

Navigating Residue Sensitivity in the Used Goods Marketplace

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Abstract

How does a previous owner's contact with used goods affect consumer judgments of these objects? This research identifies a trait measure of sensitivity to the residue of another's essence or taint found in a used possession. Those highly sensitive to residue respond to the transfer of contaminants from a previous owner of an object. Six samples in Study 1 show that residue sensitivity is a reliable and valid measure that is related to constructs of possession attachment and disease transfer. Still, residue sensitivity explains consumer behavior in the secondhand market place in ways that these existing constructs do not. Studies 2 and 3 illustrate how consumers highly sensitive to residue shift their judgments of secondhand goods according to information about the valence of a source of prior ownership.

Keywords: disgust, secondhand goods, consumer taint

Navigating Residue Sensitivity in the Used Goods Marketplace

Buyers directly interact with owners of used goods in many secondhand market settings, including garage sales, swap meets, and online classifieds site Craigslist. Even when direct buyer-to-owner interaction does not occur, buyers may surmise the previous owner's characteristics, such as when purchasing clothing in a thrift store. Thus, buyers can often draw inferences about used goods from information about previous owners. However, the consumer behavior literature has devoted little attention to understanding how consumers' intrinsic beliefs about previous owners' contaminants impacts their evaluations of used goods and their willingness to purchase these goods. The present research investigates individual differences in response to whether a good carries traces of previous owners, and also demonstrates how these beliefs determine purchase intentions in the secondhand marketplace.

This paper presents the argument that some consumers perceive transfer of the personality, residue, or "essence" of a previous owner into their used objects. For these highly residue sensitive consumers, the good might serve as a carrier for the previous owner's personality, whether this source is known or can be inferred from context. Delineating residue sensitivity can help explain consumer willingness to engage in commercial sharing systems, to lease, rent or borrow, and to buy pre-owned or refurbished goods.

This research develops and validates a scale measure of consumers' sensitivity to the "essence" or residue of another in a consumption object. The resulting residue

sensitivity scale measures the degree to which consumers perceive the residual taint of another consumer in property previously owned and used by others. The greater a consumer's residue sensitivity, the more likely the consumer is to gauge the desirability of a good based on perceptions about the source of previous ownership. However, the lower a consumer's residue sensitivity, the less likely a source's characteristics will influence judgments about secondhand goods. Less sensitive consumers might not sense residue in previously owned possessions. This paper suggests that residue sensitivity is a unique set of responses to prior owner contaminants. Moreover, these perceived contaminants impact consumer behavior above and beyond any direct effects of seller reputation, such as through inferences about a good's quality (Gilkerson & Reynolds, 2003; Ou, Abratt & Dion, 2006).

Finally, this work establishes the utility of a scale concerned with consumer residue in used goods. Residue sensitivity is related to such constructs as disgust, contamination, and possession attachment, but it also differs in ways important to consumer behavior, as discussed in this work. Five studies document the process of scale construction and outline the scale's convergent and discriminant validity, thereby revealing the nomological network in which residue sensitivity is embedded. These studies also illustrate the scale's predictive validity for decisions in consumer contexts.

Theoretical Development

Disgust and contaminants

Adaptations that enhance survival chances can become ingrained responses that set the stage for modern, individual personality differences. As a universal emotion

existing in every culture, disgust and the approach- or avoid-response to disgusting objects originated as just such an adaptation. Humans feel disgust—a basic human emotion—in a wide range of settings (Rozin, Lowrey & Ebert, 1994; Angyal, 1941). Research on evolutionary psychology has suggested that disgust facilitates individuals' survival. Feeling disgust leads people to reject contact with entities that carry pestilence and disease, including objects near or touched by insects and feces (Rozin et al., 1986; Rozin & Fallon, 1987). Many lower organisms feel disgust upon encountering harmful foods, diseased conspecifics, or other physically contaminated entities (Angyal, 1941), but humans' feelings of disgust go even further. Human disgust can also stem from sources that are only morally or socially unacceptable (Olatunji & Sawchuk, 2005; Nemeroff & Rozin, 1994; Rozin & Singh, 1999; Saad & Gill 2000). For instance, people feel disgust when they are presented extremist ideology or other societal and moral taboos (Rozin, 1999). Thus, although the primeval purpose of disgust was to trigger avoidance of physical contaminants, humans have generalized this reaction to conceptual contaminants of various types.

Humans have also generalized a principle that is part of the disgust emotion: the “magical law of contagion.” According to this principle, as described in the associative model of contamination, once a potentially contaminating source has touched an object, organisms perceive that the target object now and forever carries the source's taint (Rozin, Millman & Nemeroff, 1986). That is, as a contaminating source comes into contact with an entity, whether a person or object, the source passes on its “essence” to the target entity (Nemeroff & Rozin, 1994; Rozin, et al., 1986; Rozin & Fallon, 1987; Rozin, 1999). For instance, people are unwilling to drink a glass of juice that was mixed

with a used but thoroughly washed fly swatter (Rozin & Fallon, 1987). Although this and other examples involve physical contamination, people also exhibit behavior consistent with the magical law of contagion for conceptual contaminants. For instance, people are unwilling to use a chair that was long ago owned by Hitler (Rozin et al., 1986).

The magical law of contagion also operates in consumption settings, influencing consumers' perceptions and judgments in a variety of ways. For example, consumer contaminants impact evaluations of objects touched in a retail environment (Peck & Wiggins Johnson, 2011; Jin, 2011). Touch largely enhances product perceptions for those who initiate the touch (Marlow & Jansson-Boyd, 2011; Peck & Wiggins Johnson, 2011), but an individual's touching of a product can also impact other consumers' evaluations of these products, and this indirect effect is more equivocal. If a product has been touched or perceived to be touched by unknown others (e.g., a blouse hanging in a dressing room), consumers are more likely to feel the product is now unclean and report lower purchase intentions (Argo, Dahl & Morales, 2006).

Past work on the associative model of contamination has also proposed that a positive source's associations can transfer into objects (Nemeroff & Rozin, 1994; Rozin, et al., 1986). People approach stimuli whose source is a loved one or a known, familiar, or attractive other. Accordingly, when the source of touch in a retail environment is positive, such as an attractive member of the opposite sex, purchase intentions rise (Argo, Dahl & Morales, 2008). Consumers similarly value goods previously handled by celebrities (Newman, Diesendruck & Bloom, 2011).

