We Do What We Are: Representation of the Self-Concept and Identity-Based Choice

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The current research proposes a novel approach to identity-based choice that focuses on consumers' representations of the self-concept, as captured by the perceived cause–effect relationships among features of an individual consumer's self-concept. More specifically, the studies reported here test the proposal that the *causal centrality* of an identity—the number of other features of a consumer's self-concept that the consumer believes influenced or were influenced by the identity—underlies identity importance and is a determinant of identity-based consumer behaviors. Across seven studies, using both measured and manipulated causal centrality, the current research provides evidence for the role of causal centrality in identity-based choice. Among consumers who share an identity (belong to the same social category), those who believe that the identity is more causally central perceive the identity as more important and are more likely to engage in behaviors consistent with the norms of the social category.

Keywords: causal reasoning, identity, identity-based choice, self-concept

"We do what we do, because of who we are. If we did otherwise, we would not be ourselves."

—Neil Gaiman, The Kindly Ones

Consumer's identities, the social categories that they belong to, are the basis of a broad range of consumer behaviors (see Reed et al. 2012 for a detailed review). Consumers who belong to a given social category are more likely to act in accordance with the norms of the category than non-members (Akerlof and Kranton 2000, 2010; Markus and Wurf 1987; Turner 1985). For example, consumers who consider themselves Apple-users will be more likely to follow the norms of that group (e.g., wait in line for the newest iPhone, pay the price premium for Apple products) than those who have similar preferences for Apple products but do not self-ascribe to the Apple-user identity.

Of course, two self-proclaimed Apple-users can display large differences in identity-consistent behaviors. Such differences have been predicted by identity importance—

consumers who have high scores on identity importance scales are more likely to act in identity-consistent ways (LeBoeuf, Shafir, and Bayuk 2010; Markus and Wurf 1987; Reed 2004). Identity importance scales ask questions like how strongly consumers identify with a social category, or how well consumers believe a social category reflects who they are (LeBoeuf et al. 2010; Reed 2004) and provide little insight on how social identities become important or how to influence identity importance. In fact, identity importance has almost exclusively been studied as a measured individual difference measure (but see Reed 2004). In the absence of understanding what underlies identity importance, the usefulness of the construct to both marketing practitioners and academics remains limited and a greater understanding of the psychological basis of identity importance would afford the ability to influence both perceptions of identity importance and a wide range of consumer behaviors.

To address these key gaps in the literature, we propose a new theoretical approach to understanding identity-based behavior, that focuses on consumers' representations of specific social identities within the self-concept. We draw on research from cognitive psychology on conceptual representation, which suggests that the aspects that are most defining of a concept are those that are seen as more *causally central* (i.e., seen as influencing or being influenced by many other aspects; Rehder and Hastie 2001). We hypothesize (and find) that the causal centrality of an identity underlies identity importance. More specifically, we propose that a consumer who sees a given social identity as causally central—causally connected to other important features of the consumer's own subjective self-concept (e.g., other identities, memories, moral qualities, and personality traits)—will see that social identity as more important and be more likely to act in identity-consistent ways than a consumer who believes that the same social identity is more causally peripheral (e.g., linked to fewer features). For example, an Apple-user who sees her Apple-user identity as more connected to other features of her self-concept (e.g., her profession, her hobbies, etc.) will feel that her Apple-user identity is more important and be more likely to follow the norms of the Apple-user group than an Apple-user who sees the same identity as less connected to other features of her self-concept.

THEORETICAL DEVELOPMENT

Social Categories, Identity Importance, and Choice

Theories in psychology and economics hold that people are more likely to behave in ways that are consistent with their social identities, the social categories that they belong to. In particular, these theories posit that people have multiple social identities with potentially conflicting norms (Akerlof and Kranton 2000, 2010; LeBoeuf et al. 2010;

Markus and Wurf 1987; Oyserman 2009). Thus, increasing the salience of one social identity prioritizes the norms associated with that social identity among those holding the identity, resulting in a greater likelihood of performing behaviors consistent with the social group norms than when the identity is not salient (Brough et al. 2016; Chen, Ng, and Rao 2005; Forehand, Deshpandé, and Reed 2002; LeBoeuf et al. 2010; Shang, Reed, and Croson 2008).

While situational factors influence consumer's tendency to display identity-consistent behaviors, two consumers facing the same situational constraints may nevertheless demonstrate very different behaviors. Identity importance, sometimes referred to as strength of identification, has been used to explain individual differences in identity-based consumption among consumers who share a social identity. Theoretical and empirical research investigating the effect of social identities on behavior suggests that the subjective importance of an identity is a relatively stable individual difference, unaffected by the salience of the identity, that predicts how likely a consumer is to act in identity-consistent ways (Forehand et al. 2002; Markus and Wurf 1987). For example, consumers who rate a social identity as more important have more favorable attitudes toward products geared toward that social identity (Reed 2004) and show greater sensitivity to identity salience effects on behavior (LeBoeuf et al. 2010).

Despite the fact that identity importance is a critical construct in the identity-based consumption literature, its explanatory power and marketers' ability to influence it are limited because its psychological underpinnings are not well understood. For example, scales that measure identity importance are quite general, asking about attitudes result from perceiving an identity as important, such as "How much does [social identity] describe who you are?" and "How much do you identify with [social identity]?" (Luhtanen and Crocker 1992; Reed 2004; web appendix C). While these measures capture useful differences in people's attitudes about a given social identity, the importance construct does not provide a psychological process that underlies identity importance and thus, does not explain why an identity is perceived as important, how consumers who see an identity as important differ from those who see the same identity as unimportant, and how to influence identity importance. Next, we review literature on the representation of the self-concept and on causal reasoning in conceptual representation to develop an account of identity-based consumption that provides a psychological account of identity importance and a more nuanced explanation of who is more and less likely to display identity-consistent behaviors.

Representation of the Self-Concept

In the social psychology, consumer behavior, and economics literatures, an *identity* (or a *social identity*)

generally refers to a social category that a person belongs to. However, a broad literature from philosophy and psychology on people's beliefs about what defines the self-concept instead defines personal identity in terms of individual-level psychological traits (such as memories and moral qualities) that are not necessarily associated with social categories (see Molouki et al. 2020 for a review). Some views have defined continuity of the self in terms of specific features, particularly memories (Blok, Newman, and Rips 2005; Locke 1690/2009; Nichols and Bruno 2010) and moral qualities (Strohminger and Nichols 2014, 2015). Additionally, research on psychological connectedness to the future self suggests that a consumer's self-concept is defined by a wide range of psychological traits (see Urminsky 2017 for a review). Indeed, research has found that inducing consumers to think that their individual-level psychological characteristics will change leads to less psychological connectedness to the future self and less willingness to make farsighted choices (Bartels and Rips 2010; Bartels and Urminsky 2011, 2015; Ersner-Hershfield et al. 2009).

Integrating these diverse perspectives, we propose that differences in consumers' beliefs about how the various features of their self-concept relate to each other predict differences in identity importance and identity-consistent behaviors. In particular, we propose that it is specifically the perceived *cause–effect relationships* between a social identity and other features of one's self-concept that predict the likelihood of displaying identity-consistent behavior. We use the term *social identity* to refer specifically to a social category and use the broader terms *feature* or *aspect*[1] to refer to social categories and also individual-level properties of a self-concept (such as memories, moral qualities, personality traits, etc.), adopting terminology from the concepts and categories literature (e.g., Smith and Medin 1981; Tversky 1977). We use the term *self-concept* to refer to the full set of all the social identities and features, and the relationships among them, that a consumer believes makes them who they are as a person.

Causally Central Aspects of the Self-Concept

Causal relationships are used to understand the world and to structure knowledge, beginning in early childhood (Gopnik and Schulz 2004). Much research has suggested that knowledge is represented as intuitive theories about the world that include causal relationships (Keil 1989; Murphy and Medin 1985). For example, consumers' knowledge of Apple products not only includes the knowledge that the products are of high quality, have great customer service, and are expensive but also incorporates

theories about how these features are causally related—for example, Apple products are expensive *because* of their superior quality and customer service.

Recent research has found that causal beliefs about aspects of the self-concept are also a critical part of how people think about the self. Chen, Urminsky, and Bartels (2016) proposed that features of the self-concept are seen as defining of the self to the extent that they are seen as causally central—that is, causally linked to many other features of the self-concept, either as a cause or as an effect (Rehder and Hastie 2001). Consistent with their predictions, Chen et al. (2016) found that participants believed that they would be more of a different person when causally central features were changed than causally peripheral ones.

As an example, imagine two Apple-users who are both graphic designers, Ari and Mark. Ari believes that being an Apple-user influenced her choice of career and many of her aesthetic preferences. Mark instead believes that it was his career in graphic design that shaped his aesthetic preferences and led him to be an Apple-user. As a result, even though the features of Ari and Mark's self-concepts are identical, the differences in their causal beliefs lead to differences in what they believe is important to their self-concept. Because she believes that being an Apple-user is connected to more features of her self-concept (her aesthetic preferences *and* her profession), Ari will see it as more defining of her self-concept (i.e., as more important) than Mark does (since he sees being an Apple-user as connected to his profession *only*).

