

Transforming Celebrity Objects:
Implications for an Account of Psychological Contagion

Kristan A. Marchak

D. Geoffrey Hall

University of British Columbia

This research was supported by a fellowship to the first author and a grant to the second author from the Natural Sciences and Engineering Research Council of Canada. Address correspondence to: Kristan Marchak, Department of Psychology, University of British Columbia, 2136 West Mall, Vancouver, BC, V6T 1Z4, Canada. Telephone: 604-822-9294. Fax: 604-822-6923. E-mail: marchak@psych.ubc.ca.

Abstract

The *celebrity effect* is the well-documented phenomenon in which people ascribe an enhanced worth to artifacts owned by famous individuals. This effect has been attributed to a belief in psychological contagion, the transmission of a person's essence to an object via contact. We examined people's judgments of the persisting worth of celebrity-owned artifacts following transformations of their parts/material and found that the celebrity effect was evident *only* for post-transformation artifacts that were composed of parts/material that had direct physical contact with the celebrity. Insofar as the celebrity effect arises from psychological contagion, the findings suggest that the essence imparted to a celebrity-owned artifact is conceived as akin to a residue deposited in/on the object rather than a germ capable of spreading in an indirect manner to new parts/material added to the object. The results illuminate the nature of psychological contagion and offer insight into how best to preserve the value of historically important artifacts.

Keywords: celebrity objects, psychological contagion, artifacts, persistence, value, identity

Transforming Celebrity Objects:

Implications for an Account of Psychological Contagion

From John Lennon's piano to John F. Kennedy's desk, people routinely assign a greater value to artifacts that have been owned by famous individuals than to comparable artifacts without such connections. This *celebrity effect* is evident in frequent reports of the extravagant prices paid for the personal possessions of well-known public figures (Newman & Bloom, 2014; Newman, Diesendruck, & Bloom, 2011). The effect has also been documented in the laboratory in adults cross-culturally and also in children using evaluative measures that range from judgments of monetary value to judgments of museum-worthiness (Frazier & Gelman, 2009; Frazier, Gelman, Wilson, & Hood, 2009; Gelman, Frazier, Noles, Manczak, & Stilwell, 2015; Gjersoe, Newman, Chituc, & Hood, 2014; Hood & Bloom, 2008; Newman & Bloom, 2014; Newman et al., 2011). This study explored the nature of this phenomenon.

The celebrity effect is an example of a more general phenomenon in which people assign an enhanced worth to artifacts that acquire an important history, whether it is through their connection to a famous person (e.g., Jacqueline Onassis' sunglasses), event (e.g., a chair from the Titanic wreckage), or time (e.g., a pot from ancient Greece). Such artifacts have been described as gaining "authenticity" (Frazier et al., 2009) or "historicity" (Hutson, 2012) through such connections. How might these artifacts become imbued with these particular qualities? A number of researchers have proposed that this endowment involves a belief in psychological contagion (e.g., Gelman et al., 2015; Newman & Bloom, 2014; Newman et al., 2011; Rozin & Nemeroff, 1990). Psychological contagion is a widespread form of magical thinking that has been proposed to underlie

how people reason about a diverse set of phenomena across many cultures (see Rozin & Nemeroff, 1990 for a review; see also Hood, Gjersoe, Donnelly, Byers, & Itajkura, 2011; Meyer, Leslie, Gelman, & Stilwell, 2013). It involves a belief that an invisible essence (i.e., some property or properties) of a source (often a person) is transferred through contact from the source to a recipient object (Frazer, 1890/1996; Mauss, 1902/1972; Tylor, 1871/1974). It has been hypothesized that it is through their instantiation with this essence that artifacts gain authenticity/historicity and thereby acquire an elevated worth (Gelman et al., 2015; Rozin & Nemeroff, 1990).

Although the existence of the celebrity effect has been widely documented, relatively little is known about the nature of this phenomenon—or about the nature of the psychological contagion posited to underlie it. In particular, it is unclear whether the effect persists in artifacts following any of the myriad transformations they routinely undergo. Unlike living things, artifacts do not experience natural changes brought about in virtue of the kinds of things they are (i.e., growth, metamorphosis). Yet in everyday life, artifacts do suffer many types of changes. Many experience periods in which they are taken apart and later put back together for ease of transport (e.g., bicycles), cleaning (e.g., pipes) or storage (e.g., tents). Additionally, many endure changes to their constituent parts as they undergo alteration (e.g., suits), repair (e.g., cars), upgrading (e.g., computers) or restoration (e.g., tables). By examining whether the celebrity effect persists following such transformations, we sought to understand people's beliefs about the essence proposed to be transmitted to artifacts in psychological contagion.

Previous research suggests that people believe that the transmission of an essence in psychological contagion requires direct physical contact between a source and a

recipient (Nemeroff & Rozin, 2000; Rozin, Millman, & Nemeroff, 1986; Rozin & Nemeroff, 1990, 2002; Rozin, Nemeroff, Wane, & Sherrod, 1989). It remains unclear, however, how people conceive of this essence. One possibility is that people understand psychological contagion to involve a *spreading essence*, reasoning about the transmission of essences as analogous to the transmission of germs (Hutson, 2012; see also Nemeroff & Rozin, 2000; Rozin & Nemeroff, 1990, 2002). If people understand psychological contagion in this way, they should believe that the essence transferred to the recipient can be passed (after initial contamination) from object parts/material that have had direct contact with the source to subsequently added parts/material that lack such contact. Alternatively, people may understand psychological contagion to involve a *restricted essence* that does not spread (see Nemeroff & Rozin, 1994, on germ vs. residue models of psychological contagion). On this possibility, the essence is conceptualized in the manner of a physical trace deposited on/in the initially contaminated object and restricted to the parts/material that have had direct physical contact with the celebrity. By examining whether the celebrity effect persists after parts/material changes to artifacts owned by famous individuals, we sought to test between the two accounts of the nature of the essence implicated in psychological contagion.