Consumer contamination is not limited to hygienic qualities; contamination from moral or social undesirables also occurs. Doleac and Stein (2010) conducted an online

auction in which a photograph depicted a hand holding an iPod for sale. They found that the iPod garnered 17 percent fewer inquiries when held by a dark-skinned hand than a light-skinned hand. The researchers theorize that this result was driven by seller reputation, or a lay belief that stigmatized individuals may be less forthcoming in negotiations or have owned lower-quality products. But social contamination may also have contributed to this result; contact with a race perceived to be stigmatized can impact a good's valuations through touch itself. In support of this assertion, consumers also undervalued a product handled by an owner with a visible tattoo—a societal taboo that incurs moral disgust (Nemeroff & Rozin, 1994; Rozin & Singh, 1999).

In sum, humans have an ingrained disgust module that activates in response to both physically and conceptually contaminating sources. A key principle of the disgust module—the magical law of contagion—also operates across positive and negative sources alike, and this principle sometimes influences consumers' perceptions and judgments. Thus, the basic disgust emotion is a broad feeling that occurs in response to negative contaminants, whereas the magical law of contagion is a principle that emerged from disgust, but which also figures in response to positive sources. Although the magical law of contagion has been shown in many settings, the current investigation focuses on its effect in consumers' perceptions of previously owned goods.

Consumers differ in the extent to which they perceive the residual taint or “essence” of another consumer in property previously owned and used by that person. As discussed above, this tendency to perceive owner residue occurs due to the more universal magical law of contagion, which in turn is driven by humans' ingrained disgust module. People differ in their feelings of disgust, because this adaptive module is

moderated by inherited genetic differences, socialization, and other individual differences factors (Buss, 1991). Likewise, the potential to see owner residue would differ across individuals. Still, residue sensitivity may be orthogonal to general disgust sensitivity for reasons identified later in this paper.

The research reviewed above has demonstrated that people contain properties that are perceived to invisibly transfer to goods. This essence can be good or bad, and can stem from observed touch (Doleac & Stein, 2010; Morales & Fitzsimons, 2007), or implied and imagined touch (Argo et al., 2006, 2008). These effects are substantively important to marketers, because consumer contamination can influence decision-making and product valuations, among other outcomes. Consequently, developing valid measures that can capture individual differences in product judgments would be useful to the field

Need for a Residue Sensitivity Scale

Although research has documented that people often perceive that others' essence is invisibly transferred to goods, measures that examine how people differ in their sensitivity to such transfer have not been developed. Sensitivity to residue might vary in ways that helps marketers understand how consumers respond to previously owned goods. Highly residue sensitive individuals might differ from less residue-sensitive consumers in their thought processes, judgments, and behavior around goods in which contaminants have potentially transferred from others.

A scale measure of residue sensitivity weighs responses to the subtle transmission of contaminating personality elements from a previous user of a consumption object to the good itself. The scale is focused on consumption settings in which goods were owned

and used by other consumers. As such, it is conceptually distinct from disgust sensitivity (Haidt, McCauley & Rozin, 1994), which only examines variations in response to overtly disgusting stimuli. Residue sensitivity is similarly distinct from perceived vulnerability to disease (Duncan, Schaller & Park, 2009). Although both perceived vulnerability to disease and residue sensitivity address transmission of unseen contaminants, residue sensitivity is focused on non-physical, non-germ taint transfer. In addition, residue sensitivity provides significantly different predictions in consumption-based scenarios than disgust sensitivity and perceived vulnerability to disease.

One goal of this work is to explore residue sensitivity's role in how consumers generate both evaluations and behavioral intentions concerning products, given information about potentially contaminating previous owners. Studies 2 and 3 will test the hypothesis that highly residue sensitive individuals react to the positive (negative) source of a used good by judging a secondhand object as more (less) desirable, thereby revealing more (less) interest in owning the good.

Constructs Related to Residue Sensitivity

Haidt et al.'s (1994) disgust sensitivity scale is widely applied in the psychology literature, but it has not been employed in past work on consumers' response to contamination. This scale charts defensive avoidance responses to intruding germs and social taboos, but its items are general (e.g., "You see a bowel movement left unflushed in a public bathroom") and may not apply to consumer behavior contexts. As a result, consumer behavior researchers studying contamination instead have used different questions (e.g., How dirty was the product?) or only a few of the 32 items in the Haidt et

al. (1994) scale to examine individual differences (Argo et al., 2006, Newman et al., 2011). A residue sensitivity scale would provide greater refinement for examining individual differences in response to consumer contamination.

Importantly, reactions to gross occurrences and outright disgusting physical pollutants differ qualitatively from responses to unseen contaminants that transfer inconspicuously from consumer to possession. Thus, residue sensitivity is expected to lack correlation with disgust sensitivity. Relative to disgust sensitivity, residue sensitivity is also expected to have greater predictive power on consumer behavior outcomes involving transfer of subtle properties.

A related construct, perceived vulnerability to disease (Duncan et al., 2009) charts a chronic concern about transmission of diseases and pathogens (e.g., “I prefer to wash my hands pretty soon after shaking someone’s hand”). High vulnerability perception individuals often focus on contagions; they have a heightened awareness of the transfer of germ traces from people to objects. Highly residue sensitive individuals perceive alterations of products by previous ownership, arguably because these individuals sense a transferability of personality traits akin to the transferability of contagious germs. Consumers with greater residue sensitivity are thus expected to have greater perceptions of disease vulnerability. Perceptions of disease vulnerability are based on transfer of germs from a source to a secondary source or object and involve beliefs about disease transmission. These perceptions are thereby more related to residue sensitivity than a broader, more visceral affective response to disgusting stimuli. However, disease vulnerability is not anticipated to predict consumer behaviors in the same way residue sensitivity would. Individuals who have more perceptions of disease vulnerability may

acknowledge that invisible pathogens can transfer into objects, but they may not focus on the transfer of subtle personality associations through contagion.

Residue sensitivity might also bear a relation to possession attachment, or the bonds between owners and their goods. High attachment individuals distinguish owned goods as de-commodified and imbued with essences that are special and private (Ball & Tasaki, 1992; Kleine et al., 1995; Kleine & Baker, 2004). Highly attached consumers may perceive items as being altered by prior ownership, and thus their perception of a good may be influenced by information about prior owners. In this way, greater residue sensitivity can be expected to correlate with measures of greater attachment. However, high attachment is not anticipated to impact evaluations and purchase intent of goods in a secondhand marketplace, because the construct deals exclusively with attachment to one's own objects.

This paper will explore these and other relationships to constructs important in marketing to reveal how residue sensitivity both converges and remains distinct from related variables in consumer psychology. Further, this work demonstrates residue sensitivity's utility in marketing research concerned with buyer and seller interactions.