The Role of Causes and Effects in Causal Conceptualization of the Self-Concept

The relative importance of causes versus effects in causal centrality has long been debated, with some models suggesting that only causes matter for determining feature importance (Ahn et al. 2000; Sloman, Love, and Ahn 1998) but others suggesting that causes and effects matter similarly (Rehder 2003; Rehder and Hastie 2001). From the perspective of psychological essentialism (Medin and Ortony 1989), category membership is defined by an essence that is causally responsible for the key features of the category. Causes are closer to the essence (the deepest cause in the causal chain) than effects and are therefore more important to category representation.

However, essentialist arguments have mainly been applied to representations of categories (sets of items or individuals) and may not be relevant to the role of causal centrality in a consumer's representation of a single item or individual (e.g., the self). By contrast, research on analogical reasoning suggests that conceptual information is represented in terms of the relationships between items rather than the items themselves (Rehder and Hastie 2001). Thus, since both causes and effects are necessary to retain

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[1] We use the terms *feature* and *aspect* interchangeably to refer to any property of the self-concept, including social categories as well as other properties of the self, such as memories, personality traits, and moral qualities.

the relationship between two features, both contribute to conceptual representation (Rehder and Hastie 2001). Further, some theories suggest that people have expectations that causes and effects will be present or absent together dependent on how likely the cause is believed to produce the effect (Rehder 2003), again suggesting that both causes and effects contribute to causal centrality.

We will start from the baseline assumption that both causes and effects contribute equally to causal centrality in the self-concept. Consistent with previous work (Chen et al. 2016; Chen and Urminsky 2019), we define causal centrality of an identity in a consumer's self-concept as the number of other aspects seen by the consumer as causes or effects of the focal identity. This measure is similar to "degree centrality" in social network analysis (Freeman 1978), but differs in that the "nodes" here represent different features of the self-concept (e.g., football fan, Apple-user, gender, etc.) and the links are not simply associative, but represent a belief that one feature caused another. However, we will also return to the relative importance of causes and effects as an empirical question to be tested directly in the General Discussion.

Causal Centrality as an Explanation of Identity Importance and Identity-Consistent Behavior

We propose a novel causal centrality account of identity importance and identity-consistent behavior that integrates prior work on how social categories impact behavior, how the self-concept is constructed from individual-level features, and how causal relations structure the self-concept. By integrating these different lines of research, the current research addresses recent calls to connect research on identity-based consumption with a theoretical understanding of the self-concept as multi-faceted (Reed and Forehand 2016).

In our approach, each consumer's self-concept is a unique network of subjective causal relationships between various aspects, including not only social categories, but also individual-level aspects such as memories, goals, moral values, preferences, and personality traits. We hypothesize that, across consumers who share a given social identity, consumers who see that social identity as causally related to more other aspects of their self-concept will both perceive the social identity as more subjectively important and be more likely to engage in identity-consistent behaviors. Returning to the example above, our account predicts that Ari, who sees her Apple-user identity as more connected to other features of her self-concept than Mark does, will perceive her Apple-user identity as more important and be more willing to spend money for the newest iPhone or to select Apple over other brands (i.e., follow the norms of being an Apple-user). In fact, our first study finds that consumers who see a brand-user identity as more causally central are more likely to trade-off the flexibility of an Amazon gift card for a less flexible but higher-value brand-specific gift card.

In this article, we test our causal centrality explanation of identity importance and identity-consistent consumption. Across seven studies (and six additional studies reported in web appendix B), we demonstrate that—among consumers who self-ascribe to the same social identity—differences in the causal centrality of that social identity predict differences in identity importance and identity-based consumption. In studies 1A and 1B, we test whether a consumer's subjective causal centrality of a brand-user identity predicts both hypothetical and incentive-compatible choices of that brand. Next, in study 2, we explore whether causal centrality underlies identity importance and predicts willingness to spend on an identity-relevant experience, among football fans. In study 3, we manipulate identity importance by changing perceptions of an identity's causal centrality. In studies 4–6, we examine whether the causal centrality of an environmentalist identity predicts differences in choices between environmentally-friendly and conventional products, including over time. We distinguish causal centrality from identity salience and from mere (non-causal) associations between social identities and other aspects of the self-concept.

STUDIES 1A AND 1B: CAUSAL CENTRALITY OF THE BRAND-USER IDENTITY

Studies 1A and 1B provide an initial test of our hypothesis that causal centrality underlies identity importance and thus, consumers who see a social identity as more causally central will be more likely to make identity-consistent consumer choices. As brands are used to express and build consumers' identities at the group and personal level (Belk 1988; Berger and Heath 2007; Escalas and Bettman 2003, 2005; Swaminathan, Page, and Gürhan-Canli 2007), we had participants report a brand that they both use and see as part of their self-concept. Similar to our opening example of the two Apple-users, Mark and Ari, we examined the relationship between the causal centrality of the brand-user identity and choices (consequential in study 1A, hypothetical in study 1B) between receiving a gift card for the brand or an Amazon gift card.

As previously described, the perceived importance of an identity has been shown to moderate the effect of that social identity's salience on identity-consistent choice (LeBoeuf et al. 2010) and to predict more favorable attitudes toward identity-relevant products (Reed 2004). Using a brand-user identity proxy for identity importance, the brand-connection scale (Escalas and Bettman 2003), we build on these findings and explore whether consumers who see their brand-user identity as more causally central report greater connection to the brand and whether brand

connection scores (as a measure of identity importance) mediate the relationship between causal centrality and identity-consistent choice.

In study 1A, we further distinguish between our causal centrality approach to identity-based consumption and a more general association-based theory. The causal centrality account posits that it is beliefs about specifically causal relationships between a social identity and other features of the self-concept that predict identity-consistent behavior. This is consistent with research that suggests causal relationships are privileged in our representation of concepts, relative to simple associations. People are significantly more likely to recognize that features are correlated when they can describe a causal relationship between them (Ahn et al. 2002; Malt and Smith 1984). For example, when the fit between a firm and an event is low, consumers are more likely to remember that the company sponsored the event if an explanation for the relationship between the company and the event was provided (Cornwell et al. 2006). An explanation provides a causal basis for the relationship, without which the event and the company are merely associated. Accordingly, in study 1A, we contrast consumers' perceptions of causal centrality from consumers' beliefs about associations as predictors of identity-consistent choices.

Method

Participants. We collected 230 valid responses (study 1A) and 442 valid responses (study 1B) from U.S. Mechanical Turk participants after pre-registered exclusions for failing an attention check, making inconsistent gift card choices, or duplicate IP addresses. Pre-registration links for all studies (excluding study 2 which was not pre-registered) can be found in web appendix C. Details of analyses, additional analyses, and all data and materials are posted on OSF.[2]

Screener and Design. We screened participants to ensure that they saw a brand as part of their self-concept. Participants viewed a list of 12 brands and reported (1) whether they used any of the listed brands ("Are you a user of this brand?") and (2) whether they identified with any of the listed brands ("Do you consider being a user of this brand a part of your identity?"). Only participants who answered yes to both questions for at least one brand proceeded to the main study. Participants then confirmed that a single qualifying brand (the target brand in the study, randomly selected if multiple brands matched the criteria) was part of their self-concept.

Study 1A consisted of four main tasks: participants (1) made choices between receiving an Amazon gift card and a gift card from the target brand that they had identified as and confirmed was part of their identity, (2) performed a

"listing causal relationships" task with the target brand-user identity and other features of their self-concepts, (3) reported non-causal associative connections between the target brand-user identity and other features of their self-concepts, and (4) completed the self-brand connection scale (Escalas and Bettman 2003). Study 1B omitted the non-causal associations elicitation task.

Choice Task. Participants made 10 choices between receiving either a $50 gift card for the target brand or an Amazon gift card with a value ranging from $5 to $50 in increments of $5 (web appendix C). In study 1A, we informed participants that 10 participants would have one of their choices picked at random and would receive the option that they had selected in that choice, while the choice was hypothetical in study 1B.

This task measures the premium consumers would pay for the less-restricted Amazon card that is not constrained to brand-specific spending. We predicted that those who saw their brand-user identity as more central would not be willing to pay as large a premium for the ability to spend on non-brand purchases because they have a higher value for spending on the brand than those who see their brand-user identity as more peripheral.

Measuring Causal Centrality. All studies used a "listing causal relationships" task, adapted from Chen et al. (2016), to measure the causal centrality of features of the self-concept. In this task, participants reported the causal relationships between a set of participant-generated and/or experimenter-defined features of the self-concept. In studies 1A and 1B, the features used in the "listing causal relationships" task came from a list of 16 features found to be important to the self-concept in previous research (Chen et al. 2016; Strohminger and Nichols 2014). Participants viewed this list and selected the 10 features that they saw as most important to their self-concepts. These 10 features, in addition to the participants' brand-user identity (e.g., Apple-user), were used in the "listing causal relationships" task.

After completing two practice trials with an unrelated concept, participants completed one trial for each feature (for a total of 16 trials), in which that feature was the target (figure 1, "Being a user of [brand]" is the target feature). In each trial, participants were shown the target feature at the top of the screen (with the question text) and all of the other features, with check boxes, listed under it. Participants indicated which of the listed features, if any, were caused by the target feature (figure 1). Participants were required to check at least one option but could check as many as they wanted (unless they selected the "none" option).

