Social Traces of Generic Humans Increase the Value of Everyday Objects

Veronika Job[1], Jana Nikitin[1], Sophia X. Zhang[2],
Priyanka B. Carr[2], and Gregory M. Walton[2]

Abstract

Past research finds that people behave as though the particular qualities of specific, strongly valenced individuals "rub off" on objects. People thus value a sweater worn by George Clooney but are disgusted by one worn by Hitler. We hypothesized that social traces of generic humans can also adhere to objects, increasing their value. Experiments 1 and 2 found that simply marking that consumer products (mugs, giftwrap) were made by generic strangers (e.g., "by people using machines" vs. "by machines run by people") increased their perceived value. Experiment 3 demonstrated that this effect was mediated by thoughts about attention the object received from other people, which, in turn, led people to see the object as possessing more positive social qualities (e.g., friendly), increasing valuation. The results suggest that generic humans are perceived positively, possessing warm social qualities, and these can "rub off" and adhere to everyday objects increasing their value.

I love
all
things,
not because they are
passionate
or sweet-smelling
but because,
I don't know,
because
this ocean is yours,
and mine;
these buttons
and wheels
and little
forgotten

treasures,
fans upon
whose feathers
love has scattered
its blossoms,
glasses, knives and
scissors—
all bear
the trace
of someone's fingers
on their handle or surface,
the trace of a distant hand
lost
in the depths of forgetfulness

—Pablo Neruda, *Ode to Things*

The use of objects often degrades their quality and, thus, their value. Yet holding constant an object's quality, do people value objects more that, as Pablo Neruda writes, "bear the trace of someone's finger"?

Products and objects—a book, a watch, a blanket, and other things we encounter in our daily lives—are often appreciated not only for their functionality but for their social history: beliefs about who owned them, used them, touched them, and how they came to be. Past research finds that the association of objects with individuals with specific strong qualities affects how people perceive and value those objects. People will pay more for a sweater they believe was worn by George Clooney but are disgusted by one worn by Hitler (Nemeroff & Rozin, 1994). This research suggests that people behave as though the particular qualities of individuals who interact with an object psychologically adhere to the object and affect its value (Newman, Diesendruck, & Bloom, 2011). As Nemeroff and Rozin (1994) write, "The 'law of contagion' holds that people, objects, and so forth, that come into contact with each other may influence each other through the transfer of some or all of their properties" (p. 159). Furthermore, such qualities can be removed through purification rites, as by laundering George Clooney's sweater or by gashing Hitler's sweater with scissors (Nemeroff & Rozin, 1994).

Inspired by and extending this past research, we hypothesized that people's assessment of objects is shaped not just by the particular qualities of specific others but also by traces of socialness itself—by positive social qualities associated with humans in general. Like specific qualities, we hypothesized

[1]University of Zurich, Switzerland
[2]Stanford University, CA, USA

Corresponding Author:
Gregory M. Walton, Stanford University, Bldg 01-420, Jordan Hall, Stanford, CA 94305-2130, USA.
Email: gwalton@stanford.edu

that generic positive social qualities may be transmitted to objects increasing their perceived value. This hypothesis draws on the insight that the need to form and maintain social connections is one of the most fundamental human needs on par with basic physiological needs (Baumeister & Leary, 1995; Bowlby, 1988). Other people thus represent one of the most important sources of value for people. Therefore, we assume that people will associate other people, even generic people, with positive social qualities and that these qualities may adhere to objects associated with others. In this case, rather than acquiring the specific, strongly valenced qualities of a particular person like a celebrity, the object would acquire, by virtue of having been created by people, a social trace—general positive social qualities like warmth, friendliness, and sincerity that confer value.

Our approach draws on the theorizing of Bloom (2010), who argues that people are essentialists who believe that objects "have an underlying reality or true nature" (p. 9), an essence that might not be visible to the eye but which shapes the object's qualities. Past research shows that the essence of an object is molded by its social history, that is, its interactions with people (Nemeroff & Rozin, 1994; Newman et al., 2011; Rozin, Millman, & Nemeroff, 1986; see also Savani, Kumar, Naidu, & Dweck, 2011). Humans attend to the social history of an object (e.g., ownership) and, as early as the age of 3 years, identify an object more by this history than by perceptual features (Gelman, Manczak, & Noles, 2012; Gelman, Manczak, Was, & Noles, 2016; Gelman, Noles, & Stilwell, 2014). The representation of an object thus includes people who made, used, owned, or touched it. If generic people are associated with positive social qualities, people may perceive these qualities in the object, increasing its perceived value. We assume that social traces arise when people imagine other people having attended to an object, thought about it, felt something about it, or having had goals with regard to it, and that this perceived social attention leads people to ascribe greater value to the object. Notably, this may be the case even if the perceived quality of an object does not change, just as Hitler's sweater is presumably not of low value because it is seen as of poor quality.