Scale Development

Scale item generation

To ensure content validity (Hinkin, 1995, 1998), scale construction began with an extensive review of the literature on disgust, possession attachment, extension of self, endowment, gift-giving, sharing behavior, and social norms involved with possessions.

Scale item generation also emerged in informal brainstorming and formal research feedback from consumer behavior colleagues, resulting in a list of 43 items (see Appendix A).

These 43 items were tested in studies both in the lab and via random-intercept, with participants approached on campus. Items were both forward- and reverse-coded to ensure consistent responses to the scale. During item purification, the 43-item scale was subjected to factor analysis and inter-item correlations to produce a 4-item scale.

The primary goal in studies 1A, 1B, and 1C was to produce a short and reliable version of the residue sensitivity scale and to verify the construct, via factor analysis. The secondary purpose was to explore the nomological network in which residue sensitivity resides, by establishing convergent and discriminant validity with existing constructs. Studies 2 and 3 showed that the scale has predictive power above and beyond other constructs.

Study 1A: Scale Purification

Method

Participants. Responses to 43 original items generated for scale development were collected from a sample of 148 students at a southwestern-U.S. university (49.6% female, mean age = 20.4).

Procedure. Participants were approached on-campus at popular gathering spots by a pair of trained research assistants. Participants were asked to volunteer a few minutes for a paper survey containing the 43 items (see Appendix A), each measured on a

scale of agreement (1 = strongly disagree and 7 = strongly agree). Participants also responded to brief demographic questions.

Results

Bartlett's test of sphericity ($\chi^2(171) = 232.43, p < .05$) and the Kaiser-Meyer-Olkin measure of sampling adequacy (.55) indicated that the data were appropriate for factor analysis. Principal components factor analysis with no rotation revealed six factors, each with eigenvalues greater than 1. However, the scree plot showed a distinct demarcation between factors 1 and 2 through 6. Items loaded highly (greater than .50) on factor 1, which explained 14.94% of the variance (see Table 1). Testing these items for scale reliability revealed a Cronbach's alpha of .72. The other five factors explained less than 10% of the variance each, as indicated by the scree plot. Items in these five factors that exhibited either weak main loadings (less than .40) and/or substantial cross-loadings (greater than .30) were deleted from each factor. Reliability tests on the items that remained in each of these factors yielded low coefficients ($\alpha < .40$ in each case). These results indicate that the other components were not suited to clearly and consistently measure the construct.

Discussion

The resulting 4-item, single-factor solution that emerged via factor analysis in Study 1A (see Table 1) is a refined version of the 43-item scale that meets the goals of parsimony and elegance in scale construction (Hinkin, 1988). High item loadings and an

acceptable Cronbach's alpha also reveal that these four items are attuned to the construct of residue sensitivity, though further testing will help confirm these initial findings.

Study 1B: Convergent and Discriminant Validity

Study 1B had two goals: (1) to verify that the residue sensitivity scale was reliable and valid in new samples, and (2) to chart the convergent and discriminant validity of the construct.

Method

Participants. Data were collected from four additional samples: Sample A with 97 students (100% female, mean age = 22.9); Sample B of 130 students (49.2% female, mean age = 22.3); Sample C with 106 U.S. adults participating via an online panel on Amazon's mTurk (59.4% female, mean age = 43.5); and Sample D, with 150 U.S. adults from Amazon's online panel (58% female, mean age = 36.9). Both samples A and B were collected in traditional lab settings, with participants recruited for class credit.

Procedure. Each sample responded to different sets of scales as time allowed. Samples A and B responded to all 43 items and a battery of theoretically related and unrelated scales. Disgust sensitivity (Haidt et al., 1994), perceived vulnerability to disease (Duncan et al., 2009), social desirable responding (Paulhus, 1991), and the International Personality Item Pool Five-Factor Model measure (Donnellan, Oswald, Baird, & Lucas, 2006) were tested in Sample A. In Sample B, time allowed for collection of responses to Paulhus' social desirable responding scale, the five-factor personality scales, Ball & Tasaki's (1992) attachment scale, disgust sensitivity, and cultural

dimensions (Singelis, Triandus, Bhawuk & Gelfand, 1995). Samples C and D did not respond to all 43 items, but to only the four items selected for the residue sensitivity scale. Sample C did not respond to any other scales, but reported demographics, and Sample D responded to all of the above scales and to Higgins' (1998) promotion and prevention scale.

Results

In each sample, Bartlett's test of sphericity (significant at $p < .001$ in each of the four samples) and Kaiser-Meyer-Olkin measures of sampling adequacy (ranging from .65 to .80 over four samples) indicated that factor analysis was appropriate. Principal components with no rotation again revealed the most compelling exploratory factor analysis solution for these samples. In sample A, four usable items emerged (see Table 1) with high factor loadings and a Cronbach's alpha of .62. In samples B-D, loadings were also high on the same four items, resulting in a Cronbach's alpha of .75, .89 and .87, respectively.

The 39 other items grouped into 4-5 other factors in Samples A and B, each with eigenvalues greater than 1 but explaining less than 10% of the variance in responses. Examination of the scree plots in Samples A and B again showed a distinct elbow or demarcation after factor 1, much like in Study 1A. A combination of weak or low loadings (less than .40) and substantial cross-loadings (greater than .30) and low reliability coefficients ($\alpha < .45$ in each case) also render the other components untenable for use; these other items do not consistently tap the construct, confirming the conclusions of Study 1A. In contrast, the four usable items emerged in Samples A-D with

predicted high loadings on the single factor, and acceptable reliability (see Table 1).

These four items are thereby used exclusively to form the residue sensitivity scale. All further analyses of residue sensitivity and its effects are based on this four-item scale.

INSERT TABLE 1 HERE

Demographics. Correlation analyses indicated that demographic variables, such as age, gender, and ethnicity, were not significantly related to residue sensitivity (see Table 2). The lack of a relationship between socio-economic background and residue sensitivity is enlightening, because one might surmise that people reared in lower income households would have been more regularly exposed to used goods and the secondhand marketplace, and as a result they might be more conditioned to overlook personality essences in goods. Females have also been found to have stronger disgust reactions (Haidt et al., 1994), but still no gender differences emerged on residue sensitivity. The lack of residue sensitivity's relationship with such variables clarified that residue sensitivity is distinct from disgust reactions, and is consistent with the interpretation that residue sensitivity measures reactions that are more multi-faceted than just socialization or desensitization via family upbringing.

