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"Head versus heart": Effect of monetary frames on expression of sympathetic magical concerns

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Abstract

Most American respondents give "irrational," magical responses in a variety of situations that exemplify the sympathetic magical laws of similarity and contagion. In most of these cases, respondents are aware that their responses (usually rejections, as of fudge crafted to look like dog feces, or a food touched by a sterilized, dead cockroach) are not "scientifically" justified, but they are willing to avow them. We interpret this, in some sense, as "heart over head." We report in this study that American adults and undergraduates are substantially less likely to acknowledge magical effects when the judgments involve money (amount willing to pay to avoid an "unpleasant" magical contact) than they are when using preference or rating measures. We conclude that in "head-heart" conflicts of this type, money tips the balance towards the former, or, in other words, that money makes the mind less magical.

Keywords: sympathetic magic, willingness to pay, preference, rationality.

1 Introduction

Sympathetic magical thinking is recognizably irrational to most educated adults who show the effects. Participants often laugh at themselves or almost apologize in face-to-face studies in which they acknowledge reluctance to engage in activities such as eating a piece of chocolate that is shaped to look like dog feces, drinking apple juice from a brand new bed pan, wearing a sweater that had been previously worn by someone with AIDS after it was sterilized by heat, or drinking a glass of juice that had previously been touched to a dead, sterilized cockroach. These, and other situations are exemplifications of the two laws of sympathetic magic, first described by anthropologists around the turn of the 20th century (Edwin Tylor, 1879; James Frazer, 1895, and Marcel Mauss, 1902; see Rozin and Nemeroff, 1990, for a review). The two relevant laws are contagion ("once in contact, always in contact") and similarity ("like causes like," and "appearance equals reality"). A different or weaker form of the law of similarity involves simple association. If two entities are associated, and one has negative properties, then the second may take on some of these properties (Nemeroff & Rozin, 1994). For example, an object owned by but never touched by a disliked person, may take on negative properties. In some cases, the applicability of similarity and association principles overlaps. Consider a person who feels bad about wearing a new sweater that has the words "convicted murderer" written on the label inside the neck rim. This could be explained simply as an association between the sweater and the negative connotations of "murderer," and/or by similarity (appearance = reality), such that the words "convicted murderer" stand for the real thing; such a person actually might have owned and worn the sweater.

A majority of undergraduate and other participants (see, e.g., Rozin, Millman, & Nemeroff, 1986; Rozin, Millman, Wane, & Sherrod, 1989) are surprisingly willing to acknowledge their feelings (discomfort) in a wide range of magical scenarios. Although embarrassment would be thought to work against such admissions, participants seem to sense that in this peculiar domain they have license to display their feelings. Among the studies we have done, this combination of expressed magical thinking overcoming embarrassment is most clear in the "cyanide" studies (Rozin, Millman, & Nemeroff, 1986; Rozin, Markwith, & Ross, 1990). Participants observed as sugar from a commercial package was poured into two clean bottles. They were then given two labels, one saying "sugar" and the other saying "sodium cyanide, poison," and asked to place one label on each bottle, as they chose. Most participants subsequently showed more reluctance to drink sugar water made from the bottle that

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they had labeled with the cyanide (or even a "not sodium cyanide") label.

We suspect that this willingness to show a rather silly, if genuine response, would be curbed if the stakes were higher, that is, for example, if money were at stake. One might be willing to acknowledge a silly magical feeling, but not to put money behind it. The studies described in this paper test this idea, in questionnaire format. Identical magical scenarios are described, and respondents indicate, in a between-subject design, their feelings or willingness to pay to avoid interaction with a magically degraded object. We also include a data set in which the same respondents make both types of judgments, at different periods of time, two months apart.

2 Method

Table 1 summarizes the respondents and the items used.

There were two groups of respondents. One was University of Pennsylvania students in an introductory psychology course, in 1994 and 1996. Demographic data were not collected, but students in this course are moderately representative of arts and science students in the University; students come from all over the United States and the world, with the largest group from the middle-Atlantic and northeastern United States. Average SAT scores are in the mid 600 range. Most come from middle to upper middle class homes. Principal religious affiliations are Jewish, Catholic and Protestant. The racial background is predominantly Caucasian.

The second group of respondents was volunteers from the Philadelphia Jury Pool. Philadelphia summons adult citizens on a random basis to a jury room for one day, where they are potential jurors. We distributed questionnaires to volunteers from this pool. Between 30 and 60% of jurors, on any morning, agreed to participate. Participants were rewarded with their choice of a candy bar.

