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Sympathetic Magical Beliefs and Kosher Dietary Practice: The Interaction of Rules and Feelings

CAROL NEMEROFF and PAUL ROZIN

The two major laws of sympathetic magic, the “law of similarity” and the “law of contagion,” were considered to be universal laws of thought by the anthropologists who identified and elaborated them (Tylor 1974[1871]; Frazer 1959[1922]; and Mauss 1972[1902]). The law of similarity holds that things that resemble one another at a superficial level (e.g., in appearance or in some distinctive feature or features) also share more fundamental properties. It can at times involve a conflation of the representation of an object with the object itself (as Mauss summarized: the image equals the object) and/or an assumption that similar things can influence each other (“like produces like”). An example of the law of similarity at work is the common magical practice of making a doll to represent one’s intended target (e.g., an enemy) and damaging it in some way to bring

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about similar negative effects on the actual intended victim. The law of contagion describes the transfer of properties, whether physical, moral, or behavioral, from a “source” to a “recipient,” through contact. This transfer is accomplished via some “essence” that passes from source to recipient during the contact. Contact may be direct, as in a handshake, or indirect, that is, occurring through an intermediary object or bodily residue (e.g., an article of clothing). The most potent form of contact is actual incorporation of the source by the recipient, in whole, in part, or via residues. Thus, food and eating are commonly considered as particularly potent means of contagion. The laws of sympathetic magic were proposed to be based on the “laws of association of ideas” discussed by the British empiricist philosophers (e.g., Hume 1959[1748]; Mill 1963[1843]). They were conceived by Frazer to be distinct from the laws of association in that, rather than remaining “in the head,” the magical laws are projected into the outside world as a theory of the nature of reality (that is, they are mistakenly taken to be causal principles). This conception of them has been roundly criticized, primarily because it was realized that those engaging in them frequently did not seem to believe in their actual efficacy (reviewed in Tambiah 1990). Rather than being “beliefs,” they often seem to be “performative acts,” used primarily as ritual expressions of social relations, or “actions of instinct”—emotionally satisfying actions that, however, do not fool one cognitively (as described in Wittgenstein 1969). In a thorough treatment of the nature and historical context of magical “beliefs” and their relation to modern “rationality,” Tambiah (1990) discusses the dual nature of the magical act:

On the one hand, it seems to imitate the logic of technical/technological action that seeks to transform nature or the world of natural things and manifestations. On the other hand, its structure is also transparently rhetorical and performative in that it consists of acts to create effects on human actors according to accepted social conventions. [Tambiah 1990:82]

The psychological aspects of these laws have been discussed in some detail by Rozin and Nemeroff (1990), and the distinctions between the predictions made by magical versus associational principles have been discussed in Rozin, Millman, and Nemeroff (1986), and Rozin and Nemeroff (1990).

We have found evidence for the operation of the principles of contagion and similarity among educated American adults in the domain of food and eating with regard to disgusting objects (Rozin,

Millman, and Nemeroff 1986). Almost all subjects refuse a desirable juice after it has briefly contacted a dead, sterilized cockroach (contagion). Their emotional reactions strongly suggest that their reluctance is based in disgust toward the juice due to its contact with the roach, rather than doubt about the actual sterile status of the roach and hence the juice. In this same study, many subjects showed operation of the law of similarity, being disinclined to eat a piece of a desirable food if it was shaped to look like a disgusting item (e.g., chocolate fudge shaped to look like dog feces). We have also found that Americans behave in accordance with a derivative of the law of contagion, the principle of “you are what you eat” (Nemeroff and Rozin 1989). Furthermore, we have shown that attitudes of Americans to foods are influenced by the past history of those foods with regard to contact with other people (Rozin, Nemeroff, Wane, and Sherrod 1989). Outside of the food domain, we have found extensive evidence for the operation of these laws among Americans in the interpersonal domain, in reactions to everyday objects such as sweaters as a function of their prior and anticipated contacts with other people (Rozin et al. 1989). (See also Shweder 1977, for demonstration of the operation of the similarity principle in social judgments.)

We find the conceptual approach taken by Shweder (1977) in his discussion of magical thinking in Western culture to be useful in understanding the nature of the laws of contagion and similarity. Shweder distinguishes between “intuitive” and “nonintuitive” concepts. Intuitive concepts are easy to attain, will be acquired even under highly degraded learning conditions, and are available for use without conscious effort or reflection; the notion is similar to the concept of preparedness of learning (Seligman 1970). Nonintuitive concepts are acquired with more difficulty, requiring special (more optimal) learning conditions, effort, and self-reflection. We view the laws of sympathetic magic as highly intuitive concepts that pervade thinking, frequently regardless of “scientific” training.