Our hypothesis is consistent with research on anthropomorphism, which shows that people can "see" specific human qualities in nonhuman agents, such as emotions and intentions attributed to nonhumans that act or move with "apparent independence" like animals or cartoon characters (Epley, Waytz, & Cacioppo, 2007, p. 865). Complementing this work, we hypothesized that even inanimate objects may be seen as being imbued with positive social qualities like warmth (Cuddy, Fiske, & Glick, 2008).

Three experiments tested this hypothesis. Experiments 1 and 2 tested whether subtle cues that mark that an object was made by generic humans would increase its perceived value. We also tested whether this would be the case even when the perceived quality of the object does not change. In addition, Experiment 1 tested whether the destruction of an object

marked as human-made elicits greater distress, an affective measure of valuation. Finally, Experiment 3 tested our hypothesis about psychological process: whether being associated more with generic humans would lead people to perceive the object as having received greater attention from other people, and if this, in turn, leads people to ascribe positive social qualities to the object (e.g., warmth), increasing valuation.

Experiment 1: "Made by (People in) a Small Factory in Nebraska"

Experiment 1 tested whether people would value consumer products—mugs and giftwraps—more that were linked to human makers than not. We manipulated whether a target product was described as "made by people in a small factory in Nebraska" (social-traces condition) or as "made by a small factory in Nebraska" (control condition). Participants were asked how much they would pay for the object and how much the object was worth as indicators of value. In addition, we assessed participants' affective reactions to the prospect of the object's destruction. If participants view the target object in the social-traces condition as of greater value, they may express greater distress at its demise.

Method

Participants. A total of 209 people (all U.S. residents) recruited from Mechanical Turk completed the study online for a small payment. Because we had no prior knowledge about the possible effect size yet anticipated that the effect might be subtle, we selected a sample with high power ($1 - \beta = 0.95$) to detect the average effect size in social psychology ($d = 0.45$, Richard, Bond, & Stokes-Zoota, 2003). Seven participants were excluded: Two reported that they would pay excessive amounts for the modest consumer products examined here (i.e., >4 standard deviations [*SD*s] above the mean), suggesting that they did not complete the study seriously. One was an outlier in the valuation ratio, the main dependent measure (>4 *SD*s above the mean). Four reported that they had substantial experience in Nebraska.[1] Analyses are thus based on 202 participants (134 male, 68 female; age = 18-59 years).

Procedure and manipulation. Participants viewed images and descriptions of either two mugs or two types of giftwrap, which varied in their predominant color, side by side. One object was designated as the target object. In the social-traces condition, the target-object was described as follows: "This is a mug/giftwrap. This mug/giftwrap was made by people in a small factory in Nebraska." In the control condition, the target-object description read, "This is a mug/giftwrap. This mug/giftwrap was made by a small factory in Nebraska." In both conditions, the nontarget-object description read, "This is a mug/giftwrap. This mug/giftwrap is made with ceramics/cotton-viscose paper." The stimulus type (mug or giftwrap),

color, and placement (left or right) of the target object were counterbalanced.

Participants then reported how much they would "pay for" each object and how much each object was "worth." The variables were highly correlated ($r_{target} = .87$, $r_{nontarget} = .82$, ps < .001), and so were averaged.

After completing the valuation measures, participants reviewed the objects and descriptions again and were asked to imagine they owned each object and, further, that each object had been destroyed.[2] Participants indicated how "bothered," "upset," and "disturbed" they would feel at each object's destruction (1 = *not at all*, 7 = *very much*; α_{target} = .91; $\alpha_{nontarget}$ = .92).

Data-analytic approach. People vary substantially in how they value consumer products. Across the three experiments, valuation of the giftwrap ranged from US$0 to US$27 (M = US$6.79, SD = 4.46) and that of the mug from US$0.25 to US$28.75 (M = US$6.54, SD = 4.67). Therefore, we examined the valuation of the target object relative to the nontarget object by calculating the *valuation ratio*: the value of the target object divided by the value of the nontarget object. Values higher than one indicate greater valuation of the target object relative to the nontarget object; values lower than one indicate the opposite. The ratio is preferable to a difference score when a scale is not fixed. It takes into account that the same absolute difference means more at a low level (e.g., between US$1 and US$2) than at a high level (between US$20 and US$21).[3] Because some values were zero, we added 1 to all values (target and nontarget) before calculating the ratio. For all other variables (which were assessed by fixed scales), we calculated the difference score by subtracting ratings for the nontarget object from ratings of the target object. The same procedure was followed in all three experiments.

