

Products as Self-Evaluation Standards

LIAD WEISS

UNIVERSITY OF WISCONSIN-MADISON

GITA VENKATARAMANI JOHAR*

COLUMBIA BUSINESS SCHOOL

* Liad Weiss (lweiss@bus.wisc.edu) is an Assistant Professor of Marketing at University of Wisconsin-Madison and Gita V. Johar (gvj1@columbia.edu) is the Meyer Feldberg Professor of Business at Columbia Business School. The authors are grateful for helpful comments received from Oded Netzer, Dan Bartels, David Faro, Dana Carney, Daniel Ames, Leonard Lee, Ran Hassin, Nick Reinholtz, Tory Higgins, Yaacov Trope, Ran Kivetz, and participants at seminars at Columbia University, University of Pennsylvania, University of Alberta, Bocconi University, Marketing in Israel, ACR, and SCP. We are particularly thankful to Stephen Spiller for his invaluable help with the advanced mediation analyses. This paper is based on a doctoral dissertation completed by the first author under the supervision of the second author.

CONTRIBUTION STATEMENT

A wide body of research on social comparison (Festinger 1954) finds that consumers judge their traits relative to standards set by other people. The present research predicts that consumers may judge themselves not only relative to standards set by people (e.g., the thinness of a model), but also relative to standards set by products (e.g., the thinness of MacBook Air). This prediction is based on that notion of “self” as a category for products (Weiss and Johar 2013). Using well established categorization principles (Bless and Schwarz 2010) we predict and find that (1) people may perceive their traits as consistent with traits of products they own and as inconsistent with traits of products they do not own (even when ownership is not based on personal choice), that (2) this is because consumers construe “self” as including owned products but excluding unowned products, and that (3) this conceptualization can explain previous findings of assimilation of self to products (Gino, Norton, and Ariely 2010). For example, we find that owning a short (vs. tall) looking coffee mug lead people to feel shorter and less physically attractive. These predictions cannot be made by other theoretical accounts and illuminate the pervasive influence of products on consumers via Egocentric Categorization. The present research is therefore intended to make a contribution to the literature on social comparison, self-judgment, and the role of products and brands in consumer life.

PRODUCTS AS SELF-EVALUATION STANDARDS

Extending social-comparison research about how people judge their traits relative to standards set by other people, the present research proposes that people may also judge their traits relative to standards set by products. When the concept “ownership” is contextually evoked, people tend to construe “self” in-terms of objects (Experiment 1), and subsequently judge themselves in assimilation to traits of products they own (that they did not personally choose), but in contrast to traits of products they do not own (studies 2-4). In Experiment 2, after trying out a short (versus tall) looking 16oz mug, people assessed themselves as shorter when assigned to *own* the short (vs. tall) mug (assimilation), but assessed themselves as taller when assigned *not to own* the short (vs. tall) mug (contrast). Experiment 3 showed that Egocentric-Categorization mediated assimilation or contrast to products. Experiment 4 showed that wearing a product can induce “ownership” feelings and subsequently assimilation of self-judgments to product-traits. Theoretical and practical implications are discussed.

The “self” is a malleable concept (Markus and Kunda 1986) and individuals frequently reevaluate the “self” on different aspects relative to standards set by other people (Wood 1989). By affecting self-evaluation, such standards can shape consumer preferences (Aaker 1999; Reed II 2004). Understanding self-standards in consumption settings is therefore of key interest to marketers.

Extending research on self-evaluation standards (Festinger 1954), the present research examines whether, when people evaluate aspects of themselves (e.g., how thin am I?), they use not only standards set by other people (e.g., how thin is this model?), but also standards set by objects (e.g., how thin is this MacBook Air?). Although theories of “self” imply that people use object traits in assessing their own traits (e.g., people may infer being sexy from choosing a "sexy" product; Bem 1972), the possibility that people compare and contrast their traits to *standards* set by objects has not yet been tested.

We suggest that objects that are used as self-standards can affect peoples’ self-evaluation in a direction that is modulated by object ownership. In our conceptualization, under some conditions, a consumer judges her own traits in contrast to traits of objects she does not own, but in assimilation with traits of objects she owns. For example, seeing an ad for a MacBook Air may lead a consumer to compare her own thinness to the slim object she does not own, and thus feel fatter and less attractive than before (contrast). However, receiving the Mac as a gift may make that consumer feel unity with the thin object and thus feel thinner and more attractive than before (assimilation).

Why should products act as self-standards and affect how people evaluate themselves and why should ownership modulate the direction of the effect? Research on Egocentric Categorization (EC) finds that consumers often classify objects they own as “self” and objects they do not own as “not self,” especially when thoughts or feelings

about “ownership” are evoked, such as during shopping or while receiving a gift (Weiss and Johar 2013). Once classified in this way, consumers are likely to judge the category “self” in assimilation to items that the category includes but in contrast to items the category excludes (Bless and Schwarz 2010). Thus, consumers may judge themselves in assimilation to owned products, which they classify as “self”, but in contrast from unowned products, which they classify as “not-self.” Notably, principles of categorization predict this pattern not only for self-selected, “special” items that carry personal meaning (Belk 1988), but also for recently and arbitrarily acquired items, where the decision whether or not to own was not made by the consumer (Turk et al. 2011).

People commonly interact with objects others have selected for them. People own signup gifts selected by marketers and "hand me downs" selected by other people. People use (but do not own) coffee mugs and music sampling headphones selected by marketers and are often exposed to ads of products they do not own. Thus, finding that product traits can affect peoples' self-evaluation is important for marketers and consumers alike.

In what follows, we first review research on how self-standards affect self-judgment, and develop our predictions. We test these predictions in four experiments. We find that having thoughts or feelings about “ownership” leads a person to construe “self” in terms of objects (Experiment 1), and to judge his or her personal traits in assimilation (contrast) to traits of objects s/he owns (does not own; Experiment 2). Such assimilation and contrast patterns are driven by classification of owned (unowned) objects as “self” (“not-self”; Experiment 3). Wearing an object can also yield assimilation because people feel ownership over the object while wearing it (Experiment 4). We discuss implications for consumer researchers and marketing managers and address alternative accounts.

SELF-EVALUATION STANDARDS AND SELF-JUDGMENT

A wide range of theories in psychology suggests that the “self” is formed relative to others. People interpret, judge and understand themselves based on information, or standards, others provide (Cooley 1956/1902; Festinger 1954; Mead 1934; Tesser 1986). Research investigating the way people judge themselves as the available standard of comparison changes (Mussweiler 2003) finds that people frequently judge themselves in assimilation to, or in contrast from, self-standards. Whether assimilation or contrast ensues is often determined by social-categorization processes (Bless and Schwarz 1998; Mussweiler and Bodenhausen 2002). Assimilation to the standard commonly ensues when people classify a focal standard in their social-self, as an in-group member or ‘us,’ whereas contrast from the standard ensues when people classify a focal standard as external to their social-self, as an out-group member or ‘them’ (Ledgerwood and Chaiken 2007; Pelham and Wachsmuth 1995; Tajfel and Turner 1986).

Summarizing research on how changes in social-context affect self-judgments, an extensive review of social-comparison research concluded that “the self-concept is responsive to changes in the social context, which again suggests that the social environment imposes comparisons that have an impact on the individual” (Wood 1989; p. 233). Extending this outlook beyond social context, the present research proposes that the self-concept might be responsive also to changes in material context. Thus, not only people in a person’s social environment but also objects in a person’s material environment may impose standards for judging “self.” In particular, we predict that a consumer may judge his or her own traits in contrast from traits of products s/he does not own, but in assimilation to traits of products s/he owns. We make this prediction, and

identify conditions for it to ensue, using the theoretical lens of Egocentric Categorization (EC), a theory that explains when individuals classify objects as “self.” We next briefly review Egocentric Categorization Theory and use it to explain the reasoning for our predictions.

EGOCENTRIC CATEGORIZATION THEORY

Just as people classify and understand other people relative to the social-self, as “us” or “them,” people have been found to egocentrically classify and understand objects relative to the personal-self, as “me” or “not-me” (Weiss and Johar 2013). People use “self” as a reference-class to spontaneously, without effort or deliberation, segment, organize and understand objects in their material environment. People generally classify as “me” owned objects, not only self-selected objects that carry personal meaning (Belk 1988; Kleine, Kleine, and Allen 1995), but also recently and arbitrarily obtained objects (Gawronski, Bodenhausen, and Becker 2007; Turk et al. 2011). People generally classify as “not-me” objects they do not own.

Previous research identifies a set of boundary conditions for EC to ensue (Weiss and Johar 2013). An individual difference on “Mine-Me” sensitivity, the extent that people associate “mine” with “me,” has been shown to moderate EC predictions. People who weakly associate “mine” with “me” were found *not* to use object ownership to determine whether or not an object is “self.” This includes people for whom neither owned nor unowned objects are “me,” as well as people for whom both owned and unowned objects are “me,” because both groups do not use ownership to determine where “me” ends and “not-me” begins. Such “Mine-Me” insensitive people assign owned and

unowned objects the same levels of ‘me-ness.’ A contextual factor, the presence of cues that activate people’s personal-self, was also found to facilitate EC by inducing people to think of objects in terms of “self,” as “me” or “not-me.” Personal-self was found to be spontaneously activated when people felt product ownership or were cognizant of not owning a product (and thus felt lack of ownership), such as during on-line or in-store shopping, gift giving or receiving, product disposal, and other consumption contexts.

Consistent with Egocentric Categorization Theory, several studies have documented that people use the personal-self to organize and understand objects in their environment (Weiss and Johar 2013). One study tested whether the organizational properties of categories as documented by Fazio, Williams and Powell (2000) could also be observed with the personal-self. After participants’ personal- (vs. social-) self was activated, participants free-listed objects and, after a filler task, sorted a randomly ordered list of these objects by the extent to which they classified each object as “self.” Consistent with predicted organizational properties of the personal-self as a category for objects, activation of the personal-self increased the likelihood that people retrieved objects they classified as “self” before objects they classified as “not-self” (Weiss and Johar 2013, Study 1a). Thus, activation of the personal-self increased consistency and predictability in the order in which objects came to people’s mind. A different study tested whether the documented evaluative implications of categories (Bless and Schwarz 2010) could be observed with the personal-self. Participants evaluated the creativity of a pen and rated how much they classified it as “self,” after evaluating their own creativity and learning whether or not they get to own that pen. Consistent with predicted evaluative implications of “self” as a category for objects, people assigned to own the pen tended to classify it as “self” and, in-turn, judged the pen’s creativity in assimilation to how they perceived their

own creativity. Further, people assigned not to own the pen tended to classify the pen as “not-self” and, in-turn, judged the pen’s creativity in contrast from how they judged their own creativity. Also in-line with EC, although this overall pattern was significant on average, it was driven by individuals who were predisposed to classify owned products as “self” and unowned products as “not-self,” namely individuals high on “Mine-Me” sensitivity (Weiss and Johar 2013, Study 2).

Extending Egocentric Categorization research, the present research uniquely proposes that the implications of EC may not only lead people to use “self” to understand objects, but may also lead people to use objects to understand “self.” Thus, similarly to how EC leads people to judge *objects* in assimilation or contrast to “self,” EC may also simultaneously lead people to judge “*self*” in assimilation or contrast to objects.

Importantly, the idea that EC can have such a two-sided effect – “self” affects product and product affects “self” – is consistent with established categorization principles that categorizing an exemplar (e.g., a product) relative to a category (e.g., “self”) has independent simultaneous consequences on perceptions of both the exemplar and the category (Schwarz and Bless 1992, 2007). One demonstration of this two-sided effect used as a category a social group associated with negative traits, such as dirtiness and criminality, and as an exemplar an individual who was portrayed positively along these traits (Bless et al. 2001, Study 1). In support of a two-sided effect, when participants were induced to classify the positively portrayed individual in the negatively perceived group, group traits were evaluated more favorably (category assimilated to exemplar), but the individual’s traits were rated more negatively (exemplar assimilated to category). By contrast, when participants were induced to exclude the positively portrayed individual from the negatively perceived group, group traits were evaluated

more negatively (category is contrasted from exemplar), but the individual's traits were rated more positively (exemplar contrasted from category).

PRODUCTS AS SELF-EVALUATION STANDARDS

Given the theoretical possibility that EC may have a two-sided effect, the present research extends previous findings in support of one side – that “self” affects product evaluation – to test the other side, namely that products affect self-judgment. Building on EC principles, product owners, who construe “self” as including owned products, are predicted to judge their traits in assimilation to traits of products they own. This is because people judge a category in assimilation to an exemplar that the category includes (e.g., Bless and Schwarz 2010). Specifically, if people construe “self” as including owned products, these people may intuitively include their evaluation of a product's trait in the mental representation of the “self,” leading “self” to appear higher (lower) when the product is perceived as higher (lower) on the evaluated trait.

By contrast, non-owners, who construe “self” as excluding unowned products, are predicted to judge their traits in contrast from the traits of products they do not own. This is because people judge a category in contrast to an exemplar that the category excludes (e.g., Bless and Schwarz 2010). Specifically, if people construe “self” as excluding unowned products, these people may intuitively include their evaluation of a product's trait in the mental representation of the standard for judging the “self.” Because, compared to lower standards, higher standards of comparison make a target of judgment (e.g., “self”) appear lower and vice versa, the predicted contrast pattern will ensue.

Our conceptualization predicts that the outcome of EC – classification of owned objects as “self” and of unowned objects as “not-self” (classifying a product as “self” or “not-self” is used to reflect relatively higher or lower levels of classifying a product as “self” rather than a strict dichotomy) – drives the predicted assimilation and contrast. However, people low on “Mine-Me” sensitivity do not classify objects relative to “self” based on ownership. If ownership does not determine where ‘me’ ends and ‘not-me’ begins it cannot predict whether people include the way they perceive a product in how they mentally represent “self,” or in how they mentally represent the standard for judging “self.” Thus, owning or not owning a product should not predict assimilation or contrast for individuals low on “Mine-Me” sensitivity (Experiment 2).