The current study has three goals. First, having identified attitudes and behaviors in American culture that are consistent with the operation of the magical laws, we wished to assess whether the two conceptually distinct laws are separable empirically; that is, in any domain, might a person behave in accordance with one of these laws but not the other?

Second, we wished to explore the extent to which reactions in terms of magical principles may be considered an “individual difference,” by examining consistency in people’s reactions.

And third, we wished to understand one way people might augment or delimit the effects of magical thinking. Clearly our sensitivity to contagion and similarity vary in different situations, and clearly there are limits to the pervasiveness and influence of these principles even where they are explicitly held beliefs integrated into the cultural cosmology. The case is especially clear for contagion. Consider that the world is literally suffused with essences, traces and residues of other people and entities. Surfaces of all kinds collect grease, grime, sweat, and germs from previous contacts; each lungful of air we inhale is likely to contain molecules that have recently been inside someone else’s chest. We routinely show sensitivity to contagion well beyond the bounds of what is necessary for safety in some situations; for example, almost all subjects are unwilling to drink juice that has contacted a cockroach even though the roach has been thoroughly sterilized in an autoclave and even though the roach’s contact with the juice is brief (Rozin, Millman, and Nemeroff 1986). And yet, as Rozin and Fallon (1987) have pointed out, most people cross-culturally do not become paralyzed in daily life by fear or disgust (the exception, of course, being a subset of those individuals with obsessive-compulsive disorder; see the DSM-III-R [APA 1987], for a description). One major strategy for managing reactions to contagion seems to be to ignore it. Another is to develop explicit rules delineating the limits of its threat, efficacy, or effects. The kosher dietary system practiced by many Jews is a superb example of just such an attempt. In interpretations of the Old Testament food taboos, there is extensive discussion of what constitutes contamination, what the limits are on it, and what to do in case it occurs in spite of all one’s precautions. The last goal of this study, then, is to determine what the relation is between strict adherence to the explicit rule system of kashruth, and contagion concerns both within and beyond the kosher domain, for situations beyond the limits of “rational” (legal) concerns (i.e., in those places where magical-emotional concerns generally prevail in spite of no “rational” cause for concern).

We chose to focus on Jews for three reasons. First, the specificity of the kosher laws allows for excellent manipulability and precision

in terms of stimulus items. In the practice of kashruth (the dietary laws), only certain animals (and certain parts of them) are considered acceptable for eating. Also, meat and dairy products must not be consumed together. It would be impossible to maintain the required separation of meat food from dairy food were one to have to worry about the possibility of a molecule of dairy substance from a neighbor's kitchen depositing itself in one's beef stew. The beauty of the system of kashruth for our purposes is that rabbinic law specifies rules to handle just such concerns. The law of particular importance to us here is the "1/60th rule," according to which, after accidental contamination, a substance remains kosher assuming the bulk of the contaminant is less than 1/60th of the bulk of the total mixture; if it remains in whole or solid form it must also be less than the bulk of an olive (Grunfeld 1982). By using the system of kashruth we can define stimuli that normally might be expected to invoke magical thinking but that are, strictly speaking, permissible according to the law (for contagion, the contaminant being less than 1/60th of the volume of the total mixture; for similarity, things that are kosher but appear similar to things that are not). Our second reason for focusing on Jews is that this may be a good arena in which to study the possible independence of the laws of contagion and similarity. They seem to account for the observation (Barbara Kirschenblatt-Gimblett, personal communication, 1983) that some Jews in their practice of kashruth are very sensitive to appearance cues (similarity) but are able to ignore minor "violations" related to very low levels of contamination (contagion), while others are highly sensitive to contamination (contagion) but don't mind the appearance of a violation. The first type of individual (similarity sensitive) is uncomfortable eating vegetarian "bacon-bits," for example, but not pork that is well disguised and at low levels in a Chinese meal; the second type (contagion sensitive) would feel fine about vegetarian bacon-bits but would be sensitive to even tiny amounts of a non-kosher substance such as pork or shrimp in his or her food, regardless of how well it was disguised.

Finally, because there is a wide range of degree of observance of the kosher dietary laws, we can examine the relation of stringency of adherence to them with similarity- and contagion-based concerns.