Residue sensitivity was negatively correlated with age in two samples and was negatively correlated with education in one sample (see Table 2). There were no such effects with student-based samples (A and B), most likely due to small variance in education levels and ages. However, these correlations were not anticipated and do not appear to impact the definition and refinement of the residue sensitivity construct.

INSERT TABLE 2 HERE

Discriminant validity. Correlations between residue sensitivity and (a) disgust sensitivity and (b) social desirable responding were examined to test for discriminant validity. Throughout the samples, the disgust sensitivity scale (Haidt et al., 1994) was nonsignificantly related to residue sensitivity (see Table 2). This provides evidence that residue sensitivity— a response to perceptions of subtle contaminants transferred from person to object— is distinct from a broader, more emotion-laden sensitivity to overtly disgusting stimuli.

There were likewise no significant correlations with the Paulhus (1991) balanced inventory of desired responding, which reveals that a residue sensitive response is not a socially desirable response. Neither the impression management nor the self-deceptive enhancement subscales (see Table 2) of the social desirable responding scale were correlated with scores on residue sensitivity.

Correlations with the International Personality Item Pool Five-Factor Model measure (Donnellan et al., 2006) revealed no significant relationship between residue sensitivity and extraversion, agreeableness, openness, or conscientiousness. Thus, Study 2B confirmed that residue sensitivity is unrelated to salient personality traits that may result in merely agreeable responses to scale items.

Convergent validity. As a new construct, residue sensitivity should be grounded with other similar scales to establish its place among pre-existing psychological measures. To verify convergent validity, correlations were analyzed to test predictions that sensitivity to residue would be related to both (a) notions of possession attachment and (b) perceptions of the transferability of germs and diseases.

Possession attachment (Ball & Tasaki, 1992) was positively correlated ($r = .24$, see Table 2) with residue sensitivity, indicating that seeing one's owned objects as distinct contributes to seeing others' objects as potential carriers for their owners' personality.

The infectability subscale of perceived vulnerability to disease (Duncan et al., 2009) deals specifically with people's perceptions of their susceptibility to colds and diseases. High-scorers in infectability are those who worry their immune systems are not good barriers to transfer of infectious agents. The significant correlation with residue sensitivity ($r = .20$, see Table 2) was expected because of heightened awareness of the transfer of contaminating agents from person to person and person to object. However, a predisposition to dwell on the transfer of disease-bearing germs from another does not translate to interactions with consumer goods in the future studies described in this paper.

Discussion

The 4-item, single factor structure of residue sensitivity was confirmed via factor analysis on four distinct samples in Study 1B. Correlations to test for convergent and discriminant validity also revealed residue sensitivity's place in the literature.

The correlations charted in Table 2 showed that variation in sensitivity to the residue another consumer leaves behind in an object can be tied to some basic psychological traits. But importantly, neither attachment nor perceived vulnerability to disease were strongly correlated with residue sensitivity (each $r < .25$) and neither yield the same predictions as residue sensitivity in forthcoming study 2. Though the correlations helped reveal the construct's position in the nomological network, future

studies will show they do not usurp the predictive power of residue sensitivity and its unique contribution to the study of consumer behavior.

Study 1C: Confirmatory factor analysis.

Method

Participants. Data were collected from 134 students (53.7% female, mean age = 20.7) approached on campus by a team of two researchers.

Procedure. As in Study 1A, participants were recruited in public campus spaces to fill out a brief survey. Participant age ranged from 18 to 40. Participants filled out the 4-item residue sensitivity scale, with each item measured on a scale of agreement (1 = strongly disagree and 7 = strongly agree for each). They also responded to demographic questions.

Results

A path model in AMOS showed 4 scale items and their error variances predicting the construct of residue sensitivity. A test for goodness of fit with the hypothesized path model revealed a non-significant chi-square of 16.22 ($p = .24$, $df = 13$) and gave the first indication that the data collected fits the model. However, because chi-square is less sensitive with larger sample sizes, other fit indices were consulted to verify this preliminary conclusion. These fit indices provided a more firm basis to conclude that the results of this study were consistent with the assumed model (see Table 3). The goodness of fit (GFI) was .97 and the normed fit index (NFI) was .96, both above the generally accepted .95 level to indicate good fit (Schumacker & Lomax, 2004). All standardized

path coefficients in the model, ranging from .53 to .83, were also highly significant ($p < .001$, see Table 4).

INSERT TABLE 3 HERE

INSERT TABLE 4 HERE

Discussion

The focus of Studies 1A-1C was on testing and validating a scale of sensitivity to residue in possessions. To explore the factor structure of the 43 items generated for testing, studies 1A and 1B relied on exploratory factor analysis. Study 1C used a distinct sample and the structural equation modeling software AMOS to confirm the factor structure. The result was a 4-item scale measure of residue sensitivity that is reliable and valid in showing predicted relationships to constructs.

Six samples present converging evidence that residue sensitivity is a consistently reliable, valid, and distinct construct. However, this research has yet to show residue sensitivity's unique contribution to predicting consumer behaviors. Studies 2 and 3 will illustrate how consumers highly sensitive to residue shift their judgments of secondhand goods according to information about the source of prior contact, whereas those less sensitive to residue are less impacted by such information.

Study 2: Firefighter vs. deadbeat dad

Study 2 highlighted the predictive power of residue sensitivity while testing Nemeroff and Rozin's (1994) associative model of contagion. Does residue sensitivity predict differential judgments of target objects that stem from positive versus negative sources? If the associative model of contagion holds, the source's valence should drive

responses for those who are more sensitive to contagion. Demonstrating that residue sensitivity moderates consumers' judgments would also indicate that consumers are impacted by their perception of the seller's contamination, and they do not merely consider the seller's reputation.

Drawing on the definition of residue sensitivity, consumers high in residue sensitivity are hypothesized to respond to the valence of a source of a used good, evaluating products once owned and used by another as more (less) attractive if the source is positive (negative). Consumers low in residue sensitivity, however, are hypothesized to show less pronounced or no sensitivity to the valence of a source of contamination in their evaluations. That is, the valence of a source is anticipated to make little to no impact on less residue-sensitive individuals' perceptions of owner personality transfer. The interaction of residue sensitivity with valence of a source is hypothesized to drive intentions to purchase a used good.

Study 2 involved a scenario in which the previous owner's identity was salient. Further, the previous owners were described as clearly positive or negative in their personal characteristics. If in this context residue sensitivity moderates the effect of owner reputation on purchase intentions, then the effects are unlikely to be driven by differences in the detection of positive and negative owner characteristics, which were made to be very transparent.

