

# Physical contact influences how much people pay at celebrity auctions

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Contagion is a form of magical thinking in which people believe that a person's immaterial qualities or essence can be transferred to an object through physical contact. Here we investigate how a belief in contagion influences the sale of celebrity memorabilia. Using data from three high-profile estate auctions, we find that people's expectations about the amount of physical contact between the object and the celebrity positively predicts the final bids for items that belonged to well-liked individuals (e.g., John F. Kennedy) and negatively predicts final bids for items that belonged to disliked individuals (e.g., Bernard Madoff). A follow-up experiment further suggests that these effects are driven by contagion beliefs: when asked to bid on a sweater owned by a well-liked celebrity, participants report that they would pay substantially less if it was sterilized before they received it. However, sterilization increases the amount they would pay for a sweater owned by a disliked celebrity. These studies suggest that magical thinking may still have effects in contemporary Western societies and they provide some unique demonstrations of contagion effects on real-world purchase decisions.

There is a large market for objects that have been owned or touched by famous individuals, such as film stars, musicians, religious leaders, and politicians. Even though these objects are often common artifacts (clothing, furniture, etc.), people are willing to pay considerable sums to possess them. What is it that makes these objects so valuable?

One proposal is that people believe, perhaps unconsciously, that a person's immaterial essence (1, 2) can be transferred to an object through physical contact—a phenomenon known as magical contagion (3–11). The phenomenon of contagion has a long intellectual history dating back to anthropologists, such as James Frazer, who in 1922 suggested that this belief is common in “savage or barbarous society” (3). More recently, psychologists have found support for contagion beliefs among college undergraduates and adults (4–11), although these studies have tended to rely on hypothetical measures and participants' self-report.

Here we seek to test whether contagion effects are able to account for the results of several high-profile celebrity auctions. The contagion hypothesis predicts that bidders on celebrity memorabilia should be influenced by their beliefs about the extent of physical contact (i.e., how much the famous individual touched the object). Specifically, perceived contact should increase the value of objects belonging to well-liked individuals (due to positive contagion) and decrease the value of objects belonging to disliked individuals (due to negative contagion).

To test this hypothesis, we obtained data from three estate auctions: the estate auction of John F. Kennedy (JFK) and Jacqueline Onassis (JO), conducted by Sotheby's on April 23–26, 1996; the estate auction of Marilyn Monroe (MM), conducted by Julien's Auctions on June 4, 2005; and the estate auction of Bernard Madoff (BM) and Ruth Madoff, conducted by Gaston and Sheehan on behalf of the US Marshals Service on November 13, 2010. Descriptive data from these auctions are reported in Table 1. To provide a measure of physical contact, we had three coders, who were blind to the hypotheses of the study, rate all of the items in terms of how much contact they thought a person would have with that given item (1 = none, 9 = a lot).

Additionally, each item had a preauction estimated value as well as a final bid value. The preauction estimates were generated by the respective auction house and varied based on the type of item (e.g., a painting with an estimated value of \$2,500 vs. a shirt with an estimated value of \$25). These preauction estimates were included as a control variable in all analyses to examine the unique effects of physical contact on final bids.

## Results

Consistent with predictions stemming from contagion theory, we observed a significant positive effect of physical contact on the final bids for the JFK and JO items ( $r = 0.28$ ,  $P < 0.001$ ), a significant positive effect of physical contact on the MM items ( $r = 0.20$ ,  $P = 0.001$ ), and a marginal negative effect of physical contact on the BM items ( $r = -0.10$ ,  $P = 0.057$ ; Fig. 1). There was no effect of physical contact on Ruth Madoff's items, ( $r = 0.16$ ,  $P = 0.14$ ), which is consistent with the expectation that someone who is seen as neither positive nor negative should not elicit a contagion effect.

We then analyzed the relationship between physical contact and the final bids across all of the auctions using a stepwise regression analysis in which predictor variables are sequentially entered based on their unique predictive power. Celebrity valence (JFK, JO, and MM = positive; BM = negative), perceived contact (generated by the three coders), and the interaction between valence and perceived contact were included as predictor variables of the final bids. Additional predictor variables included the preauction estimates, a dummy variable for the auction house, and a variable, “association,” which coded whether or not the item had some explicit connection to the celebrity (e.g., a book about them, a photo of them, a monogrammed item, an ID card, etc.). This variable was intended to capture whether the item could serve as an explicit reminder of the celebrity and therefore tested whether celebrity memorabilia may also be desired for its

## Significance

Contagion is a form of magical thinking in which people believe that a person's immaterial qualities or essence can be transferred to an object through physical contact. Our paper provides unique evidence for the influence of contagion beliefs in an actual market context. We analyze several high-profile celebrity auctions and demonstrate that the degree of perceived physical contact that a celebrity has with an item influences the amount of money that collectors are willing to pay for it at auction. This effect does not appear to be accounted for in preauction estimates. Therefore, our paper is unique in suggesting the existence of contagion effects outside of the laboratory using consequential purchase decisions.