Further, although people generally classify owned objects as “self” and unowned objects as “not-self,” people may not always mentally represent “self” in terms of objects it includes and excludes, and thus not always use objects as self-standards. Take for example Jane, a cyclist and woodworker mother of two from California. At times, Jane may take on a social-identity (Brewer 1991), “a West Coaster” or “a female,” construing “self” in terms of identity-supporting affiliations such as her area of residence or gender. At other times, Jane may take on a relational-identity (Andersen and Chen 2002), “a mother” or “a daughter,” construing “self” in terms of identity-supporting others, her kids or parents. Jane may, at yet other times, take on a personal identity, “a cyclist,” or “a woodworker,” construing “self” in terms of identity-supporting objects (Solomon 1983), her handsaw or bikes (see Experiment 1). If, when judging “self,” Jane does not construe “self” along individuating aspects, such as objects she classifies as “me” or “not-me,” other ways to construe “self” may prevail (Brewer and Weber 1994), and she may judge “self” relative to other standards, such as people or groups (Dunning and Hayes 1996).

Thus, in cases where people are not predicted to construe “self” in terms of objects, product traits should not affect self-judgment (studies 3-4).

When should people construe “self” in terms of objects it includes and excludes, and, in-turn, use products as self-standards? Given that feeling ownership for a product, or being cognizant of not owning a product, triggers people to think of objects in terms of “self” and use “self” to judge objects (Weiss and Johar 2013), such “ownership” thoughts or feelings may also evoke people to think of “self” in terms of objects and use objects to judge “self.” However, when people neither feel product ownership, nor are cognizant of not owning a product (and thus do not feel lack of ownership over it), people may not construe “self” in terms of objects (Experiment 1) and thus not use objects as “self-standards” (Experiment 3).

Notably, EC research (Weiss and Johar 2013) shows that (a) evoking ownership thoughts or feelings activates the personal-self (Study 1b), that (b) activating the personal-self leads people to construe “self” in terms of objects (Study 1a), as well as *directly* that (c) evoking ownership thoughts or feelings leads people to construe “self” in terms of products (Study 2). The present research builds on the established effect of evoking ownership thoughts or feelings on whether people construe “self” in terms of objects, focusing on implications of this effect for self-judgment, without measuring whether the personal-self was intermediately activated in the process. Accordingly, further discussion on personal-self activation is excluded. We provide a high-level flowchart of the theoretical model in Figure 1.

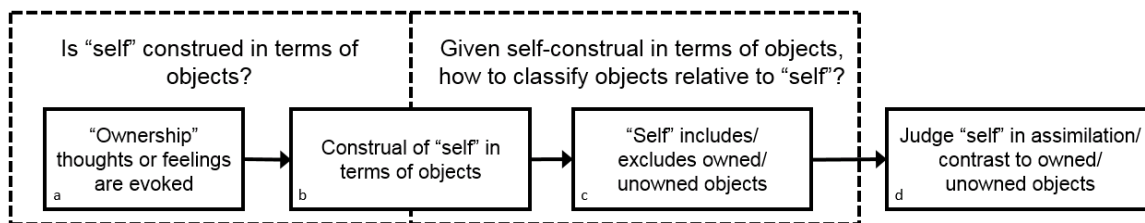
The idea that people may judge “self” in assimilation or contrast to objects is consistent with notions that people can use product traits as inputs for self-evaluation, as predicted by several theories of “self.” The Extended-Self account emphasizes the role of

special possessions in constructing and maintaining the “self” (Belk 1988; James 1890) and suggests that product traits can “transfer” to people through different consumption rituals (McCracken 1986). Self-Perception Theory (Bem 1972) implies that consumers may retrospectively interpret choosing a product associated with a certain trait as an indicator that they possess that trait. Further, Self-Signaling Theory (Bodner and Prelec 2003; Quattrone and Tversky 1984) predicts that consumers may strategically choose products with desirable personality traits (Aaker 1997) to signal to themselves positive aspects about who they are. In support of this prediction, a study found that women felt sexier after choosing and using a Victoria-Secret bag, and that students felt smarter after choosing and using a pen with an MIT logo, if the choosers/users believed that their personal traits were unchangeable (i.e., entity theorists; Levy, Stroessner, and Dweck 1998), and thus viewed their choices as signals of their “true selves” (Park and John 2010). However, previous theories do not suggest nor test our prediction that people may compare and contrast themselves to objects in their material context similarly to how individuals judge themselves vis-à-vis people in their social context (studies 2-3). Further, in self-perception/-signaling, people may perceive their traits as consistent with product traits due to inferences that – by definition – build on people’s choices, along a logic of, “if I chose this, it must be because this reflects who I am” (Bem 1972; Bodner and Prelec 2003). The present research departs from choice-based inferences by denying people choice of the object they interact with or own by clearly assigning objects and object ownership to people at random (studies 2-3).

We test our framework in four experiments, across self-evaluations on traits such as sincerity and physical appearance, and following interaction with products, such as travel mugs and headphones. To establish a directional effect of ownership (vs. the lack

thereof) on self-evaluation, all studies focused on newly formed, randomly assigned product ownership (legal or psychological). Cognizance of not owning a product (vs. lack thereof) – operated via saliency of the concept “ownership – was manipulated in studies 1 and 3, kept high in study 2 and low in study 4. “Mine-Me” sensitivity was measured in study 2. Further, based on findings that people are more likely to use “self” as a category for products under high self-awareness (Weiss and Johar 2013), attention to “self” was kept at high level in all studies (see also the General Discussion section).

FIGURE 1: FLOWCHART OF THE THEORETICAL MODEL



Note.— Parts of the model addressed in each study: Experiment 1: a->b. Experiment 2:c->d. Experiment 3: a->b->c->d. Experiment 4: a->d.

EXPERIMENT 1: THOUGHTS OR FEELINGS ABOUT “OWNERSHIP” INDUCE PEOPLE TO CONSTRUE “SELF” IN TERMS OF OBJECTS

Experiment 1 tested the prediction that inducing people to have thoughts or feelings about “ownership” leads people to construe “self” in terms of objects. The way people mentally-represent “self” at a given moment may be apparent from the type of identities that come to people’s mind when they need to describe themselves (Oyserman 2001). A person may construe “self,” along affiliations, “an American” or “a female,” along relationships, “a husband” or “a friend,” and along professions and hobbies, “a fisherman” or “a cyclist.” Notably, of these three ways to construe “self”, the first two are

more consistent with self-construal in terms of others, people or groups (Brewer and Weber 1994), whereas the third is consistent with self-construal in terms of objects (Solomon 1983). To exemplify, “an American” is essentially a person perceiving the group “Americans” as “self” and the group “non-Americans” as “not-self,” “a husband” is a person perceiving his wife, as “self,” and other people as “not-self,” whereas “a fisherman” is a person perceiving his fishing rod as “self” and objects that are unrelated to fishing as “not-self.” Indeed, self-representation in terms of affiliations and relationships might also be supported by objects (Wallendorf and Arnould 1988), such as the Statue of Liberty for Americans and a wedding ring for husbands. Further, self-representation in terms of hobbies or professions can also be supported by people or groups (Schouten and McAlexander 1995), such as fishing partners or associations. However, groups and other people are arguably more essential for defining affiliations and relations; a person can construe “self” as “an American” without the Statue of Liberty, or as “a husband” without a wedding ring, but cannot do so respectively without the group “Americans” or without his wife. Similarly, objects can be viewed as being more pivotal in defining hobbies and professions; a person can think of herself as “a fisherman” without fishing partners or associations, but not so much without her fishing equipment. To test whether having thoughts or feelings about “ownership” leads people to construe “self” in terms of objects, all subjects responded to an open-ended task in which they repeatedly described themselves. The concept “ownership” was initially made salient for half of the subjects. The frequency of object-supported identities, hobbies and professions, in subjects’ self-descriptions served as the dependent variable.

Method. Two hundred and thirteen members of the on-line panel Amazon Mechanical Turk (82 males) participated in an on-line marketing study in return for a nominal fee. The experiment included two conditions, “ownership-saliency” and “control.” At the beginning of the experiment, participants listed two sets of three durable goods, under instructions to “state specific products (e.g., a Fossil wrist watch), rather than merely a product category (e.g., watch) or brand (e.g., Fossil).” To induce one group of subjects to have thoughts or feelings about ownership, those randomly assigned to the “ownership-saliency” condition listed three durable goods they got to own recently and three durable goods they disposed of recently. To avoid inducing ownership-related thoughts and feelings among subjects in the control group, those randomly assigned to the control condition listed three durable goods they had seen ads for recently and three durable goods they had not seen ads for recently (Weiss and Johar 2013). Then, self-awareness of all subjects was heightened by asking subjects to “imagine yourself looking at a small mirror, what are the three first things that you notice?” (Carver and Scheier 1978). This manipulation served to increase attention to “self” in the rest of the studies as well. Next, after a filler, to test how participants mentally-represented the self, participants responded to the Twenty Statement Task (Kuhn and McPartland 1954). Participants read “Following are twenty blanks. Please write twenty answers to the simple question “Who am I” in the blanks. Just give twenty different answers to this question. Answer as if you were giving the answers to yourself, not to somebody else. Write the answers in the order that they occur to you. Don’t worry about logic or importance. Go along fairly fast, for time is limited.” Participants were finally debriefed and thanked.

Results and discussion. A review of participants' input in the Twenty Statement Task revealed five categories of self-descriptions, including affiliations (e.g., American, male, southerner, student, white, $M = 1.15$), relations to family and friends (e.g., father, mother, friend, lover, $M = 1.51$), self-assessments/states (e.g., tall, funny, hard-working, sensitive, tired, hungry, $M = 14.38$), actions (e.g., going on vacation, drinking coffee, on the computer, $M = .88$) and hobbies/ professions (e.g., golfer, pet lover/owner, cook, carpenter, biologist, geographer, $M = 1.78$). Two coders then coded the data along these categories, with a sixth option to choose "other" if none of these categories applied. The coders' initial agreement was 95% and disagreements were resolved through discussion. In support of the comprehensiveness of the aforementioned categories, the option "other" was selected for less than one percent of the coded self-descriptions.

To test the prediction that inducing people to have "ownership" thoughts or feelings leads to construal of "self" in terms of objects, a t-test with the priming condition ("ownership-saliency" versus "control") was conducted. The test revealed, as expected, that evoking "ownership" thoughts and feelings induced subjects to construe "self" in terms of objects, namely led subjects to describe themselves along object-supported identities, hobbies or professions, more frequently ($M_{ownership} = 2.26$ versus $M_{control} = 1.23$, $t(213) = 2.89$, $p = .004$).

In sum, inducing people to have ownership-related thoughts or feelings increased the extent people construed "self" in terms of object-supported identities, hobbies and professions. Web Appendix A describes a test of a theoretically predicted implication of construing "self" in terms of objects. Results are consistent with the idea that frequent self-descriptions in terms of hobbies and professions is a meaningful proxy for construing "self" in terms of objects. Studies 3 and 4 provide further evidence that feeling ownership

for or being cognizant of not owning objects induces people to construe “self” in terms of objects. Next, Experiment 2 directly tested whether, after having “ownership” thoughts or feelings, people may judge their traits in assimilation to traits of owned products, but in contrast from traits of unowned products.

EXPERIMENT 2: PEOPLE JUDGE THEIR APPEARANCE IN ASSIMILATION (CONTRAST) TO THE SHAPE OF A PRODUCT THEY OWN (DO NOT OWN)

Experiment 2 tested the prediction that consumers judge their traits in assimilation to traits of owned products, but in contrast from traits of unowned products. As part of a marketing study, participants assessed different aspects of a 16oz black traveling mug of one of two lengths, short or tall (see Figure 2). Participants randomly assigned to the “owned” condition received the mug they assessed as gift. Participants randomly assigned to the “unowned” condition received a different mug as a gift, and so did not own the mug they assessed. To capture participants’ predisposition to classify owned objects as “self” and unowned objects as “not-self,” participants responded to a previously established “Mine-Me” sensitivity measure. This resulted in a 2 (ownership: owned vs. unowned) x 2 (mug shape: short vs. tall) x “Mine-Me” sensitivity (measured) design. As dependent variables, participants responded to free response and closed-ended measures about their personal appearance in general, and about a specific aspect of their physique, their tallness.

The study predictions would be supported if participants in the “owned” condition who assessed the short (vs. tall) mug felt shorter (assimilation), but participants in the “unowned” condition who assessed that same short mug felt taller (contrast). Further,

consistent with EC as the underlying process, this pattern should be driven by people who are predisposed to classify owned products as “self” and unowned products as “not-self,” namely “Mine-Me” sensitive individuals.

FIGURE 2: TALL & SHORT MUGS, EXPERIMENT 2



NOTE.—Both mugs have the same capacity, 16 Oz

Method. One hundred and eighty five students of an introductory marketing class in a large Midwestern University participated in a short lab study for course credit. On the desk in front of them, each participant saw a 16oz black traveling mug, which was either five inches tall (“short” condition) or seven inches tall (“tall” condition). Subjects were asked to evaluate the mug as part of a marketing study. Each participant who was randomly assigned to the “owned” (“unowned”) condition learned that, in appreciation of the input he or she provided “you get to keep the mug you evaluate (a different traveling mug that the experimenter will give you at the end of the study). The mug you will evaluate (receive at the end of the study) is a gift for you. The mug is yours and you will take it home with you when you leave.” This information served to increase feelings of ownership over the evaluated mug for subjects in the “owned” condition, and to induce cognizance of not owning, and thus feelings of “lack of ownership” for the evaluated mug, for subjects in the “unowned” condition (and thus to induce construal of “self” in

terms of objects as Experiment 1 implies). Then, to support the cover story, participants responded to usability questions about the mug on topics ranging from durability to convenience. To covertly verify that participants indeed perceived the physical difference between the mugs, in one of these product questions participants allocated points among a list of six names that were supposedly being considered for the product; three of the names reflected stockier appearances (e.g., “Hefty Hal”), and three lankier appearances (e.g., “Gangly Gal”).

The computer then informed participants that we wanted to learn about them. To assess individuals’ momentary self-conceptions along appearance (Gardner, Gabriel, and Lee 1999), participants responded to the same Twenty Statement Task used in Experiment 1 (Kuhn and McPartland 1954), completing 20 self-descriptive statements (“I am ___”). As a trait-specific dependent variable, participants reported how they felt about their physical height between 1-very short and 7-very tall. Then, subjects completed the “Appearance” subscale of the State Self-Esteem Scale (Heatherton and Polivy 1991; includes items such as “I feel satisfied with the way my body looks right now” anchored between 1-“not at all” and 5-“extremely”).