In each analysis, we tested demographic (gender, age, income) and counterbalancing (target-object type, order, and color) variables as covariates. Although some were predictive of valuation ($p \leq .15$), retaining them did not alter the primary results in any study. Thus, for simplicity, we report all analyses without covariates.

Results

As hypothesized, an independent-samples *t* test found that participants valued the target object more in the social-traces condition (M_{ratio} = 1.10, SD = 0.43) than in the control condition (M_{ratio} = 0.99, SD = 0.37), $t(200) = 2.00$, $p = .047$, $d = 0.28$, 95% confidence interval (CI) = [0.002, 0.22] (see Figure 1). In addition, in the social-traces condition, participants valued the target object significantly more than the nontarget object (the ratio was significantly greater than 1): one-sample $t(103) = 2.45$, $p = .016$, $d = 0.48$, 95% CI = [0.02, 0.18]. This was not the case in the control condition, one-sample $t(97) < 1$. Exploratory analyses showed that no
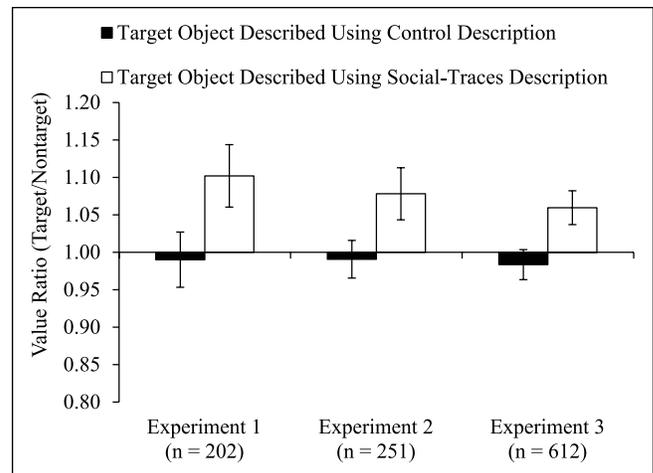

Figure 1. Ratio of valuation of the target compared to the nontarget object in Experiments 1-3: The value of the target object divided by the value of the nontarget object.
Note. Values greater than one indicate greater valuation of the target object. Error bars represent ±1 standard error of the mean.

demographic or counterbalancing variable significantly moderated the condition difference, $ps > .05$.[4]

Analysis of how bothered, upset, and disturbed participants reported they would feel at each object's destruction yielded the same pattern. Participants reported greater distress at the demise of the target object in the social-traces condition (M_{diff} = 0.12, SD = 1.33) than in the control condition (M_{diff} = −0.39, SD = 1.30), $t(200) = 2.77$, $p = .006$, $d = .39$, 95% CI = [−0.88, −0.15].

Experiment 1 found that people valued objects linked to human makers more. This was evident in ratings of value as well as participants' anticipated affective reactions to the object's destruction, hence, with a monetary and an affective measure of value. The results are consistent with the hypothesis that a connection to generic people increases the value of an object. But they are open to alternative explanations. Perhaps simply priming the word "people" increased the object's valuation. In addition, people might expect that products made by people have higher quality and are generally more attractive than those made by machines, which might increase the products' value. Experiment 2 aimed to replicate the social-traces effect and address these alternative explanations.

Experiment 2: "Made by People Using Machines" Versus "Made by Machines Run by People"

To further isolate the effect of social traces, Experiment 2 featured a simple grammatical switch. We tested whether people would value objects "made by people using machines in a small factory" more highly than objects "made by machines run by people in a small factory." Although both

statements indicate that people and machines jointly create the object, the former prioritizes the role of people (Dowty, 1991; Keenan & Comrie, 1977). This comparison holds constant the priming of the word "people." In addition, Experiment 2 assessed the perceived quality of the objects. We hypothesized that social traces endow objects with a glean of socialness that increases their perceived value—but do not affect their perceived quality.

Method

Participants. A total of 260 people (all U.S. residents) recruited from Mechanical Turk completed an online survey for a small payment. Nine participants were excluded: two valued the objects excessively highly (>4 SDs above the mean), three were outliers in the valuation ratio (>4 SDs above the mean), and four had substantial experience in Nebraska (see Note 1). Analyses are thus based on 251 participants (94 male, 152 female, 5 unidentified; age = 16-71 years).

Procedure and manipulation. As in Experiment 1, participants evaluated either two mugs or two types of giftwrap. In the social-traces condition, the description of the target object read, "This mug/giftwrap is made by people using machines in a small factory in Nebraska." In the control condition, the description read, "This mug/giftwrap is made by machines run by people in a small factory in Nebraska." In both conditions, the nontarget-object description read, "This mug/giftwrap is made in the southeastern United States." As previously, the stimulus type, color, and placement of the target object were counterbalanced.