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**Table 1. Descriptive analysis of the items sold at the three auctions**

Item	JFK/JO			MM			BM		
	<i>N</i>	<i>M</i> <sub>estimator</sub>	<i>M</i> <sub>seller</sub> \$	<i>N</i>	<i>M</i> <sub>estimator</sub>	<i>M</i> <sub>seller</sub> \$	<i>N</i>	<i>M</i> <sub>estimator</sub>	<i>M</i> <sub>seller</sub> \$
Antiques	107	3,286	25,518				17	6,462	3,604
Art	293	3,998	22,724	23	1,036	7,735	46	7,521	7,564
Decorations	44	2,139	16,511	14	763	1,997	58	703	606
Furniture	59	1,453	42,360				97	1,140	1,178
Jewelry	198	6,966	55,026				16	33,122	25,125
Literature	336	604	7,992				6	679	496
Miscellaneous	49	1,035	49,747	121	1,539	3,237	34	702	1,876
Tableware	137	343	9,227	9	569	1,160	86	491	1,059
Clothing				113	913	3,798	31	445	837
Spouse items							87	8,278	11,409
Withdrawn, no estimate	74			8			11		
Total	1,297	2,766	24,445	288	1,176	3,704	489	4,061	4,468

ability to bring to mind positive associations. In total, there were 221 such items (11.7% of the sample).

This analysis was conducted on the entire dataset, as well as on subsets of the data (i.e., on only items with an estimated value under \$10,000 and only items with an estimated value under \$5,000).

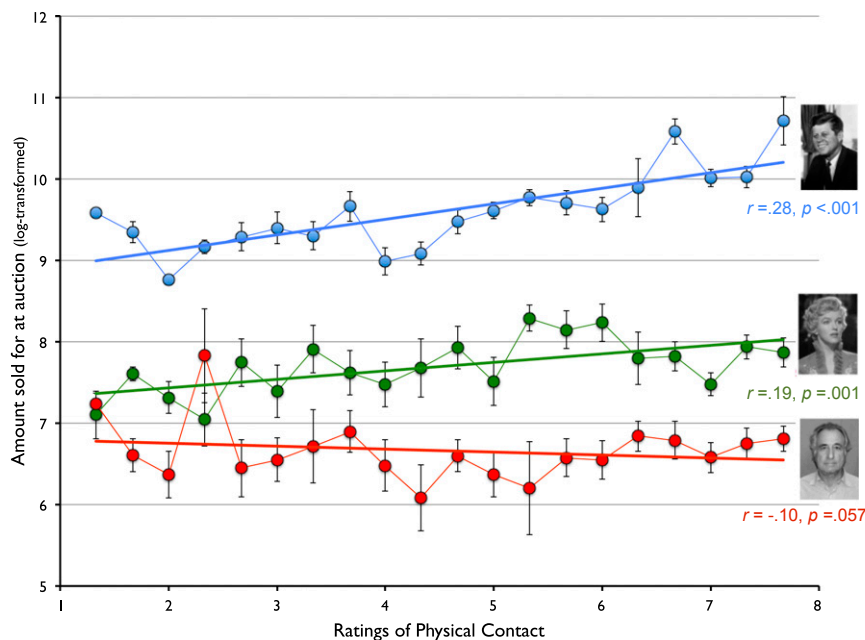
As seen in Table 2, we observed a significant interaction effect between the degree of perceived contact and the valence of the celebrity ( $\beta = 0.18, P < 0.001$ ) wherein greater perceived contact resulted in higher bids for the positive celebrity items, but lower bids for the negative celebrity items. This interaction effect was obtained when we restricted the analysis to only items with an estimated value under \$10,000 ( $\beta = 0.19, P < 0.001$ ) and only items with an estimated value under \$5,000 ( $\beta = 0.20, P < 0.001$ ), demonstrating that the effect of physical contact is not due to specific high-value items, such as expensive jewelry.

The other significant main effects were expected: the pre-auction estimates significantly predicted final bids, and the items from positive individuals sold for more money. Further, there was a significant effect of association ( $\beta = 0.07, P < 0.001$ ).

Importantly, however, this effect was distinct from the valence  $\times$  contact interaction.