We recruited adult subjects ranging from Lubavitch Hassidim (ultra-orthodox) to minimally observant Jews, and had them fill out questionnaires. Half of the questions asked the subjects to rate their reluctance or willingness to consume items on the basis of religious convictions or tendencies. All items were technically kosher, and this was made clear in the questionnaire. However, some items were similar to non-kosher items, some unintentionally had non-kosher “microcontaminants” mixed in, and some items had been “pseudocontaminated” with items similar to non-kosher items (e.g., a drop of non-dairy creamer in a kosher meat stew). There was an equivalent set of questions having to do with items that (while not technically unkosher) are sources of disgust to a great many Americans.

METHODS

SUBJECTS

Sixty-one adult Jewish subjects were recruited, through the Hillel House and the Chabad House on campus at the University of Pennsylvania, as well as through acquaintance networks. Hillel House attracts a broad range of individuals, mainly University students and staff, ranging in degree of observance from those interested in eating strictly kosher meals and remaining immersed in Jewish culture and activities to those simply interested in good, inexpensive, convenient food and/or occasional folk-dancing. The Chabad House is sponsored by the Lubavitch community, an extremely observant orthodox group that includes newly orthodox people from all walks of life as well as those born and raised in the community. While it also attracts a wide range of people to its classes and Shabbat dinners, only full-fledged members of the Lubavitch community were recruited through Chabad House. Finally, a small number of questionnaires were administered to Jewish acquaintances of the authors, ranging from moderately orthodox to minimally observant individuals. Thus, subjects ranged from “Lubavitch” orthodox to minimally observant Jews who, although not practicing kashruth, reported some residual kosher concerns. We feel that this yielded a fairly representative sample of the Philadelphia Jewish community in terms of age, socioeconomic status, and level of observance, although highly orthodox people were no doubt overrepresented, as were those who have some connection to the University community.

Four vegetarian subjects were excluded from the final sample, since many of our stimulus items would be unacceptable to them for reasons irrelevant to our interests, for a final sample of 57 subjects. Their average age was 26.6 years, with a range of 18 to 64 years; 38 subjects were male and 19 female.

PROCEDURE

Subjects were individually given a 58-item questionnaire, which they completed and returned at their convenience. The first 19 items dealt with demographic information and degree of adherence to the laws of kashruth. Adherence was measured as follows: subjects were assigned a kosher-observance score (K-score) based on their responses to six questions covering the major laws of kashruth: eating only kosher types of meat (e.g., no pork or shellfish); eating only meats from a kosher butcher (i.e., ritually slaughtered and prepared); avoiding mixing meat and milk products together at a given meal; waiting a prescribed period between ingesting meat after milk, and vice versa (to avoid their mixing inside the body); eating only from dishes kept separate for meat and dairy; and avoiding ingesting animal blood, by specially preparing (draining, salting) meats and cooking them until "well done." For each item, subjects were asked if they observed the rule at home and when eating out. We assigned a score of zero if they did not observe the law at all; a score of 1 if they observed it at home but not when eating out; and a 2 if they observed it both at home and when eating out. Thus the minimum kosher-observance score possible was 0, if they regularly observed none of the laws in either context, and the maximum possible was 12 if they observed all the laws in both contexts.

The remaining items assessed similarity and contagion in the domains of kashruth and of disgust. For each domain, there were five "similarity" items, five "contagion" items, and five "contagion-via-similarity" items. Subjects rated their willingness to eat the items in question on the following five-point scale: "I would ____ it": (1) refuse to eat; (2) be reluctant to eat; (3) feel neutral about eating; (4) be inclined to eat; (5) eagerly eat. In addition, for a subset of items, namely, kosher-similarity, and all disgust items, subjects who were reluctant to eat any given item specified whether it was solely because of the taste, or for traditional or religious reasons (in the case of kosher items) or ideational reasons (in the case of disgusting items). With this information we could distinguish magical from

nonmagical effects; for example, a subject might refuse to eat bacon-bits only because he or she disliked the taste of bacon rather than because of their similarity to a non-kosher substance. We wished to be able to distinguish this type of response from a magical one.

Similarity items were substances similar to either kosher or disgusting items (e.g., kosher meat in a creamy sauce made without actual dairy products). Contagion items were normal foods into which a “contaminant” had been mixed (e.g., mashed potatoes into which a single drop of beef blood has fallen). Contagion-via-similarity items were items in which a normal food was “pseudocontaminated” with an item that was not in itself unkosher or disgusting, but which was similar to such an item (e.g., kosher chicken soup into which a drop of non-dairy creamer fell). All items were in fact kosher by the provisions of the laws, and this was made clear in the questionnaire. The full set of items is shown in Table 1.