The "pay for" and "worth" outcomes were identical to those used in Experiment 1. They correlated (r_{target} = .72, $r_{nontarget}$ = .78, ps < .001), and were averaged to form the measure of valuation. In addition, participants reported how "high quality" and how "attractive" each object was (1 = *not at all*, 7 = *very much*). These items correlated (r_{target} = .65, $r_{nontarget}$ = .61, ps < .001) and so were averaged to index the perceived quality of the target object.

Results

As predicted, participants valued the target object more in the social-traces condition (M_{ratio} = 1.08, SD = 0.38) than in the control condition (M_{ratio} = 0.99, SD = 0.29), $t(249)$ = 2.05, p = .041, 95% CI = [0.004, 0.17], d = 0.26 (see Figure 1). In addition, in the social-traces condition, participants valued the target object significantly more than the nontarget object, one-sample $t(121)$ = 2.24, p = .027, d = 0.41, 95% CI = [0.009, 0.15]. There was no difference in the valuation of the two objects in the control condition, one-sample $t(128)$ < 1.

There was no evidence that participants saw the target object as of higher quality or as more attractive in the social-traces condition. The condition effect on the difference score

of the quality measure was nonsignificant (social-traces: M_{diff} = 0.04, SD = 1.60; control: M_{diff} = −0.07, SD = 1.48), t < 1. Furthermore, although the perceived quality of the object was a significant predictor of valuation in an ANCOVA, $F(1, 248)$ = 178.29, p < .001, the effect of the social-traces manipulation remained significant with quality controlled, $F(1, 248)$ = 4.86, p = .028, d = 0.28.

Thus, a minor grammatical shift but one that highlighted a generic social history—from "made by machines run by people" to "made by people using machines"—increased the perceived value of the object, and did not alter its perceived quality.

Experiment 3: Underlying Mechanisms

Experiments 1 and 2 found that people value objects more when their human makers are marked, even when those makers are generic strangers. This effect was not driven by the object's perceived quality or attractiveness. Instead, we hypothesized that objects can acquire social traces—positive social qualities from their connection with generic people. Experiment 3 tested this hypothesis. We examined whether people would imagine that an object marked as made by people would have received more attention, thoughts, feelings, and goals from other people, and if this would lead people to ascribe positive social qualities to the object, increasing its valuation.

Method

Participants. To assess our hypothesis about psychological process, we recruited a larger sample. A total of 629 people (all US residents) recruited from Mechanical Turk completed an online survey for a small payment. Seventeen participants were excluded: Eight valued the objects excessively high (>4 SDs above the mean; one of whom, who reported a willingness to pay more than US$1,100 for the object, was excluded before computing the SD), five were outliers on the valuation ratio (>4 SDs above the mean), and four had substantial experience in Nebraska (Note 1). Analyses are thus based on 612 participants (314 male, 285 female, 13 unidentified; age = 18-74 years).

Procedure, manipulation, and dependent measures. The procedure was similar to Experiment 1.[5] The social-traces manipulation was identical. We then assessed how much participants would "pay for" the objects and how much they thought each object was "worth." These variables correlated (r_{target} = .85, $r_{nontarget}$ = .75, ps < .001), and were averaged to form the measure of valuation.

Next, we assessed the process measures. First, participants were asked to evaluate both the target and the nontarget object on social qualities using three adjectives from the warmth scale (Fiske, Cuddy, Glick, & Xu, 2002). They read, "Sometimes people ascribe human characteristics to objects. To what extent do you think about [the object] as . . . warm/friendly/sincere" (1 = *do not think about it this way at all*, 5
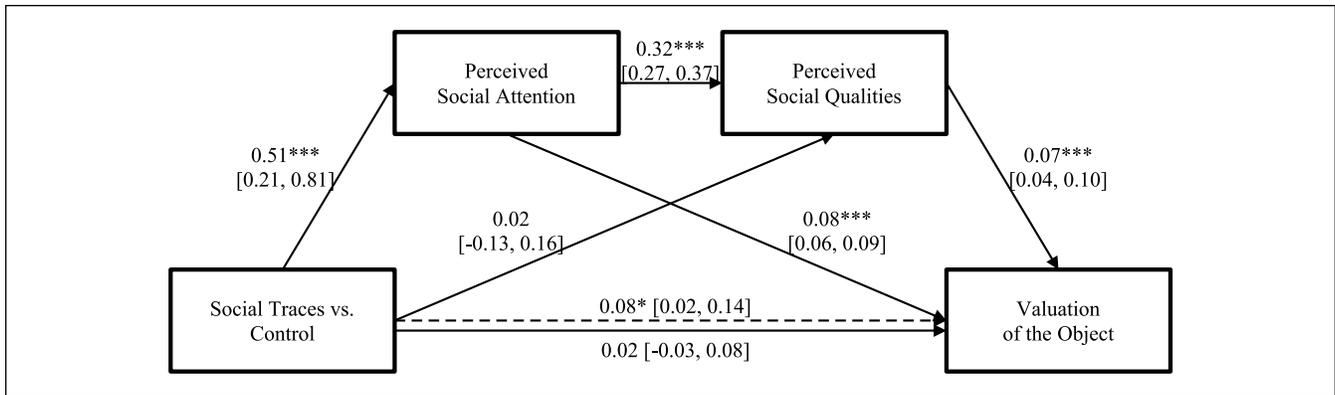
Figure 2. Indirect effect of social-traces manipulation (vs. control) on the valuation of the target object relative to the nontarget object via perceived social attention and perceived social qualities of the target object relative to the nontarget object.
Note. 95% confidence intervals of the effects are reported in brackets. *p < .05, ***p < .001