In a final analysis, we constructed pairs of items that had the same estimated value, but differed in their ratings of physical contact (high vs. low). A mixed-model ANOVA indicated a significant interaction between contact and celebrity valence [ $F(1, 114) = 15.33, P < 0.001$ ]. Consistent with the other analyses, we found that for positive celebrities (JFK, JO, and MM), high-contact items sold for more than low-contact items [median (*MD*)<sub>high</sub> = \$14,764 vs. *MD*<sub>low</sub> = \$8,604;  $t(64) = 5.85, P < 0.001$ ]. However, for the negative celebrity (BM) there was a slight trend for low-contact items to sell for more than high-contact items, although this difference did not approach significance [ $MD$ <sub>high</sub> = \$678 vs.  $MD$ <sub>low</sub> = \$1,096;  $t(50) = -0.68, P = 0.49$ ].

In a follow-up study we examined whether directly manipulating physical contact had a subsequent effect on willingness to pay for celebrity possessions. Using a method developed by previous research (6), participants were asked to report the maximum amount of money they would be willing to bid on the sweater that belonged either to a famous person that they admired or to



**Fig. 1.** Final auction bids ( $\pm$ SE) as a function of perceived physical contact. The colored lines (blue, green, and red) correspond to the JFK, MM, and BM auction results, respectively.

**Table 2. Standardized coefficients from a stepwise regression analysis performed on different subsets of the data**

Variables entered	All items ( <i>N</i> = 1,894)						Under \$10,000 ( <i>N</i> = 1,802)	Under \$5,000 ( <i>N</i> = 1,731)
	Model						6	6
	1	2	3	4	5	6		
Auction house	0.71***	0.70***	0.57***	0.57***	0.57***	0.57***	0.59***	0.60***
Auction estimates		0.24***	0.24***	0.24***	0.24***	0.24***	0.28***	0.24***
Valence × contact <sup>†</sup>			0.26***	0.26***	0.25***	0.18***	0.19***	0.20***
Association				0.07***	0.07***	0.07***	0.08***	0.08***
Contact					0.05**	0.07***	0.10***	0.10***
Celebrity Valence						0.10**	0.16***	0.15***
<i>R</i> <sup>2</sup>	0.500	0.557	0.609	0.614	0.616	0.617	0.726	0.728

\*\**P* < 0.01 and \*\*\**P* < 0.001

<sup>†</sup>When the analysis was conducted with items under \$10,000 and under \$5,000, the valence × contact interaction entered into the model prior to the preauction estimates.

a famous person that they despised. Participants were then asked to imagine that the object was transformed in one of three ways. Participants in one group were told to imagine that the sweater was sterilized; a second group was told that if they purchased the sweater, they could never resell it; and a third group was told that the sweater was moved from the original storage location to the auction house. This final condition served as a type of control by introducing the idea that the sweater was physically manipulated and handled by other people, but not in a manner that should affect beliefs about contagious essence.

After reading about the transformation, participants were again asked to provide willingness to pay for the sweater in light of the transformations described. At the end of the study participants also responded to several items which have been established by previous research to assess one’s sensitivity to contagion (8–10).

A repeated-measures ANOVA indicated a significant three-way interaction between willingness to pay (before vs. after the transformation) valence of the celebrity (positive vs. negative) and the type of transformation (“sterilization,” “can’t resell,” and “move location”) [*F*(2, 429) = 6.22, *P* = 0.002] (Fig. 2). Further analyses indicated that in the case of the positive celebrity, sterilizing the sweater significantly decreased willingness to pay [*t*(68) = 3.37, *P* = 0.001], whereas limiting the resale only weakly reduced willingness to pay [*t*(76) = 1.14, *P* = 0.26] and moving the location of the sweater had no effect [*t*(75) = 1.35, *P* = 0.18]. The difference in willingness to pay across the three transformations was statistically significant [*F*(2, 219) = 3.17, *P* = 0.044].

In the case of the negative celebrity, however, the pattern was different: here we observed that sterilizing the sweater significantly increased willingness to pay [*t*(71) = 2.13, *P* = 0.037], whereas limiting resale marginally reduced willingness to pay [*t*(70) = 1.60, *P* = 0.12], and moving the location of the sweater also increased willingness to pay, perhaps because participants now thought that it was removed from the bad celebrity’s residence [*t*(69) = 2.28, *P* = 0.029]. The difference in willingness to pay across the three transformations was also statistically significant [*F*(2, 209) = 4.49, *P* = 0.012].