From this series of questions, we calculated each feature's causal centrality—the number of causal relationships that a feature participates in, either as a cause (the number of other features selected in the trial in which that feature

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2   https://osf.io/6zcbp/.

FIGURE 1

EXAMPLE TRIAL OF LISTING CAUSAL RELATIONSHIPS TASK

Think about the following aspect **Being a user of [brand]**
Which of the other features of your personal identity listed below, if any, are <u>caused by</u> this aspect, **Being a user of [brand].** By caused, we simply mean the feature was influenced or shaped by: **Being a user of [brand].**

You may select as many or as few features as you see fit. In the below list, please select all the features that you believe are caused by the above feature.

- ☐ Goals for personal life
- ☐ Important childhood memories
- ☐ Intelligence level
- ☐ Favorite activities and hobbies
- ☐ Close friendships
- ☐ Aesthetic preferences
- ☐ Level of honesty
- ☐ Significant romantic relationships
- ☐ Cherished memories of time with family
- ☐ Level of loyalty
- ☐ None of the above

NOTES.— Participants saw one trial for each of the features of the self-concept used in each study. For example, in study 1 which used 16 features, participants saw 16 total trials.

was the target) or as an effect (the number of times the feature was selected across all the other trials in which it was listed as potentially being caused by the target). Our measure of causal centrality was the sum of these cause and effect links for each feature.

It is important to emphasize that the purpose of the "listing causal relationships" task is to test the basic psychological process that we have proposed underlies consumers' representation of the self-concept and identity importance. That is, the "listing causal relationships" task is not meant to be another scale to measure individual differences in the attitudinal outcomes of identity importance. Rather, the task is intended to measure the belief structure that we propose underlies identity importance and that leads to the attitudinal differences that are measured by identity importance scales.

Measuring Non-Causal Associations (Study 1A Only). After the "listing causal relationships task," participants reported any of the features that they saw as merely associated with their brand-user identity. Participants saw their target brand identity at the top of the screen with a personalized list of features that they had not previously reported as being causally related to their brand-user identity. Participants were asked to select any features from the list that they saw as being associated with (i.e., "somehow going together with or somehow connected to") the target

feature despite not being causally connected with the target feature (web appendix C).

Measuring Self-Brand Connection. As an initial exploration of whether causal centrality underlies identity importance, we examined whether a related scale that specifically measures integration of a brand into the self-concept, the self-brand connection scale (Escalas and Bettman 2003), mediates the relationship between causal centrality and choice. The scale consists of seven statements ($\alpha = 0.922$) that describe how much consumers have used a brand to define and create their self-concepts (e.g., *I feel a personal connection to Brand X, I identify with brand X*, web appendix C). Participants reported how much each statement described them on a seven-point scale (*1 = Not at all, 7 = Extremely well*).

Study 1A Results

Descriptive Statistics. On average, participants reported 3.15 causal relationships and an additional 1.49 associative links between the brand-user identity and the other aspects of the self-concept, from an average total of 30.60 links (see tables 1 and 2 in web appendix A for more details). The average number of brand gift card choices was 5.87 (out of 10). Descriptive statistics for all other studies can be found in web appendix A.

Relationship between Causal Centrality and Brand Choice. Consistent with our theory, consumers who saw the brand-user identity as more causally peripheral were willing to pay a higher premium for the Amazon gift card in a consequential choice task than those who saw the identity as more central. On average, low causal centrality consumers (based on a median split) selected the brand gift card approximately one fewer time than high centrality consumers ($M_{\text{peripheral}} = 5.40$, $M_{\text{central}} = 6.37$, $t(228) = 2.27$, $p = .024$, Cohen's $d = 0.30$, 95% CI of the difference = [0.13, 1.80]). As the value of the Amazon gift card increased by \$5 with each subsequent choice and the brand gift card value was always \$50, the observed difference between the high and low centrality consumers suggests that consumers who saw the brand-user identity as more peripheral were, on average, willing to accept \$5 *less* in Amazon spending for the \$50 brand gift card, in a consequential choice, than those who saw the brand-user identity as more central.

To test the continuous relationship, we fit a linear regression predicting the number of brand gift card choices with the causal centrality of the brand-user identity, controlling for total number of links (to account for differences in the general tendency to report more links as a potential confound). The regression confirmed that consumers for whom the brand-user identity was more causally central were more likely to choose the brand gift card over the Amazon gift card, indicating a higher valuation for consumption of that brand ($B = 0.32$, SE = 0.09, $p < .001$). In this study (and all other studies), the relationship between causal centrality and behavior remained significant controlling for income ($B = 0.32$, SE = 0.09, $p < .001$, table 3 in web appendix A). Follow-up analyses also found no significant difference between the effects of cause links versus effect links, when included in the regression as separate predictors (table 15 in web appendix A).

Distinguishing Causal Centrality from Non-Causal Associative Links. To examine the relationship between non-causal associative links and choices of the brand gift card, we reran the regression, adding the number of non-causal associative links as an additional predictor. Causal centrality of the brand-user identity predicted branded gift card choices ($B = 0.31$, SE = 0.09, $p = .001$), controlling for the number of non-causal associative links to the brand, which was not a significant predictor ($B = -0.17$, SE = 0.18, $p = .360$). This supports our theoretical claim that it is specifically *causal* relationships between a social identity and other aspects of the self-concept (as opposed to general associations) that are relevant to identity-consistent behavior.

Mediation Analysis. We conducted a mediation analysis to test whether the relationship between causal centrality and choice operates via self-brand connection (as a proxy for identity importance), controlling for the total

links reported. The analysis revealed that those who perceived their brand-user identity as more causally central reported greater connection to the brand ($B = 0.19$, SE = 0.03, $p < .001$). There was a directional reduction in the strength of the relationship between causal centrality and choice when controlling for self-brand connection ($B = 0.27$, SE = 0.10, $p = .007$ vs. total effect: $B = 0.32$, SE = 0.09, $p < .001$). However, the indirect effect of centrality via brand connection was not significant ($B = 0.05$, 95% CI [-0.03, 0.13]). To explore whether study 1A was underpowered to detect a significant indirect effect, we ran the same analysis with a larger sample in study 1B.

Study 1B Results

The main results of study 1A were replicated in study 1B. A linear regression predicting the number of choices of the branded gift card with the causal centrality of the brand-user identity, controlling for total number of links, revealed that consumers for whom the brand-user identity was more causally central were more likely to choose the brand-specific gift card over the Amazon gift card, ($B = 0.12$, SE = 0.06, $p = .033$). The relationship between causal centrality and choice remained significant when controlling for income ($B = 0.13$, SE = 0.06, $p = .026$, table 4 in web appendix A). Follow-up analyses found no significant difference between the effects of cause links versus effect links, when included in the regression as separate predictors (table 16 in web appendix A). We return to this distinction in the General Discussion.

The mediation analysis revealed that those who saw the brand-user identity as more causally central reported greater connection to the brand ($B = 0.18$, SE = 0.02, $p < .001$). We found a significant indirect effect of causal centrality choice via self-brand connection ($B = 0.07$, SE = 0.01, 95% Bootstrapped CI = [0.02, 0.13], figure 2). Self-brand connection mediated more than 50% of the effect of causal centrality on choice. Causal centrality did not significantly predict choice when controlling for self-brand connection ($B = 0.05$, SE = 0.06, $p = .398$).

Discussion

The results of studies 1A and 1B support our hypothesis that consumers who see a social identity as more causally central see that identity as more important and are more likely to make identity-consistent choices, including in consequential choices (study 1A). Specifically, consumers who reported more causal links between their brand-user identity and other aspects of the self-concept were more likely to choose a brand-specific gift card over a less restricted Amazon gift card, demonstrating a higher revealed valuation for brand-constrained spending. This was not the case for mere associations between brand identity and other aspects of their self-concept. Further,

FIGURE 2

SELF-BRAND CONNECTION MEDIATES RELATIONSHIP BETWEEN BRAND-USER CENTRALITY AND CHOICE OF BRAND GIFT CARD, STUDY 1B
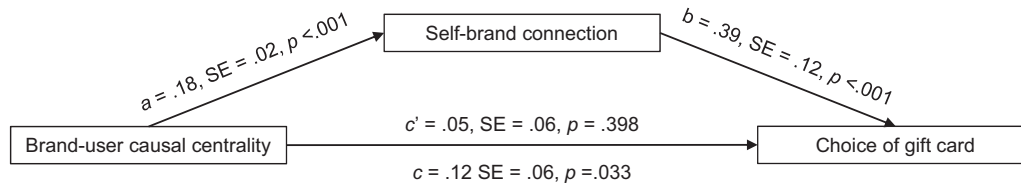
NOTES.— Mediation analysis performed using the PROCESS bootstrapping macro (model 4) with 5,000 resamples and total number of links as a covariate. A 95% confidence interval was computed to test the indirect effect (95% CI of the indirect effect = [0.02, 0.13]). Total number of links was included as a covariate in the analysis.

consistent with our hypothesis that causal centrality underlies identity importance, in study 1B, the relationship between the causal centrality of the brand-user identity and choice was mediated by self-brand connection, a proxy for identity importance specific to brands.