The next part of the experiment assessed participants’ “Mine-Me” sensitivity using a previously established method (Weiss and Johar 2013). Participants rated the extent to which they classified four objects in immediate proximity to them as “self.” Of the four objects, two, the shoes and shirt subjects were wearing, were owned by them, and the other two, subjects’ lab table and seat, were not owned by them. To assess individual differences on “Mine-Me” sensitivity ($M = 3.32$, $SD = 1.7$), we subtracted the average rating of the unowned objects from the average rating of the owned objects. For individuals with higher (vs. lower) “Mine-Me” sensitivity, ownership over a product (vs.

lack thereof) should lead to a greater increase in the perception of that product as “self.” Then, to explore whether implicit self-theories facilitate the predicted effects, subjects responded to the eight-statement Implicit Persons Theory Measure (Levy et al. 1998) on a 1 (strongly disagree) to 7 (strongly agree) scale ($M = -.38$, $SD = 2.42$). The scale had no main or interaction effects and is not discussed further.

Subsequently, participants coded their responses to the Twenty Statement Task in two ways. First, they indicated whether each of their answers “refers to your own physical appearance (e.g., “I am pretty,” “I am heavy,” “I am unsatisfied with my appearance”) or not.” Then, they specified whether they “feel that the answer reflects a relatively positive, neutral or relatively negative aspect of the way you see yourself.” Finally, controls such as subjects’ height in inches and weight in pounds were collected.

Support for the study’s prediction would come from finding that participants in the “owned” (“unowned”) condition judge their own tallness in assimilation with (contrast from) the mug’s tallness. Support for EC as the underlying process would come from finding that this effect is facilitated by high personal level of “Mine-Me” sensitivity.

Results. We first tested the predicted trait-specific effect, and then downstream implications for overall physical self-esteem. As a test for the mug shape manipulation, a “perceived mug stockiness” index ($M = .18$, $SD = 15.88$) was created by subtracting the points allocated to the “lankier” mug names from those allocated to the “stockier” mug names. A t-test with that index confirmed that participants perceived the short (vs. tall) mug as stockier ($t(185) = 6.26$, $p < .0001$).

Participants’ assessment of their own tallness was entered into analysis of covariance to test the main prediction. The analysis included ownership (owned,

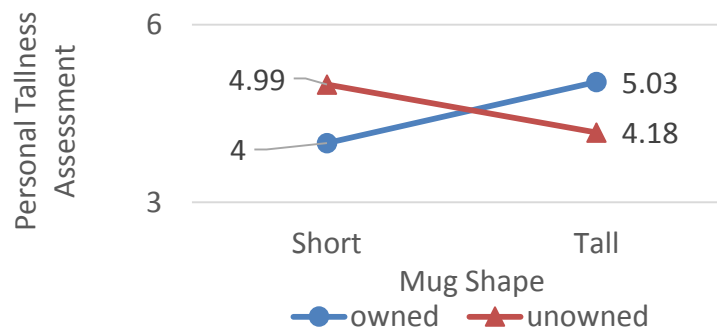
unowned), mug shape (short, tall), mean centered “Mine-Me” sensitivity, and their two-way and three-way interactions. To control for study-exogenous factors that are likely to affect self-assessment on tallness, the analysis controlled for height in inches ($F(1, 176) = 478.94, p < .0001$) and gender ($F(1, 176) = 160.48, p < .0001$; the same height in inches might be perceived as short by males but tall by females). The analysis revealed the predicted interaction between ownership and mug-shape ($F(1, 176) = 22.11, p < .0001$). Further, this two-way interaction was qualified by “Mine-Me” sensitivity, yielding a significant three-way interaction ($F(1, 176) = 8.36, p = .004$, see adjusted means in Figure 3; repeating the analysis without controls does not change the observed pattern). Subsequent flashlight analysis at high “Mine-Me” sensitivity (i.e., one standard deviation above the mean) revealed that, as expected, the ownership by mug shape interaction was significant ($\beta = 1.84, t(185) = 5.52, p < .0001$). Planned contrast among subjects in the “owned” condition revealed the expected assimilation: subjects assessing the short mug felt shorter ($M = 4.00$) than those assessing the long mug ($M = 5.03, \beta = 1.03, t(185) = 4.59, p < .0001$). The same analysis among subjects in the “unowned” condition revealed the expected contrast: those assessing the short mug felt taller ($M = 4.99$) than those assessing the long mug ($M = 4.18, \beta = -.81, t(185) = -3.30, p = .001$). Similar analyses at low “Mine-Me” sensitivity (i.e., one standard deviation below the mean) revealed no significant effects (p 's $> .22$).

Next, we tested whether the observed trait-specific effects on how people judged their tallness have downstream implications for overall physical self-esteem. Based on subjects' coding of their own “I am...” statements, we created a physical appearance index that was the difference between the number of self-rated positive and negative appearance self-descriptions ($M = .79, SD = 1.52$), where a higher score reflects more

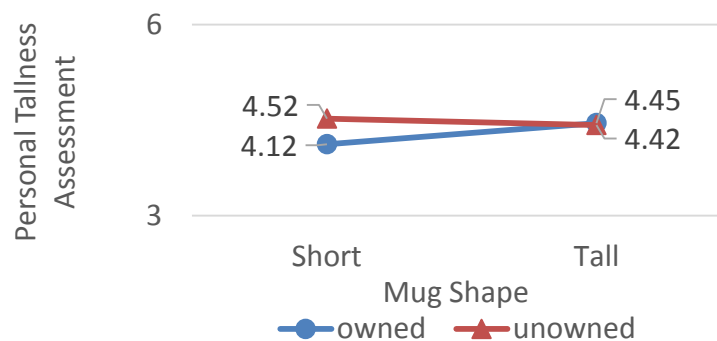
positive evaluations. The physical appearance index was submitted to a bootstrap mediation analysis using the PROCESS macro (Hayes 2013, model 4). The analysis included ownership status (*owned* = 1, *unowned* = -1), mug shape (*short* = 1, *tall* = -1), mean-centered “Mine-Me” sensitivity, and their two-way and three-way interactions as well as subjective tallness and its controls, height in inches and gender. The three-way interaction served as IV, and the subjective tallness measure was the predicted mediator.

FIGURE 3: OBJECT AFFECTS “SELF:” PERSONAL TALLNESS RATINGS UNDER HIGH (A) AND LOW (B) “MINE-ME” SENSITIVITY, EXPERIMENT 2

A



B



NOTE.—Panel A represents one SD above and panel B one SD below the mean of “Mine-Me” sensitivity.

The bootstrap analysis revealed, as expected, that the mean indirect effect was negative and significant ($-.0510$), with a 95% confidence interval excluding zero ($-.1577$ to $-.0029$). In the indirect path, among subjects assigned to own the short mug (predicted to feel shorter following assimilation) or to use (but not own) the tall mug (predicted to

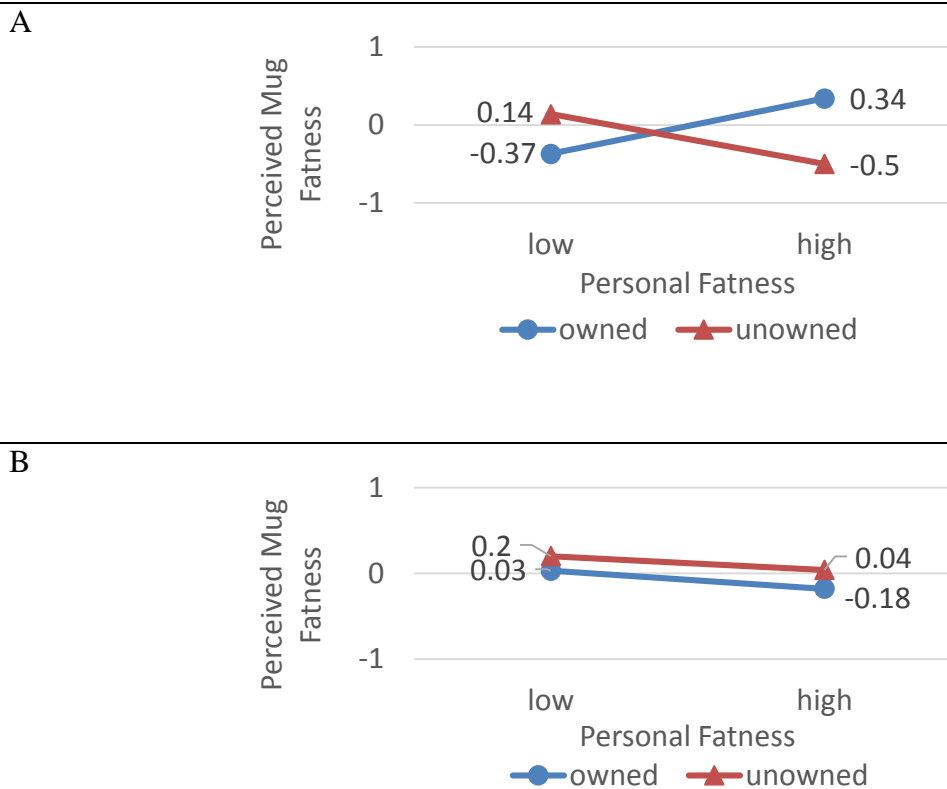
feel shorter following contrast), higher “Mine-Me” sensitivity decreased personal tallness assessment by .1767 units. Further, holding constant the three-way interaction of mug shape, ownership and “Mine-Me” sensitivity, a unit increase in personal tallness assessment increased the physical-appearance index by .2888 units. The direct effect (-.0570) was not significant ($p = .62$).

The same mediation analysis revealed consistent results for the close ended “Appearance” subscale of the State Self-Esteem Scale. The mean indirect effect was negative and significant (-.0343), with a 95% confidence interval excluding zero (-.0865 to -.0078). In the indirect path, among participants assigned to own the short mug or to use (but not own) the tall mug, higher “Mine-Me” sensitivity decreased personal tallness assessment by .1767 units. Further, holding constant the three-way interaction of mug shape, ownership and “Mine-Me” sensitivity, a unit increase in personal tallness assessment increased the Appearance Self-Esteem Scale by .1939 units. The direct effect (.0202) was not significant ($p = .71$).

Discussion. This experiment demonstrated that people may judge their personal traits, such as how tall they feel, in assimilation to a product they owned, but in contrast to a product they tried-out but did not own. Further, consistent with EC as the underlying process, participants predisposed to classifying owned products as “self” and unowned products as “not-self” were more likely to show the effect. Moreover, the observed effects of product shape on how people perceive specific dimensions of their physique predicted overall appearance self-esteem, elicited either through an open ended (less intrusive) measure taken before the trait-specific measures or through a close-ended scale taken after the trait-specific measures. Notably, because the two-way interaction between

ownership and mug shape is significant in addition to its three-way interaction with “Mine-Me” sensitivity, it suggests that “Mine-Me” sensitivity facilitates the assimilation and contrast effects, but it is not a necessary condition for them to ensue.

FIGURE 4: SELF AFFECTS OBJECT: PERCEIVED MUG FATNESS RATINGS UNDER HIGH (A) AND LOW (B) “MINE-ME” SENSITIVITY, EXPERIMENT 2



NOTE.—Panel A represents one SD above and panel B one SD below the mean of “Mine-Me” sensitivity.

Previous research used EC to predict and find that object owners (vs. non-owning users) judge *object traits* in assimilation (vs. contrast) to their personal traits (Weiss and Johar 2013). Juxtaposing these previous findings that “self” affects objects with the present findings that objects affect “self” raises the question of whether the two effects can independently be observed within the same study as has been documented in past categorization research (Bless et al. 2001). We used the “perceived mug stockiness”

index (measured as a manipulation check for mug shape) to address this question here. We tested whether fatter participants (as reflected through reported weight in pounds controlling for gender and height) judged the mugs as stockier in the “owned” condition (assimilation), but as less stocky in the “unowned” condition (contrast). Identifying a second effect predicted by EC in the same data further supports EC as the process underlying the newly identified effect, given parsimoniousness principles.

The “perceived mug stockiness” index was entered into ANCOVA with ownership (owned, unowned), personal fatness – the residual of reported weight in pound after controlling for height and gender (taller individuals and males tend to weigh more without being fatter) – mean centered “Mine-Me” sensitivity and their two-way and three-way interactions, controlling for mug shape ($F(1, 176) = 39.21, p < .0001$; the short mug was objectively stockier looking than the tall mug). Consistent with findings by Weiss and Johar (2013), the analysis revealed a significant ownership by personal-fatness interaction ($F(1, 176) = 5.63, p = .019$). Further, this two-way interaction was qualified by “Mine-Me” sensitivity, yielding a significant three-way interaction ($F(1, 176) = 4.73, p = .03$, see Figure 4; adjusted means are reported on a normalized scale). Follow up flashlight analysis at high “Mine-Me” sensitivity (i.e., one standard deviation above the mean) revealed that the ownership by personal fatness interaction was significant ($\beta = -.68, t(185) = -3.47, p = .0006$). Planned contrast among subjects in the “owned” condition revealed the expected assimilation: “perceived mug stockiness” was *higher* for fatter subjects ($M = .34$) relative to thinner subjects ($M = -.37, \beta = .35, t(185) = 3.06, p = .0026$). The same analysis among subjects in the “unowned” condition revealed the expected contrast: “perceived mug stockiness” was *lower* for fatter subjects ($M = -.50$) compared to thinner subjects ($M = .14, \beta = -.32, t(185) = -2.06, p = .04$). A

similar analysis at low “Mine-Me” sensitivity (i.e., one standard deviation below the mean) revealed no significant effect (p 's > .48).

In sum, the data consistently supported two sets of findings – product affects “self” and “self” affects product – independently predicted by EC. Experiment 1’s results suggested that people spontaneously construe “self” in terms of objects if they initially had thoughts or feelings about ownership. Experiment 2 found evidence for self-judgment vis-à-vis mug traits after inducing subjects to have “ownership” thoughts or feelings (by informing subjects whether they own the mug they judged). However, predictions that (a) products would not affect self-judgment if “ownership” thoughts or feelings are not evoked, and that (b) EC – classification of products as “self” – mediates self-judgments have not yet been directly tested. Experiment 3 tested these predictions.

EXPERIMENT 3: ASSIMILATION (CONTRAST) ENSUES BECAUSE PEOPLE CLASSIFY OWNED (UNOWNED) PRODUCTS AS “SELF” (“NOT-SELF”)

The purpose of Experiment 3 was two-fold. First, the study tested the prediction that people classify owned products as “self,” and unowned products as “not-self,” which, in turn, renders personal-traits of these people more consistent with traits of owned products, but more inconsistent with traits of unowned products. The study also tested whether the predicted effects dissipate when people feel neither ownership nor lack of ownership for objects they interacted with (and thus, according to our framework, do not construe “self” in terms of objects, as Experiment 1’s “no ownership saliency” control condition implies). This is the case, for example, after people interact with an

unowned object without thinking of “ownership,” and thus are not cognizant of not owning the product.