Philosophers have long debated whether an artifact persists as the same individual through extensive changes to its constituent parts/material (e.g., Hobbes, 1672/1913). In one version of a famous puzzle of identity—the "Ship of Theseus" puzzle—an artifact is described as undergoing a gradual and complete part-by-part transformation in which the replacement parts look identical to the original parts. At the end of the transformation, the artifact appears unchanged but consists entirely of new parts. At this point, the complete

set of original parts is reassembled to create a second identical-looking artifact. This puzzle has intrigued philosophers interested in questions of identity because it involves a single pre-transformation artifact that ends up being replaced by two post-transformation artifacts, either of which could be judged to be the same persisting individual as the initial object (e.g., Hirsch, 1982; Hume, 1739/2000; Wiggins, 2001). The artifact made entirely of replacement parts (*new-parts* object) could be judged to be the same persisting individual via a criterion of spatiotemporal continuity. In contrast, the artifact made entirely of the reassembled original parts (*old-parts* object) could be judged to be the same persisting individual via a criterion of parts/material continuity.

The preceding puzzle poses a question about the persistence of individual identity that is analogous to our question about the persistence of worth of celebrity-owned artifacts: Does the identity of an artifact spread to subsequently added yet spatiotemporally connected, replacement parts/material, or does it remain restricted to the object's original parts/material? Little psychological research has explored how adults reason about the persistence of artifacts through such transformations. One exception is the work of Hall (1998) in which participants received a version of this puzzle involving a simple novel artifact. The results of that research suggest that adults tend to view the identity of artifacts in restricted rather than spreading terms: When asked to choose which of the two post-transformation artifacts was the same individual as the pre-transformation artifact, participants favored the *old-parts* object. Adults thus judged that an artifact persisted through a period of disassembly and subsequent reassembly of its parts, despite the fact that this judgment involved a violation of spatiotemporal continuity, a core

criterion of object persistence (see Bloom, 2000; Spelke, Kestenbaum, Simons, & Wein, 1995; Xu & Carey, 1996).

In this study, we adapted the preceding puzzle in order to investigate how people reason about the persisting value of celebrity-owned artifacts that suffer changes to their parts/material. Do they judge the enhanced worth ascribed to a celebrity artifact to endure through a spatiotemporally continuous change of its parts/material and/or through its original parts/material following a period of disassembly and subsequent reassembly? In this way, we aimed to determine whether the psychological contagion posited to underlie the effect involves a belief that a source's essence spreads from an initial recipient object to subsequently added parts/material or remains restricted to the parts/material that have had direct contact with the source at the time of contamination.

In our task, participants read scenarios, each describing an artifact owned by a celebrity or a non-celebrity, and then rated the worth of these objects. Participants next read that each artifact underwent a gradual and complete part-by-part transformation and that the original parts were subsequently reassembled. As in the Ship of Theseus puzzle described earlier, each transformation thus resulted in two artifacts: a *new-parts* object and an *old-parts* object. To examine the role of direct celebrity contact in persisting value judgments, we manipulated between conditions whether there was continued contact or no continued contact between the owner and the artifact during the transformation. Participants then rated the worth of both post-transformation artifacts. For purposes of comparison with prior research, we also asked participants to rate the persisting individual identity of the two post-transformation artifacts.

According to both the spreading and the restricted essence accounts of psychological contagion, participants should attribute an enhanced worth to the *old-parts* celebrity artifact, regardless of whether the celebrity maintains contact with the object during the transformation. This enhancement should occur because the celebrity has had direct physical contact with this artifact's parts/material, imparting his/her essence directly to the object. In contrast, the two accounts make different predictions about whether participants should attribute an enhanced worth to the *new-parts* celebrity artifact. According to the spreading essence account, participants should judge the *new-parts* celebrity artifact to have an enhanced worth, regardless of whether the celebrity maintains contact with the object during the transformation: If the celebrity keeps in contact with the artifact, the *new-parts* artifact contains parts/material that have had direct physical contact with the celebrity and should acquire his/her essence directly; and if the celebrity does not keep in contact with the artifact, the *new-parts* artifact contains parts/material that acquire the celebrity's essence indirectly through its spreading from parts/material that have had direct physical contact with the celebrity (i.e., the original parts) to the new parts/material added to the object. In contrast, according to the restricted essence account, participants should judge the *new-parts* celebrity artifact to have an enhanced worth only if the celebrity maintains contact with the artifact during the transformation: If the celebrity does not keep in contact, his/her essence should not spread to new parts/material added to the artifact.

Finally, in addition to examining the role of celebrity contact in adults' judgments of the persisting *worth* of celebrity artifacts through change, we explored the role of celebrity contact in judgments of the persisting *identity* of these objects. Recall that in a

previous study involving a similar transformation puzzle, Hall (1998) found that most adults chose the *old-parts* artifact to be the same persisting individual as the original, suggesting a restricted view of individual identity. The artifacts in the prior study were not, however, historically important. In the philosophical literature, there has been discussion of whether the history of an artifact influences judgments of its persistence (Dauer, 1972; Smart 1972,1973). In particular, Dauer (1972) proposed that there is a stronger case to be made that the *old-parts* artifact is the same persisting individual as the original in this puzzle if the initial artifact has an important history than if it lacks one: When the artifact is historically important, its original parts/material become more central to its persisting identity. If this proposal is correct, then celebrity contact may affect not only judgments of persisting worth, but also judgments of persisting identity.

Method

Participants

Fifty-three English-speaking North American undergraduate students received either course credit or a two-dollar honorarium for participating (mean age = 20.5, 87% female). Five participants were excluded from the final sample for reporting that they were unfamiliar with more than one celebrity. The remaining 48 participants were randomly assigned in equal numbers to either the *no continued contact* condition or the *continued contact* condition.

Materials

We developed a questionnaire with eight trials, each focused on a different artifact. For four trials, the objects were described as having celebrity owners, whose profession and celebrity status were mentioned explicitly (e.g., Serena Williams, the

famous athlete). For the remaining four trials, the owners were described as non-celebrities. These individuals received names with no intended associations to famous individuals and were described as having more mundane professions (e.g., Jennifer Williams, a teacher). Table 1 lists the artifacts, the celebrities, the non-celebrities, and their respective professions used in the questionnaires. We selected celebrities that we expected participants to judge favorably, because previous research has revealed a direct relationship between amount of contact with a positively viewed celebrity and an object's value (Newman & Bloom, 2014; Newman et al., 2011)¹. We also chose artifacts that were associated in some way with the celebrity's profession (and thus with the source of their fame) in order to maximize the likelihood that we would observe the celebrity effect in our pre-transformation objects (see Newman et al., 2011).