STUDY 2: CAUSAL CENTRALITY AND WILLINGNESS TO PAY WHEN IDENTITY SALIENCE IS HIGH

In study 2, we test our framework with a new consumer identity, being a fan of a football team. Further, as prior research has shown that identity-consistent behavior increases when a social identity is made situationally salient, we examine whether the causal centrality of an identity can predict identity-consistent behavior even in situations in which the social identity is made highly salient by a real-world event. We conducted study 2 at a time when the football fan identity was highly salient, around the Super Bowl, and examined willingness to pay for an identity-relevant experience, tickets to the Super Bowl. To test robustness of the results, we conducted two waves of the study across two years, one directly after (wave 1) and the other directly before (wave 2) a Super Bowl. We also test our hypothesis that causal centrality underlies identity importance by examining whether scores on a general identity importance scale (instead of the self-brand connection scale used in studies 1A and 1B) mediate the relationship between causal centrality and willingness to pay.

In study 1, participants selected the features of the self-concept used in the "listing causal relationships" task from a pre-set list of 16 important features of the self-concept from previous research. As a test of robustness of the results, and to ensure that our results were not due to the specific features used in study 1, participants in study 2 each generated the majority of features used in the "listing causal relationships" task themselves in an open-ended elicitation task.

Method

Participants. In wave 1, 306 football fans who were residents of North Carolina and Colorado (the home states of the two teams in the 2016 Super Bowl) were recruited from an online commercial marketing-research panel and completed the study one to three days after the Super Bowl. After excluding participants who failed the attention check, provided invalid answers as features of their self-concept (all the same answer or no response) or for their willingness to pay (specifically, WTP of $1,000,000,000,000,000), the survey yielded 253 valid responses. All the results remained significant when all participants were included in the analysis (table 5 in web appendix A).

In wave 2, approximately 2.5–4.5 hours prior to the 2017 Super Bowl, we recruited 247 football fans on Amazon Mechanical Turk from throughout the U.S. Five participants were excluded for failing an attention check, yielding 242 valid participants.

Procedure. Participants completed an abbreviated version of the "listing causal relationships" task from study 1, comprised of 10 self-generated features that participants listed as defining who they are and six additional pre-specified features: being a fan of the football team they favored, childhood memories, personal life goals, friendships, values and principles, and personality. Wave 2 included an additional control feature, "level of hunger."[3]

Participants indicated the causal links to the other features for two target features: the behaviorally relevant feature (being a fan of their favorite football team) and a control feature. As a control, we elicited the causal centrality of either the (arbitrarily selected) fifth feature

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3   "Level of Hunger" was used as a control feature in wave 2 because in previous studies it consistently participated in very few causal relationships (Chen et al. 2016), making it a good measure of participants' tendency to report relationships merely because that is what the task involved.

participants had listed (wave 1) or their "level of hunger" (wave 2), to account for potential differences in the general tendency to report more or fewer causal links among the features of the self-concept. Participants completed two trials for each of the target features: one that measured the number of other features causing the target feature (i.e., the feature's causes) and another that measured the number of other features caused by the target feature (i.e., the feature's effects).

For example, a participant who reported being a Carolina Panthers fan would first be asked which other aspects of her self-concept *caused her* to be a fan of the Carolina Panthers. She would then be asked which other aspects of her self-concept were *caused by* her being a fan of the Carolina Panthers. The causal centrality of being a Carolina Panthers was calculated by summing the number of features selected across the two trials.

Participants were asked how much they would be willing to pay for a ticket to see their team play in the Super Bowl if their team made it the following year. Participants then reported measures of sports involvement: whether they knew who had won the Super Bowl (wave 1), whether they had watched the Super Bowl (wave 1) or how likely it was that they would watch the Super Bowl (wave 2), their interest in football, and how many hours per week they spent on sports (including participating, watching, playing sports video games, etc.).

In wave 2, after reporting that they were an NFL fan but before the "listing causal relationships" task, participants completed the identity importance scale (Reed 2004; web appendix C). The importance scale asked how much participants feel that being a fan of a team describes who they are, how much they identify with that group, and how much they admire the group. Although our focus is on identity importance, because previous literature had also found greater identity congruency effects among those with high identity esteem (Shang, Reed, and Croson 2008), we also had participants complete the identity esteem scale which measures perceived standing in a social group (web appendix C).

Results

Relationship between Causal Centrality and Willingness to Pay. As the WTP data were positively skewed, we report analyses using the natural log of WTP + 1. We regressed log-WTP on the causal centrality of being a fan, controlling for the causal centrality of the control feature. As predicted, football fans who perceived their fan identity as more causally central were willing to pay significantly more than those who perceived being a fan as more causally peripheral ($B = 0.14$, SE $= 0.03$, $p < .001$). The relationship between the causal centrality of the football fan identity and log-WTP remained highly significant when

controlling for income ($B = 0.13$, SE $= 0.03$, $p < .001$, table 6 in web appendix A).

While our focus is on identity-consistent behaviors, exploratory analysis revealed that causal centrality also predicted interest in football (controlling for number of total links reported), suggesting that causal centrality may predict degree of involvement with the social identity. According to our account, football fans whose fandom is more causally central will be more willing to pay to see their team in the Super Bowl, because they perceive acting in identity-consistent ways as more congruent with who they are than those who perceive fandom as causally peripheral. However, it is also possible that the causal centrality measure is merely capturing differences in involvement with football. To examine this, we ran another linear regression, predicting log-WTP with football fan causal centrality and the control links, controlling for interest in football. The relationship between fan causal centrality and log-WTP remained significant ($B = 0.09$, SE $= 0.03$, $p = .002$), suggesting that interest in football does not explain the relationship between causal centrality and log-WTP.

To further examine whether involvement could explain the relationship between causal centrality and log-WTP, we added additional proxies for involvement to the above regression: amount of the Super Bowl watched (wave 1, which took place after the Super Bowl) or likelihood of watching the Super Bowl (wave 2, which took place before the Super Bowl), and the number of hours spent on sports per week. Even after adding these additional controls, causal centrality was a highly significant predictor of log-WTP ($B = 0.09$, SE $= 0.03$, $p = .004$).

Identity Importance as a Mediator. We conducted a mediation analysis with the wave 2 data (in which we measured identity importance) to test whether causally central identities feel more important than causally peripheral ones and whether the relationship between causal centrality and valuation operates via football fan identity importance, controlling for the control feature links. We found that those who perceived the football fan identity as more causally central reported that that identity was more important ($B = 0.12$, SE $= 0.03$, $p < .001$). Furthermore, there was a significant indirect effect of causal centrality on log-WTP via fan identity importance ($B = 0.03$, SE $= 0.01$, 95% Bootstrapped CI $= [0.00, 0.06]$, figure 1 in web appendix A). Importance mediated approximately 50% of the relationship between causal centrality and log-WTP (total effect of causal centrality on log-WTP: $B = 0.06$, $p = .108$). Causal centrality did not significantly predict log-WTP when controlling for importance ($B = 0.03$, SE $= 0.04$, $p = .413$). Identity esteem was strongly correlated with importance ($r = 0.47$, $p < .001$) and also mediated the effect (figure 2 in web appendix A). However, the two scales (identity importance and esteem) were not

disassociable in a factor analysis, suggesting that both scales may measure the same construct (table 7 in web appendix A).

Discussion

Consistent with the findings in study 1, the results of study 2 suggest that football fans who believe being a fan is causally central are more willing to spend in identity-consistent ways. Further, the relationship between causal centrality and log-WTP remained when controlling for whether participants watched or planned to watch the Super Bowl, and the amount of time spent on sports, suggesting that causal centrality is not simply a measure of involvement with identity-related activities.

In wave 2, we found that causally central identities are perceived as more important than causally peripheral ones and that identity importance mediated the relationship between causal centrality and log-WTP, replicating study 1B. Complementing previous findings that identity importance predicts attitudes toward identity-relevant products (Reed 2004), these results suggest that identity importance predicts identity-consistent behavior even when identity salience is high and are consistent with our hypothesis that causal centrality underlies identity importance. We further test our claim that causal centrality underlies identity importance in study 3.

STUDY 3: MANIPULATING CAUSAL CENTRALITY

The previous studies provide strong correlational evidence for the relationship between an identity's causal centrality and its perceived importance (studies 1A, 1B, and study 2, wave 2), and for the relationship between an identity's causal centrality and identity-consistent behaviors (studies 1A, 1B, and 2). Thus far, we have studied causal centrality of an identity as a relatively stable individual difference, much like identity importance (Forehand et al. 2002; Reed 2004). However, given that causal centrality is based on a subjective perception, even if deeply held, it may be possible to experimentally manipulate the causal centrality of a given social identity in the moment, specifically by prompting participants to either focus on causal connections to that social identity (more central) or to focus on how that social identity is independent from other aspects of the self-concept (less central). Further, based on our theorizing, if causal centrality underlies identity importance, successfully manipulating causal centrality should influence identity importance and, as a result, should also influence identity-consistent choices.