Method

Participants. Two hundred and twenty-seven students (38% female, mean age = 20.1) participated in the study in return for class credit at a southwestern-U.S. university.

They were randomly assigned to a 2-cell (valence of source: positive vs. negative) between-subjects design, with measured residue sensitivity also included as an independent variable.

Procedure. Participants seated at individual computer stations in the lab first read a scenario about an auction and viewed a photo of a vintage bowling bag. The type of source varied by condition, but the auction was described in both conditions as “a public charity auction.”

“At a public charity auction downtown, you see a stylish bowling ball and matching bag for a great price that you want to buy. You notice initials sewed on the bowling bag, and find out the bag was donated to the charity after *police seized it from the property of a deadbeat father who never paid child support (after it was donated by a local fireman).*”

Prior contact was manipulated through variations of the source of the bag in the scenario; the bowling bag was either donated by a fireman (positive source) or it was repossessed from a father who failed to pay child support (negative source). As the key dependent measure, participants indicated on a 7-point scale (1 = very unlikely, 7 = very likely) how likely they would be to place a bid on the bowling bag. Participants then responded to demographics and the residue sensitivity scale (4 items, 1 = strongly disagree, 7 = strongly agree), as well as Ball & Tasaki’s (1992) attachment scale and the Perceived Vulnerability to Disease scale (Duncan et al., 2009).

Results

The 4-item residue sensitivity scale yielded an acceptable reliability ($\alpha = .78$), confirming results from Study 1 samples. The key dependent measure, likelihood of bidding, was regressed for simple slope analyses with independent variables (i) manipulated source of the secondhand item (i.e., firefighter vs. deadbeat-dad), (ii) residue sensitivity, and (iii) their interaction. Source condition revealed a significant main effect ($F(1, 225) = 7.04, p < .01$); participants were more likely to bid on the firefighter's bag than on the deadbeat-dad's bag. Residue sensitivity did not, in this study, exhibit a significant main effect ($F(1, 225) = 1.33, p = .11$).

Further, these results were qualified by the predicted interaction in the simple slope regression ($\beta = .26, t(223) = 3.27, p = .02$), which reveals the role of residue sensitivity in consumer response to the perceived source of a secondhand item. The slope of residue sensitivity was significant and positive when the source was the positive firefighter, whereas the slope of residue sensitivity was significant and negative when the source was the negative deadbeat-dad. A spotlight analysis at one standard deviation above the mean of residue sensitivity showed a significant effect of source condition such that high residue sensitive consumers desired the product more when the source was the positive firefighter versus when the source was the negative deadbeat-dad ($\beta = -.17, t(223) = 2.92, p = .05$). In comparison, this effect of source condition was relatively muted at one standard below the mean of residue sensitivity ($\beta = .15, t(223) = 1.62, p = .11$).

Analyzing a median split on residue sensitivity further helped reveal the effect's pattern (see Fig. 1). Highly residue-sensitive participants desired the firefighter's bag (M

= 3.86) more than the deadbeat-dad's bag ($M = 2.62$), whereas source condition did not significantly affect the less residue-sensitive participants' evaluations ($M_{\text{positive}} = 3.15$ vs. $M_{\text{negative}} = 2.98$). Notably, this finding goes above and beyond seller reputation effects, which should not vary according to participants' residue sensitivity. The interaction with residue sensitivity reveals that these results are driven by a response to the transfer of contaminants from a negative previous owner into an object.

INSERT FIGURE 1 HERE

To test the extent to which the residue sensitivity scale makes unique predictions relative to the related constructs of attachment and perceived vulnerability to disease, the same regression model (described above) was analyzed with those scales in place of residue sensitivity as a predictor of likelihood of bidding. Importantly, neither attachment nor disease vulnerability perceptions replicated these results; the regression interaction of the scale with source manipulation was not significant for either scale ($F < 1$ and $p > .3$ for both). In addition to the weak correlation values observed in Study 2B, this confirms the distinct predictive power of residue sensitivity.

Discussion

Study 2 demonstrated that those who are sensitive to the residue another consumer leaves behind in a used good respond to the source of such residue when weighing secondhand purchase decisions. Highly residue-sensitive individuals respond to the associative model of contamination, reacting as if positive or negative associations are carried from the former user into his or her object. Those who are low in residue

sensitivity do not show such a contaminant-driven response to the used good based on the valence of the previous owner.

In Study 2, participants explicitly learned that the previous owner had positive or negative characteristics. Demonstrating the hypothesized effects in a context in which the previous owner's characteristics were relatively salient ensures that the effects are not driven by differences in the detection of owner characteristics. Moreover, this context maps on to other settings in which the owner's characteristics are likely to be easily learned, such as face-to-face interaction in a yard sale. Study 3 seeks to extend these findings by testing the extent to which these effects hold when the characteristics of the previous owner are only implicitly conveyed. In addition, Study 3 employed a mock online used-good advertisement, such as those found on eBay, to generalize results to another secondhand marketplace setting consumers often encounter.

Study 3: Tattooed Source

Method

Participants. Ninety-seven undergraduates (46 male, mean age = 21.1) participating for class credit at a southwestern-U.S. university were randomly assigned to a 2-cell (personality traits salient: ideal vs. non-ideal) between-subjects design, with measured residue sensitivity included as another independent variable.

Procedure. Participants at individual computer stations in the lab first viewed an image of a Nintendo Wii video game controller for sale in a mock online classified advertisement that resembled a Craigslist.org advertisement. Such game controllers are

often sold separately in stores for Nintendo owners seeking to complement their gaming systems.

In Study 2, source valence was manipulated by using different sources – one explicitly positive, the other explicitly negative. In Study 3, the source was the same for both conditions (a single image of a hand with a tattoo), but the valence of the source's traits were manipulated via experimental framing. Study 3 employed a mock-online advertisement and showed a light-skinned hand with a wrist tattoo holding the object for sale, as a source of negative (moral) taint (Rozin & Singh, 1999; Doleac & Stein, 2010). All participants viewed the photo containing a hand, tattooed on the wrist with a skull, flames, and crossed-swords, holding a Nintendo Wii video game controller.