Instructions for kosher-similarity were the following:

All of the items below are technically Kosher, according to the laws of Kashruth. Nevertheless, many people who keep Kosher, or who have some inclination to Kashruth, or who were raised in this tradition, are reluctant to eat some of these items. For some people, this reluctance may be based on their interpretation of the “spirit” of the law, or feelings based in their traditional or religious training. Please rate how you would feel about eating each of the items below, by circling *all* of the statements that are relevant. (Imagine that you are alone while eating, so that “maurit ayin” [appearances] is not a problem.)

We used these instructions, which at first appear quite leading, to solve just the opposite problem. In circulating an initial version of the questionnaire for comments prior to running the study, non-orthodox Jewish readers found it confusing to first read that items were kosher yet then be asked if they were reluctant to ingest them, with no further explanation. Several reported that they suspected that it was in fact a test of knowledge of kashruth, while others thought they had misunderstood and the items must not all be kosher; in both cases they stated that they would have become more conservative in their responses (i.e., more reluctant to eat the items). When the basis for possibly rejecting kosher items was explained to them, the doubt and confusion were removed and they reported that they would feel more comfortable simply reporting their actual feelings about ingesting the items. While we have no way of knowing the extent to which other subjects found the revised wording to be leading, we received no complaints or comments about it.

TABLE 1
ITEMS USED, BY DOMAIN AND LAW^a

Kosher

Similarity

1. Vegetarian bacon-bits
2. Vegetarian (soya) meat substitute which looks and tastes like ground pork
3. Beef-fry, strips of kosher beef which look, cook, and smell like bacon
4. Turkey-ham roll (kosher turkey meat prepared to resemble smoked ham in texture and flavor)
5. Kosher meat in a creamy sauce made without real dairy products

Contagion: basic vehicles

1. Mashed potatoes
2. Applesauce
3. Vegetarian lasagna
4. Kosher chicken soup
5. Kosher brisket of beef

Contagion: microcontaminated vehicles

1. Mashed potatoes into which a drop of beef blood has fallen accidentally
2. Applesauce accidentally served with a spoon used to serve shrimp
3. Vegetarian lasagna into which a trace of pork sausage fell accidentally
4. Kosher chicken soup into which a drop of milk fell accidentally
5. Kosher brisket of beef accidentally sliced with a knife used to slice pork

Contagion-via-similarity: pseudocontaminated vehicles

1. Potatoes served with utensils used to serve beef-fry
2. Applesauce served with a spoon used to serve imitation (soya) ground pork
3. Lasagna into which a trace of vegetarian bacon-bits fell
4. Chicken soup into which a drop of non-dairy creamer fell
5. Brisket sliced with a knife used to slice kosher turkey-ham roll

Disgust

Pure disgustants

1. A lock of human hair, sterilized^b
2. One of the species of locust specified as kosher in the Bible, broiled
3. Human fingernail clippings, softened and sterilized^b
4. Whole pickled baby calves' tongue
5. Slice of moldy bread, sterilized

Disgust-similarity

1. Imitation hair made of spun soya protein
2. Crunchy candies made to look convincingly like locusts
3. Imitation fingernail clippings (softened) made from vegetable products
4. Imitation baby calves' tongues, made of vegetable products
5. Slice of bread colored with food-coloring to look moldy

Disgust-contagion: microcontaminated vehicles (base vehicles are the same as for kosher contagion items)

1. Mashed potatoes in which you found (and removed) a strand of sterile hair
2. Applesauce in which a kosher locust had fallen (and been removed)
3. Vegetarian lasagna in which (sterile) fingernail clippings had fallen (and been removed)
4. Chicken soup in which a baby calf's tongue had fallen (and been removed)
5. Brisket served on a piece of moldy bread (which was then removed)

(continued on next page)

TABLE 1
(CONTINUED)

Disgust-contagion-via-similarity: pseudocontaminated vehicles

1. Potatoes in which imitation (soya) hair was found (and removed)
 2. Applesauce into which a candy imitation locust had fallen (and been removed)
 3. Lasagna into which imitation (vegetable product) fingernail clippings had fallen (and been removed)
 4. Chicken soup into which an imitation calf's tongue (vegetable product) had fallen (and been removed)
 5. Brisket served on a piece of bread made to look moldy with food-coloring (the bread is then removed)
-
-

^aAll items in both the kosher and disgust sections are kosher under the provisions of rabbinic law, which allows for (specified) minute amounts of accidental contamination to occur without rendering the food in question inedible. The relevant rabbinic guidelines were summarized clearly next to the item(s) to which they pertained.