In study 3, we experimentally manipulate causal centrality by having football fans either write about how their football fan identity is causally connected to other aspects of their self-concepts (high centrality condition) or write

about how their football fan identity was causally independent from other aspects of their self-concept (low centrality condition). We test whether this makes the social identity seem more important and increases the likelihood of identity-consistent behavior (as measured by WTP for seeing one's team in the Superbowl).

Based on our theory and the results of study 2, we predicted that prompting participants to think about their football fan identity's causal relationships with other features of the self-concept would increase both perceived identity importance and WTP. However, the alternative possibility is that thinking of a social identity as more causally independent of other features of the self-concept could be interpreted as the identity revealing one's true, deeper self. That is, contrary to our causal centrality hypothesis, someone who believes that she would have been a football fan regardless of the relationships she had with other people, what cities she lived in, what her profession was, etc. could feel that being a fan is an integral part of who she is. In this alternative account, prompting consideration of causal connections could make the identity seem to be a product of or the cause of more surface-level features.

Method

Participants. We collected a total of 904 valid surveys from football fans from Prolific Academic, after pre-registered exclusions for duplicate IP addresses, failed attention check, outlier log-WTP values (± 2 SD from the mean), and non-valid answers to the open-ended questions.

Procedure. Participants first completed a screener in which they answered eight questions about specific identities, including if they were an NFL fan and seven distractor questions. Participants who passed the screener reported which team they were a fan of. The main study consisted of three tasks in which participants first wrote about their football fan identity (the causal centrality manipulation), and then reported their WTP and completed the identity importance scale (Reed 2004, used in study 2, wave 2), with the order of reporting WTP and the scale counterbalanced. Our findings were not moderated by task order so, in our analyses, we collapse across the two different task orders.

To manipulate the causal centrality of the football fan identity, participants were randomly assigned to either the high or low centrality condition. Participants in the high centrality condition wrote about how their football fan identity had influenced or been influenced by whichever other aspects of their self-concept they considered causally related to their football fan identity. Participants in the low centrality condition wrote about how their football fan identity was independent from (i.e., was not influenced by and had not influenced) whichever other aspects of their self-concept they considered separate from their football

fan identity (see web appendix C for exact wording for both conditions).

Importantly, having participants in both conditions write about their football fan identity equalized the salience of the identity across the conditions. After reading the instructions to the writing task, participants answered a comprehension question. Participants who answered correctly were informed that they had selected the correct answer and completed the writing task. Participants who answered incorrectly were informed that they had selected the wrong answer and were asked to carefully read instructions again prior to completing the writing task.

Results

Effect of the Causal Centrality Manipulation on Importance. Consistent with our prediction, participants in the high centrality condition reported significantly higher football fan identity importance than those in the low centrality condition ($M_{\text{HighCentrality}} = 4.72$, $M_{\text{LowCentrality}} = 3.86$, $t(902) = 7.86$, $p < .001$, $d = 0.52$, 95% CI of the difference [0.64, 1.07]).

Effect of the Causal Centrality Manipulation on WTP. Participants in the high centrality condition reported a higher log-WTP to see their team in the Super Bowl than those in the low centrality condition ($M_{\text{HighCentrality}} = 5.76$, $M_{\text{LowCentrality}} = 5.60$, $t(902) = 2.30$, $p = .022$, $d = 0.15$, 95% CI of the difference [0.02, 0.30]). Results were similar when using raw WTP (table 8 in web appendix A). A linear regression predicting log-WTP by condition (high vs. low centrality), controlling for income, confirmed that those in the high centrality condition were willing to pay more to see their team play in the Super Bowl ($B = 0.17$, SE = 0.07, $p = .016$, table 9 in web appendix A).

Mediation Analysis. We conducted a mediation analysis to test whether the effect of the causal centrality manipulation influenced log-WTP via importance. There was a significant indirect effect of the causal centrality manipulation on log-WTP via fan identity importance ($B = 0.16$, 95% Bootstrapped CI = [0.11, 0.22]). Importance mediated almost all of the effect of causal centrality on log-WTP (total effect of causal centrality on log-WTP: $B = 0.16$, $p = .022$). The relationship between the causal centrality manipulation and log-WTP was no longer significant when controlling for importance ($B = 0.002$, SE = 0.07, $p = .980$, figure 3).

Discussion

The results of study 3 provide causal evidence for our account, using an experimental manipulation of causal centrality. After writing about their football fan identity's causal connections with other aspects of the self-concept (vs. about the identity's independence from other aspects

of the self-concept), consumers perceived the football fan identity as more important and were willing to pay more for an identity-relevant experience.

Additionally, replicating the results of study 1B and wave 2 of study 2, identity importance mediated the influence of causal centrality on WTP. This provides further support for our theorizing that the causal centrality of an identity underlies identity importance and impacts identity-consistent behaviors, in part, by making that identity subjectively more important. In a second study using the same design (study A1, reported in web appendix B, $n = 384$), we confirm the robustness of the positive effect of the causal centrality manipulation on willingness to pay as well as the mediation via increased identity importance.

Finally, our successful manipulation of causal centrality highlights the usefulness of understanding how social identities fit into the broader self-concept in influencing both identity importance and identity-based consumer behaviors. By identifying causal centrality as a determinant of identity importance, we were able to design a manipulation that influenced identity importance which has primarily been studied as a stable individual difference (Dalton and Huang 2014; Forehand et al. 2002; LeBoeuf et al. 2010; Mazodier, Henderson, and Beck 2018). Reed (2004) also manipulated importance of family identity, using an emotion-based manipulation that prompted participants to consider either their role in or their independence from their family. This can be interpreted in terms of the causal centrality account, as a manipulation prompting more versus less consideration of connections within the self-concept. The finding that our theory-based manipulation also influenced identity-consistent behaviors suggests that such manipulations could prove useful in promoting a wide range of consumer behaviors.

STUDY 4: IDENTITY SALIENCE AND CAUSAL CENTRALITY

In study 4, we generalize our findings by testing a completely different consumer identity, being an environmentalist. We measured the causal centrality of the environmentalist identity among self-identified environmentally-friendly consumers and had these consumers make a series of hypothetical purchase decisions between a more expensive environmentally-friendly product and a cheaper conventional product.

Furthermore, we contrast the causal centrality of an identity with identity salience. Prior research has found that the salience of an environmentalist identity impacts consumer choice and judgments (Bolton and Reed 2004; Coleman and Williams 2013). In this view, salience of the identity makes the norms and/or emotional profiles associated with that identity salient, influencing behavior. By contrast, we have posited that the causal centrality of a

FIGURE 3

STUDY 3: IDENTITY IMPORTANCE MEDIATES THE RELATIONSHIP BETWEEN THE CAUSAL CENTRALITY MANIPULATION AND
LN(WTP + 1)
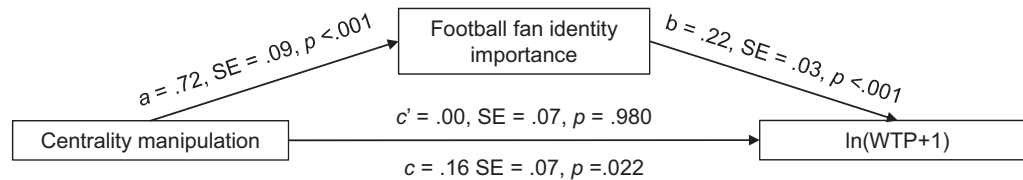
NOTES.— Centrality manipulation was coded as follows: low centrality = 1, high centrality = 2. Mediation analysis was performed using the PROCESS bootstrapping macro (model 4) with 5,000 resamples. A 95% confidence interval was computed to test the indirect effect (95% CI of the indirect effect = [0.11, 0.22]).

social identity guides behavior because consumers generally value their own behavior more when it is consistent with more subjectively important social identities, rather than because of identity salience temporarily activating norms. Consistent with this view, studies 2 and 3 documented the effect of causal centrality when the relevant consumer identity (football fandom) was highly salient (on Super Bowl Sunday in study 2, after writing about the identity as both conditions did in study 3). While in study 3 we found that making *specifically* the causal connections to an identity more salient increased identity importance, and in turn, influenced behavior, we have not directly tested for a potential role of more general identity salience in the effects of causal centrality.

In order to examine whether identity salience drives the relationship between causal centrality and purchase decisions, in part 1 of study 4, we manipulated the salience of the environmentalist identity, using a task from the prior literature intended to specifically impact salience of the identity but which does not highlight causal relationships (unlike the causal centrality manipulation used in study 3). If identity salience is responsible for the relationship between causal centrality and purchase decisions, we would expect the salience manipulation to increase both causal centrality of the environmentalist identity and identity-consistent consumption. If, instead, identity salience and causal centrality are separable, we would expect each construct to independently predict choice of environmentally-friendly products.