= *think about it this way extremely much*). The scale was reliable (α_{target} = .91; $\alpha_{\text{nontarget}}$ = .89), so responses to the three items were averaged.

Next, we assessed how much social attention participants imagined each object had received: "To what extent did people think about/feel something about/attend to/have specific goals or intentions about [the object] as it was being made?" (1 = *not at all*, 7 = *extremely*). The 4-item scale was reliable (α_{target} = .93; $\alpha_{\text{nontarget}}$ = .94).

Participants then reported how "high quality" and how "attractive" each object was (1 = *not at all*, 7 = *very much*). The two items correlated (r_{target} = .61, $r_{\text{nontarget}}$ = .64, ps < .001).

Results

Valuation. Replicating Experiments 1 and 2, participants valued the target object more in the social-traces condition (M_{ratio} = 1.06, SD = 0.39) than in the control condition (M_{ratio} = 0.98, SD = 0.35), $t(610)$ = 2.52 p = .012, d = 0.20, 95% CI = [0.02, 0.14] (see Figure 1). In addition, in the social-traces condition, participants valued the target object significantly more than the nontarget object, one-sample $t(302)$ = 2.63, p = .009, d = 0.30,, 95% CI = [0.02, 0.10], whereas the valuation of the target and the nontarget object did not differ in the control condition, $t(308)$ < 1.

Process measures. Participants imagined other people attending to, thinking and feeling about, and having goals with respect to the target object relative to the nontarget object more in the social-traces condition (M_{diff} = 0.54, SD = 2.03) than in the control condition (M_{diff} = 0.03, SD = 1.72), $t(610)$ = 3.35, p = .001, d = 0.27, 95% CI = [0.21, 0.81]. Participants also ascribed positive social qualities of warmth, friendliness, and sincerity to the target relative to the nontarget object more in the social-traces condition (M_{diff} = 0.18, SD = 1.14) than in the control condition (M_{diff} = 0.00, SD = 1.04), $t(610)$ = 1.99, p = .047, d = 0.16, 95% CI = [0.003, 0.35].

Indirect-effect analyses using Hayes (2013) PROCESS macro[6] confirmed that the two variables mediated the effect on valuation (see Figure 2). The social-traces manipulation affected the degree to which participants imagined the target object relative to the nontarget object as having received social attention. In turn, this was associated with the degree to which they ascribed positive social qualities to the target relative to the nontarget object, which had an effect on valuation. The indirect effect of manipulation → perceived social attention → perceived social qualities → valuation was 0.01 (95% CI = [0.005, 0.02]).[7]

Perceived quality. As in Experiment 2, there was no condition difference in the perceived quality of the object (social-traces: M_{diff} = −0.003, SD = 1.68; control: M_{diff} = −0.19, SD = 1.67), $t(610)$ = 1.40, p = .16. Moreover, even controlling for perceived quality in the analysis of valuation—which was predictive, $F(1, 596)$ = 541.81, p < .001—the effect of the social-traces manipulation remained significant, $F(1, 596)$ = 3.93, p = .048, d = 0.17. Thus, even in a larger sample with greater statistical power, perceived quality did not explain the effect of social traces on valuation.

General Discussion

Three experiments found that simply marking that an object was created by generic strangers increased its perceived value. For example, consumer products described as "made by people using machines" were valued more highly than the same products described as "made by machines run by people" (Experiment 2). This increase in valuation did not arise from a change in the perceived quality or attractiveness of the object (Experiments 2 and 3). Instead, marking the social origins of an object led people to imagine the object as having been the subject of greater attention, thoughts, feelings, and goals from other people. In turn, this led people to ascribe positive social qualities to the object (e.g., warmth), increasing its valuation.