Participants viewed the image, then were asked to assess their views on the gameplay the Wii remote offers. Source valence was manipulated by varying the adjectives participants encountered when evaluating gameplay with the game controller. Coding of an open-ended pretest among a panel of non-student U.S. adults (N = 106) revealed agreement that the most commonly listed positive trait for people with tattoos was “exciting,” and the most commonly listed negative trait for people with tattoos was “unreliable/unprofessional.” In four separate questions in the ideal-traits (positive) condition, participants were asked to consider if gameplay with this controller would be: “exciting,” “intense,” “boring,” and “tedious.” Such questions were anticipated to draw attention to the positive associations with tattooed people and their personality traits. Participants in the non-ideal-traits (negative) condition, instead, evaluated if gameplay with the controller would be “reliable,” “smooth,” “refined,” or “violent.” Such questions

were expected to draw attention to the negative associations with the traits of tattooed individuals.

These questions about how enjoyable a secondhand good is when offered by a tattooed owner were anticipated to impact traits that those more sensitive to residue summon when judging how much interest they have in owning the object. Framing non-ideal-stereotype traits was hypothesized to negatively impact the interest of highly residue sensitive consumers in owning the object, whereas framing ideal-stereotype traits of tattooed individuals was expected to positively impact highly residue sensitive consumers' interest in owning the object.

After evaluating the game controller on the dimensions (above) that varied by condition, participants then rated how willing they were to purchase the game controller before responding to the 4-item residue sensitivity scale and demographic questions.

Results

The 4-item residue sensitivity scale was again reliable ($\alpha = .75$). Interest in owning the game controller was regressed via simple slope analyses on (i) residue sensitivity (ii) ideal-traits vs. non-ideal-traits condition, and (iii) their interaction, controlling for how often consumers report playing video games. Residue sensitivity yielded a significant main effect on the dependent variable ($F(1, 95) = 3.69, p < .05$), with less residue sensitive participants showing more interest in owning the used good regardless of source traits perceptions. The traits condition also yielded a significant main effect on interest in owning ($F(1, 95) = 2.13, p < .05$), with consumers overall showing

more interest in the used object when more ideal traits were made salient via evaluation (i.e., “exciting” and “intense.”).

These results are further qualified by the hypothesized significant interaction in the simple slope analyses ($\beta = .89, t(67) = 2.51, p = .01$). The results showed a significant two-way interaction between residue sensitivity and the ideal or non-ideal framing of the source. The slope of residue sensitivity was significant and positive when the source was framed with ideal traits, whereas the slope of residue sensitivity was significant and negative when the source was framed with non-ideal traits. A spotlight analysis at one standard deviation above the mean of residue sensitivity showed a significant difference such that high residue sensitive consumers desired the product more with an ideal traits evaluation versus a non-ideal traits evaluation ($\beta = -.24, t(67) = 3.65, p = .03$). A spotlight at one standard deviation below the mean of residue sensitivity, however, yielded no significant difference based on condition ($\beta = .04, t(67) = 0.97, p = .23$).

Analyzing a median split on residue sensitivity via an analysis of variance helped reveal the effect’s pattern (see Fig. 2). Highly sensitive participants showed more interest in owning the item when the tattooed source’s traits were framed more ideally (e.g., “exciting,” $M = 2.43$) vs. less ideally (e.g., “reliable,” $M = 1.67$). Less sensitive participants showed little differentiation, regardless of how the source’s traits were framed ($M_{\text{ideal-traits}} = 2.84$ vs. $M_{\text{nonideal-traits}} = 2.70$). Thus, framing perceptions of a source’s personality traits influenced those who were sensitive to the residue of another consumer in an object previously owned and used by another consumer. The interaction with

residue sensitivity revealed, as in Study 2, that response to transfer of residue, and not merely seller reputation, drove these results.

INSERT FIGURE 2 HERE

Discussion

Studies 2 and 3 demonstrated that the valence of a source of a used good, whether implicit or explicit, interacts with residue sensitivity to determine evaluations and purchase intentions in the secondhand marketplace. Highly residue sensitive individuals respond to the transfer of essence from positive sources (or sources framed positively) with higher interest in owning, and similarly respond to the contaminating properties of negative sources (or sources framed negatively) with lower evaluations and interest in owning. Low residue sensitive individuals, however, are less responsive or unresponsive to a source's contaminants when evaluating previously owned goods.

Together these studies reveal a pattern for goods previously used and owned: The source of used objects impacts the judgment of consumers who are more sensitive to the residual essence of others in consumer goods.

General Discussion

The construct of residue sensitivity distinguishes between consumers who are more likely to perceive and respond to the "essence" or contamination of a previous user in their former possessions and those who are less likely to perceive such personality transfer of past owners. Residue sensitivity builds on the evolutionary module of avoidance responses to disgusting stimuli yet adds an individual difference measure that is not captured in sensitivity to overt, disgusting objects (i.e., Haidt et al., 1994). The

theory of consumer contamination (Argo, Dahl & Morales, 2006, 2008) posits that disgust responses drive desirability of certain products once touched by others in a retail setting. Residue sensitivity moves beyond mere touch and simple disgust. It is a marketplace adaptation that emerges when some consumers sense the transfer of contaminating associations and essences (whether positive or negative) from a previous owner and user into a secondhand or refurbished good. The construct holds promise for the study of consumer behavior: Two studies show that residue sensitivity might predict ways of thinking and behaving in a host of consumer contexts involving secondhand goods.

In the specific domains tested in this research, differences in behavioral outcomes are telling. Those more sensitive to residual properties in objects treated the objects in markedly different ways from those who are less sensitive to residual taint, judging the same good as less desirable depending on their perceptions of taint transfer from a source of prior contact. This research demonstrates in five studies that some consumers are more sensitive to the residual essence or personality of a previous owner or user, whereas others tend to be less sensitive to sense such transfer. A reliable, 4-item residue sensitivity scale was created, and it is shown that those who score high on this scale are more sensitive than low scorers to previous owners' trace contaminants and are also less willing to purchase goods from negatively perceived previous owners.

The scale is also conceptually linked to attachment and perceived vulnerability to disease, yet distinct from disgust sensitivity. The nomological network examined in this work grounds residue sensitivity in the literature on both the transferability of contagions and the specialness that meaningful possessions can have. However, the weak nature of

such correlations (less than $r = .25$) shows that such concepts are associated with residue sensitivity, but that residue sensitivity is quite distinct from previously established constructs. As well, important to this work, pre-existing constructs such as attachment and perceived vulnerability to disease do not predict responses to sources of used goods in the studies examined here. Thus, the residue sensitivity scale may supplant these other scales in future consumer behavior research involving secondhand goods.