To further test a prediction of our causal centrality account of identity-based consumption, we investigated not only immediate effects, but also the longer-term relationship. If causal centrality underlies identity importance, a relatively stable association between a consumer's sense of self and an identity, causal centrality could also be relatively stable over time and the causal centrality of a social identity (unlike momentary salience) should predict choices made substantially later in time. To test this, we re-recruited participants approximately 11 months after part 1

for a second unanticipated survey (part 2) in which they made the same product choices that they had in part 1. We predicted that the reported causal centrality of the environmentalist identity previously measured in part 1 would predict choices in part 2 but that the identity salience condition (from part 1) would not.

Method

Participants. A power analysis from a pilot study (study A3 in web appendix B), in which the effect of the salience manipulation was marginally significant, suggested that detecting an effect of salience on causal centrality with 95% power in this context might require approximately 200 participants per condition.

As pre-registered,[4] we recruited a total of 450 US participants from Prolific Academic, who had previously reported caring about environmental issues (answering a 4 or 5 on a 1-to-5 scale to the question, "How concerned are you about environmental issues?" in the Prolific panel questions). The survey yielded a total of 411 valid participants after exclusions for a failed attention check or reporting that they did not intend to have an environmentalist identity in the main survey. Recruiting for part 2 occurred approximately 11 months after part 1. We invited all the participants who had participated in part 1 and were still active on Prolific, yielding 177 participants with valid responses.

Procedure. At the beginning of part 1 of the study, participants reported whether they agreed with an initial set of social identity-related statements, including one about the target social identity: "I want to be an environmentally-friendly person." Five other questions served to disguise the criteria for inclusion in the study.

The rest of part 1 of the study consisted of three tasks: (1) a writing task (the salience manipulation), (2) the

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4   Part 2 of study 4 was not part of the original experimental design
     and was not included in the pre-registration.

"listing causal relationships" task to measure causal centrality, and (3) the environmental-products choice task. The salience manipulation was adapted from Coleman and Williams (2013). Participants were randomly assigned to either write about their environmentalist identity (environmentalist-salient condition) or to write about what they had done the previous day (control condition, web appendix C for wording).

Prior to completing the "listing causal relationships" task, participants reported the features that they felt were most important to the person who they are, in six categories found to be important to the self-concept in previous research (Chen et al. 2016; Strohminger and Nichols 2014): memories, preferences, moral qualities, personality traits, goals/desires, and other (in which participants could describe anything important to their self-concept that they had not yet listed). Participants then completed the full "listing causal relationships" task from study 1 with twelve features of the self-concept, including their environmental identity, the six features they had just described, and the features they had reported in five questions from the initial set of identity questions. The presentation order of these features was randomized across participants.

In the choice task, participants made three hypothetical purchasing decisions between an environmentally-friendly version and a cheaper conventional version of the same product type. To ensure their choices were not based on brand loyalty instead of a greater willingness to pay for environmentally-friendly products, the conventional and environmentally-friendly products were either from the same brand or were unbranded (figure 4). The placement of the choice options (environmentally-friendly vs. conventional) on the screen was randomized. After choosing, participants rated which product in each choice set they thought was better for the environment on a five-point scale. In all studies using environmentally-friendly versus conventional product choice sets, participants consistently rated environmentally-friendly products as better for the environment than the conventional products (all $ps < .001$, web appendix A).

Eleven months after part 1, all participants who were still active on Prolific were invited to do an unexpected follow-up study (part 2). Participants completed the choice task from part 1 (with the same choice sets) and rated the environmental-friendliness of the products.

Results

Effect of the Salience Manipulation on Causal Centrality. The salience manipulation did not have a significant effect on the causal centrality of the environmentalist identity ($M_{env} = 3.45$ vs. $M_{control} = 3.10$, $t(409) = 1.15$, $p = .249$, $d = 0.11$, 95% CI of the difference = $[-0.25, 0.94]$). A linear regression predicting causal centrality by condition, controlling for total number of links,

also confirmed that the salience manipulation had no significant effect on causal centrality ($B = 0.16$, SE $= 0.18$, $p = .370$). Despite high statistical power (80% power to detect $d = 0.28$), we find no evidence that manipulating the salience of the environmentalist identity affects its causal centrality, although we cannot rule out a small positive or negative effect.

In an additional pre-registered study, we used the abbreviated listing causal relationships task from study 2 (study A4 in web appendix B) instead of the full task to reduce the time between the measurement of the causal centrality and the target identity and maximize the possible influence of salience on causal centrality. We likewise found no effect of salience on either causal centrality ($n = 432$, $M_{env} = 5.27$, $M_{control} = 4.91$, $t(432) = 1.04$, $p = .300$, $d = 0.10$, 95% CI of the difference = $[-0.32, 1.04]$) or on identity importance ($M_{env} = 5.29$, $M_{control} = 5.34$, $t(432) = 0.50$, $p = .616$, $d = -0.05$, 95% CI of the difference = $[-0.24, 0.14]$). These results are consistent with the conceptualization of identity importance as an enduring trait that is not influenced by general identity salience (Forehand et al. 2002), but which is instead based on causal centrality, which can be affected by the salience of specifically the causal connections to an identity (which we successfully manipulated in study 3).

Effect of the Salience Manipulation on Product Choices. Consistent with prior research, participants chose more environmentally-friendly products in the environmentalist-salient condition ($M = 2.11$), than in the control condition ($M = 1.96$, $t(409) = 1.83$, $p = .068$, $d = 0.18$, 95% CI of the difference = $[-0.01, 0.32]$), a marginally significant difference.

Relationship between Causal Centrality and Product Choices. A linear regression confirmed that participants who saw their environmental identity as more (vs. less) causally central chose more environmentally-friendly products ($B = 0.10$, SE $= 0.02$, $p < .001$), controlling for total number of links. This result was replicated in two additional studies (studies A2 and A3, reported in web appendix B) that used the same choice task as study 4 (study A2: $n = 96$, $B = 0.13$, SE $= 0.05$, $p = .014$; study A3: $n = 292$, $B = 0.09$, SE $= 0.03$, $p = .004$). The relationship between the causal centrality of the environmentalist identity and choice remained when controlling for income ($B = 0.09$, SE $= 0.03$, $p = .005$, table 10 in web appendix A). Further, the relationship between causal centrality and choice holds both in the environmentalist-salient condition ($B = 0.10$, SE $= 0.03$, $p = .004$) and in the control condition ($B = 0.10$, SE $= 0.03$, $p = .001$).

Relationship between Causal Centrality, Salience, and Product Choice. A linear regression found that the causal centrality of the environmentalist identity significantly predicted environmentally-friendly choices ($B = 0.10$,

FIGURE 4

STUDIES 4 AND 5: CHOICE SETS, ENVIRONMENTAL-PRODUCTS CHOICE TASK

SE = 0.02, $p < .001$), controlling for a directional non-significant effect of salience condition ($B = 0.13$, SE = 0.08, $p = .102$), and total number of causal links. To test whether the relationship between causal centrality and choice was moderated by salience, we re-ran the regression, adding salience condition × causal centrality and salience × total links interaction terms. The near-zero salience × causal centrality interaction ($B = 0.00$, SE = 0.04, $p = .928$), suggests that causal centrality of a social identity predicts identity-relevant choices similarly regardless of whether the identity salience has been manipulated to be high or not.

Relationship between Causal Centrality and Product Choice over Time. To examine long-term effects, we ran a linear regression predicting part 2 choices by the measured causal centrality of the environmentalist identity and identity salience condition (both from part 1), controlling for total links. Causal centrality of the environmentalist identity, measured 11 months earlier, significantly predicted choice ($B = 0.12$, SE = 0.04, $p = .001$), while the identity salience condition did not ($B = -0.17$, SE = 0.14, $p = .229$).

Discussion

Study 4, as well as studies A2 and A3, replicated the findings of the previous studies with a different consumer-relevant social identity. Consumers who perceived the environmentalist identity as more causally central were more likely to make identity-consistent choices, both immediately and after a long delay, than those who perceived this identity as more causally peripheral, regardless of whether the identity was first made salient or not. The results of the environmentalist-salient condition show that even when a social identity is experimentally manipulated to be salient, centrality still predicts purchase decisions—consistent with our study 2 finding that centrality of the football fan identity predicted willingness to pay, even when a real-world event made the identity highly salient.

The results of study 4 suggest that causal centrality and salience of an identity are dissociable and have separate influences on identity-consistent behavior. The salience manipulation had no effect on causal centrality. Further, while the results of study 4 (and study A3 in web appendix B) were consistent with prior findings that experimentally manipulating an identity to be more salient increases consumers' identity-consistent choices (pooled $B = 0.18$, $p = .007$, web appendix B), we found no evidence that the

influence of the salience manipulation on choice differs depending on the causal centrality of the environmental identity. The lack of an interaction between salience and causal centrality suggests that the salience manipulation is equally effective among consumers who see the identity as central and peripheral. Finally, the lack of an interaction also rules out an alternative explanation of our earlier findings, that higher causal centrality of an identity motivates identity-relevant choices by making that identity more chronically salient.

The part 2 results revealed that the causal centrality of the environmentalist identity predicts choices made nearly a year after measuring centrality. This is consistent with our proposal that causal centrality underlies a relatively stable construct, identity importance, in the absence of specific factors that change perceptions of causal relationships among aspects of identity (as our manipulation of causal centrality did in study 3).