Participants in a marketing study were asked to assess headphones that were positioned as either sincere – authentically reproducing sound – or insincere – artificially improving sound – (see Web Appendix B). The design included three ownership conditions. The concept “ownership” was made salient in one “owned” and one “unowned” condition (as in Experiment 2), but was not made salient in an additional “unowned” condition. This resulted in a 3 (ownership: owned-ownership-saliency, unowned-ownership-saliency, unowned-no-saliency) x 2 (headphones “insincerity”: sincere, insincere) factorial design. As a dependent variable, subjects participated in a trivia contest with incentive and opportunity to artificially inflate their apparent performance. Then, to test whether such predicted cheating behavior can be traced back to a more specific effect on the extent subjects attempt to present themselves in an excessively favorable manner, subjects then responded to the classic Social Desirability scale (Crowne and Marlowe 1960), which allows people to respond either honestly or in a socially desirable manner. Further, to test EC as process, subjects reported the extent to which they classified the headphones they evaluated as “self.”

The study predictions would be supported if owning the insincere (vs. sincere) headphones would indirectly lead participants to exhibit *more* insincerity via higher classification of the headphones as “self;” however, not owning the insincere headphones would indirectly lead participants to exhibit *less* insincerity via lower classification of the headphones as “self;” finally, the indirect effect of classifying headphones as more or less “self” should dissipate in the “unowned-no-saliency” condition, where participants neither felt they owned, nor were cognizant of not owning, the headphones.

Method and Procedure

Independent variables (IVs). One hundred and fifty students in a large Northeastern University joined a lab experiment for \$8 participation fee. On the desk in front of them, each participant saw a set of headphones (see Web Appendix C, Panel A) he or she had to evaluate for a marketing study. To induce participants in the “owned-ownership-saliency” condition to feel headphones ownership, and participants in the “unowned-ownership-saliency” condition to be cognizant of not owning the headphones, the concept “ownership” was made salient to them (as in the “owned” and “unowned” condition of Experiment 2). Specifically, participants in both “ownership-saliency” conditions were informed that, as additional compensation, they get to own either the headset they evaluated or a different set featured in the study, as would be determined later by a draw. In contrast, participants in the “unowned-no-saliency” condition were simply informed of receiving additional \$2 for their input, and to avoid making them cognizant of not owning the headphones, no “ownership” information was given.

Then, participants who were randomly assigned to the “sincere” headphones (“insincere” headphones) condition read product information that portrayed the headphones as authentically reproducing sound (artificially improving sound; see the stimuli employed and a pretest of its effectiveness in Web Appendix B). After using the headphones to listen to a 30 seconds music track (BWV 1006, Johann Sebastian Bach), subjects randomly assigned to the “owned-ownership-saliency” condition learned that they would keep the set they had evaluated. In contrast, subjects randomly assigned to the “unowned-ownership-saliency” condition learned that they receive a different set, and so

they did not own the set they evaluated. Then, to verify that effects of the ownership manipulation extend beyond the duration of product usage (see Experiment 4), subjects in all conditions placed the headphones in a large envelope, sealed it, and put it aside.

Dependent variables. Later, in an ostensibly separate study, participants' inclination to cheat by artificially inflating reports of how well they did in a task was surreptitiously documented through a trivia knowledge quiz that incentivized good performance and provided an opportunity to cheat. To sensitize of the insincerity test, the cheating outcome of receiving an inflated score was set as default, and subjects had to opt-out to act sincerely (see Web Appendix D for details). Next, we wanted to test whether cases where participants inflated their apparent performance can be traced back to a more general effect on the extent participants attempt to present themselves in an excessively favorable manner. For that purpose, participants responded to the classic Social Desirability scale that allows people to respond either honestly or in a socially desirable manner (Fitzsimons, Chartrand, and Fitzsimons 2008). Then, to test whether the predicted effects on the "self" are driven by EC, participants rated the extent to which they classify the headphones as "self." Specifically, participants read "if you think of all the objects in the world, some of them are more part of your self, and some of them are less part of your self. To different people different products fall into a different category (i.e., part vs. not part of the self). To what extent would you classify the headphones you evaluated today as part of your self?" (1-not at all self to 7-very much self). Finally, as a test for the ownership manipulation, participants responded to three items on whether they felt ownership over the judged headphones (Peck and Shu 2009; includes items

such as “I feel that these headphones are mine,” anchored between a 1-strongly agree and 7-strongly disagree).

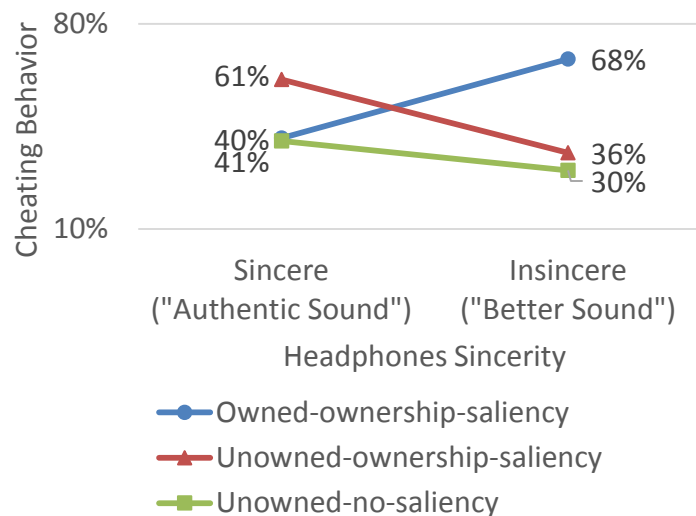
Results and Discussion

Analysis outline and overview of results. We first show that the two manipulated factors, ownership and headset sincerity, interacted to affect cheating behavior. Then, to flesh out the process, we show that this pattern is mediated by the extent subjects classified the headset as “self” and their subsequent social-desirability scores. In analyzing the underlying process, we first show that assigning people to own versus not to own headset increased the extent people classified the headset as “self” (predicted mediator). We then show that classification of the headset as more “self” yielded assimilation, but classification of the headset less “self” yielded contrast, in social-desirability. We also use contrast analyses to separately test the effect of classifying headset as “self” on assimilation and contrast under each “ownership” condition, and show that the assimilation and contrast effects dissipated in the “unowned-no-saliency” condition. Finally, we use mediation analyses to show that product ownership indirectly predicted cheating behavior by increasing classification of headset as “self,” which, interacted with headset insincerity to predict social desirability, and, in-turn, cheating.

To test the effect of the ownership manipulation on felt ownership (manipulation check), the three items on feeling headset ownership ($\alpha = .92$) were averaged to form an ownership scale. An ANOVA with the three ownership conditions as a single factor indicated that the ownership manipulation was successful: the omnibus effect ($F(2,149) = 17.17, p < .0001$), and the corresponding contrast ($F(1,149) = 33.42, p < .0001$)

revealed greater feelings of ownership over the headset in the “owned-ownership-saliency” ($M = 3.59$) versus the “unowned-ownership-saliency” ($M = 2.26$) and “unowned-no-saliency” ($M = 1.97$) conditions. Consistent with the intended nature of the “ownership-saliency” manipulation – to make subjects cognizant of not owning the device during self-judgment rather than to decrease subjects’ feelings of ownership for the device – the difference between the two “unowned” conditions was not statistically significant ($p > .34$)

FIGURE 5: OWNERSHIP AND HEADPHONES SINCERITY MANIPULATIONS INTERACT TO AFFECT CHEATING BEHAVIOR, EXPERIMENT 3



IV -> *cheating behavior*. Participants’ cheating behavior was submitted to a 3 (ownership: owned-ownership-saliency, unowned-ownership-saliency, unowned-no-saliency) x 2 (headphones insincerity: insincere vs. sincere) logistic regression (see means in Figure 5). The (dummy) dependent variable received a value of 1 if participants cheated. The analysis revealed no main effect, a significant omnibus interaction of ownership and headphones sincerity $\chi^2(2, 150) = 7.06, p = .029$ and a significant

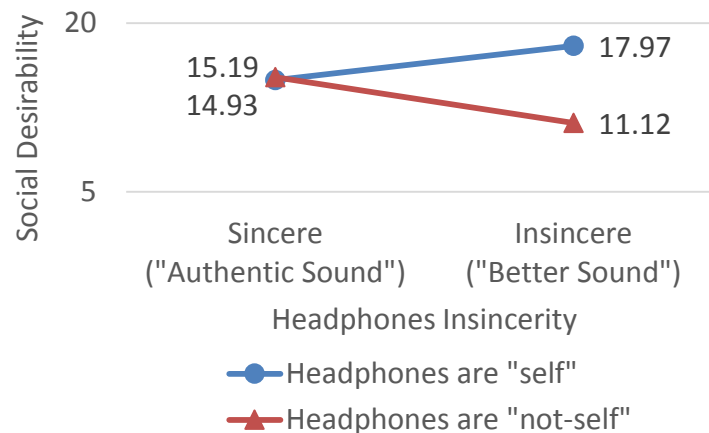
interaction for the contrast excluding the “unowned-no-saliency” condition $\chi^2(1, 150) = 6.58, p = .01$). Planned contrast among subjects in the “owned-ownership-saliency” condition revealed an expected assimilation pattern: subjects assessing the insincere headphones were marginally significantly *more* likely to cheat ($M_{cheat} = 68\%$, or 17 out of 25) than those assessing the sincere set ($M_{cheat} = 41\%$, or 12 out of 29), $\chi^2(1, 150) = 3.1, p = .054$. The same analysis among subjects in the “unowned-ownership-saliency” condition revealed an expected contrast pattern: subjects assessing the insincere headphones were marginally significantly *less* likely to cheat ($M_{cheat} = 36\%$, or 9 out of 25) than those assessing the sincere set ($M_{cheat} = 61\%$, or 14 out of 23), $\chi^2(1, 150) = 2.91, p = .08$). Finally, planned contrast among subjects in the “unowned-no-saliency” condition expectedly revealed no effect: cheating likelihood among subjects assessing the sincere headphones ($M_{cheat} = 40\%$, or 10 out of 25) and among those assessing the sincere set ($M_{cheat} = 30\%$, or 7 out of 23) did not statistically differ ($\chi^2(1, 150) = .47, p = .49$).

IV -> mediator. To test the effect of ownership on the predicted mediator, classification of the headset as “self” was submitted to ANOVA with the three ownership conditions as a single factor. The omnibus effect ($F(2,149) = 9.53, p < .0001$) and the corresponding contrast ($F(1,149) = 18.94, p < .0001$) revealed that, as expected, subjects classified the headset as “self” more in the “owned-ownership-saliency” ($M = 3.07$) than in the “unowned-ownership-saliency” ($M = 1.90$) and “unowned-no-saliency” ($M = 2.0$) conditions. Consistent with the prediction that felt ownership (low vs. high), rather than ownership-saliency, will affect classification of the headphones as “self,” the difference between the two “unowned” conditions was not statistically significant ($F < 1$).

Mediator -> *social desirability*. To test whether classifying headphones as “self” predicted assimilation and contrast, Social-Desirability was entered into an ANOVA with mean-centered headphones’ classification as “self,” headphones insincerity (insincere vs. sincere) and their interaction. Further, to test the prediction that classifying headphones as “self” does not predict assimilation or contrast in the “unowned-no-saliency” condition, the ANOVA also included ownership (owned-ownership-saliency, unowned-ownership-saliency, unowned-no-saliency), and its two-way and three-way interactions with the other two predictors. The analysis revealed an unexpected positive effect of classifying headphones as “self” ($B = 1.71$, $F(1, 138) = 17.95$, $p < .0001$) and its interaction with ownership ($F(2, 138) = 3.13$, $p = .047$). We speculate about the nature of these effects in Web appendix E. More importantly, the analysis revealed an expected significant interaction between classifying headphones as “self” and headphones insincerity ($F(1, 138) = 8.05$, $p = .005$). As expected, this effect was qualified by ownership, yielding a marginally significant three-way interaction ($F(2, 138) = 2.48$, $p = .087$). Planned contrasts then tested the prediction that the extent people classified the headphones as “self” would yield assimilation or contrast in the two “ownership-saliency” conditions, but not under “unowned-no-saliency.” In-line with this prediction, the interaction between classifying headphones as “self” and headphones insincerity was significant in the two “ownership-saliency” conditions (*owned*: $\beta = 4.09$, $t(150) = 3.17$, $p = .002$; *unowned*: $\beta = 3.01$, $t(150) = 2.15$, $p = .033$), but not in the “unowned-no-saliency” condition ($\beta = -.22$, $t(150) = -.15$, $p > .46$). The difference between the interactions across the two “ownership-saliency” conditions and the interaction under the “unowned-no-saliency” was significant ($\beta = 3.78$, $t(150) = 2.13$, $p = .035$).

Next, planned contrasts (using data from all conditions) tested the nature of the interaction between classifying headphones as “self” and headphones insincerity under the two ownership-saliency conditions – where this interaction was expected and found (see Figure 6). A flashlight analysis among subject classifying the headphones as “self” (i.e., one standard deviation above the mean) revealed an expected assimilation: subjects assessing the insincere (vs. sincere) headphones demonstrated greater insincerity, namely scored higher on social desirability (17.97 vs. 15.19, $B = 3.09$, $t(150) = 2.54$, $p = .012$). Similar analysis among subject who classified the headphones as “not-self” (i.e., one standard deviation below the mean) revealed an expected contrast: subjects assessing the insincere (vs. sincere) headphones exhibited lower insincerity, namely scored lower on social desirability (11.12 vs. 14.93, $B = -4.00$, $t(150) = -3.2$, $p = .002$).

FIGURE 6: SOCIAL DESIRABILITY UNDER “OWNERSHIP-SALIENCY”,
EXPERIMENT 3



NOTE.—“self” represents one SD above and “not-self” one SD below the mean of classifying the headphones as “self.” Higher social desirability reflects greater insincerity.