The findings in this work are not limited to the secondhand marketplace, though they rely on the commonplace events of used-goods exchange as testing grounds. The results documented here extend to any setting in which consumers encounter goods once used and owned by another, from inherited items and interpersonal sharing among friends and neighbors to commercially organized sharing systems and donation centers. Any setting in which consumer behavior can be routed by the need to avoid negative contaminants of unknown others or approach positive taint of attractive others could be impacted by the phenomena demonstrated in the present work. As such, residue sensitivity may also provide theoretical insights into literatures on sharing (Belk, 2010), services marketing (Berry, 1991) and possession attachment (Kleine, Kleine & Allen, 1995), and the scale could appropriately be employed in these research domains.

The residue sensitivity scale may also be applied to predict consumers' response to items that are regularly touched and re-used in service settings (e.g., hotel towels, hospital sheets, restaurant dishes, etc.). Consumers high in residue sensitivity might respond to residue left by previous users of an object, even if those users never owned the object. On the other hand, it is possible that the extreme anonymity of previous users in service settings effectively obscures any effect of user residue. Consumers may be

motivated to ignore signs about prior usage due to willful ignorance of undesirable information (Ehrich & Irwin, 2005), and this limited information search may minimize essence transfer.

Another potential application might be residue sensitivity's impact on consumers' decisions to dispose meaningful objects. For instance, when consumers consider bequeathing items to heirs (Price, Arnould, & Curasi, 2000) or contemplate whether to trash, store, or donate no-longer-useful items (Naylor, 2006; Haws, Naylor, Coulter & Bearden, 2011), such decisions may hinge on their perception of whether their own personalities have rubbed off onto these items. Further study on the relationship between residue sensitivity and attachment may help explain other behavioral tendencies. If highly residue sensitive individuals also become more easily attached to goods, they may be more likely to exhibit packrat or hoarding behavior (Coulter & Ligas, 2003; Haws et al., 2011).

An enhanced understanding of the residue sensitivity construct is also important. Specifically, it is unclear what individuals low in residue sensitivity perceive when they assess a previously handled good: Do they sense consumer residue but are not impacted by it in their judgments, or do they see merely the depreciation of the object and attend to seller reputation? Similarly, the mechanism by which owner residue impacts consumer behavior is still unknown and worthy of further study.

Future research might explore the moderating conditions of differences in residue sensitivity on perceived essence transfer. It is possible that because some product domains involve very intimate touch between owners and the object, sensitivity to a previous owner's potential residue may be very high across all individuals in these

domains. Indeed, a majority of participants in an open-ended pretest of 101 undergraduates at a large northeastern university revealed that the top “things I would never buy used,” following used underclothing, were dishes, utensils and bedding. Conversely, objects that were previously owned but used at a distance (e.g., wall decorations) might exhibit very low perceived essence transfer for all consumers. Essence transfer might be impacted by the moderating role of various product-related differences, such as the object’s identity relevance (Berger & Heath, 2007), or the length of prior ownership (Novemsky & Kahneman, 2005). These and other product differences may simply shift the level of perceived residue transfer across all individuals, or they may interact with residue sensitivity in predicting behavioral outcomes.

Differences in purchase settings or purchase occasion may also moderate the effects of residue sensitivity. For instance, perceived essence transfer may differ by whether the purchase is made only for oneself or as an item to be gifted to another or shared with others. Perhaps an owner’s identity becomes diffused when the buyer contemplates known others using the same object. Essence transfer may also differ in its effect on consumer behavior in different secondhand markets. Settings such as antique shops and trendy thrift stores might capitalize on prior owners’ residue as a hallmark of style or taste, whereas clothing consignment stores and Goodwill shops might fare better downplaying the source of their used goods. Taken together, identifying residue sensitivity opens up new avenues for further research on various consumer behavior phenomena.

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measurement refinement. *Cross-Cultural Research: The Journal of Comparative Social Science*, 29 (3), 240-75.

Appendix A: 43-items tested to create scale (Study 1)

1. I enjoy a possession more if it has been shared with my favorite people.
2. A professional athlete's game-worn jersey is no different than anyone's jersey.
3. Something I own gains value if others also use it.
4. I don't see any difference between possessions inherited from family members and any other object I own.
5. I value possessions that were once owned by friends or family.
6. I handle gifts with extra attention and care.
7. Art is best when it reminds me of the artist who created it.
8. I place no special value on objects owned by my favorite celebrities.
9. I keep some items that remind me of people even when I no longer use the item.
10. Family heirlooms can also be shared with people outside the family.
11. I have special keepsakes that I don't want others to touch.
12. If I had a falling out with someone, I would still use any gifts that person gave me.
13. I would not mind living in a house where the last occupant died.
14. It's bad luck to buy an engagement ring previously worn by a divorced woman.
15. If I found a pair of sunglasses and could not track down the owner, I would wear them myself.
16. I have no problem reading the same copy of a book a patient once read in the hospital.
17. I would never buy the display version of a product, because too many customers have touched it.
18. I would be less comfortable in my apartment if I learned that the previous occupant was an alcoholic.
19. If I bought a used couch from a stranger, I would have to wash it right away.
20. After used products are cleaned and refurbished, they are as good as new.
21. I would never want to wear a pair of used jeans from a secondhand clothing shop.
22. Used goods are dirty.
23. I would not give friends my old possessions, because they might think that's gross.
24. I would not want to wear a jacket a convicted murderer once wore.
25. Cars remind me of their owners.
26. I never think of who gave me something when I am using it.
27. Objects take on the characteristics of the people who own them.
28. The more someone uses something, the more it becomes their item.
29. The only reason used furniture costs less is depreciation.
30. A possession once owned by someone else takes on the quirks of its former owner.
31. A possession's value only comes from how useful it is to me.
32. I don't find qualities in my possessions that weren't manufactured.
33. Possessions don't take on personalities.
34. A clean, used leather jacket is the same as a new one.
35. It doesn't matter to me who owned a used good before I bought it.
36. Second-hand sports goods only cost less because their value declines from use.
37. People transfer their essence into the goods they use.
38. A second-hand book is just like a new book, only older.
39. Hand-me-down clothes remind me of their original owner.
40. A gently-used object is almost as good as a brand-new object.
41. A product is only worthwhile if it is not broken.
42. A home appraisal doesn't capture its true worth to the family that lived there.
43. I only value what I can touch and see in a possession.