Table 1 here

We created two versions of each trial, one of which paired a given object with a celebrity (e.g., Serena Williams' tennis racquet) and one of which paired it with a non-celebrity of the same gender (e.g., Jennifer Williams' tennis racquet). As a result, there were two versions of the questionnaire, each of which had a different set of four celebrities and four non-celebrities. Within each version, we created two semi-random orderings of the eight trials, subject to the constraint that one of the versions began with a celebrity trial and one began with a non-celebrity trial.

¹ In contrast, there is an inverse relationship between amount of contact with an unfavorable celebrity (e.g., Bernie Madoff) and an object's value (Newman & Bloom, 2014; Newman et al., 2011).

Each trial consisted of five parts. We describe a sample celebrity trial, involving Serena Williams' tennis racquet:

1. *Object introduction.* We described the kind of artifact, along with the name and occupation of the owner: "Imagine a tennis racquet. This racquet belongs to Serena Williams, the famous athlete."

2. *Pre-transformation worth ratings.* Participants provided two ratings of the worth of the initial object: its estimated value and its museum-worthiness (see Frazier et al., 2009). The **value** question was: "How much do you think the particular racquet described in Part 1 would be worth (for example, in an eBay auction)?" Participants answered on a 5-point scale, where 1 was labeled "significantly less than retail price", 3 was labeled "retail price", and 5 was labeled "significantly more than retail price". The **museum** question was: "Do you think the particular racquet described in Part 1 belongs in a museum?" Participants answered on a 6-point scale, where 1 was labeled "very sure it does not belong in a museum", and 6 was labeled "very sure it belongs in a museum".

3. *Transformation event.* We then described a transformation of the object: "Suppose that the racquet [...] is composed of exactly two hundred and fifty parts. Now suppose that someone finds this racquet in Serena Williams' house". Between conditions, we manipulated whether the owner had continued contact with the object during the transformation. In the *no continued contact* condition, participants read that someone "[...] takes it [the racquet] from the house. Serena never uses the racquet again." In the *continued contact* condition, participants read that someone "[...] leaves it [the racquet] in the house. Serena uses the racquet daily." The remainder of the description was the same for both conditions: "Each month over a period of months, the person removes a

single different part. After removing each part, this person puts a new, identical part in its place. This person saves the old parts after each replacement. After all the parts have been replaced, the person puts together the old parts exactly as they had previously been assembled. This results in two racquets, one made of new parts and one made of old parts. The two racquets look identical. Both racquets are equally functional." We stated that both post-transformation objects looked identical and were equally functional to ensure that participants' ratings of the persisting worth and identity of the two objects were not attributable to differences in their appearance or utility.

4. *Post-transformation worth ratings.* Participants rated both the value and the museum-worthiness of the two post-transformation objects: the *old-parts* object and the *new-parts* object. The questions and scales were the same as those used for the ratings of the pre-transformation objects. In half the questionnaires (of each version), we questioned the *old-parts* object before the *new-parts* object. In the other half, we reversed the order.

5. *Post-transformation identity ratings.* In order to examine the relation between ratings of persisting worth and ratings of persisting individual identity, we asked participants to "suppose that the racquet described in Part 1 [the pre-transformation object] is called 'X'". We then asked them to think of the *old-parts* and *new-parts* objects. We reminded them that both objects looked identical and were equally functional. They were then asked to provide identity ratings for both objects independently by answering whether they thought the object was 'X', using a scale where 1 was labeled "very sure no" and 6 was labeled "very sure yes". In half the questionnaires (of each version), we questioned the *old-parts* object before the *new-parts* object. In the other half, we reversed

the order. This order was always the reverse of the order in which we asked the post-transformation worth questions.

At the end of the questionnaire, participants indicated how familiar they were with each celebrity on a 6-point scale from 1 (very unfamiliar) to 6 (very familiar), as well as how favorable they rated each celebrity to be on a 6-point scale from 1 (very unfavorable) to 6 (very favorable). This served as a check that our celebrities were both familiar and perceived as favorable by our participants.

Procedure

Participants completed a paper questionnaire individually.

Results

As a check on our manipulation of the celebrity status of the object owners, we first examined participants' ratings of the familiarity and favorability of the celebrities. Participants rated that they were "familiar" ($M = 5.43$, $SD = 0.82$) with all celebrities². In addition, they judged all celebrities to be at least "somewhat favorable" ($M = 4.86$, $SD = 1.02$).

Pre-transformation worth ratings

We next established that participants showed a celebrity effect, rating the worth of the initial celebrity objects more highly than that of the non-celebrity objects.

For both the value and the museum questions, we computed a mean rating for each subject for celebrity objects and non-celebrity objects by averaging across the four

² Five participants reported being "somewhat unfamiliar" ($n = 4$) or "unfamiliar" ($n = 1$) with one of the celebrities. While these participants were personally unfamiliar with one of the celebrities, they still judged the celebrity's object to be worth more than retail price. Thus, we included them in the final sample.

trials involving each object type³. We then computed a mean difference score for each subject for both questions by subtracting the mean rating of the non-celebrity objects from the mean rating of the celebrity objects (see Figure 1). These scores could range from +4 to -4 for ratings of value and +5 to -5 for ratings of museum-worthiness with positive difference scores providing evidence of a celebrity effect.

Figure 1 here

As expected, and consistent with prior results (Frazier & Gelman, 2009; Frazier et al., 2009; Gelman et al., 2015; Gjersoe et al., 2014; Hood & Bloom, 2008; Newman & Bloom, 2014; Newman et al., 2011), an analysis of the difference scores revealed that participants showed a clear celebrity effect on ratings of both value and museum-worthiness in the *no continued contact* and the *continued contact* conditions. One-sample *t*-tests of the mean difference scores against a mean of 0 (the expected mean difference score under the null hypothesis that there is no difference between the ratings of worth for celebrity and non-celebrity objects) were all significant (p 's < .001). In addition, there was no difference in mean difference scores between conditions on either the value ($t(46) = 0.42, p > .05, 95\% \text{ CI } [-0.28, 0.42]$) or the museum-worthiness ratings ($t(46) = -0.03, p > .05, 95\% \text{ CI } [-0.82, 0.80]$).