Mediation analyses. We then tested the prediction that owning the insincere (vs. sincere) headset would indirectly lead participants to exhibit *more* insincerity via higher

classification of the headset as “self,” but not owning the insincere headset would indirectly lead participants to exhibit *less* insincerity via lower classification of the headphones as “self.” That is, we tested whether the ownership manipulation increased classification of headphones as “self,” which interacted with headset sincerity to affect social-desirability. To account for the confirmed prediction that classifying headset as “self” would not interact with headset insincerity to predict assimilation or contrast in the “unowned-no-saliency” condition, we employed two analyses strategies to test the predicted mediation. As a first, simpler, analysis, we excluded the observations in the “unowned-no-saliency” condition and performed a moderated mediation analysis using the two ownership-saliency (owned versus unowned) conditions as a dichotomous independent variable. Then, given known limitations of data exclusion, a second test used data from all conditions to perform a more complex moderated mediation analysis.

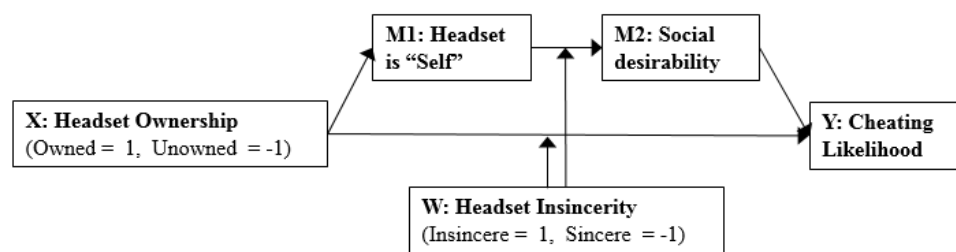
To execute the first analysis, observations from the “unowned-no-saliency” condition were excluded, and Social Desirability was submitted to a bootstrap moderated mediation analysis using the PROCESS macro (Hayes 2013, model 15). The analysis included ownership ($owned = 1, unowned = -1, IV$), mean-centered classification of headset as “self” (*predicted mediator*), and headset insincerity ($insincere = 1, sincere = -1, moderator$). The results from a bootstrap analysis revealed, as expected, a statistically significant moderated indirect effect (moderated mediation index = .3055), with a 95% confidence interval excluding zero (.1319 to .5932). In the indirect path, owning the headset increased classification of headset as “self” by .3779. Further, holding headset ownership constant, a single unit increase in the interaction of headset-insincerity with headset classification as “self” – the extent insincere headset was perceived as “self,” or

sincere headset was perceived as not “self” – increased social desirability by .4041 units. The direct effect (-.0287) was not significant ($p > .77$).

A more complex moderated mediation analysis with data from all conditions yielded a consistent pattern: classifying an insincere (vs. sincere) headset as “self” increased social desirability in the two “ownership saliency” conditions, but not in the “unowned-no-saliency” condition. This analysis is reported in full in Web Appendix F.

Finally, we tested whether the observed effect of headset ownership on cheating (cheat = 1, no cheat = 0) as a function of headset insincerity was mediated by social desirability, which was itself driven by the interaction between the extent people classified the headset as “self” and the headset sincerity. That is, we tested a model with two mediators that operate serially, where the connections between the two mediators and between the independent variable and dependent variable are moderated. A conceptual model is presented in Figure 7. A corresponding statistical model and estimation method are described in Web Appendix G.

FIGURE 7: MODERATED MEDIATION CONCEPTUAL MODEL, EXPERIMENT 3



As expected, the mean indirect effect from a bootstrap analysis was positive and significant ($a \times b_1 \times b_2 = .1623$), with a 95% confidence interval excluding zero (0.0147 to .4121). Importantly, the analysis revealed, as expected, that the indirect effect was moderated by headset sincerity (moderated mediation index = .0926), with a 95% confidence interval excluding zero (.0078 to .2420). In the indirect path, owning the

headset increased their classification as “self” by .3779 units (all units are standardized). Further, holding the classification of headphones as “self” constant, a single unit increase in the interaction between headphones-insincerity and classification of headphones as “self” – the extent the insincere headset was perceived as more “self,” or the sincere headset was perceived as less self – increased social desirability by .4041 units. Finally, holding constant headset ownership and the interaction of classification of the headset as “self” and headset-insincerity, a unit increase in social desirability increased the cheating coefficient by .5362 units. The direct effect (.7233) was also significant ($p = .0045$).

In sum, Experiment 3 demonstrated that people tend to classify as “self” products they own, but to classify as “not-self” products they do not own. This classification, in turn, rendered a personal-trait of these people, sincerity, more consistent with the sincerity of the product when they owned that product, but more inconsistent with the sincerity of the same product when they did not own that product. Notably, reports on the extent people classified the headphones as “self” predicted assimilation and contrast – or reflected how people construed “self” in terms of objects during self-judgment – only when people were initially evoked to feel ownership or feel lack of ownership. This pattern is consistent with Experiment 1’s results, where subjects construed “self” in terms of objects only after being evoked to have thoughts or feelings about ownership.

Studies 2 and 3 showed that using a product without owning it may yield contrast. However, an open question remains whether using a product without formally owning it can also yield assimilation in some cases. This question arises from previous findings of assimilation when people merely used, but did not formally own, a product (Gino et al. 2010). Experiment 4 aimed to address this open question.

EXPERIMENT 4: WEARING AN OBJECT YIELDS ASSIMILATION OF “SELF” TO OBJECT VIA FELT OBJECT OWNERSHIP

Experiment 4 tested whether lack of declared ownership could sometimes yield assimilation, rather than always contrast. Such a possibility is raised by previous research (Gino et al. 2010), where participants assessing designer sunglasses that they believed to be fake, rather than authentic, felt like “fakes” and were more likely to cheat, a pattern consistent with assimilation. In these studies, participants did not own the shades, and ownership-related thoughts and feelings were not explicitly evoked, rendering these studies compatible, yet seemingly inconsistent in results, with the “unowned-no-saliency” condition of Experiment 3, where no effect of headphones “insincerity” was observed.

Experiment 4 tested one notable difference between the experimental settings of the two studies that may help to resolve the aforementioned apparent inconsistency. Specifically, in Gino et al.’s studies participants responded to the dependent variable (cheating) while wearing the sunglasses, whereas in Experiment 3 participants responded to the dependent variable after removing the headphones. Previous research on the positive effect of haptic touch on feeling product ownership (Peck and Childers 2003) implies that having direct contact with a product could yield ad-hoc feelings of ownership over the product for the duration of the contact. Such feelings of product ownership – evoked by wearing the product – may induce people to construe “self” in terms of objects it includes and excludes, guide people to classify the product as “self,” and lead people to judge themselves in assimilation to the product. However, removing the product after wearing it may cause feelings of ownership that were evoked by wearing the product to dissolve. Therefore, after removing the product people may neither feel product

ownership nor be cognizant of not owning the product. In such cases, people might not construe “self” in terms of objects it includes and excludes, nor use products as a self-standards, as the “unowned-no-saliency” condition of Experiment 3 and the “control” condition of Experiment 1 suggest. Thus, the present study tested whether cases where non-owning users judge themselves in assimilation to a product while wearing it, but not after removing it, can be explained by the heightened feeling of ownership that users had while wearing the product. This would resolve the aforementioned apparent inconsistency by showing that wearing a product can implicitly induce feelings of ownership, consistent with the ownership-to-assimilation prediction made by EC (as studies 2 and 3 confirm).

Experiment 4 used the same product category as Experiment 3, headphones, but manipulated a different trait, weight. Previous research showed that people further “embrace into self” objects that are more consistent with their momentary perceptions of “self” (Gao, Wheeler, and Shiv 2009; Reed II 2004). Thus, the extent to which subjects perceived rest-related versus physical-activity-related objects as “self” (e.g., sofa versus running shoes), potentially due to changes in perceived bodyweight, served as a dependent variable. The study additionally tested whether potential effects on perceived bodyweight also predicted the extent subjects perceived themselves as physically attractive. The study compared two cases where declared ownership was absent. In the “while wearing” condition, corresponding with Gino et al., the dependent variables and predicted mediator – feeling of product ownership – were measured while participants still wore the headphones. By contrast, in the “after wearing” condition that corresponded with the “unowned-no-saliency” condition of Experiment 3, the dependent variables and predicted mediator were measured after the device was removed.

The study predictions would be supported if subjects would experience heightened feelings of headphones ownership while wearing the headphones, but these feelings of ownership would dissipate after the headphones were removed. Consequently, assessing “self” *while* wearing the lighter (vs. heavier) headphones would indirectly lead subjects to assess their bodyweight as lower (assimilation) via heightened feelings of headphones ownership. Further, feeling lighter would, in-turn, make people classify activity-related objects (e.g., running shoes) as more “self” than rest-related objects (e.g., sofa). Moreover, given the importance of bodyweight in perceived physical attractiveness (Franzoi and Herzog 1987) feeling lighter would also make people feel more physically attractive. By contrast, assessing “self” *after* removing the lighter (vs. heavier) headphones should not affect self-assessed bodyweight, the extent subjects perceived activity versus rest objects as “self,” or self-assessed physical attractiveness

Method and Procedure

One hundred and forty five students of a large East Coast University joined a lab experiment for \$8 participation fee. At the beginning of the experiment, each participant was randomly assigned a study ID. The ID consisted of one of two letters, either “D” (representing random assignment to a box labeled “D”) or “H” (representing random assignment to a box labeled “H”) followed by a number. At the lab were two boxes, each containing several headphones by JVC of one of two models a lighter HA-V570 (4.23 Oz) and a 64% heavier HARX300 (6.94 Oz; see Web Appendix C, panel B). Subjects were not informed of nor had an opportunity to experience the weight difference between the devices. The computer informed subjects that they would evaluate the usability of one

of two headsets as part of a marketing study and then asked each participant to go to the box corresponding to the letter on his or her study ID and pick up a headphones set. We randomized across sessions whether the box with the lighter set was labeled “D” and the box with the heavier set was labeled “H” or vice versa.

To support the cover story, after picking up a pair of headphones and responding to some cover-supporting questions about the headphones’ adjustability, participants put them on and responded to some additional questions about the device’s comfort level. Participants then plugged-in the headphones to their lab workstation and listened to a 30 sec music track (from “Clocks” by Radio-Head). Subjects were asked to “keep the headphones on your head. You will be asked to take them off soon after wearing them for a few minutes so we could get a sense of how they feel on your head after a while. Meanwhile, you will respond to some questions about the headphones, about yourself, and about your experience with the headphones.” At this point, the order of events differed between the “while wearing” and “after wearing” conditions: to test how physically attractive participants felt (DV), those in the “while wearing” condition responded to three questions about their physical attractiveness (“right now, I feel attractive,” “I feel confidence in my ability to attract potential intimate partners,” “I feel that I have low sex-appeal at the moment,” reverse coded), anchored between a 1-strongly disagree and 7-strongly agree. Then, to test whether predicted effects on how participants judged their own physical attractiveness were specifically driven by changes in how participants assessed their bodyweight at the time of judgment, participants reported their bodyweight in pounds. Next, participants were asked on the extent they classified six objects –three physical-activity-related (running shoes, golf clubs, camping gear) and three rest-related (sofa, bed, reading glasses) – as “self” using wordings similar

to the ones used in Experiment 3. Notably, to avoid inducing people to have ownership-related thoughts and feelings, the concept “ownership” was not mentioned thus far in the study. Then, to test the expected process, participants in the “while wearing” condition rated the extent they felt ownership over the headphones on the same three-item psychological ownership scale used in Experiment 3 (Peck and Shu 2009; note that, whereas in Experiment 3 ownership was directly manipulated rendering this scale a manipulation check, here the manipulation is merely wearing the headphones, rendering feelings of ownership a process measure). Finally, subjects in the “while wearing” condition removed the headset and reported how durable they were and how comfortable they felt after a while.

In contrast, participants in the “after wearing” condition first responded to the headphones durability questions, then removed the headphones and responded to the comfort questions and only then reported how attractive they felt, assessed their weight in pounds, answered on the extent they classified the rest and activity items as “self,” and responded to the felt ownership scale. Then, to explore whether implicit self-theories facilitate the predicted effects, subjects responded to the same Implicit Persons Theory Measure (Levy et al. 1998) used in study 2 ($M = -.09$, $SD = 2.38$). The scale had no main or interaction effects and is not discussed further). Finally all subjects assessed the headphones’ lightness (a manipulation check for product weight; three items e.g. “the headphones are very light,” on a 1-strongly disagree to 7-strongly agree scale) and after responding to several controls, such as height in inches, age and gender, were debriefed and thanked.

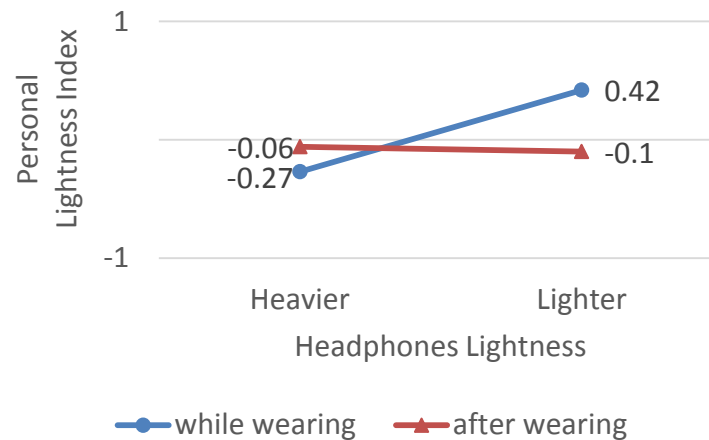
Results and Discussion

“Personal lightness index.” To test the headphones’ weight manipulation, the three headphones heaviness items ($\alpha = .87$) were averaged into a headphones lightness index. A t-test confirmed that subjects who examined the lighter (vs. heavier) set rated it as lighter ($M_{\text{lighter}} = 5.01$ $M_{\text{heavier}} = 4.27$ vs., $t(145) = 3.49$, $p = .0006$). Next we tested whether subjects in the “while wearing” condition randomly assigned to the lighter (vs. heavier) headphones perceived activity- (vs. rest-) related objects as more “self.” We created a “personal lightness index” by subtracting the extent subjects classified as “self” the three rest-related items ($\alpha = .63$) from the three activity-related items ($\alpha = .58$), where higher value reflects stronger classification of activity versus rest related items as “self.” The “personal lightness index” was submitted to an ANOVA with measurement timing (while wearing vs. after wearing) and headphones lightness (light vs. heavy) as factors. The analysis revealed an expected interaction effect ($F(1, 141) = 4.99$, $p = .027$; see Figure 8 for normalized means). Planned contrast among participants in the “while wearing” condition revealed the expected assimilation: participants assigned to the lighter headphones ($M = .42$) scored higher on the “personal lightness index” than participants assigned to the heavier headphones ($M = -.27$, $F(1, 141) = 9.10$, $p = .003$). A similar analysis among participants in the “after wearing” condition revealed an expected null effect: headphone weight did not affect how participants scored on the “personal lightness index” ($M_{\text{lighter}} = -.1$ vs. $M_{\text{heavier}} = -.06$, $F < 1$, NS).