Implications for Theory and Future Directions

Previous research shows that when an object is linked to a specific person with particular qualities, like a gown worn by Princess Diana, this affects its valuation (Frazier, Gelman, Wilson, & Hood, 2009). People seem to behave as though a specific psychological essence is transmitted from a specific person to an object (Nemeroff & Rozin, 1994). It has long been assumed that this contagion process involves only the particular qualities of specific individuals. Extending this perspective, the present research shows that people's assessment of objects is also shaped by an association with generic humans. People act as though a general social essence is transmitted from generic others to an object.

Consistent with the basic need to belong (Baumeister & Leary, 1995), our findings also imply that generic people are not perceived as neutral but as possessing positive social qualities, as these can be transmitted to objects associated with generic humans. Thus, in Experiment 3, objects "made by people in a small factory" were seen as warmer, friendlier, and more sincere than objects "made by a small factory." The conclusion that people in general are associated with positive qualities is consistent with previous research, which shows that when people are asked to characterize specific groups with regard to these adjectives (e.g., poor/rich people, homeworkers, and immigrants), most groups are rated positively and even the least positive groups (i.e., welfare recipients) are rated around the scale midpoint (Cuddy et al., 2009; Fiske et al., 2002). Using a different methodology, the present results provide independent evidence that people in general are seen positively.

In so doing, our results go beyond the positivity-offset effect, which shows that people regard a variety of completely novel stimuli as slightly positive (e.g., Cacioppo, Gardner, & Berntson, 1997; Ito & Cacioppo, 2005). The present studies show that this positivity is greater when people respond to an object associated more so with other people than not.

Relatedly, our findings contribute to research examining the psychological potency of unfamiliar strangers for people. Past research finds that cues as minor as a shared birthday or membership in a minimal group can create a sense of social connection with unfamiliar others (Burger, Messian, Patel, del Prado, & Anderson, 2004; Jones, Pelham, Carvallo, & Mirenberg, 2004; Tajfel, Billig, Bundy, & Flament, 1971), and lead people to develop shared emotions (Cwir, Carr, Walton, & Spencer, 2011) and goals and motivations (Master & Walton, 2013; Shteynberg & Galinsky, 2011; Walton, Cohen, Cwir, & Spencer, 2012). People also respond to the mere perception that another person regards them as working together on a task with enhanced motivation (Butler & Walton, 2013; Carr & Walton, 2014; see also Ross & Lollis, 1987; Tomasello, Carpenter, Call, Behne, & Moll, 2005; Warneken, Chen, & Tomasello, 2006). The present research extends this past work

to valuation. It shows that a mere connection to generic strangers through an object can enhance the object's value.

In demonstrating that a kind of social value can adhere to objects, the present research complements research showing the ease with which people dehumanize targets of social stigma (e.g., Goff, Eberhardt, Williams, & Jackson, 2008). Taken together, these lines of research imply the malleability of perceptions of socialness: We both readily deny the humanity of members of stigmatized outgroups and ascribe socialness to mere physical objects with human origins (or characteristics, Epley et al., 2007). A direct implication of this intersection is to imply that objects created by a stigmatized out-group may be less apt to acquire social traces that would increase their value. Indeed, an important direction for future research is to test to what extent the social-traces effects observed here are generalizable across groups or are contingent on an explicit or implicit sense of common identity.

The present research also complements past research showing that consumer products can lose value when they are used or touched by other people. A new car loses considerable value when it is driven off the dealer's lot. Making salient that a t-shirt has been tried on by other consumers can create a sense of "contamination" that makes people feel disgusted and decreases valuation (Argo, Dahl, & Morales, 2006). Holding constant the quality, prior use, and physical contact of others with an object, the present studies show that simply marking that an object was created by people can increase valuation.

Considering research on contamination and social traces together, an important direction for future research is to examine whether maintaining rather than severing a connection to a generic prior user can mitigate the loss of value typically associated with the use of an object. Past research shows that symbolic purification rites like laundering George Clooney's sweater can reduce the effect of a well-known prior user on valuation (Nemeroff & Rozin, 1994). Does the commercialization of used products likewise sever a link to a generic prior user? If so, would people value used products more when bought from a generic prior user than when bought from a store? Our research suggests this possibility. Perhaps maintaining a link to a generic prior user even transforms the meaning of indicators of another person's use of the object. Consider renting a car from a traditional rental car company like *Hertz* and finding a map left behind by a prior renter. This may seem to represent the poor quality of the product—the failure of *Hertz* to properly clean "your" car—and perhaps even trigger feelings of disgust (Argo et al., 2006). Would the same map found in a car rented from a community car-sharing service like *Zipcar* have the same meaning? Perhaps the map would then seem to connect one to other drivers, creating a sense of collectivity in renting (or "sharing") the car and being a customer (or "member") of the *Zipcar* "community." Perhaps it would even enhance value.