Post-transformation worth ratings

To shed light on how people reason about the persistence of the celebrity effect, we next conducted a parallel set of analyses on the mean difference scores for the two

³ In a preliminary ANOVA, we found no effect of version of the questionnaire on the mean ratings of value and museum-worthiness in either condition. Thus, this factor was not included in subsequent analyses.

post-transformation objects (see Figure 2). We computed difference scores exactly as we did for the pre-transformation objects.

Figure 2 here

Old-parts objects. Participants showed the celebrity effect for the *old-parts* artifacts, regardless of whether the celebrity maintained continued contact with the object during the transformation.

The results revealed a clear celebrity effect on ratings of both value and museum-worthiness in the *no continued contact* condition and the *continued contact* condition (see top panel Figure 2). One-sample *t*-tests of the mean difference scores against a mean of 0 were all significant (p 's < .001). In addition, there was no significant difference in the mean difference scores between conditions on either the value ($t(46) = -1.88, p > .05, 95\% \text{ CI } [-1.10, 0.04]$) or the museum-worthiness ratings ($t(46) = -0.84, p > .05, 95\% \text{ CI } [-1.13, 0.47]$).

New-parts objects. Participants demonstrated the celebrity effect for the *new-parts* artifacts only if the celebrity maintained continued contact during the transformation. If the celebrity did not maintain this contact, the celebrity effect was not present.

Unlike the pre-transformation objects or the *old-parts* objects, the difference scores for the *new-parts* objects varied between the two conditions (see bottom panel Figure 2). We observed a significant difference between mean difference scores in the two conditions on both value ($t(46) = -3.96, p < .001, 95\% \text{ CI } [-1.84, -0.60]$) and museum-worthiness ratings ($t(46) = -3.35, p < .01, 95\% \text{ CI } [-1.58, -0.40]$). In the *no*

continued contact condition, there was no evidence of a celebrity effect for ratings of either value or museum-worthiness (one-sample *t*-tests of the mean difference scores against a mean of 0 were not significant, both p 's > .05). In contrast, in the *continued contact* condition, there was clear evidence of a celebrity effect for ratings of both value and museum-worthiness (both p 's < .001).

Post-transformation identity ratings

Unlike the worth ratings, participants' ratings of the persistence of individual identity were not influenced by the celebrity status of the owner or by whether the owner maintained continued contact with the object during the transformation. For celebrity and non-celebrity artifacts in both conditions, participants ascribed higher persistence ratings to the *old-parts* objects than to the *new-parts* objects.

For identity questions concerning both the *old-parts* and the *new-parts* objects, we computed a mean rating for each subject for celebrity objects and non-celebrity objects by averaging across the four trials involving each type of object. We then computed a mean difference score for each subject, by subtracting the mean rating of the non-celebrity objects from the mean rating of the celebrity objects (see Figure 3). These scores could range from +5 to -5 with positive difference scores indicating higher identity persistence ratings for celebrity than non-celebrity objects.

Figure 3 here

Contrary to Dauer's (1972) proposal, there was no evidence that celebrity contact influenced identity ratings. For the *old-parts* objects, there was no difference between ratings for celebrity and non-celebrity objects in either the *no continued contact* or the

continued contact condition (one-sample t -tests of the mean difference scores against a mean of 0 were not significant, both p 's $> .05$). In addition, there was no significant difference in the mean difference scores between conditions ($t(46) = -0.92, p > .05, 95\%$ CI [-0.40, 0.15]). For the *new-parts* objects, we observed the same pattern of results. There was no difference between ratings for celebrity and non-celebrity objects in either condition (both p 's $> .05$). There was also no significant difference in the mean difference scores between conditions ($t(46) = -1.21, p > .05, 95\%$ CI [-0.58, 0.14])⁴.

To determine whether participants judged either of the post-transformation objects to be the same persisting individual as the original, we also analyzed the *mean* identity ratings ascribed to the *old-parts* and the *new-parts* objects. Given that there was no difference in identity ratings between celebrity and non-celebrity objects, we collapsed across this factor in these analyses (see Figure 4). In both the *no continued contact* condition and the *continued contact* condition, participants were significantly more certain that the *old-parts* object was the same persisting individual than they were that the *new-parts* object was the same persisting individual, $t(23) = 7.69, p < .001, 95\%$ CI [2.09, 3.63], and $t(23) = 3.94, p < .001, 95\%$ CI [1.07, 3.44], respectively. In addition, there was no difference in the mean identity ratings between conditions for either the *old-parts* ($t(46) = 0.44, p > .05, 95\%$ CI [-0.59, 0.93]) or the *new-parts* objects ($t(46) = -1.11, p > .05, 95\%$ CI [-1.24, 0.36]).

⁴ There was also no difference in either condition between ratings for celebrity and non-celebrity objects when we compared the first trial ratings of participants who received a celebrity trial first and those who received a non-celebrity trial first. These results suggest that the lack of difference was not due to our within-subjects design.

Figure 4 here

Discussion

We examined whether people ascribe a heightened worth to celebrity-owned artifacts following transformations of their parts/material. We found that people attributed an elevated worth to these objects only if their parts/material had direct physical contact with the celebrity. We now discuss the implications of our findings for the nature of psychological contagion, the relationship between persistence of value and persistence of identity, and the preservation of historical artifacts.

Psychological contagion

Insofar as the celebrity effect arises through psychological contagion (e.g., Gelman et al., 2015; Newman & Bloom, 2014; Newman et al., 2011; Rozin & Nemeroff, 1990), our results clarify the nature of the essence that is understood to be transmitted from a source (here a celebrity) to a recipient (here an artifact) in this phenomenon. Specifically, our findings speak against the *spreading essence* account, whereby the essence that is initially embodied in an artifact is understood to be able to propagate in the new parts/material added to the object after its initial contact with the celebrity if the parts/material have no direct contact with the celebrity. In this way, people's understanding of psychological contagion does not appear to be analogous to their understanding of the transmission of disease (cf. Hutson, 2012; Nemeroff & Rozin, 2000; Rozin & Nemeroff, 1990, 2002). Instead, our results are consistent with the *restricted essence* account: People view the essence embodied in a celebrity artifact as confined to

the parts/material of the object that had direct contact with the celebrity, akin to viewing the essence as a residue or trace deposited on or in the parts/material (Nemeroff & Rozin, 1994).

