORLD BASIS FOR SIMILARITY

Similarity can be viewed as an overextension of a useful principle. Surely, sometimes appearances are deceiving. But, as a general rule or heuristic, the principle that if X looks like a Y, it is a Y, is a good one. Indeed, it is wise to operate on the principle that what looks like a tiger is a tiger. The problem arises when this heuristic has major influences on behavior in situations where appearances are deceiving. There is mimicry in the natural world.

The extent of belief in similarity among Americans. Although similarity may be the more "simple-minded" of the two laws of sympathetic magic, we find its operation to be commonplace among educated, adult Americans (Rozin et al., 1986). Thus, 49 of 50 University of Pennsylvania community subjects showed more reluctance to hold between their lips what was obviously a clean rubber replica of vomit (from a prank store) than a clean rubber drain mat of the same size. Similarly, 45 of 50 of these same subjects rated themselves less desirous of consuming a well-crafted mound of chocolate fudge, shaped to appear like a "doggie-doo," than an equivalent mound of the same fudge shaped in the form of a disc (Rozin et al., 1986). Furthermore, these same subjects were significantly poorer in accuracy in throwing darts at the point midway between the eyes of a picture of a revered figure (John F. Kennedy) or an imagined head of a loved person, than at a blank paper or picture of a disliked person (Rozin et al., 1986).

We believe that nominal realism is also common among adults. We suspect that many adults would be uncomfortable tearing up a piece of paper on which the name of a loved one is written. How many of those who use computers a lot have had second thoughts about erasing a file named for a liked person, especially when the erase command is "KILL," e.g. "KILL MILDRED," followed by the computer display "KILLING MILDRED." We demonstrated such tendencies in the laboratory by offering people a choice of two glasses of sugar water. One glass was made with sugar taken from a bottle labeled "sucrose table sugar," and the other with sugar from a bottle labeled "sodium cyanide, poison" (Rozin et al., 1986). People rate the "cyanide" water significantly less desirable. There can be no question that the subjects thought there might really be cyanide in the cyanide-labeled bottle. Subjects watched sugar poured into both of the bottles. They were then given the two sticky labels (sugar and cyanide), and asked to put one label on whichever bottle they wanted to.

There are many other manifestations of similarity in our culture. A striking set of examples that can be construed as similarity is the reliance on resemblance as opposed to contingency in the formation of impressions (Shweder, 1977). Indeed, Shweder argues for the prevalence of related magical beliefs in Western-developed cultures.

THE DEVELOPMENT OF SIMILARITY

The developmental picture for the "primitive" belief in similarity is what might be expected (in contrast to contagion). Similarity does seem to be a childish way of thinking, which becomes less salient (but does not disappear) with age.

In an impressive and extensive series of recent studies, John Flavell and his colleagues have demonstrated that young U.S. American children (below the age of 5 or 6) fail to make the appearance-reality distinction in many situations (reviewed in Flavell, 1986). For example they believe that a yellow object actually becomes red when it is seen behind a red filter, even if a part of the yellow color sticks out from the side of the filter. This finding is in keeping with Keil's (1986) work on natural kind, where preschoolers hold that a skunk shaved and otherwise superficially altered to look like a raccoon, *is* a raccoon.

Nominal realism was described by Piaget (1967) and Werner and Kaplan (1963) as a normal feature of childhood in Western cultures. Through the age of six years, children believe that the name is inseparable from the referent. Up to the age of nine or ten, children continue to believe that things must have a name.

Similarity and contagion: contrasts and similarities

JOINT OPERATION OF SIMILARITY AND CONTAGION

Since beliefs in both similarity and contagion are widespread, and since both focus on significant entities, we would expect both to operate with

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respect to some of the same entities. And they do. Both are operative with respect to attitudes to pork and other nonkosher foods or combinations of foods by kosher Jews (Nemeroff & Rozin, 1989). Responses to offensive animals or decay in many cultures follow both laws. Within American culture, the correlations between degree of belief in contagion and similarity, as gauged by a number of questionnaire and laboratory tests, is positive, but very small (Rozin et al., 1986). There is no question that the laws can act independently. In the case of sorcery, creating a replica of a person and then damaging it is a pure example of similarity. Obtaining a personal residue (e.g., hair, fingernail paring) and damaging it is a pure example of contagion. Among kosher practices, rejection of soy imitation bacon bits is a pure example of similarity, and rejection of an eggroll that contains tiny amounts of pork is a pure example of contagion.

In many situations, both laws operate simultaneously, to reinforce one another. Thus, Frazer ([1959] 1890) cites the Malay custom in which a clay figure of an enemy is constructed (similarity) incorporating residues from that person (contagion). The figure is then scorched, causing harm to the enemy by both laws.