^bBoth "hair" and "fingernail clippings" are considered nonfood (inappropriate objects for eating), but not unkosher. This was clearly indicated to subjects.

A typical kosher-similarity item was the following: vegetarian bacon-bits (a purely vegetarian product that looks, tastes, and smells like small bits of fried bacon). "I would ____ it."

The instructions for kosher-contagion and kosher-contagion-via-similarity questions were the following:

All of the items below are Kosher. The first item in each set of 3 is the food named, in pure form. We simply want to know how much you like it. The second item in each set is the same food as the first, but contaminated with a non-Kosher substance. It is still technically Kosher, however, based on provisions in the laws of Kashruth (the amount of contamination with non-Kosher substance is less than is prohibited, and it is presumed to have occurred accidentally; also the trace of non-Kosher substance is not detectable either visually or by taste). The third item in each set is again the same as the first, but is contaminated with a substance that, while completely Kosher, is similar to a non-Kosher substance. Although all of these items are technically Kosher, many people . . . [continues as for similarity items]. "Please rate how you would feel about eating each item by circling the appropriate statement. Remember, the "contaminated" item shows no signs, in appearance or taste, of the contamination.¹

A typical contagion sequence was: (1) mashed potatoes; (2) mashed potatoes into which a drop of (beef) blood has fallen; (3) mashed potatoes served with the same utensil just used to serve beef-fry (strips of beef prepared to look, cook, and smell like bacon). See Table 1 for a complete list of the items used.

For disgust items, the instructions were:

Imagine that you are *very* hungry and the items below are all that is available to you to eat. Please rate how you would feel about eating the following substances by circling the appropriate statement. . . . In rating each item, please try to imagine it as vividly as possible.²

As with kosher-similarity items, subjects who answered “refuse to eat” or “reluctant to eat” on a given item also answered whether it was solely because of the (known or presumed) taste. Subjects first rated the pure disgustants (to make sure that they were in fact disgusted by them), then rated (1) disgust-similarity: items similar to the disgustant; (2) disgust-contagion: the base vehicles from the kosher section that had been microcontaminated with disgustants; and (3) disgust-contagion-via-similarity: the same vehicles that had been “pseudocontaminated” with disgust-similarity items. Again for “contaminated” items, they read that “*No trace of the contaminant is detectable, either visually or by taste.*”

RESULTS

ASSIGNMENT OF SCORES

Subjects were assigned “scores” on each item according to the following criteria:

1. **Kosher-similarity (K-sim):** The actual scores subjects gave to items, ranging from 1 = refuse to eat to 5 = eagerly eat, with 3 being neutral, were averaged over the qualifying items to form a kosher-similarity score. Cases of rejection based on taste alone were excluded from analyses. (The number of cases excluded ranged from 5 to 12 out of the 57 cases, depending on the item.) Subjects were considered to have shown an overall “kosher-similarity effect” if their K-sim score was ≤ 2.5 (i.e., at least halfway between “neutral” and “reluctant to eat,” indicating at least some negative feeling).

2. **Kosher-contagion (K-con):** Scores were based on the difference between subjects’ ratings of base vehicles initially (in unadulterated condition) versus after contact with the “contaminant.” Cases where the unadulterated base vehicle was rejected were excluded from analysis. Cases where the ratings were more positive following contamination were also excluded from analysis. The number of cases excluded based on these criteria ranged from 0 to

3, depending on the item. Scores were assigned as follows: a score of 5 represents no change following contact; 4, a drop of 1 point; 3, a drop of 2 points; 2, a drop of 3 points; and 1, the maximal possible drop of 4 points. Thus, as for kosher-similarity items, a score of 1 represents the largest possible negative (magical) effect and a score of 5 no negative (magical) effect. Subjects were considered to have shown an overall “kosher-contagion effect” if their average score across the K-con items was ≤ 4 (indicating at least a 1-point drop on average following contamination, once again indicating at least some negative feeling for the contaminated vehicle relative to the uncontaminated vehicle).