When participants assigned an increased worth to a post-transformation celebrity artifact, we nonetheless observed a drop in value compared to the value ascribed to the pre-transformation object. For the reassembled *old-parts* object (in both the *no continued contact* and the *continued contact* conditions), this drop may be related to the fact that the object fell temporarily out of existence (during the period of disassembly), resulting in a loss of the strength of the celebrity's essence (i.e., the break-up of the object partially dissipated the trace or residue deposited in/on the parts/material). For the transformed *new-parts* object (in the *continued contact* condition), the drop may be connected to the fact that the celebrity had less contact with the parts/material of this object (especially the late-added parts/material) than with the parts/material of the pre-transformation object, leading to the belief that the celebrity's essence was more weakly instantiated in this object (i.e., less of a trace or residue was understood to be deposited in/on the object's parts/material). It is also possible that both drops in value are related to the fact that someone other than the celebrity was said to handle the parts/material of the object during the transformation, transferring his/her own essence and diluting the celebrity's essence in/on the artifact.

Our data suggest that psychological contagion involves the transmission of an essence that is restricted to the parts/material that had direct contact with a celebrity owner, but it is an outstanding question just how localized the essence is understood to be. Our study was not designed to examine whether people believe that the enhanced

worth (and, by hypothesis, the celebrity's essence) that is initially transmitted to the recipient artifact is localized to specific individual parts/material of an object that have been in direct physical contact with the owner (e.g., the keyboard of Elton John's piano) or to all parts/material of the object. In future research, it would be interesting to test between these possibilities by asking participants to provide value ratings for parts/material of an object that have received extensive direct physical contact with a celebrity owner (e.g., the keyboard of Elton John's piano) as well as for parts/material that have received limited or no direct physical contact with the celebrity (e.g., the legs of Elton John's piano). If people reason about the heightened worth (and the essence) as being localized to specific parts/material, we would predict the magnitude of enhanced value judgments for parts/material of celebrity objects to vary directly with judgments of the amount of direct physical contact between the celebrity and the parts/material.

Our finding that the celebrity effect arises in conjunction with the *old-parts* objects suggests that the essence instantiated in a celebrity artifact remains embodied in the object for an extended period of time. The transformations in our study were described as occurring each month over a period of 250 months (i.e., approximately 20 years). Participants judged the celebrity objects reassembled from original parts/material to have an enhanced worth even after this period of time, suggesting that people believe the essence that is transmitted to be long lasting. Psychological contagion has often been described with the adage "once in contact, always in contact" (Nemeroff & Rozin, 2000; Rozin & Nemeroff, 1990, 2002). If this adage does capture the nature of the phenomenon, then the length of the transformation should not affect the tendency to assign an enhanced value to the reassembled celebrity artifact. Although the current

results do not shed light on how long the essence can remain instantiated in a celebrity object, we conducted a modified replication of the current study in which we described the same transformations as occurring monthly over a period of only 25 months (i.e., approximately two years). We observed the same results as in the current study, revealing that the celebrity effect did not diminish between two and 20 years. It remains an open question whether people believe the essence to remain instantiated in the object for periods even longer than 20 years (see Frazier et al., 2009, for an examination of people's ratings of the worth of artifacts from ancient times).

As previously mentioned, our study focused on artifacts that were associated in some way with the celebrities' professions, and thus with the source of their fame (e.g., Elton John's piano). Previous research indicates that the celebrity effect also arises in conjunction with objects (e.g., a sweater, a wristwatch, a pair of gloves, or a piece of chewing gum) that are unconnected to a celebrity's profession/source of fame (see Frazier et al., 2009; Gjersoe et al., 2014; Newman et al., 2011). Yet past studies leave open the question of whether psychological contagion is equally strong in association with these sorts of objects. Prior work also does not directly address the question of the amount of direct contact required between a celebrity and an artifact in order for the celebrity effect to emerge. For example, people may judge the piano that Elton John played only once in concert to be more valuable than the toothbrush that he used every day, even though the latter had extensive direct physical contact with the source. Answers to these questions will require further research.

Persistence of value and persistence of identity

Unlike the value ratings, the identity ratings in our study were the same for both

celebrity and non-celebrity artifacts. These findings indicate that, although celebrity contact clearly affects how people rate the *persisting worth* of an object following change, it does not influence ratings of an object's *persisting identity*, contrary to Dauer's (1972) proposal. Furthermore, we found that participants rated only one post-transformation artifact, the reassembled original-parts artifact, to be the same persisting individual as the original regardless of whether the celebrity maintained contact with the object during its transformation. These findings replicate the results of Hall (1998), bolstering the claim that people readily judge artifacts to persist through periods of disassembly and subsequent reassembly, even though such judgments violate a fundamental principle of object cognition: spatiotemporal continuity (e.g., Bloom, 2000; Spelke et al., 1995; Xu & Carey, 1996). People thus appear to trace the persisting identity of an artifact (celebrity or non-celebrity) through its original parts/material.

Our results suggest a clear parallel between the way that people reason about the spread of enhanced *value* in a celebrity artifact through change and the way they reason about the spread of individual *identity* through change: They conceive of both in a restricted sense. Participants judged that the heightened value and the identity of a celebrity artifact persisted in its original parts/material, even through a period of disassembly. At the same time, we observed a clear difference between how people think about the spread of enhanced value and how they think about the spread of identity: If a celebrity maintained contact with an artifact during its transformation, participants judged *both* the artifact made of the reassembled original parts/material *and* the artifact made of replacement parts/material to have an elevated worth. Yet participants judged *only* the reassembled original-parts artifact to be the same persisting individual, regardless of

celebrity contact. This difference suggests an important distinction between criteria for judging the persistence of value and criteria for judging the persistence of identity. When determining whether a transformed artifact carries a heightened value, people rely on whether the object contains parts/material that have been in contact with the celebrity. As a result, people may judge that *multiple* artifacts have an enhanced worth. In contrast, when deciding whether an artifact is the same persisting individual through transformation (e.g., whether a piano is 'X'), people seek out a continuant made of the object's original parts/material, and only one artifact can satisfy this criterion.