IV -> mediator. We then tested whether wearing the headphones while responding to the predicted mediator, perceived ownership, increased feelings of

headphones' ownership. A t-test revealed that responding to the ownership questions while wearing (vs. after wearing) the headphones led to a greater feeling of ownership ($M_{\text{while-wearing}} = 2.42$ vs. $M_{\text{after-wearing}} = 1.91$, $t(145) = 2.45$, $p = .015$).

FIGURE 8: "PERSONAL LIGHTNESS INDEX," EXPERIMENT 4

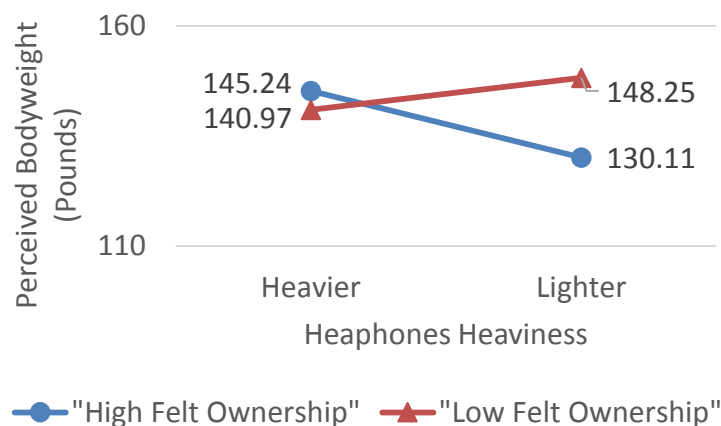


NOTE.—The "Personal Lightness Index" reflects the extent participants classified activity-related objects (e.g., running shoes) as more self than rest-related objects (e.g., sofa). The means are presented on a normalized scale.

Mediator -> *perceived bodyweight*. To test whether feeling of headset ownership interacted with headset's weight to affect assessments of one's own bodyweight, bodyweight assessment was entered into an ANCOVA with mean-centered feeling of headset ownership, headset lightness (*heavy* = -1, *light* = 1) and their interaction, controlling for gender ($F(1, 139) = 6.95$, $p = .0093$) and height in inches ($F(1, 139) = 15.87$, $p = .0001$; males and tall individuals tend to have higher bodyweight). The analysis revealed a significant interaction between feelings of headset ownership and headset lightness ($F(1, 139) = 7.13$, $p = .0085$, for adjusted means see Figure 9). A flashlight analysis at high felt ownership (i.e., one standard deviation above the mean) revealed the expected assimilation: subjects assessing the lighter (vs. heavier) headset assessed their

bodyweight as lower (130.11 vs. 145.24, $B = -15.12$, $t(145) = 2.51$, $p = .013$). Repeating the analysis at low felt ownership (i.e., one standard deviation below the mean) revealed an expected null effect: subjects assessing the lighter (vs. heavier) headset reported similar bodyweights (148.25 vs. 140.97, $B = 7.28$, $t(145) = 1.26$, $p = .21$).

FIGURE 9: PERCEIVED BODYWEIGHT, EXPERIMENT 4



NOTE.—“High felt ownership” represents one SD above and “low felt ownership” one SD below the mean of felt ownership.

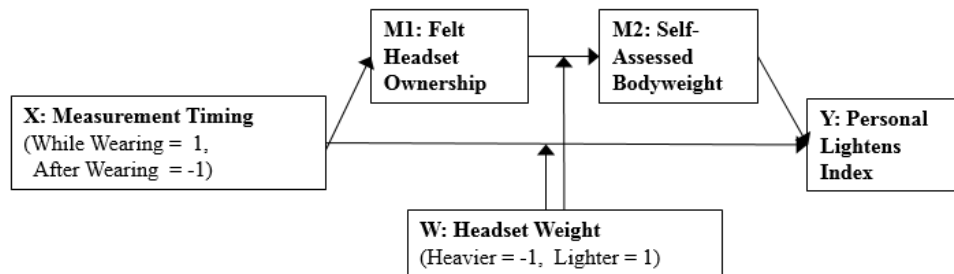
Mediation analyses. We then tested the prediction that wearing the lighter (vs. heavier) headset would indirectly lead subjects to feel lighter via felt headset ownership. That is, we tested whether assessing “self” while wearing (vs. after removing) the headset increased feelings of headset ownership, which interacted with headset weight to affect self-assessed bodyweight. Self-assessed bodyweight was submitted to a bootstrap mediation analysis using the PROCESS macro (Hayes 2013, model 15). The analysis included measurement timing (*while wearing* = 1, *after wearing* = -1), mean-centered felt headphones ownership (*predicted mediator*) and headphones lightness (*heavy* = -1, *light* = 1), controlling for gender and height. The results from a bootstrap analysis revealed, as

expected, a statistically significant moderated indirect effect (moderated mediation index = -2.6169), with a 95% confidence interval excluding zero (-6.5077 to -.6255). In the indirect path, reporting felt ownership while wearing the headset increased felt ownership by .2621. Further, holding measurement timing constant, a single unit increase in the interaction of headset-weight with felt headset ownership – the extent the lighter headset was perceived as more owned, or the heavier headset was perceived as less owned – decreased self-assessed bodyweight by 4.9975 units. The direct effect (3.2833) was not significant ($p > .12$).

Next, we tested whether the observed effect of measurement timing on the “personal lightness index” as a function of headset weight was mediated by assessed bodyweight, which was itself driven by the interaction between the extent people felt headset ownership and the headset weight. That is, we tested a model with two mediators that operate serially, where the connections between the two mediators and between the independent variable and dependent variable are moderated (see Figure 10 for a conceptual model; the statistical model is identical to the one used for the corresponding model in Experiment 3, with addition of two controls, gender and height, see also Web Appendix G). As expected, the mean indirect effect from a bootstrap analysis was positive and significant ($a \times b_1 \times b_2 = .0211$), with a 95% confidence interval excluding zero (0.0009, .0638). Importantly, the analysis revealed, as expected, that the indirect effect was moderated by headset weight (moderated mediation index = .0114), with a 95% confidence interval excluding zero (.0007 to .0390). In the indirect path, reporting felt ownership while wearing the headset increased felt ownership by .2621 units. Further, holding measurement timing constant, a single unit increase in the interaction of headset-weight with felt headset ownership – the extent the lighter headset was perceived

as more owned, or the heavier headset was perceived as less owned – decreased self-assessed bodyweight by 4.9975 units. Finally, holding constant measurement timing and the interaction of headset-weight with felt headset ownership, a unit increase in self-assessed bodyweight decreased the “personal lightness index” coefficient by .0102 units. The direct effect (.2962) was also significant ($p = .0067$).

FIGURE 10: MODERATE MEDIATION CONCEPTUAL MODEL, EXPERIMENT 4



Next, we tested whether the effect on assessed bodyweight also predicted the extent subjects felt physically attractive, using the same model with physical attractiveness ($\alpha = .85$) replacing the “personal lightness index” as a dependent variable. As expected, the mean indirect effect from a bootstrap analysis was positive and significant ($a \times b_1 \times b_2 = .0185$), with a 95% confidence interval excluding zero (0.0001, .0564). Importantly, the analysis revealed, as expected, that the indirect effect was moderated by headset weight (moderated mediation index = .0120), with a 95% confidence interval excluding zero (.0001 to .0353). In the indirect path, reporting felt ownership while wearing the headset increased felt ownership by .2621 units. Further, holding measurement timing constant, a single unit increase in the interaction of headset-weight with felt headset ownership – the extent the lighter headset was perceived as more owned, or the heavier headset was perceived as less owned – decreased self-assessed bodyweight by 4.9975 units. Finally, holding constant measurement timing and the

interaction of headset-weight with felt headset ownership, a unit increase in self-assessed bodyweight decreased self-assessed physical attractiveness coefficient by .009 units. The direct effect (.1424) was not significant ($p = .2041$).

In sum, Experiment 4 demonstrated that people feel greater ownership over a product while (vs. after) they wear it, even in absence of declared ownership. Such feelings of product ownership, in-turn, led people to assess a personal-trait, their bodyweight, in assimilation with a related trait of the product. Further, consistent with the idea that people are less likely to use products as self-standards in the absence of ownership-related thoughts and feelings, when people did not feel headphones ownership nor were made cognizant of not owning the headphones, headphones' traits did not affect self-judgment. Taken together, these results help to resolve the apparent inconsistency of the findings in Experiment 3 with previous research, suggesting that assimilation while people wear a product without owning it (Gino et al. 2010) is not inconsistent with classification of products as "self" based on product ownership, as predicted by EC.

GENERAL DISCUSSION

Ample research concludes that the "self" is malleable (Aaker 1999; Markus and Kunda 1986) as people construct and judge "self" relative to standards in their environment (Mussweiler 2003). A wide body of research on Social Comparison documents that a person's social context, people and groups, can impose standards that affect self-judgment (Wood 1989). Building on Egocentric Categorization (EC) research (Weiss and Johar 2013) and on people's ability to use product traits as inputs for judging their own traits (Park and John 2010), we suggest that a person's material context, objects

and goods, may also impose standards that affect self-judgment. Previous EC research finds that, in certain situations, such as when people think about or feel ownership or lack thereof, people classify objects in-terms of "self" and judge objects relative to "self." Extending EC, we suggest that, the same situations may also induce people to construe "self" in terms of objects and use objects as standards to judge the "self." Consequently, people may judge themselves in assimilation to owned objects, which people classify as "self," but in contrast to unowned objects, which people classify as "not-self."

Key results. In support of the proposed extended view of EC, two studies showed that thinking about or feeling ownership may lead people to construe "self" in terms of objects (studies 1, 3), extending previous findings that thinking about or feeling ownership can lead people to perceive products in terms of "self." Self-construal in terms of objects was apparent from observing that, when induced to have "ownership" thoughts or feelings, (a) people described themselves more in terms of object-supported identities, hobbies and professions (Experiment 1), and (b) the extent people classified a product as "self" predicted self-judgment (Experiment 3).

Studies 2-4 supported predicted consequences of construing "self" in terms of objects for self-judgment, and implicated the role of classifying objects as "self" in the effect of object traits on self-judgment. People evaluated themselves in assimilation to owned objects (studies 2-3) or to objects they merely felt ownership over (Experiment 4), but in contrast from unowned objects (studies 2-3). Assimilation and contrast patterns were replicated based on a brand-personality trait, sincerity, which differed merely by how people perceived it (Experiment 3), or based on physical product traits, weight and shape, which tangibly differed across products (studies 2, 4). The results generalized

across different combinations of product categories and traits including mugs that varied on physical appearance (Experiment 2), as well as headphones that varied on their perceived sincerity (Experiment 3) or physical weight (Experiment 4). Moreover, consistent with EC as the process, assimilation and contrast of self-judgment to products (a) were mediated by whether people classified objects as "self" (Experiment 3), (b) were moderated by whether people are predisposed to classify owned objects as "self" and unowned objects as "not-self" (Experiment 2), and (c) dissipated without cues that induce people to construe self in terms of objects, such as "ownership" thoughts or feelings (studies 3-4). Further, two effects that EC predicts – assimilation and contrast of "self" to products and of products to "self" – were concurrently observed (Experiment 2).

The studies also documented broader consequences and were consistent with the spontaneity of the observed trait-specific effects. Trait-specific effects on how people perceive their own tallness, sincerity, or bodyweight respectively predicted people's overall physical self-esteem (Experiment 2), cheating behavior (Experiment 3), or self-assessed physical-attractiveness (Experiment 4). Moreover, in-line with the spontaneity of self judgment relative to objects, broader consequences of self-judgment relative to objects were observed not only when trait-specific measures were taken first, and thus directly elicited judgment along a focal dimension (studies 2, 4). Rather, broader consequences of self-judgment were also observed when specific measures were taken *after* the broader, less intrusive, measures (studies 2-4), consistent with the possibility that a trait-specific judgment already took place without elicitation.

The studies contribute to the subtle distinction between two closely related factors in EC, saliency of the concept "ownership" (high versus low) and product ownership (owned versus unowned). For subjects in the "owned" condition, assimilation was

observed regardless to whether the concept “ownership” was made salient (studies 2, 3) or not (Experiment 4). However, for subjects in the “unowned” condition, contrast was observed only when people were made cognizant of not owning the product (i.e., in Experiment 2 and in Experiment 3 under ownership-saliency, but not in Experiment 3 under no-saliency or in Experiment 4). Thus, ownership-saliency, or other ways to activate “self,” might be necessary for contrast to ensue following lack of ownership, but not for assimilation to ensue following ownership. This difference might be because in most contexts the default state of objects is “unowned,” rendering a feeling of lack of ownership part of the “taken for granted” background. In such cases, people may only notice and respond to the ownership state of objects following changes in the “unowned” state, such as following a newly formed feeling of object ownership, and in the absence of such changes, when “ownership” aspects of the situation are called into mind.

Alternative accounts. Taken together, the studies help rule-out several alternative accounts. The observed pattern, whereby object traits affect self-evaluation by owners and non-owners in diametrically opposing manners, assimilation or contrast, helps to rule out competing accounts that make a unidirectional prediction, such as concept activation (Shapiro, MacInnis, and Heckler 1997), product contagion (Morales and Fitzsimons 2007) or embodied-cognition (Ackerman, Nocera, and Bargh 2010). Although such accounts can explain assimilation under ownership, they cannot explain contrast under lack thereof (studies 2-3), mediation via classification of products as “self” (Experiment 3) or via felt ownership (Experiment 4), nor moderation by “Mine-Me” sensitivity.

In addition, inference-based accounts (e.g., “I own a sincere product so I must be sincere;” Kardes, Posavac, and Cronley 2004), such as self-perception (Bem 1967) or

self-signaling (Bodner and Prelec 2003), cannot hold when people own a product due to random assignment rather than choice (studies 1-4). This is because “free choice” has been explicitly identified as a critical factor for such effects to ensue (Bem 1972; Fazio, Zanna, and Cooper 1977). The plausibility of inference-based accounts further diminishes when a focal product trait is less likely to be considered diagnostic of a respective trait of its owner. For example, whereas owning “sexy” (e.g., Victoria Secret bag), “creative” (e.g., Apple computer), or “masculine” (e.g., Hummer Jeep) products may yield an inference that the owner is respectively sexy, creative or masculine, the same inference seems less likely for many physical characteristics (as the ones employed in studies 2 and 4). Thus, all else equal, owning a dark-colored phone, a heavier laptop, or a taller water drinking bottle seem less likely to yield an inference that the owner is respectively of darker complexion, heavier, or taller. Finally, previous research finds that a self-perception/signaling effect on people using a product persists beyond the time the product is being used (Park and John 2010). Thus, a self-perception/signaling effect cannot account for cases where assimilation is driven by ad-hoc feeling of ownership that dissipates once a product is removed (Experiment 4).