For the students, both relevant surveys were distributed and completed in class, as part of an in-class "laboratory." Results from most of the items were eventually presented to the class and used in lectures. Each student had a randomly assigned subject number, known only to the student. The students wrote this number on all questionnaires, allowing for matching across time. One set of items, for 1994, were distributed as part of class questionnaires in January and March in the same course. Students received, at random, forms that had either rating or money judgments in January, and, again at random, forms with money, rating, or preference judgments in March.

The second questionnaire was given out on one occasion in class in 1996.

On all questionnaires, items on other topics were included. All of the items reported here relate to self-reports on choices that would be made in hypothetical situations, in which the subject is confronted with the issue of whether or not to engage with an object that either had contact with something negative (contagion), or was associated with or looked like something negative (similarity). As a between-subject manipulation, the mode of response (money, rating scale, simple dichotomous preference) was varied. The different response forms were mixed together at random, and then handed out to the class.

Altogether, 221 questionnaires were completed in January and 162 in March of 1994. For the within subject analyses, questionnaires from January and March were matched to their two different questionnaires by their participant numbers. A total of 85 subjects provided complete and matched forms across the two time periods.

To test and compare different rating scales, two forms of these three questions were tested in January (1994) and three forms of these three questions were tested in March (1994). Of the two forms asked in the January questionnaire, the form referred to as the rating form, asked subjects to:

"Rate your feelings about wearing each of the sweaters below FOR THREE HOURS WHILE ALONE IN YOUR ROOM. Use a scale from -100 (extremely unpleasant) through 0 (neutral) to +100 (extremely pleasant).

A. A brand new sweater, thoroughly laundered. We assume that you are neutral about this sweater. PLEASE ENTER A ZERO FOR THIS ITEM.

B. This same brand new sweater after it was worn for one day by a convicted murderer. The sweater was thoroughly laundered after the convicted murderer wore it.

C. This same brand new sweater after the words 'CONVICTED MURDERER' were printed on the label inside the neck rim. The sweater was then thoroughly laundered."

In another form, referred to as the money form, subjects were asked to:

"Indicate how much money you would pay in order NOT to have to wear the sweaters described below FOR THREE HOURS WHILE ALONE IN YOUR ROOM".

The description of the three sweaters for the money form is identical to the sweater descriptions above.

On the preference form, used only in March, subjects were asked about a choice between sweaters A and B (worded exactly as above) and, separately, sweaters A and C. The precise wording was:

"Which sweater would you rather wear (answer A, B or N [if you are totally indifferent]). Assume that you wear the sweater FOR THREE HOURS WHILE ALONE IN YOUR ROOM."

In March, approximately one-third of students received each of the rating, money, or preference forms.

The data collected in 1996 dealt with a different set of

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magical thinking questions, asked in money, preference or rating format, as above. There were complete returns from 203 students. The 1996 questionnaires differed from the 1994 version in that: 1) the vehicle for transmission of magical effects was a condominium apartment rather than a sweater; 2) two sources of contamination were used: a convicted murderer and a man dying of tuberculosis. There were six forms of questionnaires, with three different response modes crossed with two different types of contaminants (convicted murderer or man dying of TB). On any individual form there were two questions: one asked about response to renting a condo that had been previously rented by a "contaminated" person (contagion), and the other asked about renting a condo that had been previously owned but never used by a "contaminated" person (association-similarity).

The general form of the 1996 questionnaire is illustrated for the convicted murderer below, initially in the rating version, followed by the other modes of response items.

"Consider a condo in the mountains in Aspen, Colorado. This is a time share condo, in which participating individuals own one week of use of the condo, and hence 1/52 of the condo. Some owners actually use the condo, and others never do, and have never even seen it; it is just an investment that is managed locally by an agency. There is a great demand for condo rentals, and all condos are always filled.

"You intend to rent a condo a few months from now, and find one at a good price of $350 for the week. Assume you think this is a fair price.

"On a scale of satisfaction ranging from −100 extremely unsatisfied, to +100, extremely satisfied, with zero as neutral, you would rate this condo as ZERO, because it is just what you expected to pay.

"We will call this condo A. Write a zero for this rating on the left.

"You now hear that the condo is actually owned by a convicted murderer. It is just an investment ... he has never even been in it. We will call this condo MO (murderer owned).

"Rate your satisfaction with the condo (MO) under these conditions, relative to the prior zero satisfaction rating on condo A (the scale from −100 to +100).

"Under a second set of conditions, you hear that a convicted murderer rented and used the condo for one week (now a condo owned by just a regular person) 2 month ago (condo MR- murderer rented).