Preserving historical artifacts

These results have implications for practices involved in the preservation of historical artifacts more broadly, not just those owned by celebrities. In particular, our discovery that people ascribe an elevated value to transformed celebrity artifacts only if their new parts/material have had direct physical contact with the famous individual reveals that there is potential economic hazard in restoring historical artifacts by replacing their original parts/material. Making such changes may run the risk of diminishing (if not eliminating all together) the essence imparted to the object and, therefore, any enhancement of the object's value. In contrast, our results suggest there is less risk involved in taking apart a historical artifact for ease of transport, storage or cleaning during restoration. Performing such an action may lower enhanced value ratings to some degree (as we saw in our own data), but it does not appear to eradicate the heightened worth all together.

Indeed, it appears that people may believe so strongly that a celebrity artifact's heightened value resides in the original parts/material that have had direct contact with

the celebrity that they will ascribe a heightened worth to an object made from the original parts/material, even if those parts/material are transformed into an object of an *entirely different kind*. This belief appears to be exhibited by the manufacturer, Croft House, who recently sold sets of speakers made from "historically correct" wood boards from a studio floor once danced upon by Michael Jackson. This manufacturer presumably judged that the heightened value (and, by hypothesis, Michael Jackson's essence) was attached to the original parts/material of the floor and that it would persist even when these parts/material were transformed into objects of another kind. The fact that these speakers sold for an elevated price suggests that the manufacturer's judgment was correct.

Conclusion

Researchers have posited that beliefs in psychological contagion underlie a diverse set of phenomena across many of the world's cultures: The celebrity effect observed in our North American English-speaking sample is just one example. This effect has also been documented in participants outside North America (Frazier et al., 2009; Gjersoe et al., 2014), and analogous effects have been uncovered for a wide range of historically important objects in both Western and non-Western cultural contexts (Frazier & Gelman, 2009; Frazier et al., 2009; Gelman et al., 2015; Gjersoe et al., 2014). Furthermore, psychological contagion beliefs have been invoked to explain a number of other phenomena in various cultural settings, from people's judgments that "you are what you eat" (Nemeroff & Rozin, 1989), to people's attraction or aversion to clothing worn by others (e.g., Argo, Dahl, & Morales, 2006, 2008), to people's reactions to the consequences of organ transplants (Hood et al., 2011; Meyer et al., 2013). To the extent that our findings elucidate the nature of the essence that is transmitted from a source to a

recipient in this form of magical thinking, they thus may contribute to our understanding of a broad set of under-explored issues in human cognition.

In Press

References

- Argo, J. J., Dahl, D. W., & Morales, A. C. (2006). Consumer contamination: How consumers react to products touched by others. *Journal of Marketing*, *70*(2), 81-94.
- Argo, J. J., Dahl, D. W., & Morales, A. C. (2008). Positive consumer contagion: Responses to attractive others in a retail context. *Journal of Marketing Research*, *45*(6), 690-701.
- Bloom, P. (2000). *How children learn the meanings of words*. Cambridge, MA: MIT Press.
- Dauer, F. W. (1972). How not to reidentify the Parthenon. *Analysis*, *33*(2), 63-64.
- Frazer, J. G. (1996). *The golden bough: A study in magic and religion*. New York; Harmondsworth, England: Penguin Books. (Original work published 1890)
- Frazier, B. N., & Gelman, S. A. (2009). Developmental changes in judgments of authentic objects. *Cognitive Development*, *24*, 284-292.
- Frazier, B. N., Gelman, S. A., Wilson, A., & Hood, B. M. (2009). Picasso paintings, moon rocks, and hand-written Beatles lyrics: Adults' evaluations of authentic objects. *Journal of Cognition and Culture*, *9*, 1-14.
- Gelman, S. A., Frazier, B. N., Noles, N. S., Manczak, E. M., & Stilwell, S. M. (2015). How Much Are Harry Potter's Glasses Worth? Children's Monetary Evaluation of Authentic Objects. *Journal of Cognition and Development*, *16*(1), 97-117.
- Gjersoe, N. L., Newman, G. E., Chituc, V., & Hood, B. M. (2014). Individualism and the extended-self: Cross-cultural differences in the valuation of authentic objects. *PloS one*, *9*(3), e90787.

- Hall, D. G. (1998). Continuity and the persistence of objects: When the whole is greater than the sum of the parts. *Cognitive Psychology*, 37, 28-59.
- Hirsch, E. (1982). *The concept of identity*. Oxford, England: Oxford University Press.
- Hobbes, T. (1913). *Metaphysical system of Hobbes in twelve chapters*. Chicago, IL: Open Court Publishing. (Original work published 1672)
- Hood, B. M., & Bloom, P. (2008). Children prefer certain individuals over perfect duplicates. *Cognition*, 106, 455-462.
- Hood, B. M., Gjersoe, N. L., Donnelly, K., Byers, A., & Itajkura, S. (2011). Moral contagion attitudes towards potential organ transplants in British and Japanese adults. *Journal of Cognition and Culture*, 11(3-4), 269-286.
- Hume, D. (2000). *A treatise of human nature*. Oxford; New York: Oxford University Press. (Original work published 1739)
- Hutson, M. (2012). *The seven laws of magical thinking: How irrational beliefs keep us happy, healthy, and sane*. New York: Hudson Street Press.
- Mauss, M. (1972). *A general theory of magic* (R. Brain, Trans.). New York: Norton. (Original work published 1902)
- Meyer, M., Leslie, S. J., Gelman, S. A., & Stilwell, S. M. (2013). Essentialist beliefs about bodily transplants in the United States and India. *Cognitive Science*, 37(4), 668-710.
- Nemeroff, C. J., & Rozin, P. (1989). "You Are What You Eat": Applying the Demand-Free Impressions Technique to an Unacknowledged Belief. *Ethos*, 17(1), 50-69.
- Nemeroff, C. J., & Rozin, P. (1994). The contagion concept in adult thinking in the United States: Transmission of germs and of interpersonal influence. *Ethos*,

22(2), 158-186.