STUDY 5: THE STABILITY OF CAUSAL CENTRALITY IN PREDICTING CHOICES

Study 5 addresses a potential confound, self-generated validity (Feldman and Lynch 1988). In the previous studies, participants made their choices and reported causal centrality in the same session. This raises the possibility that participants' decisions and causal centrality ratings may have been influenced by a desire to keep responses consistent across tasks (although the belief that more connections to an identity is consistent with maintaining identity norms could also reflect our framework).

Study 4 partially addressed this concern, because participants also made choices 11 months after they had reported causal centrality in part 1. However, participants had made the same choices directly after reporting causal centrality in part 1 and could have recalled their previous choices when participating in part 2. Furthermore, measurement of centrality after the salience manipulation could have reduced the potential effect of the salience manipulation on choices by making the environmental identity salient even in the control condition or by distracting participants. To address these potential limitations, in part 1 of study 5, we measured causal centrality with no reference to product choices. Then, one week later, in part 2, we manipulated the salience of the environmentalist identity and participants made choices between more expensive environmentally-friendly products and cheaper conventional products (as in study 4).

Method

Participants. We collected valid surveys from 878 Amazon Mechanical Turk participants, after pre-registered exclusions for duplicate IP addresses or worker IDs,

providing nonsense answers to open-ended questions, or failing the attention check.

Design. The experiment consisted of two parts that were one week apart. The tasks used in study 5 were the same as those used in study 4 but presented in a different order and with the addition of the identity importance scale used in studies 2 and 3.

Part 1. As in study 4, participants first reported whether they agreed with a series of six identity-related statements, including one that related to the target identity: "I want to be an environmentally-friendly person." Only participants who answered "yes" to this question were invited to complete the study. The other five questions were unrelated to the target identity and served to mask the survey's intention so that participants could not strategically answer to qualify for the survey. Participants then reported the features that were most important to the person who they are, from each of six categories (memories, preferences, moral qualities, personality traits, goals/ desires, and other) and completed the "listing causal relationships" task.

After the "listing causal relationships" task, participants completed the identity importance scale used in studies 2 and 3, modified to ask about the environmentalist identity. Finally, participants were told that they would be invited back the following week for part 2 of the study, but were not told what would be asked.

Part 2. As in study 4, participants were randomly assigned to either write about their environmentalist identity (environmentalist-salient condition) or to write about what they had done the previous day (control condition, web appendix C). Directly after the writing task, participants made the same three hypothetical purchasing decisions as in study 4 (figure 4) and then rated which product in each choice set they thought was more environmentally friendly.

Results

Effect of Identity Salience on Product Choice. Consistent with study 4 and conceptually replicating prior research, participants in the environmentalist-salient condition chose more environmentally friendly products than in the control condition ($M_{env} = 2.19$, $M_{control} = 1.65$; $t(876) = 8.44$, $p < .001$, $d = 0.57$, 95% CI of the difference = [0.41, 0.67]).

Relationship between Environmentalist Causal Centrality and Choice. We fit a linear regression predicting the total number of environmentally-friendly choices based on identity-salience condition (environmental vs. control) and measured causal centrality of the environmental identity, controlling for the total number of links. Consumers who saw their environmental identity as more central chose significantly more environmentally friendly

products ($B = 0.07$, SE $= 0.02$, $p < .001$). This analysis also confirmed the main effect of the salience-manipulation condition ($B = 0.27$, SE $= 0.03$, $p < .001$). The relationship between the causal centrality of the environmentalist identity and choice remained significant when controlling for income ($B = 0.07$, SE $= 0.02$, $p < .001$, table 11 in web appendix A).

In a follow-up regression, we included a condition × causal centrality interaction term, which was not significant ($B = -0.01$, SE $= 0.01$, $p = .456$). This suggests that the effect of the salience manipulation on choices did not depend on the causal centrality of the environmentalist identity, and that the relationship between choices and previously measured causal centrality was robust to the salience of the environmentalist identity at the time of choice (i.e., a similar relationship between causal centrality and choice was found in the environmentalist-salient and control conditions).

Mediation Analysis. We conducted a mediation analysis to test whether the relationship between causal centrality and choice operates via identity importance, controlling for the total links reported. We found that those who perceived their environmentalist identity as more causally central also reported that the identity was more important ($B = 0.21$, SE $= 0.02$, $p < .001$). There was a significant indirect effect of causal centrality on choice via environmentalist identity importance ($B = 0.06$, 95% Bootstrapped CI $=$ [0.04, 0.07]). Importance mediated the majority of the relationship between causal centrality and choice, and the relationship between causal centrality and choice was no longer significant when controlling for importance ($B = 0.02$, SE $= 0.02$, $p = .269$, figure 3 in web appendix A).

Discussion

Study 5 finds that causal centrality of the environmentalist identity predicts choices of more expensive but environmentally-friendly products, even when choices are measured at a different time. This suggests that the relationship between causal centrality and choice is unlikely to be explained by self-generated validity and provides additional evidence that causal centrality, a relatively stable individual difference, underlies identity importance. Further, replicating the results of studies 1B, 2 (wave 2), and 3, in study 5, consumers who perceived their environmentalist identity as more causally central also perceived it as more important and identity importance mediated the relationship between causal centrality and choice.

The effect of centrality on later choices was also tested in three additional two-part (one week apart) pre-registered studies. The effect was replicated in one study that used the same design as study 5 (study A5: $n = 585$, $B = 0.04$, SE $= 0.02$, $p = .059$) and another study in which participants completed the choice and centrality task in the opposite order (i.e., choice in the first session, centrality in the second session; study A6: $n = 208$, $B = 0.08$, SE $= 0.04$,

$p = .041$), but not in a third study. In a meta-analysis ($n = 2,153$) of the four studies (5, A5, A6, and A7, reported in web appendix B) in which choice and causal centrality were measured at different times, the relationship between causal centrality and choice was significant ($B = 0.05$, SE $= 0.01$ $p < .001$).

The results of study 5 provide further confirmation that salience and causal centrality of identity represent distinct psychological processes. Replicating study 4, the effect of identity salience was distinct from causal centrality, significantly shifting choices whether the social identity was causally central or not. Furthermore, causal centrality predicted identity-relevant product choices whether or not the social identity was manipulated to be salient at the time of choice. The disassociation between salience and causal centrality (e.g., the lack of mediation or interaction) was also replicated in the two additional pre-registered two-part studies described in the previous paragraph, studies A5 and A6, testing the effects of the salience and centrality of the environmental identity (web appendix B).

Our finding that salience and causal centrality have independent non-interacting effects on choice may seem at odds with previous findings that salience interacts with identity importance in predicting choice (Bolton and Reed 2004; LeBoeuf et al. 2010). Because our theory is about the relative impact of identities that people hold on their consumption decisions, our studies only included people who self-ascribed to an identity (e.g., screening out participants who did not consider themselves environmentalists). The interaction between salience and importance found in prior research occurred in general unscreened samples (Bolton and Reed 2004), and included consumers who did not hold the identity.

For example, the interaction found in LeBoeuf et al. (2010, study 3) was driven by low identifiers making more identity-*inconsistent* choices when the identity was salient, the opposite of mid and high identifiers. This pattern of results is consistent with both our results among those identifying with an identity (who would presumably be mid and high identifiers), and with prior theorizing that consumers who do not identify with a social group (low identifiers) may wish to disassociate and respond negatively to in-group members (Forehand et al. 2002). Therefore, the seeming discrepancy may be explained by salience increasing norm-consistent preferences and behavior, as shown in this research, only among consumers who hold the identity, with low importance ratings indicating that the consumer either does not hold the identity or holds a contrary identity (e.g., anti-environmentalist).

STUDY 6: QUALITY TRADE-OFFS

Thus far, we have documented the role of causal centrality in identity-based consumption for trade-offs between

money and identity-relevant spending. In study 6, we test whether our findings extend beyond monetary trade-offs, to trade-offs between identity-relevance and quality. Participants in study 6 chose between environmentally-friendly products and conventional products with either higher quality ratings or with lower prices (as in studies 4 and 5), depending on the condition. As previous research has suggested that consumers are particularly unwilling to trade-off quality (functional performance) for environmental-friendliness (Luchs and Kumar 2017), using causal centrality of the environmentalist identity to predict consumer willingness to trade off quality for environmental-friendliness is a particularly strong test of the generality of our theory.

Method

Participants. As in study 4, we recruited U.S. participants from Prolific Academic who had previously reported caring about environmental issues. The survey yielded a total of 811 valid participants, after pre-registered exclusions for a failed attention check or for not agreeing that they wanted to be an environmentally-friendly person in the screener.

Procedure. As in studies 4 and 5, participants were screened to ensure that they self-ascribed to the environmentalist identity. Participants then reported the features most important to who they are, from each of six categories (memories, preferences, moral qualities, personality traits, goals/desires, and other) and completed the same "listing causal relationships" task.

Participants then made three choices between an environmentally friendly product and a conventional version of the same product. Two product pairs (lightbulbs and batteries) were the same as in studies 4 and 5. Because quality ratings did not seem relevant to shopping bags, they were replaced with Ikea food storage containers (figure 6 in web appendix C). The placement of the choice options (environmentally-friendly vs. conventional) on the screen was randomized.