"Rate your satisfaction with the condo (MR) under these conditions, relative to the prior zero satisfaction rating on condo A (the scale from −100 to +100).

The other contamination source in the rating frame was identical except that "man dying from tuberculosis" was substituted for "convicted murderer."

The money form contained the same two introductory paragraphs as above (ending with "... a fair price").

"You now hear that the condo is actually owned by a convicted murderer. It is just an investment ... he has never even been in it. We will call this condo MO (murderer owned).

"Given the base rental of $350, what is the highest price you would pay to rent this condo, assuming another exactly equivalent condo, owned by a regular person, is available at the $350 rate.

"Under a second set of conditions, you hear that a convicted murderer rented and used the condo for one week (now a condo owned by just a regular person) 2 months ago (condo MR-murderer rented).

"Given the base rental of $350, what is the highest price you would pay to rent this condo, assuming another exactly equivalent condo, rented by a regular person for one week, 2 months ago, is available at the $350 rate."

The preference form read as follows (same initial two paragraphs, to "... a fair price").

"You now hear that the condo is actually owned by a convicted murderer. It is just an investment ... he has never even been in it. We will call this condo MO (murderer owned).

"Assuming another exactly equivalent condo, owned by a regular person (RO), what would be your preference?

"1 = condo RO, 2 = totally indifferent between them, 3 = condo MO.

"Under a second set of conditions, you hear that a convicted murderer rented and used the condo for one week (now a condo owned by just a regular person) for one week 2 months ago (condo MR-murderer rented).

"Assuming another exactly equivalent condo, rented for a week two months ago by a regular person (RR), what would be your preference?

"1 = condo RR, 2 = totally indifferent between them, 3 = condo MR"

The questions used with the Philadelphia jury pool, in 2002, were again part of a larger questionnaire on a variety of subjects. Each of 152 respondent received two questions, identical to those used in March 1994, as detailed above. Both dealt with a convicted murderer, one involving sweater contagion and the other about the sweater label. The same three forms were used in March 1994, with preference, ratings, or willingness to pay, in a between-participant design.

3 Results

3.1 Between-subject results on different modes of response

For the students, a similar pattern of results appears for similarity and contagion, across the three data collection episodes. The single effect measure for each response mode group is the percent of participants who show no contagion or similarity effect (indifference). That is, for money respondents, those who elect to pay nothing to avoid the magically "degraded" sweater, or who do not demand a discount for renting the "contaminated" condo; for rating respondents, those who give it the same (or higher) rating as the undegraded object (e.g., new sweater, condo lived in by a regular person), and for preference respondents, those who show indifference to (or, rarely, preference for) the magically degraded object. Overall, in all 8 comparisons between money and rating (4 of similarity, 4 of contagion), a higher percentage of money participants show indifference (Table 1). The percentage difference varies between 34 and 7 points (m = 24 percentage points). The difference is significant (using chi-square, and a $p < .01$ criterion) in 5 of the 8 cases. The effect is somewhat higher for the case of contagion (m = 28) than similarity (m = 20) and is higher for the sweater vehicle (m = 30) than for the condos (m = 20). Similarly, for money vs. preference, in all 6 cases there is a higher incidence of indifference for money, with a range of 4 to 46 percentage points, and a mean of 17. One of the effects is individually significant ($p < .01$).

Rating and preference measures show almost identical no-effect scores over the six comparisons; 4 out of 6 times rating is less "sensitive" than preference, and the mean difference is one percentage point, favoring rating (range -8 to 12) (Table 1).

Note that the n per group is more than twice as high in the sweater than the condo condition, resulting in more statistical power for the sweater comparisons, and that the two sets of contagion and similarity comparisons from the sweater study come from the same subjects at two different times.

The data from the jurors (Table 1) shows all of the same relations as the data from students; indifference is significantly more common ($p < .01$ or better, by chi-square) for the money frame than either preference or rating frames, for both the contagion and similarity manipulations. There are no significant differences between the preference and rating frames.

3.2 Within-subject comparisons on response mode

The lower "sensitivity" of money measures is confirmed in the second data analysis, using scores obtained on two occasions from the same respondent. There are 32 respondents who made ratings at one time and money judgments at another time. Each made one similarity and one contagion judgment, yielding a total of 64 judgments. Of these, 20 showed a disparity in which only one of the measures showed indifference. In 19 of these 20 cases, it was the money judgment that showed indifference (Table 2). In the smaller sample of 18 instances where preference and money were paired, 8 of the 9 disparities involved money indifference.