- Nemeroff, C. J., & Rozin, P. (2000). The makings of the magical mind. In K. S. Rosengren, C. N. Johnson, & P. L. Harris (Eds.), *Imagining the impossible: magical, scientific, and religious thinking in children* (pp. 1–34). Cambridge, UK: Cambridge University Press.
- Newman, G. E., & Bloom, P. (2014). Physical contact influences how much people pay at celebrity auctions. *Proceedings of the National Academy of Sciences*, 111(10), 3705-3708.
- Newman, G. E., Diesendruck, G., & Bloom, P. (2011). Celebrity contagion and the value of objects. *Journal of Consumer Research*, 38(2), 215-228.
- Rozin, P., Millman, L., & Nemeroff, C. J. (1986). Operation of the laws of sympathetic magic in disgust and other domains. *Journal of Personality and Social Psychology*, 50, 703–12.
- Rozin, P., & Nemeroff, C. J. (1990). The laws of sympathetic magic: A psychological analysis of similarity and contagion. *Cultural psychology: Essays on comparative human development*, 205-232.
- Rozin, P., & Nemeroff, C. J. (2002). Sympathetic magical thinking: the contagion and similarity "heuristics". In T. Gilovich, D. Griffin, & D. Kahneman (Eds.), *Heuristics and biases: The psychology of intuitive judgment* (pp. 201-216). Cambridge: Cambridge University Press.
- Rozin, P., Nemeroff, C. J., Wane, M., & Sherrod, A. (1989). Operation of the sympathetic magical law of contagion in interpersonal attitudes among Americans. *Bulletin of the Psychonomic Society*, 27, 367–370.

- Smart, B. (1972). How to reidentify the ship of Theseus. *Analysis*, 32(5), 145-148.
- Smart, B. (1973). The ship of Theseus, the Parthenon and disassembled objects. *Analysis*, 34 (1), 24-27.
- Spelke, E. S., Kestenbaum, R., Simons, D., & Wein, D. (1995). Spatio-temporal continuity, smoothness of motion, and object identity in infancy. *British Journal of Developmental Psychology*, 13, 113-142.
- Tylor, E. B. (1974). *Primitive culture: Researches into the development of mythology, philosophy, religion, art, and custom*. New York: Gordon. (Original work published 1871)
- Wiggins, D. (2001). *Sameness and substance renewed*. Cambridge, England: Cambridge University Press.
- Xu, F., & Carey, S. (1996). Infants' metaphysics: the case of numerical identity. *Cognitive Psychology*, 30, 111-153.

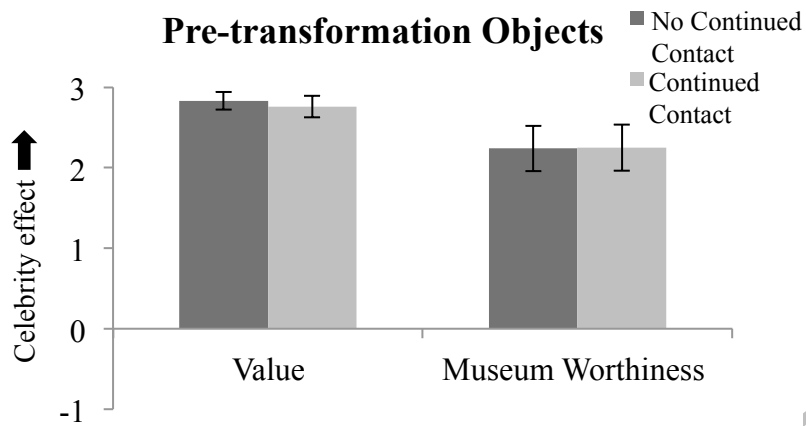
Table 1

Artifact and owner pairs

Artifact	Celebrity Status	Owner	Profession
Computer	Celebrity	J.K. Rowling	the famous author
	Non-Celebrity	Patricia Johnson	a cashier
Guitar	Celebrity	Taylor Swift	the famous musician
	Non-Celebrity	Mary Wilson	an accountant
Gun	Celebrity	Clint Eastwood	the famous actor
	Non-Celebrity	James Davis	a lawyer
Pen	Celebrity	Stephen King	the famous author
	Non-Celebrity	Michael Jones	a realtor
Piano	Celebrity	Elton John	the famous musician
	Non-Celebrity	John Brown	a salesperson
Soccer Jersey	Celebrity	David Beckham	the famous athlete
	Non-Celebrity	Robert Smith	a server
Tennis Racquet	Celebrity	Serena Williams	the famous athlete
	Non-Celebrity	Jennifer Williams	a teacher
Tennis Shoe	Celebrity	Ellen DeGeneres	the famous comedian
	Non-Celebrity	Linda Miller	a bank teller