Turning to the contagion sensitivity measure, we observed a significant interaction between contagion sensitivity and the valence of the celebrity (positive vs. negative) on the amount that participants were willing to initially pay for the sweater (before any transformation was described) ( $\beta$  = 0.09, *t* = 2.49, *P* = 0.013). Specifically, contagion sensitivity was positively correlated with willingness to pay for the positive celebrity (*r* = 0.16, *P* = 0.018), but weakly negatively correlated with willingness to pay for the negative celebrity (*r* = -0.07, *P* = 0.30). Further, the contagion sensitivity measure interacted with the effect of the sterilization transformation ( $\beta$  = -0.16, *t* = 2.00, *P* = 0.047), but not the can’t-

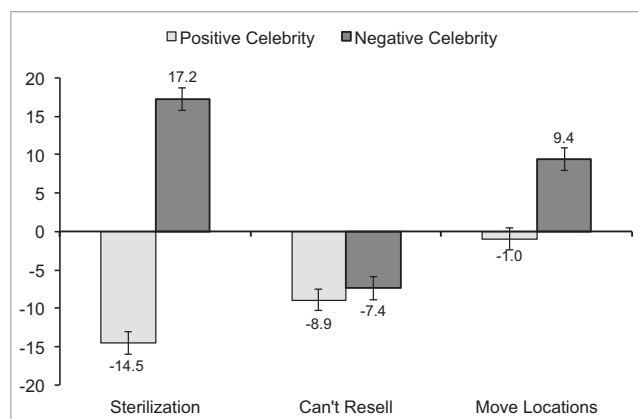
resell manipulation (*P* = 0.24) nor the move-location manipulation (*P* = 0.41).

### Discussion

Consistent with the contagion hypothesis, physical contact appears to have a real-world effect on how much people pay for celebrity objects. Moreover, the present findings suggest that desires for positive celebrity memorabilia really do reflect a belief in contagion—for example, it is not simply that collectors feel that objects that have been more frequently touched by a celebrity have more of an association with that person. This conclusion is supported by the auction data which showed an effect of contact that was independent from explicit associations with the celebrity, the experiment which showed that sterilization causes a drop in people’s willingness to pay, and further, the measures of contagion sensitivity which also had significant effects on willingness to pay for positive celebrity memorabilia.

This positive effect of physical contact, however, only held for the well-liked individuals, suggesting that the appeal of the objects owned by negative individuals exists despite the effects of contagion, not because of it. That is, the psychological appeal of objects owned by despised individuals, such as BM, will have to be explained in a very different way than the appeal of objects owned by beloved individuals.

In the auction data, the effects of physical contact were obtained while controlling for the preauction estimates, suggesting that these effects were not fully anticipated by those responsible for the estimates (i.e., the specialists at the auction houses). This



**Fig. 2.** The average percentage change in willingness to pay (±SE) as a function of the three different transformations.

suggests that while those individuals responsible for the estimates are aware of the obvious fact that celebrity ownership raises the value of an object (if they did not know this, they would not have celebrity auctions in the first place), the particular importance of physical contact was not fully appreciated—or at least it did not appear to enter into their explicit decision processes when estimating the value of the item. Exploring explicit beliefs about contagion, in both laypeople and specialists, is a worthwhile direction for future research.

Previous laboratory studies (6, 7) exploring negative contagion find evidence for dose insensitivity, in which an instance of negative contact, however small, has a powerful effect. (This is most obvious in the case of food contagion: a single cockroach can ruin a large pot of soup.) In the auction studies, however, we find evidence for dose sensitivity: for example, in the case of the BM items, the extent of perceived contact is weakly negatively related to object value. Still, our effects are much stronger with the positive celebrities than the negative celebrity, which is consistent with the insight of Rozin et al. (6, 7) that there is an asymmetry between positive contagion and negative contagion, in which the former might be more dose sensitive than the latter.

Finally, it is worth noting that the three positive celebrities in our auction study were all individuals found by many to be physically attractive. While we find it implausible that sexual desire per se plays a causal role in our findings, it might be that the physicality of these particular celebrities intensified our effects. We see this as an area for future investigation, although it is clear that there are real-world cases in which everyday objects take on significant value after being touched by respected figures who are not normally seen as sexually attractive (e.g., Mother Teresa or Gandhi).

In sum, our findings suggest that contagion beliefs may be pervasive in contemporary Western societies and can influence the real-world purchasing decisions of collectors. This lends further support to the notion that beliefs in contagion may be a human universal—perhaps coopted from evolutionarily adaptive

mechanisms used to track disease contaminants (6, 7)—that can contribute dramatically to our intuitive appreciations of value.