Conclusion

One of the most important motivations people have is the need to belong: to connect with others and to sustain positive social relationships (Baumeister & Leary, 1995; Bowlby, 1988). As Pablo Neruda foretold—"I love all things . . . all bear the trace of someone's fingers"—we value objects and products not just because they are attractive or useful but because they connect us to each other, even to strangers.

Supplemental Material

The supplemental material is available online.

Notes

1. At the end of each experiment, participants listed "every state you have lived in extensively" or "have had substantial experience in." Because the manipulation focused on the state of Nebraska, we excluded on an a priori basis any participant who had substantial experience in this state.
2. We manipulated whether each object's destruction was attributed to wear-and-tear (e.g., "wore out") or an accident (e.g., "fell to the floor, smashed, and broke"). This manipulation did not produce a main effect on the distress composite, $t < 1.10$, or interact with the social-traces manipulation, $F < 1$, so it is not discussed further.
3. Repeated-measures ANOVAs revealed similar albeit somewhat weaker results (see online supplemental material). This is likely the case because repeated-measures ANOVAs examine simple differences in object valuation and do not account for the fact that the meaning of this difference changes with the absolute level of valuation. It is because the same raw difference means more when it represents a greater change in ratio (US$1 vs. US$2 as opposed to US$20 vs. US$21) that we examined the valuation ratio as the primary outcome. However, the effect is still reliable. Meta-analyzing across the three studies and weighting by sample size, the effect of social traces was significant ($d = 0.19$, 95% confidence interval [CI] = [0.07, 0.31], $z = 3.17$, $p = .0015$.
4. Across the three studies, we conducted 18 analyses testing for interactions between experimental condition and a potential moderator. None were significant ($p < .05$), three were marginal ($.05 < ps < .10$), three were trends ($.10 < ps < .20$), and 12 were nonsignificant at $p > .20$. Given the exploratory nature of these analyses, the inflation of the α-error across multiple comparisons, and the nonsystematic pattern of results, we do not interpret these patterns further.
5. Before starting the experiment, some participants saw a social-ostracism video (for the exact procedure, see Over & Carpenter, 2009). This manipulation did not produce a main effect on valuation, $F(1, 404) = 1.73$, $p = .19$, or interact with the social-traces manipulation, $F < 1$, so it is not discussed further.
6. The number of bootstrap samples for bias corrected bootstrap CIs was 10,000. The level of confidence for all CIs was 0.95. All standard errors are based on the HC3 estimator.
7. The indirect effect of the social-traces manipulation → perceived social attention → valuation was 0.04 (95% CI = [0.02, 0.07]). The indirect effect of the social-traces manipulation → perceived social qualities → valuation was 0.001 (95% CI = [−0.01, 0.01]). Total effect was .08 (95% CI = [0.02, 0.14]. Direct effect of the social traces manipulation on valuation was 0.02 (95% CI = [−0.03, 0.08]). The total effect was 0.08 (95% CI = [0.02, 0.14]).

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*, 81-94.

Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, *117*, 497-529.

Bloom, P. (2010). *How pleasure works: The new science of why we like what we like*. New York, NY: W.W. Norton.

Bowlby, J. (1988). *A secure base: Parent-Child attachment and healthy human development.* London, UK: Routledge.

Burger, J. M., Messian, N., Patel, S., del Prado, A., & Anderson, C. (2004). What a coincidence! The effects of incidental similarity on compliance. *Personality and Social Psychology Bulletin*, *30*, 35-43.

Butler, L. P., & Walton, G. M. (2013). Cues to collaboration increase motivation among preschoolers. *Journal of Experimental Child Psychology*, *116*, 953-961.

Cacioppo, J. T., Gardner, W. L., & Berntson, G. G. (1997). Beyond bipolar conceptualizations and measures: The case of attitudes and evaluative space. *Personality and Social Psychology Review*, *1*, 3-25.

Carr, P. B., & Walton, G. M. (2014). Cues of working together fuel intrinsic motivation. *Journal of Experimental Social Psychology*, *53*, 169-184.

Cuddy, A. J., Fiske, S. T., & Glick, P. (2008). Competence and warmth as universal trait dimensions of interpersonal and intergroup perception: The Stereotype Content Model and the BIAS Map. *Advances in Experimental Social Psychology*, *40*, 61-149.