3.3 Relation of contagion to similarity "sensitivity"

There is a substantial correlation or coincidence between similarity and contagion effect sizes across respondents. A Pearson correlation is an appropriate measure for the rating scores: the correlation between contagion and similarity rating scores was .46 for January 1994, .75 for March, 1994, .66 for juror rating scores, and .72 for the 1996 condominium rating scores.

Wide variations (from zero to millions) in dollar estimates make correlation statistics questionable for money, so we instead report measure the percent of participants who showed either no effect (indifference) for both contagion and similarity or a greater than zero amount of money for both similarity and contagion. These values varied between 69% and 94% for the 3 groups for money and two groups for preference. Four of the five effects were significant by chi- square at $p < .01$ or better.

3.4 Within subject comparisons on consistency

The dual ratings by the same respondent allow for an estimate of rating consistency, across the same type of measure, and across different types of measures (Table 2). Rating-rating correlations (Pearson rs) for the 19 qualifying subjects in study 1 were .61 for contagion and .54 for similarity. Corresponding values for money-money judgments were .89 and .99.

Consistency across money-rating pairings is much lower, at –.24 and –.25 respectively. (Negative is the predicted direction.) The correlations for preference and money are comparably small (–.25 and –.20) but in the predicted direction, and those for preference and rating are yet smaller (.04, and –.19).

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Table 1: Percent (number) of subjects showing no magical effects[1] with monetary vs. rating vs. preference probes

Date	Negative source	Vehicle	Magic type	Measure	N	% (N) no effect[3]	chi-square[2]
Jan 94	murderer	sweater	contagion (wear)	rating	83	18 (15)	r$ **
				$	80	52 (42)	
			similarity (label)	rating	83	33 (28)	r$ *
				$	80	59 (47)	
Mar 94	murderer	sweater	contagion (wear)	rating	78	23 (18)	r$ *
				$	84	57 (48)	p$ *
				preference	62	11 (7)	
			similarity (label)	rating	78	30 (23)	r$ *
				$	83	55 (46)	p$ *
				preference	62	36 (22)	
Apr 02 (jury)	murderer	sweater	contagion (wear)	rating	46	17 (8)	r$ *
				$	53	66 (35)	
				preference	53	13 (7)	p$ *
			similarity (label)	rating	46	24 (11)	r$ *
				$	52	69 (36)	
				preference	52	15 (8)	p$ *
1996	murderer	condo	contagion (rented)	rating	36	31 (11)	
				$	29	38 (11)	
				preference	38	34 (13)	
			association (owned)	rating	36	31 (11)	
				$	29	48 (14)	
				preference	38	26 (10)	
	tuberculosis	condo	contagion (rented)	rating	32	25 (8)	r$ *
				$	36	61 (22)	p$ *
				preference	30	33 (10)	
			association (owned)[1]	rating	33	82 (27)	
				$	36	92 (33)	
				preference	31	74 (23)	

[1] Includes a substantial number of Ss (n=15, overall) who showed enhanced value.

[2] This column reports χ^2 tests of contrasts between pairs of methods: ratings (r), willingness to pay ($), and preference (p). In cases where there are three groups, following on a significant overall chi-square, significant contrasts are tested in accordance with the procedure described in Marascuilo and McSweeney (1977).

[3] No effect percentage includes the small number of cases in which the sweater was rated above neutral (5).

chi square and contrasts: * $p < .05$ ** $p < .01$.

All respondents are college students except the April, 2002 jurors.

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Table 2: Within-subject patterns of response to successive response modes two months apart

Comparison	N	Contagion		Similarity	
		r[1]	# 0/non0 disparities[2]	r[1]	# 0/non0 disparities[2]
Rate-rate	19	.61	4	.54	4
$-$	19	.89	2	.99	3
Rate-$ $-rate	32	−.24	11 $=0	−.25	8 $=0
			0 r=0		1 r=0
Pref-rate	15	.04	3 p=0	−.19	5 p=0
			0 r=0		3 r = 0
Pref-$	9	−.25	4 $=0	−. 20	4 $=0
			1 p=0		0 p=0

[1] Pearson r for contagion or similarity ratings two months apart, on response modes indicated in left column.

[2] Case in which on one of the two (January or March) questionnaires, the subject showed no magical effect. The value, e.g., 11 $=0 indicates that for the rate-$ or $-rate comparisons, there were 11 cases in which there was a magical effect for rating, but the $ response showed no magical effect.