3. Kosher-contagion-via-similarity (K-simcon): Scores were calculated as for kosher-contagion, based on drops in ratings of the base vehicle following “pseudocontamination” with a kosher-similarity item. Once again, a mean score of ≤ 4 was the cutoff for being considered to have shown a “kosher-contagion-via-similarity effect.” Cases in which subjects were reluctant to eat either the kosher-similarity item or the base vehicle were excluded (from 0 to 3, depending on the item).

4–6. Disgust-similarity (Dg-sim), Disgust-contagion (Dg-con), and Disgust-contagion-via-similarity (Dg-simcon): Scores were calculated as for kosher-similarity, kosher-contagion, and kosher-contagion-via-similarity, respectively. However, we additionally excluded those cases where a subject did not reject the pure disgustant, scoring their reaction to it as neutral or better (≥ 3), since, if there was no reaction to the disgustant in the first place, we could not expect similarity or contagion effects based on it. The number of cases thrown out on this basis ranged from 5 to 35 (out of 57 cases), depending on the item.

FREQUENCY AND INDEPENDENT OPERATION OF EFFECTS

The number of subjects showing each type of magical effect (by the criteria described in the last section) is shown in Table 2. Both for kashruth and for disgust, all but 11 of 57 subjects (19%) showed magical effects on at least one of the three measures (similarity, contagion, and contagion-via-similarity).

Within kashruth, 2 subjects showed similarity but no contagion sensitivity (4%) and 29 showed contagion without similarity (51%). Within disgust, 9 showed similarity without contagion (16%), and 15 showed contagion in the absence of similarity (26%).

These numbers provide evidence that the two laws can operate independently. However, a substantial proportion of subjects showed both types of effect (15 subjects [26%] showing both for kosher, and 22 [39%] showing both for disgust).

Finally, 12 subjects (21%) showed contagion-via-similarity effects within the domain of kashruth, and 19 (33%) showed them within the domain of disgust.

COHERENCE OF SIMILARITY AND CONTAGION AS DIMENSIONS

Spearman rhos were calculated for each pair of the 30 items (5 each of K-sim, K-con, K-simcon, Dg-sim, Dg-con, and Dg-simcon), yielding a 30×30 diagonal matrix. Median rhos were then computed both within and between dimensions (i.e., similarity, contagion, and contagion-via-similarity) separately for both domains (i.e., kosher and disgust). Within-dimension median rhos were based on 10 correlations each (5 items, 2 at a time, e.g., all kosher-similarity items) while between-dimension median rhos were based on 25 correlations each (5 items \times 5 items, e.g., kosher-similarity versus kosher-contagion items). The resultant 6×6 matrix of median rhos is shown in Table 3.

With regard to kashruth, the within-dimension correlations (K-sim with K-sim, K-con with K-con, and K-simcon with K-simcon) are the highest by far (range .52 to .61). There is in fact no specific significance test for these median rhos, since they are not independent measures. Therefore we adopt the extremely conservative position of evaluating the median rho for significance as if it were an

TABLE 2
NUMBER OF SUBJECTS SHOWING EFFECTS

		Kosher-similarity		Disgust-similarity	
		Yes	No	Yes	No
Contagion	Yes	15 (26%)	29 (51%)	22 (39%)	15 (26%)
	No	2 (4%)	11 (19%)	9 (16%)	11 (19%)

TABLE 3
INTERDOMAIN CORRELATIONS: MEDIAN RHOS

	K-sim	K-con	K-simcon	Dg-sim	Dg-con	Dg-simcon
K-sim	.605** (38)					
K-con	.150 (48)	.516** (55)				
K-simcon	.289+ (48)	.398** (55)	.615** (55)			
Dg-sim	.101 (34)	.169 (41)	.260 (41)	.505** (28)		
Dg-con	.047 (36)	.241 (42)	.391* (42)	.291 (34)	.439* (33)	
Dg-simcon	.175 (36)	.270 (42)	.473** (42)	.430* (34)	.425** (36)	.541** (33)

Key: Kosher-similarity = K-sim; Kosher-contagion = K-con; Kosher-contagion-via-similarity = K-simcon; Disgust-similarity = Dg-sim; Disgust-contagion = Dg-con; Disgust-contagion-via-similarity = Dg-simcon.