Contribution to extant theory. Consumers regularly make decisions and judgments about people and about products. Previous research about how people make decisions and judgments about themselves and about products has been largely conducted separately, within distinct bodies of research. Research on how people judge themselves concludes that people often do so relatively to how they perceive other people (Festinger 1954; Tesser 1986; Tesser and Campbell 1980). Research on how people judge products concludes that people often do so relative to how they perceive other products (Hsee

1996; Hsee and Leclerc 1998; Morales and Fitzsimons 2007; Yeung and Wyer 2005).

The present research suggests that Egocentric Categorization Theory is well positioned to begin bridging these two separate bodies of research. Extending findings that people judge objects not only relative to other objects, but also relative to how people judge themselves (Weiss and Johar 2013), the present research shows that people may also judge themselves not only relative to other people, but also relative to objects. Future research would benefit from further investigating this underexplored interplay between how consumers judge products and judge themselves.

Previous research finds that people use different self-aspects to organize and understand different facets of their social environment and their identity within it. People understand themselves in terms of groups and relationships respectively based on the *social* (Brewer and Weber 1994; Tajfel et al. 1971) and the *relational* (Andersen and Chen 2002; Aron et al. 1991) aspects of “self.” Could people also use “self” to organize and understand their material environment and their identity within it? The present research gives rise to a notion of yet another distinct aspect of the self, the “*instrumental-self*,” that people may use to guide their interactions with and perceptions of objects as well as to guide their assessments of themselves. When situational factors, such as cues that induce people to feel ownership or lack thereof, activate the instrumental-self, people might be more likely to judge their traits relative to traits of products, rather than relative to traits of other individuals or groups, especially if their “Mine-Me” sensitivity is high.

Previous research has used different terms to describe various aspects of the interplay between people and objects. For instance, Belk’s seminal conceptualization of the *Extended-Self* refers to self plus objects. However, this conceptualization seems too broad for describing “self” as a category for objects, as it is designed to include places

and people which have been classified in other aspects of “self,” “social” (e.g., “New Yorker”) and “relational” (e.g., parent). At the same time the *Extended-Self* conceptualization also seems too narrow for describing “self” as a category for objects, as it distinctly applies for special possessions that gained personal meaning over time, rather than to randomly acquired items that are in the focus of the empirical evidence of the present work. Another fundamental notion, materialism, also captures aspects of “self” plus objects. However, given that materialism is a value (Richins and Dawson 1992), it may guide people across self-construals. Future research should further explore the usefulness of studying the *Instrumental-self* as a unique self-construal to further our understanding of consumer judgment and decision making.

Implications and limitations. The notion that people use products to construct and assess “self” – that ‘we are what we have’ – is widely accepted (e.g., Belk 1988; James 1890; Tuan 1980). Taking a motivational standpoint, much previous research implicitly asserts certain restrictions on when objects would affect “self.” objects are assumed to affect people’s self-concept only if people (i) *want* to update the way they view themselves, (ii) *choose* to do so through buying or using products, and (iii) use products with traits that effectively “signal” their own traits (Cryder et al. 2008; Leary and Kowalski 1990). Adding to these perspectives, EC highlights a cognitive standpoint, asserting that people sometimes use “self” to categorize and understand their material environment, and themselves within it. Notably, this assertion allows analyzing interplay between people and objects using well-established categorization principles (Lingle, Altom, and Medin 1984; Medin, Ross, and Markman 2004). Based on EC principles, the present research finds that a product can affect self-evaluation in a broader set of

circumstances than previously assumed, such as (i) when people have no apparent desire to “change” identity, (ii) when product exposure or ownership is involuntary (e.g., an ad, a gift), and (iii) when product traits (e.g., “tallness” of a Mug) do not effectively signal respective user traits (i.e., user’s tallness).

The finding that a product can affect people’s self-evaluation and behavior has worrisome implications to people in modern society, who often acquire objects without any intention to do so, such as when they inherit, win or receive them as gifts. Our findings suggest that when people acquire an object, not only do these people gain control over it, but ironically they also surrender control to it, allowing its traits to systematically influence the way they see themselves and behave. Moreover, the growing popularity of product usage by non-owners (e.g., via leasing or renting) in many industries (e.g., car, fashion), as well as the massive exposure of people to product advertising, increases the importance of the effects we document for non-owners. Future research would benefit from looking at whether the observed effects are long lasting or short-lived. Further, whereas experimental research is useful for isolating the existence of such effects in controlled lab-settings, additional research should examine whether such effects also hold outside the lab when they overlap with others signals.

Is owning a product necessary for observing assimilation of self to the product? The extant research suggests that this is not the case. Assimilation patterns can be driven by various accounts, including inference (Kardes et al. 2004), goal activation (Fitzsimons et al. 2008) and others (see the “alternative accounts” section). Our findings imply that cases where people feel product ownership may foster, whereas cases where people feel lack of ownership may inhibit or even reverse, other assimilative effects. The relative

strength of various effects is likely to be context dependent, and may also vary based on individual differences, such as “Mine-Me” sensitivity.

Previous EC research on the effect of self-evaluation on product judgment has found that heightened self-awareness facilitates usage of the category “self” in judging products. Given these findings, self-awareness was heightened in all the studies of the present research (see study 1’s procedure). Notably, in product judgment, different categories (e.g., product category, brand) can serve as reference. In such cases, self-attention directs people’s focus to the “self” during judgment, which increases likelihood that people use “self” to judge products. By contrast, in self-judgment, the “self” is likely the default category, already in the center of people’s attention, which may render further increase in self-attention superfluous. Future research would benefit from testing whether or not heightening self-awareness facilitates the effect of product traits on self-judgment.

To summarize, this research finds that people may use objects as self-standards, judging “self” in assimilation to owned products that people classify as “self,” but in contrast to unowned products that people classify as “not-self.”

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WEB APPENDICES

WEB APPENDIX A: SELF-CONSTRUAL IN TERMS OF OBJECTS FACILITATES
ACTIVATION OF OBJECT-IMPOSED TRAITS, EXPERIMENT 1

We report here a test for a theoretically predicted implication for self-judgment of whether a participant construed “self” in terms of objects. Our conceptual framework predicts that, when people construe “self” in terms of objects, people spontaneously judge themselves relative to standards imposed by products in their surroundings. We wanted to test whether people who described themselves along object-supported identities, hobbies and professions, were more likely to spontaneously judge “self” relative to product-imposed standards. As an unobtrusive proxy for spontaneous self-judgment along a trait we used trait-activation, as self-judgment along a trait requires people to mentally access that trait, which increases its activation (Higgins 1996). As a trait for self-judgment we used personal physique, and we tested whether subjects’ physique becomes activated after exposing subjects to laptop ads that emphasized the device’s physical shape.

As part of the filler between the condition manipulation and the “I am ___” task of Experiment 1, subjects saw a series of 4 laptop ads that highlighted the physical shape of the devices. Three of the ads emphasized the thin figure of the advertised laptop, and one stressed the strong and bulky build of the device (see Figure A1). To support the marketing study cover story, participants indicated on five point scales whether each ad was effective, informative and original. Next, to test whether exposing people to ads that highlight the physicality of products activates people’s thoughts of their own physique, after completing the “I am ___” task, participants played a word-puzzle game on a 15 X 15 matrix containing 225 letters (for the actual stimulus employed, see Figure A2).

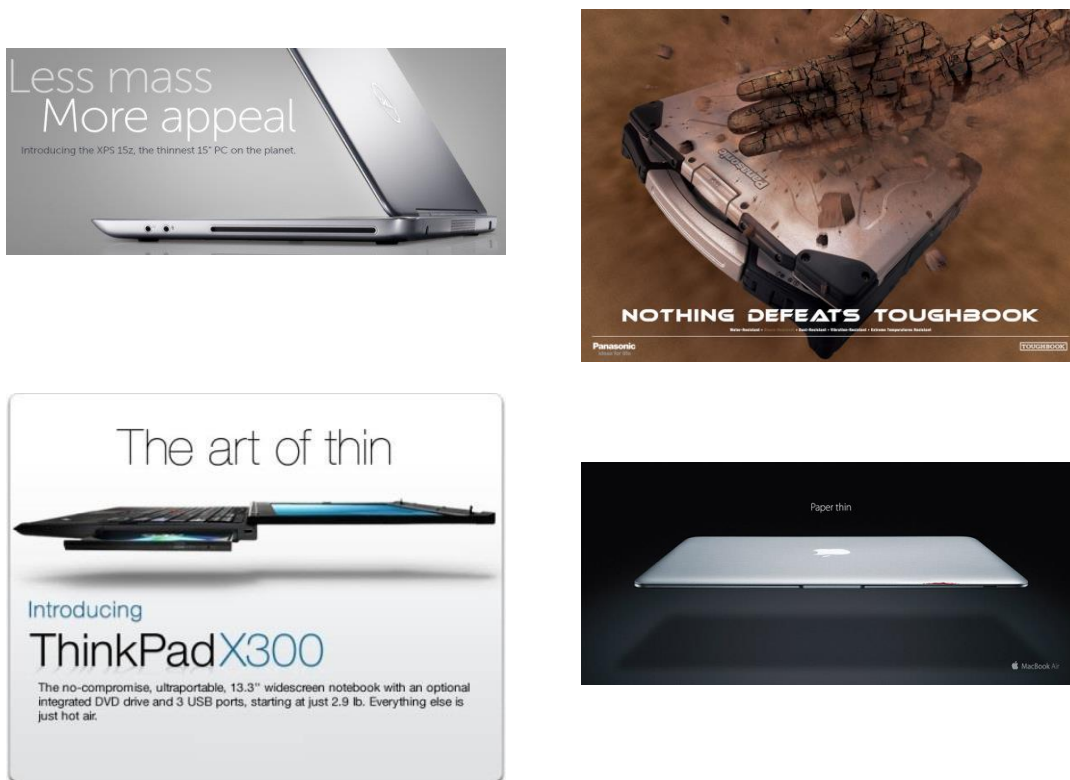
Participants had 60 seconds to find and write down as many five-letter or longer words

that “can (but not necessarily) *describe them*” as they could find in the matrix. The instructions required that the words be meaningful and constructed out of letters linked in a straight line (horizontal or vertical) in the letter matrix. The 60-second time limit constrained the number of words the participants could find, leaving them only enough time to identify the words that jumped out at them. This enabled us to determine to what extent the concept of interest, participants’ physique, was accessible in participants’ minds (Parker and Schrifft 2011). Note that, unlike traditional word-puzzle games, we did not give participants the list of words to be found. The word-puzzle contained five personal-physique words (heavy, rotund, bulky, stout, chubby) and five control, affect-related, words (anxious, nervous, tense, jumpy, jittery). Both sets were selected to be negative to avoid a positivity bias and motivation-based effects given that subjects were asked to find words that could describe themselves. Participants received a full explanation of the task before beginning the task.

We then wanted to test whether exposing people to ads for thin and bulky laptops lead subjects who were induced to have “ownership” thoughts and feelings, and thus described themselves along hobbies and professions, to have higher activation of traits associated with their personal physique. The number of personal-physic words participants found in the word-puzzle was submitted to a bootstrap mediation analysis using the PROCESS macro (Hayes 2013, model 4). The analysis included experimental condition (*ownership-saliency*= 1, *control* = -1) as IV, and the number of hobbies and professions participants used for describing themselves as the predicted mediator. Following the analysis methods recommended by Zhao, Lynch, and Chen (2010), we found that the mean indirect effect from a bootstrap analysis was, as expected, positive and significant (.0199), with a 95% confidence interval excluding zero (.0035 to .0489).

In the indirect path, ownership-saliency increased the number of self-descriptions along hobbies and professions by .4846 units. Further, holding constant the effect of ownership-saliency, a unit increase in the number of self-descriptions along hobbies/professions increased the number of found physical-shape words by .041 units. The direct effect (.0190) was not significant ($p = .72$). Adding the number of control words participants found as a covariate in the analysis strengthened the observed mediation pattern.

FIGURE A1: LAPTOP ADS, EXPERIMENT 1



A second measure for personal-physique activation yielded consistent results. As a second activation measure, we calculated for each participant a score that reflects the tendency to find physical-shape words before (vs. after) control words. This score, the Standardized Median Rank Difference (SMRD) of the list of found words, is defined as $2(MR_c - MR_p)/n$. In this formula, MR_c = median rank (i.e., median location) of control

words in a participant's list of found words, MR_p = median rank of physical-shape words in a participant's list of found words, and n = total number of words in the list (Johnson, Haubl, and Keinan 2007). The SMRD score can take on values from 1 (all physical-shape words were found before any control words) to -1 (all control words were found before any physical-shape words). We predicted that the more participants construed "self" in terms of objects (i.e., listed more hobbies/professions as descriptions of "self"), the earlier they would find physical-shape words. To examine this prediction, the SMRD was submitted to the same mediation analysis as the number of found physical-shape words above. The SMRD score was defined only for the 175 participants who found at least one word in the puzzle. Consistent with our prediction, the mean indirect effect from a bootstrap analysis was, as expected, positive and significant (.0552), with a 95% confidence interval excluding zero (.0162 to .1144). In the indirect path, "ownership-saliency" increased the number of self-descriptions along hobbies or professions by .5614 units. Further, holding constant the effect of "ownership-saliency," a unit increase in the number of self-descriptions along hobbies or professions increased the SMRD score---the extent subjects found physical-shape words before control words---by .0984 units. The direct effect (-.0807) was not significant ($p = .25$).

To sum, consistent with a meaningful positive effect of the ownership-saliency manipulation on the extent people construed "self" in terms of objects, for subjects who used more object-supported identities to describe "self," seeing ads that emphasize laptop physicality rendered these subjects' own physique more top-of-mind. Limiting the possibility that the effect of "ownership" saliency was a manipulation artifact, the mediation result is consistent with the idea that construing "self" in terms of objects induced people to spontaneously judge themselves along object-imposed standards.