4 Discussion

Our findings confirm the prediction that, in judgments about sympathetic magical feelings, respondents will behave in an overtly more rational way when placed into a monetary frame of reference. As stated in the introduction, the expression of patently irrational magical beliefs, especially in non-monetary situations, is apparently acceptable to most college students and American adults. Other data we have collected on magical thinking also supports similar results for students and adult samples (Rozin et al., 1989).

Our results, taken narrowly, bear only on the domain of sympathetic magical thinking. In fact, there is evidence (e.g., Irwin, Slovic, Lichtenstein, & McClelland, 1993; Irwin, 1994) that similar choices may produce different results when the domain of the question (commodities versus environmental effects) is changed. Our results take a place with these studies by Irwin, and preference reversals described in prior studies (e.g., Lichtenstein & Slovic, 1971), as illustrations of the fact that reported preferences may be inverted by method of presenting the choice, across the same pair of alternatives. Some previously reported reversal effects are subject to explanation by two principles. First, the compatibility between the nature of the choices and the modality of the choice question may have an influence; when money is a recognizable attribute of an object, then the money framing of the choice carries relatively more weight (Slovic, Griffin, & Tversky, 1990). Second, prominent attributes may be more influential in choice situations, because such decisions are more driven by reasoning and argument, and prominent attributes are effective and compelling ways of arguing for and justifying a particular choice (Tversky, Sattath & Slovic, 1988).

Neither of these accounts seem particularly applicable to the feelings and judgments about magical thinking that we present here. We prefer the account that stresses the salience of being rational in the face of monetary expenditures, as opposed to just following feelings. However, there are counterinstances to this claim, as well. Gold and Hester (1987) report that individuals who are aware of the gambler's fallacy, and can explicitly state it, still place their bets in such a way as to credit the fallacy. This is a case in which the real, money-related behavior, is less under the guidance of "rationality" than the judgments. It is possible that our results, and those of Gold and Hester are compatible, and in line as well with the prominent attribute account. Perhaps, in all cases, people adopt the more rational alternative when the embarrassment about their choices or the justifications they may give for their choices is greater (suggested by R. Dawes, 1998, personal communication).

Our findings fit with a growing interest in the balance between affect and rationality in choices. At one level, they support the importance of affect, in some contexts. A striking feature of our findings is that the "rational" (no willingness to pay to avoid an admittedly unpleas-

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ant event) response can be considered "irrational" in the sense that an individual opts not to pay even a trivial amount to avoid what is admitted to be an unpleasant experience. This is aligned with results from Amir and Ariely (2007), which demonstrate that individuals refuse to pay to delay a positive event, even though they acknowledge that they prefer the delayed event. They account for this in terms of invocation of a "rule" about2 things that one does not pay for. Our finding could be framed as invocation of a rule that one does not pay money to avoid negative feelings that the self sees as irrational. Hsee et al. (2003) have described lay rationalism, including instances in which lay individuals invoke "rational" perspectives in making decisions under situations in which they sometimes result in decisions opposed to maximizing pleasure. One version of lay rationalism that they propose, lay scientism, privileges "hard" over "soft" data. Our findings can be seen as an instance of this process, invoked by the monetary context.

The decision frames that we compare may differ not only in the terms used (e.g., money, hedonic rating, preference) but possibly also in the degree to which they involve separate versus joint judgments. The preference judgment is explicitly comparative in a simple way. The money and rating judgments both involve comparison, however, in the sense that one option is defined as a standard, to which the other option is compared. We found differences between money and rating judgments, as well as between money and preference, so no simple form of the separate-joint distinction can account for our results.

Our results derive from imagined scenarios. It is quite possible that people are generally poor at predicting their own actual behavior in the real version of the situation actually imagined. Some of our prior work comparing real and imagined contagion situations (e.g., dropping a cockroach in juice) has indicated a moderate degree of congruence between imagined and actual behavior (in terms of percent behaving magically). In a recent study on disgust sensitivity, undergraduate subjects both completed questionnaires asking about their response to disgusting, often magical interactions, and some months later, in an apparently unrelated study, were actually asked to perform some of the acts proposed in scenarios. There is some, but not substantial similarity in the two sets of results (Rozin, Haidt, McCauley, Dunlop, and Ashmore, 1999).

We believe our results bear two messages. The first is that, depending on the domain of inquiry, the use of monetary versus preference/rating measures may produce a disparity in results. The second is that in the particular domain of magical thinking, where such thinking is explicitly recognized by respondents, this disparity may be particularly wide. We conclude that in the contexts studied here. the money frame gives the head a lead on the heart, or that money makes the mind less magical.

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