Appendix B: Tables & figures

Item	Study 1A	Study 1B, Sample A	Study 1B, Sample B	Study 1B, Sample C	Study 1B, Sample D
<i>Possessions don't take on personalities.</i>	-0.65	-0.69	-0.84	-0.82	-0.83
<i>Objects take on the characteristics of the people who own them.</i>	0.77	0.52	0.83	0.76	0.92
<i>People transfer their essence into the goods they use.</i>	0.69	0.63	0.77	0.89	0.93
<i>A possession once owned by someone else takes on the quirks of its former owner.</i>	0.68	0.58	0.53	0.85	0.75
Cronbach's alpha	0.72	0.62	0.75	0.89	0.87

Measure	Sample A, n = 97	Sample B, n = 130	Sample C, n = 106	Sample D, n = 150
<i>Demographics</i>				
Religiosity	--	--	--	$r = -.08$
Family income	$r = -.08$	--	--	$r = -.05$
Gender	--	$t = -1.57$	$t = -.46$	$t = 1.15$
Age	--	--	$r = -.14$	$r = -.18^*$
Education	--	--	--	$r = -.19^*$
<i>Discriminant validity</i>				
Disgust sensitivity	$r = .11$	$r = .07$	--	$r = .04$
Impression management	$r = -.14$	$r = .05$	--	$r = .10$
Self-deceptive enhancement	$r = -.17$	$r = .06$	--	$r = -.13$
<i>Convergent validity</i>				
Attachment	--	$r = .24^{**}$	--	--
Perceived vulnerability to disease (infectability)	$r = .20^*$	--	--	$r = .20^*$
<i>Personality</i>				
Extraversion	$r < .001$	$r = -.12$	--	--
Agreeableness	$r = .05$	$r = .06$	--	--
Openness	--	$r = -.11$	--	--
Conscientiousness	--	$r = .10$	--	--
Neuroticism	$r = .21^*$	$r = .18^*$	--	$r = .05$
<i>Note: Correlations marked with * are $p < .05$, and with ** are $p < .01$.</i>				

Fit index	Value for model
Chi-square	16.23, $p = .237$
NFI	0.96
GFI	0.97
AGFI	0.93
RFI	0.91
IFI	0.99
TLI	0.98
CFI	0.99
NCP	3.22
RMSEA	.043

Path	Standardized estimate	p -value
RS1 <--- Residue sensitivity	0.64	0.001
RS2 <--- Residue sensitivity	0.76	0.001
RS3 <--- Residue sensitivity	-0.53	0.001
RS4 <--- Residue sensitivity	0.83	0.001

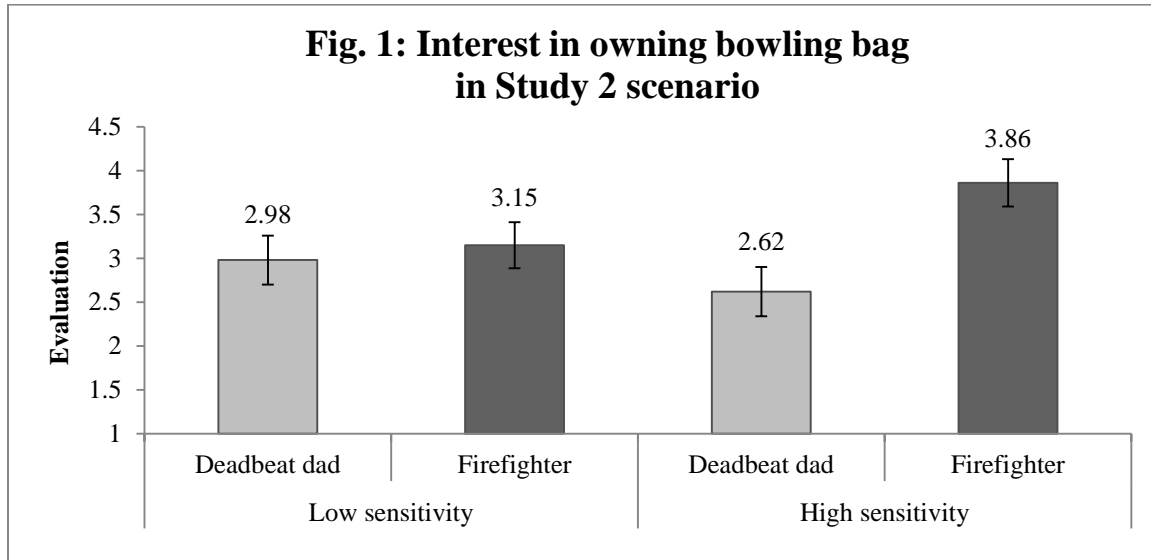


Figure 1: Interest in owning bowling bag in Study 2 scenario. Error bars represent standard error of the mean.

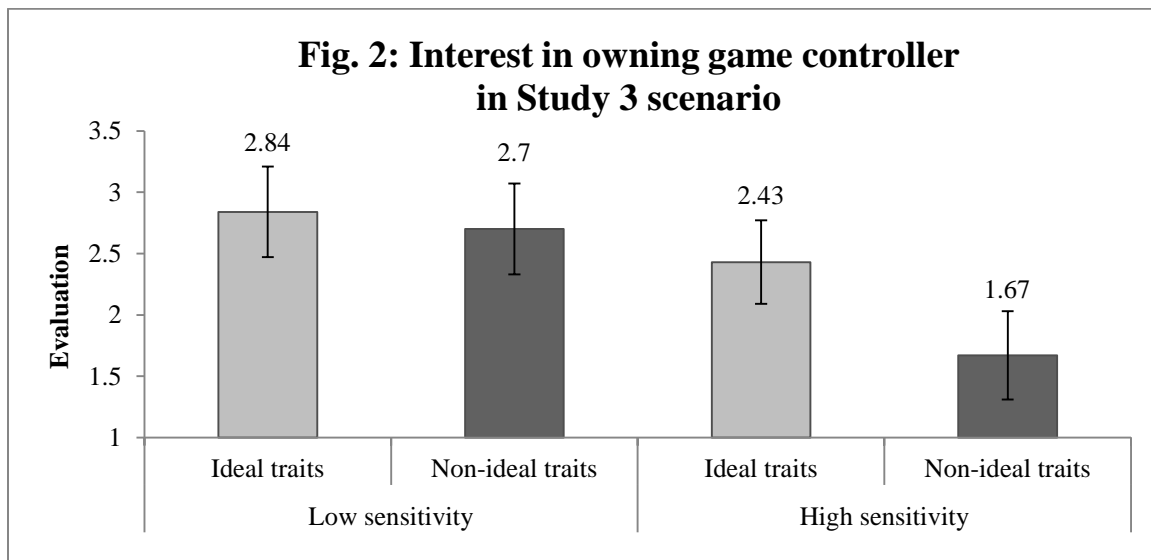


Figure 2: Interest in owning game controller in Study 3 scenario. Error bars represent standard error of the mean.