## Methods

Data were gathered from multiple online resources. Auction estimates and final bids for the JFK and JO auction were obtained from <http://usatoday30.usatoday.com/life/special/jackie/jack000.htm>. Auction estimates and final bids for the MM auction were obtained from <http://web.archive.org/web/20110605015051/http://www.juliensauctions.com/auctions/Marilyn-Monroe/results.html>. Auction estimates for the BM auction were obtained from <http://txauction.com/index.cfm> and final bids for the BM auction were obtained from [www.proxibid.com/asp/CatalogPrint.asp?aid=32413](http://www.proxibid.com/asp/CatalogPrint.asp?aid=32413). These datasets were selected because they were all auctions from a single estate; they included both well-liked individuals (JFK, JO, and MM) and a disliked individual (BM), they represented a large number of items of varying type, and they included preauction estimates as well as final sale values for each item. The preauction estimates included a low estimate and a high estimate. For all analyses we used the average of these two values. Scores from the three coders were reliable ( $\alpha = 0.81$ ) and were averaged to produce a single measure of perceived physical contact for each of the items. Given that there was high variance in the final bid amounts, we performed all analyses using log-transformed values.

In the combined regression analysis, we excluded items that belonged only to Ruth Madoff (e.g., a woman's blouse, a necklace, etc.).

When constructing the pairs of items with the same estimated value, we coded the items as either high contact (top third of contact scores) or low contact (bottom third of contact scores). When multiple items had the same preauction estimated value, we averaged their final bid values to produce one value for the high-contact category and one for the low-contact category.

In the follow-up study, participants were 435 adults (mean age = 37.9) who were recruited online and were randomly assigned to one of six conditions in a 2 (valence: positive vs. negative)  $\times$  3 (transformation: sterilization, can't resell, and move location) between-subjects design. Given that there was high variance in the willingness to pay values, we performed all analyses using log-transformed values. Please see *SI Text* for the stimuli used in this study. This research was approved by the Human Subjects Committee at Yale University.

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# Supporting Information

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### SI Text

This page contains the materials used in the follow-up experiment. Participants first read either the positive celebrity or negative celebrity prompt. After providing a willingness to pay, participants then read about one of the three transformations (sterilization, can't resell, or move location) and provided a second willingness to pay value. Finally, at the end of the study, participants responded to the contagion sensitivity items using a nine-point scale (1 = strongly disagree, 9 = strongly agree).

**Celebrity Valence Manipulations. Positive celebrity.** In the space below please provide the name of your favorite living celebrity or public figure. This could be a movie star, a musician, a professional athlete, a politician, etc. This should be someone whom you like very much and admire and would be excited to meet personally.

\_\_\_\_\_

**Negative celebrity.** In the space below please provide the name of a living person, whom you consider to be evil, or to personify evil; not someone you know personally, but a villain. This could be a mass murderer, or a fanatical leader—someone that you have strong negative feelings about.

\_\_\_\_\_

**Initial Valuation.** Imagine that you are on ebay and you have the opportunity to bid on a sweater that belonged to [ ].

What is the maximum amount of money that you would be willing to pay for this sweater?  
\$ \_\_\_\_\_

**Transformation Manipulations. Sterilization.** Imagine that you are bidding on the same sweater that belonged to [ ]. However, now imagine that before it was listed for sale the sweater was completely sterilized so that any evidence of [ ]'s physical contact with the item was removed. (This process did not damage the sweater in any way).

In this case, what is the maximum amount of money that you would be willing to bid on this sweater?  
\$ \_\_\_\_\_

**Can't resell.** Imagine that you are bidding on the same sweater that belonged to [ ]. However, one condition of the sale is that you sign a contract in which you promise that you will never resell the sweater to another person. In other words, the item is yours to keep, but must remain in your possession.

In this case, what is the maximum amount of money that you would be willing to pay for this sweater?  
\$ \_\_\_\_\_

**Move location (control).** Imagine that you are bidding on the same sweater that belonged to [ ]. Imagine that before the sweater was listed for sale, people moved it from the location where it was being stored to an auction house where it is now being sold.

In this case, what is the maximum amount of money that you would be willing to bid on this sweater?  
\$ \_\_\_\_\_

**Contagion Sensitivity Items ( $\alpha = 0.70$ ).** Please rate your agreement with the following statements:

Even if I were hungry, I would not drink a bowl of my favorite soup if it had been stirred by a used, but thoroughly washed flyswatter.

It would bother me to sleep in a nice hotel room if I knew that a man had died of a heart attack in that room the night before.

It really bothers me when people sneeze without covering their mouths.

I don't like to write with a pencil someone else has obviously chewed on.

I prefer to wash my hands pretty soon after shaking someone's hand.

I dislike wearing used clothes because you don't know what the past person who wore it was like.