Cuddy, A. J., Fiske, S. T., Kwan, V. S., Glick, P., Demoulin, S., Leyens, J. P., . . . Ziegler, R. (2009). Stereotype content model across cultures: Towards universal similarities and some differences. *British Journal of Social Psychology*, *48*, 1-33.

Cwir, D., Carr, P. B., Walton, G. M., & Spencer, S. J. (2011). Your heart makes my heart move: Cues of social connectedness cause shared emotions and physiological states among strangers. *Journal of Experimental Social Psychology*, *47*, 661-664.

Dowty, D. (1991). Thematic proto-roles and argument selection. *Language*, *67*, 547-619.

Epley, N., Waytz, A., & Cacioppo, J. T. (2007). On seeing human: A three-factor theory of anthropomorphism. *Psychological Review*, *114*, 864-886.

Fiske, S. T., Cuddy, A. J., Glick, P., & Xu, J. (2002). A model of (often mixed) stereotype content: Competence and warmth respectively follow from perceived status and competition. *Journal of Personality and Social Psychology*, *82*, 878-902.

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., Manczak, E. M., & Noles, N. S. (2012). The non-obvious basis of ownership: Preschool children trace the history and value of owned objects. *Child Development*, *83*, 1732-1747.

Gelman, S. A., Manczak, E. M., Was, A. M., & Noles, N. S. (2016). Children seek historical traces of owned objects. *Child Development*, *87*, 239-255.

Gelman, S. A., Noles, N. S., & Stilwell, S. (2014). Tracking the actions and possessions of agents. *Topics in Cognitive Science*, *6*, 599-614.

Goff, P. A., Eberhardt, J. L., Williams, M. J., & Jackson, M. C. (2008). Not yet human: Implicit knowledge, historical dehumanization, and contemporary consequences. *Journal of Personality and Social Psychology*, *94*, 292-306.

Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York, NY: Guilford Press.

Ito, T., & Cacioppo, J. (2005). Variations on a human universal: Individual differences in positivity offset and negativity bias. *Cognition & Emotion*, *19*, 1-26.

Jones, J. T., Pelham, B. W., Carvallo, M., & Mirenberg, M. C. (2004). How do I love thee? Let me count the Js: Implicit egotism and interpersonal attraction. *Journal of Personality and Social Psychology*, *87*, 665-683.

Keenan, E. L., & Comrie, B. (1977). Phrase accessibility and universal grammar. *Linguistic Inquiry*, *8*, 63-99.

Master, A., & Walton, G. M. (2013). Membership in a minimal group increases motivation and learning in young children. *Child Development*, *84*, 737-751.

Nemeroff, C., & Rozin, P. (1994). The contagion concept in adult thinking in the United States: Transmission of germs and interpersonal influence. *Ethos*, *22*, 158-186.

Newman, G. E., Diesendruck, G., & Bloom, P. (2011). Celebrity contagion and the value of objects. *Journal of Consumer Research*, *38*, 215-228.

Over, H. & Carpenter, M. (2009). Priming third-party ostracism increases affiliative imitation in children. *Developmental Science*, *12*, F1-F8.

Richard, F. D., Bond, C. F., & Stokes-Zoota, J. J. (2003). One hundred years of social psychology quantitatively described. *Review of General Psychology*, *7*, 331-363.

Ross, H. S., & Lollis, S. P. (1987). Communication within infant social games. *Developmental Psychology*, *23*, 241-248.

Rozin, P., Millman, L., & Nemeroff, C. (1986). Operation of the laws of sympathetic magic in disgust and other domains. *Journal of Personality and Social Psychology*, *50*, 703-712.

Savani, K., Kumar, S., Naidu, N. V. R., & Dweck, C. S. (2011). Beliefs in emotional residue: The idea that emotions leave a trace in the physical environment. *Journal of Personality and Social Psychology*, *101*, 684-701.

Shteynberg, G., & Galinsky, A. D. (2011). Implicit coordination: Sharing goals with similar others intensifies goal pursuit. *Journal of Experimental Social Psychology*, *47*, 1291-1294.

Tajfel, H., Billig, M. G., Bundy, R. P., & Flament, C. (1971). Social categorization and intergroup behaviour. *European Journal of Social Psychology*, *1*, 149-178.

Tomasello, M., Carpenter, M., Call, J., Behne, T., & Moll, H. (2005). Understanding and sharing intentions: The origins of cultural cognition. *Behavioral & Brain Sciences*, *28*, 675-735.

Walton, G. M., Cohen, G. L., Cwir, D., & Spencer, S. J. (2012). Mere belonging: The power of social connections. *Journal of Personality and Social Psychology*, *102*, 513-532.

Warneken, F., Chen, F., & Tomasello, M. (2006). Cooperative activities in young children and chimpanzees. *Child Development*, *77*, 640-663.