Figure 1

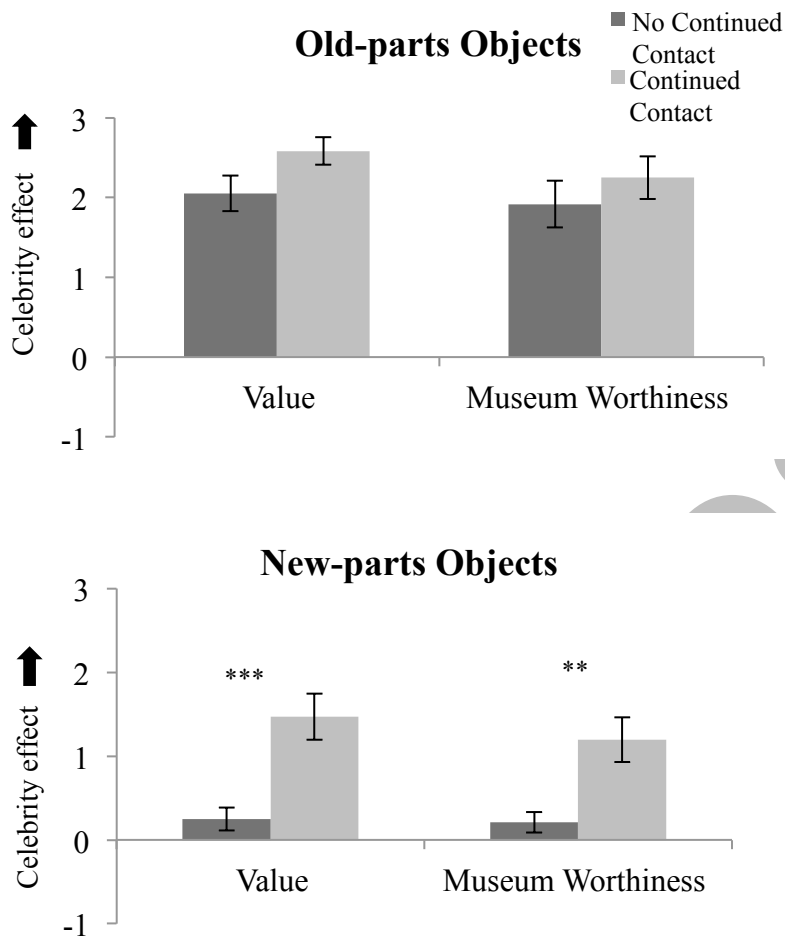
Pre-Transformation Value and Museum-Worthiness Ratings: Mean Difference Scores



Note. Mean difference scores were computed by subtracting the mean rating of the non-celebrity objects from the mean rating of the celebrity objects. Positive difference scores provide evidence of a celebrity effect. Error bars represent one standard error.

Figure 2

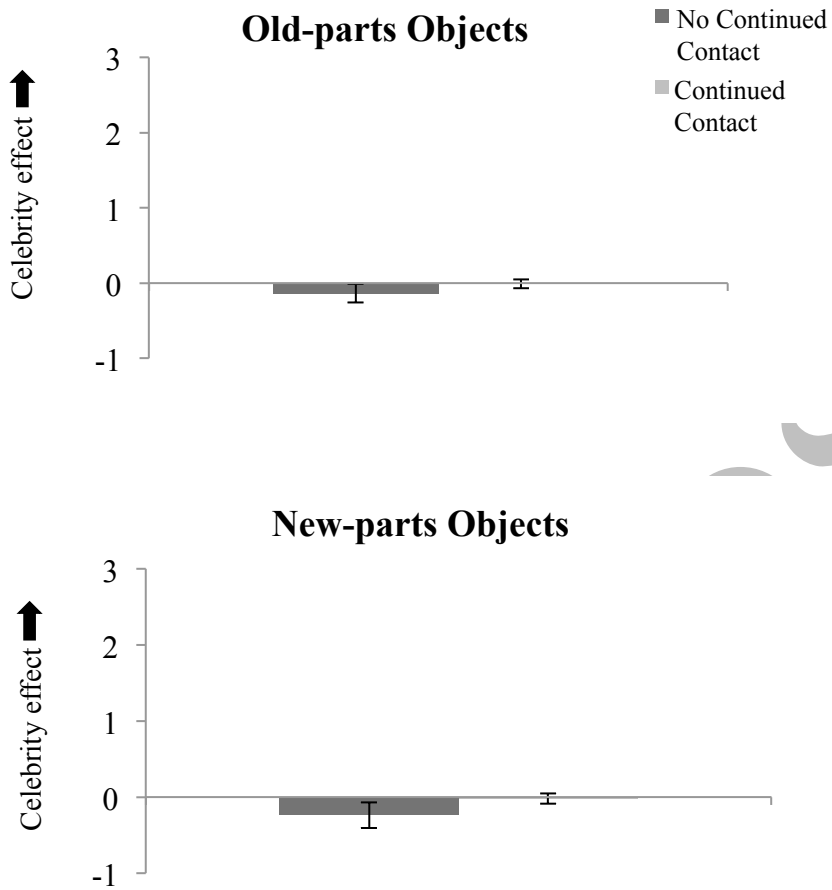
Post-Transformation Value and Museum-Worthiness Ratings: Mean Difference Scores



Note. Mean difference scores were computed by subtracting the mean rating of the non-celebrity objects from the mean rating of the celebrity objects. Positive difference scores provide evidence of a celebrity effect. Error bars represent one standard error. Asterisks indicate a significant difference between conditions, ** $p < .01$, *** $p < .001$.

Figure 3

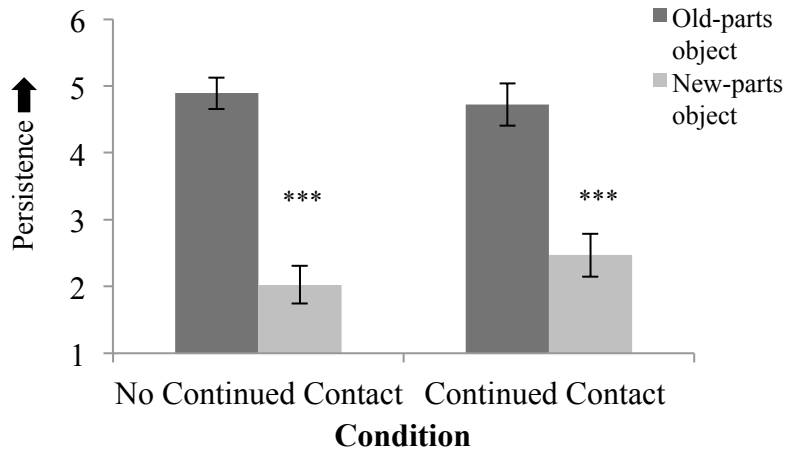
Post-Transformation Identity Ratings: Mean Difference Scores



Note. Mean difference scores were computed by subtracting the mean rating of the non-celebrity objects from the mean rating of the celebrity objects. Error bars represent one standard error.

Figure 4

Post-Transformation Identity Ratings: Mean Scores



Note. Means were computed by collapsing across celebrity and non-celebrity objects.

Error bars represent one standard error. Asterisks indicate a significant difference

between ratings for *old-parts* and *new-parts* objects, *** $p < .001$.