Note: + indicates a rho significant at the .05 level; * indicates significance at the .02 level; ** indicates significance at the .01 level or greater. See text for assumptions in calculating significance levels for median rhos. Numbers in parentheses are mean *N*s for the set of rhos from which each median was calculated.

individual rho for an *N* that is representative of the *N*s in each comparison: the mean *N* for the set of rhos from which the median was calculated (range from 28 to 55). Inter-item correlations are strongly significant for a given law within a domain: kosher-similarity items correlated .60 with each other; for kosher-contagion items with each other the rho was .52; disgust-similarity items correlated .50 with each other, and disgust-contagion items .50 (for all rhos, $p < .01$). However, median rhos are low for the separate laws: of the between-dimension correlations (similarity versus contagion), kosher-similarity items correlated only .150 with kosher-contagion items (n.s.) and disgust-similarity items correlated only .291 with disgust-contagion items (n.s.). Of the between-dimension rhos, only the relations between kosher-contagion and kosher-contagion-via-similarity (.40) and disgust-similarity and disgust-contagion with disgust-contagion-via-similarity (.43 and .42, respectively) were substantial (rhos $p < .02$). This is not surprising, since contagion-via-similarity effects no doubt require sensitivity to both principles.

Across domains, median correlations of kosher items with disgust items are consistently low, except for disgust-contagion with kosher contagion-via-similarity (.39) and disgust-contagion-via-similarity with kosher contagion-via-similarity (.47); this suggests that only a “hypersensitive” subset of subjects respond to contagion-via-similarity effects, that when they do it is a generalized concern across domains, and that it is more closely linked to contagion concerns than to similarity concerns.

In sum, within a domain, similarity and contagion are quite coherent, and relatively independent of one another, with contagion-via-similarity weakly related to both. The coherence of similarity and contagion does not hold up across content domains, however, with only contagion-via-similarity ratings showing substantial correlations across both kosher and disgust items.

CORRELATION OF DEGREE OF KOSHER OBSERVANCE WITH MAGICAL EFFECTS

Five subjects obtained a total kosher-observance score (K-score) of 0. This did not mean they had no concern with kashruth at all, however, since all subjects had initially been selected to meet a minimum criterion of at least sometimes refraining from eating things that were not kosher for reasons related to kosher training or concern, even if they did not systematically keep kosher. Nineteen subjects showed the maximum K-score of 12, and 41 scored 9 or above.

We calculated Spearman rhos between K-scores and each of the six measures of magical effects (K-sim, K-con, K-simcon, Dg-sim, Dg-con, Dg-simcon) (see Table 4). There were substantial and significant positive correlations between kosher-scores and all three

TABLE 4
CORRELATION OF KOSHER SCORE WITH EACH OF SIX MEASURES: SPEARMAN RHOS
($N = 57$)

K-score versus:	rho	<i>t</i> of rho	sig (2-tailed)
K-sim	-.030	.223	n.s.
K-con	-.204	1.543	n.s.
K-simcon	.25	1.912	n.s.
Dg-sim	.356	2.826	$p < .01$
Dg-con	.415	3.387	$p < .01$
Dg-simcon	.277	2.139	$p < .05$

disgust measures, indicating a heightened sensitivity of very observant subjects to similarity and contagion within the domain of disgust. However, there was no correlation between kosher-similarity and the kosher-score, and only a weak, nonsignificant ($-.20$) negative correlation between kosher-contagion and the kosher-score.

DISCUSSION

We have shown that a majority of our sample of Jews with some degree of involvement with the laws of kashruth report reactions that extend beyond the limits established by rabbinic law and that are consistent with magical views concerning similarity and/or contagion. We have also shown that these magical reactions are sufficiently powerful that, for 12 subjects, a “twice-removed nonviolation” (kosher-contagion-via-similarity) would deter ingestion. Similar results were obtained in the domain of disgust.

We found considerable individual consistency for the operation of a particular law across exemplars within a particular domain (i.e., kosher or disgust). On the other hand, the relation between sensitivity to contagion and to similarity is very weak, as is the relation between sensitivity to a particular law across the two domains. Thus, we have confirmed the hypotheses that the two laws act as coherent principles, and can operate independently, but have also shown that their operation does not necessarily generalize across different content domains.

We also find that the more observant Jews have more magical reactions to disgust but not to kosher nonviolations. In fact, they may have a weak tendency to be less magical about kosher situations; although the $-.20$ correlation between kosher-observance score and kosher-contagion was not significant, it would have been a statistical trend given a one-tailed test. Inasmuch as it was the only negative correlation in the set, and given the weak, ordinal nature of the kosher-observance-score measure and the relatively low power of nonparametric tests, we consider it to be worth reporting and thinking about. The greater disgust sensitivity of highly observant (high K-score) subjects was robust and needs explanation. We see two major alternatives to explain this effect. It may be that the attentiveness to contamination brought about by observance of the laws of kashruth cause a relative overconcern where there are no delimiting laws; by this account, people, in learning to keep strictly

kosher, are taught a world view that sensitizes them to disgust and/or contagion in general in domains not covered by the explicit rule systems. Alternatively, it may be that individuals who are initially more disgust-sensitive are more likely to remain observant in later life (or if not raised observant, more likely to adopt kosher food practices as adults).