The laws can operate in sequence, in a situation we call contagion by similarity. That is, the contagious entity is not the original source of contagion, but a replica of it. Thus, among the Moose of Burkina Faso, a medicine that will aid an individual in his ambition to be head of a village includes a rock from the highest mountain, an epiphyte from the top of a tall tree, the bark of a tree that fell opposite to the wind, and a piece of lion. These similarity-based entities are compounded into a powder or burnt to charcoal and then mixed with food and ingested (contagion) (Fiske, personal communication). Among the Hopi, the navel cord of a newborn boy is attached to an arrow shaft (contagion) so he will become a good hunter (similarity). For the female child, a stirring stick is used, so that she will become a good cook. In a questionnaire used with college students to measure disgust sensitivity, subjects were asked about the extent to which they would be discouraged from consuming their favorite soup if it was stirred by a brand new comb. The new comb is a negative entity by similarity to a used comb. By stirring the soup, the principle of contagion is engaged, by an item similar to a disgusting item. Sixty-four percent of subjects rated the stirred, previously favorite soup as neutral or disliked as a result of this hypothetical maneuver, a clear example of contagion by similarity. Similarly, stirring of a favorite soup with a brand new flyswatter resulted in equivalent effects in 71% of subjects (data from Rozin, Fallon, & Mandell, 1984).

In the same manner, we (Nemeroff & Rozin, 1989) have found that many kosher Jews will reject a kosher food that has been contaminated by contact with a kosher item that is similar to a nonkosher item. Thus, 42% of our 56 kosher subjects were reluctant to eat vegetarian lasagna into which a trace of vegetarian bacon bits had fallen, while

Table 4.1. *Comparison of similarity and contagion*

Similarity	Contagion
<i>Similarities</i>	*
Image = object	Parallel to: Part = whole
Forward-backward dimension	Forward-backward dimension
Positive-negative dimension	Positive-negative dimension
<i>Differences</i>	
Appearance = reality	Appearance $\neq$ reality
Decreases with age	Increases with age

57% were reluctant to eat kosher chicken soup into which a drop of nondairy creamer had fallen.

In general, it seems that when a source is sufficiently negative, and a person sufficiently swayed by the magical principles in this context, contagion by similarity can occur.

COMPARISON OF SIMILARITY AND CONTAGION

Both laws of sympathetic magic (and the law of opposites, as well) are empirical generalizations that supposedly describe universal laws of thought. The laws have notable similarities and differences (summarized in Table 4.1).

Similarities. Both laws are manifested in terms of forward and backward causation, and both have both positive and negative forms. Although both have a basis in predicting events in the world, both fail under some conditions, particularly in the backward causation form. In this sense, there is something irrational about some of the applications of both laws.

There is a close parallel between similarity and contagion. The image equals the object, a shorthand for similarity, can be glossed as a part of the object (its name or image), can stand for the whole object, and behaves in significant ways (e.g., with respect to backward causation) as the real object. The part equals the whole, a gloss of the holographic aspect of contagion, represents basically the same relation. Although these two relations have been distinguished as metaphoric and metonymic (e.g., Leach, 1976), they share the part/whole feature. In other words, both can be thought of as generalizations, or over-generalizations.

Differences. The fundamental contrast between the laws is in degree of sophistication. The law of similarity can be glossed as "appearance equals reality." The law of contagion, in its emphasis on insensible traces of past interactions, emphasizes that appearance does not always represent reality. The latter is clearly the more sophisticated, less

sense-based notion. Perhaps it is because of this greater sophistication of the law of contagion that contagion seems to increase with age, whereas similarity decreases with age.

Conclusions

This discussion has different functions for psychologists and anthropologists. For psychologists, it calls attention to unfamiliar cousins to the familiar laws of association. These cousins, the laws of sympathetic magic, call attention to phenomena ignored by psychologists, which, especially in the form of contagion, may have major implications for social interaction. We hope to harness the considerable experimental skills of psychologists in an effort to explain these so far untouched-by-psychology aspects of human thought. For anthropologists, the essay should serve as a reminder of something familiar, and a reminder that although the laws of sympathetic magic are familiar, we know very little about how they operate, what they entail, their development, and their psychological basis.

The laws of sympathetic magic may well be universal beliefs or laws of thought. The overtness of belief, and the domains in which the laws operate, vary both across cultures and across individuals within cultures. We believe that the laws are factors in decision making in U.S. culture. We have argued that the two laws are very different, if not opposite, in the degree of sophistication that they presume. We hope that this contrast, the ubiquity of the laws, and their almost pristine state as subjects of investigation will encourage interest in further explorations.

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