FIGURE A2: WORD-PUZZLE, EXPERIMENT 1

y	h	l	c	o	e	u	s	b	s	b	r	y	t	h
b	u	b	h	s	y	t	e	n	s	e	u	b	r	s
k	b	u	l	k	y	h	y	e	o	y	e	o	s	
a	t	u	s	i	t	t	u	r	o	s	j	k	t	b
t	y	h	e	s	t	o	u	t	n	b	i	e	u	t
n	e	r	v	o	u	s	h	y	m	u	t	s	n	u
r	o	t	t	c	u	c	e	k	a	y	t	b	d	u
s	n	a	y	h	t	h	b	u	j	t	e	l	m	h
x	u	n	e	u	i	e	b	s	u	b	r	a	p	o
i	e	x	h	b	e	h	s	o	m	y	y	s	j	r
j	h	i	h	b	s	e	y	p	p	t	b	h	y	r
a	h	o	a	y	h	a	e	s	y	n	s	u	h	y
o	y	u	s	r	u	v	e	m	i	x	o	j	o	i
m	e	s	e	u	v	y	v	p	e	g	n	g	i	y
n	r	f	e	h	e	s	t	j	i	e	e	h	y	v

WEB APPENDIX B: HEADPHONES “SINCERITY” PRETEST, EXPERIMENT 3

Loosely inspired by an industry headphones ad (see Figure B1), we identified two countervailing benefits that consumer may get from headphones. The first benefit allows users to hear sound exactly the way the artist intended it (e.g., useful for music critics), whereas the second benefit allows users to hear the sound as well as it could be (e.g., useful for music producers). Thus, the first benefit comes from headphones that authentically reproduce sound (“authentic-sound”), and the latter benefit comes from headphones that artificially improve sound (“better-sound”). We expected that people would view “better-sound” headphones as desirable and valuable as, but less truthful and sincere (Aaker 1997) than “authentic-sound” ones. To test this expectation, 40 individuals of the main experiment’s population read about one of two sets of headphones (see Figure B2) and then rated their sound reproduction on sincerity related attributes (authentic, true, unembellished, not-adorned) and the headphones on attractiveness (appealing, desirable, good) and quality (worthwhile, of high quality, useful). The results confirmed that the “authentic-sound” headphones were comparable to the “better-sound” ones on attractiveness (5.48 vs. 5.90, $p > .33$) and quality (5.78 vs. 5.97, $p > .59$), but higher on sincerity (6.11 vs. 4.02, $p < .0001$).

FIGURE B1: MOTIVATING HEADPHONES AD

Beats™ by Dr. Dre™ - Studio
High-Definition Powered Isolation Headphones

- Extra-large speakers, powerful digital amplifier for sound just the way the artist intended it
- Powered noise isolation—tunes out noise for better music
- Spacious, plush earcups—listen all night long in comfort
- iSoniTalk™ headphone cable with built-in call answer button

\$299.99

studio™
with **ControlTalk™**
High Definition Powered Isolation™ Headphones

SOUND. FASHION. STYLE.

- Headphones as hot as the iPod
- Considered the world's best sounding headphone by many artists and recording professionals
- Stylistically worn by the top professionals in sports and entertainment world
- Special ear cushions that make listening for hours comfortable
- Monster powered noise isolation takes you to another world
- Monster High Performance headphone cable

1. Authentic-sound: “sound just the way the artist intended it”
2. Better-sound: “tune out noise for better music”

FIGURE B2: HEADPHONES SINCERITY

High Product Sincerity

1. The *AuthenticSound Headphones*TM use a domestically developed high fidelity technology, which authentically reproduces sound.
2. The *AuthenticSound Headphones*TM technology does not improve the sound of music; rather it reproduces the sound exactly as it was recorded.
3. The *AuthenticSound Headphones*TM allow people to listen to the music precisely as it is and reveal its true and genuine quality and sound.
4. The *AuthenticSound Headphones*TM won the Musicians' Best Headphones Set award of 2009, for "producing the most wholesome and, yet, accurate sound reproduction".
5. The *AuthenticSound Headphones*TM have been widely adopted by music critics who need to truly and honestly connect with the sound of the music they listen to, as it was genuinely meant to be heard.

Moderate Product Sincerity

1. The *BetterSound Headphones*TM use an imported sound improvement technology, which takes the original sound and improves it to make the sound better.
2. The *BetterSound Headphones*TM technology improves the sound of music, rather than reproducing the sound exactly as it was recorded.
3. The *BetterSound Headphones*TM allow people to listen to the music at its best and uncover what it can be, rather than merely sticking to its original quality and sound.
4. The *BetterSound Headphones*TM won the Musicians' Best Headphones Set award of 2009, for "producing the most wholesome and, yet, improved sound reproduction".
5. The *BetterSound Headphones*TM have been widely adopted by music producers who need to uncover how good the music can become, and not be limited by the music's current sound.

WEB APPENDIX C : STIMULI HEADPHONES, STUDIES 3-4

A



B



NOTE---The headphones used as stimuli in Experiment 3 and 4 are respectively presented in panels A and B. In panel B, the set on the left is lighter than the one on the right

WEB APPENDIX D: TRIVIA CONTEST, EXPERIMENT 3

Participants were told that if they scored in the top 50%, they would be entered into a lottery for an additional prize of \$50. Then they were asked to answer two sets of eight general-knowledge multiple-answer trivia questions, such as to identify the writer of the play “Cat on a Hot Tin Roof.” To measure honesty, participants received an opportunity to inflate their quiz scores. In particular, we informed participants of recent problems in our data collection system such that it sometimes inverted the digits in a score (e.g., from 54 to 45), and asked them to verify that the score reported by the computer was accurate. Then, to reduce suspicion in the DV, after the first set of trivia questions, when participants were asked to indicate whether the score they earned and the score the system reported it will save were consistent, the two scores were indeed consistent. Next, after answering the second set of trivia questions, when participants had to indicate (for the second time) whether the received and the to-be-saved scores were consistent, the two differed: the computer informed participants that they answered 5 questions correctly and received 45 points but that the system would save the score 54 (i.e., an inverted 45; see Figure D). Participants were classified as behaving honestly if they reported that the scores were inconsistent.

FIGURE D: OPPORTUNITY TO CHEAT IN THE TRIVIA TASK

You answered correctly on 5 of the 8 questions, each worth 9 points, which sums up to a total of 45 of 72 possible points.

The following number of points will be added to your record towards the draw:

54

If you see any inconsistency between the figures choose the "inconsistent" check box and move on to update the figures. Other wise, choose the "consistent" check box and move on to the next part of the quiz.

Inconsistent



Consistent



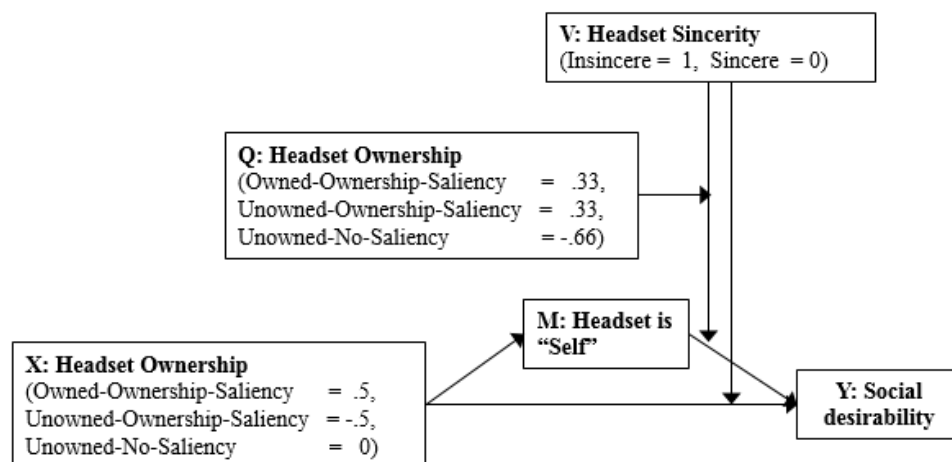
WEB APPENDIX E: INTERPRETATION OF UNEXPECTED RESULTS IN
EXPERIMENT 3

The analysis revealed an unexpected positive effect of headphones self-inclusion ($B = 1.71$, $F(1, 138) = 17.95$, $p < .0001$) and an interaction effect of headphones self-inclusion with ownership ($F(2, 138) = 3.13$, $p = .047$). Speculatively, the simple effect was observed because participants across conditions (wrongly) believed that classifying the headphones as “self” is socially desirable and so those who rate the headphones as “self” also fared higher on the social desirability. A contrast analysis to explore the observed interaction revealed a pattern consistent with this logic: higher reports of headphones self-inclusion predicted social desirability more strongly in the two no-ownership conditions than in the ownership condition ($t(150) = 2.27$, $p = .025$). That is, under no-ownership, where headphones self-inclusion should generally be low, reports of high self-inclusion may have reflected greater social-desirability.

WEB APPENDIX F: MODERATED MEDIATION ANALYSIS, EXPERIMENT 3

Social Desirability was submitted to a bootstrap moderated mediation analysis using the PROCESS macro (Hayes 2013, model 20). The analysis included mean-centered classification of headset as “self” (predicted mediator), three ownership levels, and headset insincerity (*insincere* = 1, *sincere* = -1; *predicted mediation moderator*). To represent the three ownership levels, we created two orthogonal contrast-coded variables, one contrasting between the two “ownership-saliency” conditions (“*unowned-ownership-saliency*” = -1/2, “*unowned-no-saliency*” = 0, “*owned-ownership-saliency*” = 1/2), and the other contrasting the two “ownership-saliency” conditions with the “no-saliency” condition (“*unowned-ownership-saliency*” = 1/3, “*unowned-no-saliency*” = -2/3, “*owned-ownership-saliency*” = 1/3). The contrast between the two “ownership-saliency” conditions served as the IV, and the contrast of two “ownership-saliency” conditions with the “no-saliency” condition served as the moderator for the mediation’s moderator (see Figure F).

 FIGURE F: MODERATED MEDIATION MODEL, EXPERIMENT 3



 NOTE.—Social Desirability served as a proxy for personal insincerity

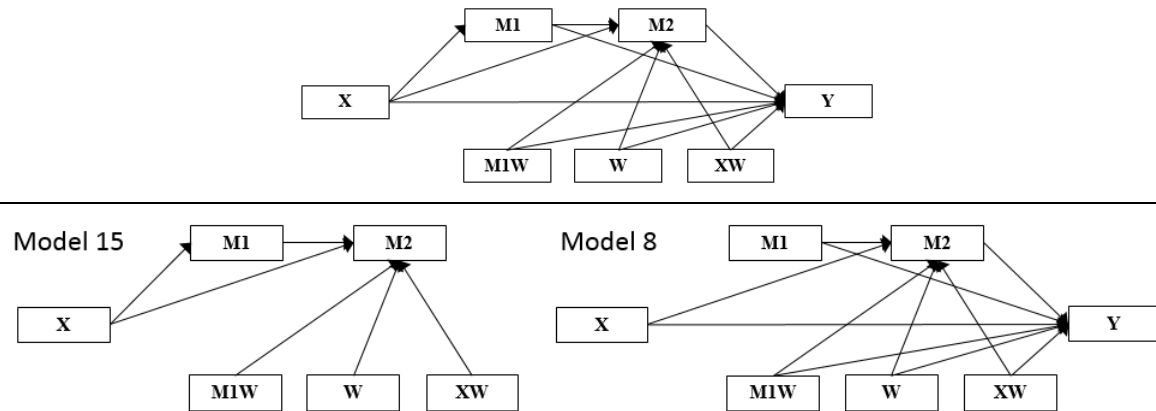
The results revealed that the mean indirect effect of including an insincere (vs. sincere) headset as “self” from a bootstrap analysis was, as expected, positive and significant under the two “ownership-saliency” conditions ($a \times b = 2.7036$), with a 95% confidence interval excluding zero (1.3512, 4.9083), but insignificant ($a \times b = 1.3614$), with a 95% confidence interval including zero (-.3658, 3.4661) in the “no-saliency” condition. In the indirect path, owning the headphones increased classification of headphones as “self” by .788 units. Further, consistent with the predicted nature of moderated mediation, holding headphones ownership constant, a unit increase in the three-way interaction between classifying headphones as “self,” product-insincerity and the contrast of the “ownership-saliency” conditions with the “no-saliency” condition increased social desirability by 2.083 units. The direct effect (.0120) was not significant ($p > .98$).

WEB APPENDIX G: SERIAL MODERATED MEDIATION ESTIMATION, EXPERIMENT 3

The final model tested in Experiment 3, two mediators operate serially with the relation between the two mediators and the relation between the independent variable and the dependent variable moderated, do not have a built-in model in PROCESS, the commonly used bootstrapping macro for assessing indirect effects (Hayes and Preacher 2013). Thus, we adapted the procedure outlined by Hayes (2015) to manually assess the desired indirect and moderated mediation effects based on various outputs that PROCESS can provide. Specifically, we ran two separate bootstrap analyses, model 15 and model 8 (see figure below), via PROCESS using the same random seed, generating two datasets with 10,000 rows (each row represents the estimates generated for each bootstrapped sample). The dataset generated by model 15 included estimates for the effect of headset ownership (X) on classifying the headset as “self” (M1). The dataset also included estimates for the effects of M1, X, headset insincerity (W), and the interactions of M1 and X with W on social desirability (M2). The dataset generated by model 8 included estimates for the effects of X, M1, W, and the interactions of X and M1 with W on M2. The dataset also included estimates for the effects of X, M1, M2, W, and the interactions of X and M1 with W on cheating behavior. After confirming that all the columns common to both datasets are identical, we merged both data sets. Following Hayes (2015), the overall indirect effect was then calculated by multiplying three estimates: the effect of X1 on M1, the sum of the effects of M1 and the interaction of M1 with W on M2, and the effect of M2 on Y. Further, the moderated mediation index was calculated by multiplying the effect of X1 on M1, the effect of the interaction of M1 with

W on M2, and the effect of M2 on Y. Unbiased 95% confidence intervals were calculated using the BCCI command built into PROCESS (Hayes 2013).

FIGURE F: MODERATED MEDIATION MODEL, EXPERIMENT 3



NOTE.—Upper pannel: the statistical model used. Lower pannel: the submodels used for estimating the parameters. X: Headset ownership, M1: Headset is “self,” M2: Social desirability, W: Headset insincerity, Y: Cheating behavior.