Assuming the negative kosher-observance-score correlation with contagion to be real, this finding may have practical as well as theoretical import. If adherence to an articulated rule system limits (within-domain) magical contagion effects for kosher Jews, it may be that similar systems could help people cope more rationally in cases where they are showing hypersensitivity to a contagion-related issue (for example, AIDS, where extreme negative reactions to clearly noncontagious forms of contact such as a handshake are rampant). We do not know what the qualities of such a system would have to be—in particular, whether moral issues need to be engaged so that the rule system has the same kind of personal import that the kosher dietary system has and that other religious doctrines often have. A first step in following this up might be to extend the generality of the finding by examining the Hindu food transaction rules, which are intensely concerned with interpersonal contagion, in order to see whether they limit the concern of practicing Hindus with contacts that are technically allowable within the system. In contrast to these moral systems, one might then look at degree of adherence to germ theory, contrasting medical doctors, Western laypersons, and individuals raised in traditional cultures in terms of their sensitivity to magical contagion where medical contagion is ruled out. On the other side, gaining an understanding of what sensitizes people to contagious concerns might also be helpful (for example, in motivating people to take appropriate precautions with regard to sexual behavior).

An obvious limitation of the present study is the use of a questionnaire format, rather than behavioral observations. The advantages to a questionnaire format are clear: it is far more manageable to present a large number of unlikely stimuli in a fully balanced design to a large number of subjects via questionnaire than *in vivo*. Indeed, setting up some of the stimuli and situations subjects were asked to imagine would not have been possible in a laboratory situation (e.g., apparently accidental contaminations of just the right

magnitude; procuring kosher locusts). However, the major disadvantage of the questionnaire method is also obvious: we cannot know the extent to which subjects' reported responses to imagined stimuli accurately reflect their behavior were the stimuli actually in front of them. We are not overly concerned about this issue, however, for two main reasons. First, we have utilized *in vivo* measures of contagion and similarity in prior work (Rozin, Millman, and Nemeroff 1986), and responses were consistent with self-report data. Second, in asking for an immediate gut-level reaction to an explicitly described situation, we feel that a minimum of introspection and/or insight is required (relative to many self-report questionnaire measures), and thus there is less room for distortion to occur. While people are not always accurate in reporting their own motivations, our impression is that they know their gut-level reactions fairly well.

This paper raises the question of the determinants of congruence between belief systems and feelings or attitudes. While our similarity-sensitive subjects no doubt *believed* that vegetarian bacon-bits are in fact kosher, their feelings about them remained negative. Getting beliefs and knowledge to translate into feelings and behavioral tendencies is a critical issue in the attempt to encourage adoption of health-promoting behaviors and the avoidance of health-damaging behaviors. We have contributed to the understanding of this issue by showing, for one example, that magical feelings may supersede an explicit rule system (in this case, a moral-based system) in predictable ways. We have also shown that for those who adhere stringently to the system, magical feelings may be *increased* for domains beyond the applicability of that rule system, and possibly be blunted *within* the domain of applicability of the system. Several implications for health education arise from these findings: for example, one should probably not expect people to generalize beyond the domain of applicability of their current knowledge; also, in spite of the advantage of simplicity, teaching isolated facts may be less effective than presenting a full rule-based system or linking new facts to existing rule- or theory-systems, in promoting rational behavior. While these speculations go well beyond current data, we feel that this approach to the study of the interaction of rules and feelings merits continued investigation.

NOTES

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¹Once again, the wording of these questions might seem suggestive. As for similarity items, the wording was chosen in response to pilot subjects' comments. However, even if some subjects' responses were influenced, we would not be overly concerned, since our primary goals were to assess consistency and coherency of the principles, rather than to establish base rates of magical concerns, which we have already done elsewhere.

²These instructions were given to ensure that there would be some range of responding (i.e., if very hungry, at least some subjects would be willing to eat most items), while instructions to vividly imagine were in keeping with standard disgust manipulations.

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