We randomly assigned participants to the price-trade-off condition (similar to studies 4 and 5) or the quality-trade-off condition. Participants in the price condition chose between more expensive environmentally-friendly products and cheaper conventional products. Participants in the quality condition chose between lower-rated environmentally-friendly products and higher-rated conventional products, presented as average ratings of at least 100 independent consumers.

To ensure that the price and quality trade-offs were comparable, we first ran a separate titration test (study A6 in web appendix B) in which participants made a series of trade-offs between purchasing a lower quality product for the low price and a higher quality product for a higher price (using high and low prices from studies 4 and 5, not

describing any products as environmentally friendly). We used the quality scores from the indifference points as the ratings for the more expensive products in the quality condition of this study (for light bulbs: 2 stars vs. 4.5 stars, for food containers: 2 stars vs. 4.25 stars, for batteries: 2 stars vs. 4.5 stars).

All participants then made a series of three control choices which did not involve environmentally-friendly products. In each of these choices, participants chose between two products from the same brand: an expensive product with a higher average rating and a cheaper product with a lower average rating (figure 6 in web appendix C). These choices were included to ensure that any relationship found between the causal centrality of the environmentalist identity and choice was not due to those perceiving the environmentalist identity as more causally central being relatively more price or quality sensitive. Finally, participants rated which product in each of the environmentally friendly choice sets they thought was better for the environment.

Results

We fit a linear regression predicting the total number of environmentally-friendly choices based on condition (price vs. quality) and the causal centrality of the environmentalist identity, controlling for the total number of links. This analysis confirmed that consumers who saw their environmentalist identity as more central chose significantly more environmentally friendly products overall ($B = 0.08$, SE $= 0.02$, $p < .001$) and revealed a main effect of the trade-off condition (more environmental choices in the price-trade-off condition: $B = -0.53$, SE $= 0.07$, $p < .001$). The relationship between the causal centrality of the environmentalist identity and choice remained significant when controlling for income and for the number of expensive choices in the control task in the above regression ($B = 0.08$, SE $= 0.02$, $p < .001$, table 12 in web appendix A). For the control products, the relationship between causal centrality and choice was not significant ($B = 0.01$, SE $= 0.02$, $p = .726$).

Notably, the relationship between causal centrality and choice was significant and similar in magnitude in the price ($B = 0.09$, SE $= 0.03$, $p < .001$) and the quality condition ($B = 0.08$, SE $= 0.03$, $p = .006$), and each remained significant when controlling for income and the number of expensive choices in the control task (tables 13 and 14 in web appendix A). The non-significant interaction between trade-off condition and causal centrality ($B = 0.02$, SE $= 0.03$, $p = .437$) in a follow-up regression confirmed that we did not detect a difference in the relationship between choice and causal centrality when participants were considering price or quality trade-offs.

Discussion

The results of study 6 replicated the results of studies 4 and 5. The causal centrality of the environmentalist identity predicted choices when consumers traded off environmental-friendliness for price. Further, we found that the causal centrality of the environmentalist identity also predicted choices when consumers traded off environmental-friendliness for quality, suggesting that causal centrality predicts a wider range of consumer trade-offs. Two additional studies, studies A7 and A8 in web appendix B, also examined the role of causal centrality in quality versus environmentally-friendliness trade-offs. A meta-analysis across all three studies (excluding the price trade-off condition from study 6) revealed that those who perceived their environmentalist identity as more causally central were more likely to trade-off product quality for environmental-friendliness (pooled $B = 0.03$, $p = .014$, web appendix B).

GENERAL DISCUSSION

Our studies demonstrate that understanding social identities in terms of how they interact with each other and fit into consumers' broader self-concept provides new explanations for identity importance and for consumers' identity-based behaviors. We find that more causally central identities are perceived as more important (studies 1A, 1B, 2, and 5) and that experimentally increasing the causal centrality of a social identity increases the importance of that identity (study 3). Additionally, across multiple consumer-relevant identities, we provide evidence that among consumers who belong to the same social category, those who perceived that social identity as more causally central (measured or manipulated) are more likely to act in identity-consistent ways, compared to those who perceived the same social identity as more causally peripheral. Finally, we demonstrate that the relationship between a social identity's causal centrality and identity-consistent behaviors cannot be explained by non-causal associations between an identity and other features of the self-concept (study 1A), involvement in identity-related activities (study 2), identity salience (studies 2, 4, and 5), or general price or quality sensitivity (study 6).

Theoretical Implications

Our novel approach to understanding identity-consistent behavior theoretically advances the identity-based consumption literature in a number of ways. First, our approach reconciles cognitive approaches to the self-concept, which focus on individual-level conceptualization (e.g., Blok et al. 2005; Nichols and Bruno 2010; Strohminger and Nichols 2014, 2015), and prior consumer research on identity-based consumption, which has focused on social categories (e.g., Brough et al. 2016; Reed 2004; LeBoeuf et al. 2010). By measuring how identities relate to each other within an individual's broader self-concept, our approach integrates and builds on both lines of literature to provide a more complete framework for the role of identity importance and identity-based norms in behavior.

Second, our approach provides a novel psychological explanation of identity importance, a key determinant of an identity's influence on behavior (LeBoeuf et al. 2010; Markus and Wurf 1987; Reed 2004). By understanding the consumer psychology that underlies identity importance, we can explain how identities become important. Furthermore, identifying the basis of identity importance enabled us to construct the theory-based manipulation of the perceived causal centrality of an identity used in study 3 to influence identity importance and downstream identity-consistent behaviors.

Further, understanding that causal centrality underlies identity importance highlights that some research has defined identity importance narrowly (e.g., on scales measuring identity importance) as a combination of a positive evaluation of the group and affiliation with the group (e.g., measuring admiration of the group as well as reported identification with the group and that group membership is a good description of who they are, Reed 2004). There is a broader construct of identity importance that is captured by causal centrality. More specifically, a social identity's causal centrality is the extent that consumers perceive that social identity as having influenced or been influenced by other aspects of the self (Chen et al. 2016; Chen and Urminsky 2019), regardless of the valence of a consumer's evaluation of the social identity.

For example, an alumna of a college could see her college social identity as causally central because her undergraduate experience shaped her career, where she went to graduate school, and gave her the opportunity to study abroad. If she does not have a positive evaluation of the alumna identity (she chose to study abroad and go to graduate school at a different university because she did not like her undergraduate institution), her score on identity importance scales would be low. Nevertheless, her identity as an alumna of the college would still be important as it has had a large influence on who she is as an individual and she would be a very different person had she gone to a different college (reflected by high causal centrality of the alumna identity), even though she likely does not admire or may not even strongly affiliate with the social identity (reflected by low scores on an identity importance scale). This is an interesting potential direction for future research.

Finally, we also provide independent and pre-registered replication tests of the effects of identity salience on consumer choice (e.g., Coleman and Williams 2013; see Kettle 2019 for a review). Across the four studies in which the salience manipulation occurred directly before the

choice task (studies 5 and A5, A6, and A7), we find that manipulating the salience of an environmentally conscious identity using an online writing task increased choices of environmentally friendly products (total $n = 2{,}153$, overall $d = 0.56$; $p < .001$; significant at $p < .001$ in all four studies). The only time we did not replicate the effect was in Study 4, in which the listing causal relationships task was conducted between the salience manipulation and choice tasks. This may suggest intervening tasks as a boundary condition, but we did not test that systematically. These constitute theory-test replications and contribute to our understanding of the robustness and generalizability of identity salience effects (Urminsky and Dietvorst, forthcoming).

Our findings also challenge some assumptions about how people engage in causal reasoning. While some prior research has argued that only causes matter (Ahn et al. 2000; Sloman et al. 1998) for determining causal centrality, others have argued that both causes and effects matter (Rehder 2003; Rehder and Hastie 2001). In a meta-analysis across all studies except for study 3, we predicted choice with the number of times the target identity was a cause and the number of times the target identity was an effect as separate variables, controlling for the total number of links. Both the number of times the target identity was a cause ($B = 0.08$, SE $= 0.02$, $p < .001$) and the number of times it was an effect ($B = 0.16$, SE $= 0.02$, $p < .001$; bootstrapped CI of the difference $= [0.01, 0.15]$) significantly predicted choice (table 17 in web appendix A).

The finding that both causes and effects matter in the representation of the self-concept has important consequences. Since causes always occur before their effects, if only being a cause contributed to centrality, consumers' identities would be more defined by the events that occurred or features that developed earlier in life. Because an identity is also perceived as central when it is the consequence of other features of identity, what is most defining of the self can change over time. Features that develop later in life (e.g., culminating identities, such as a profession or becoming a parent) can become more defining of the self-concepts than their causes, consistent with the self-concept being a changing and dynamic entity (Reed and Forehand 2016).

Our approach to identity-consistent behavior also has important implications for cross-disciplinary research on decision making. For example, inspired by social psychology, some economic models of utility incorporate identity by assuming that the utility an individual gains from acting in identity-consistent ways depends on how much the person has embraced the social category (e.g., Akerlof and Kranton 2000, 2010). These models do not attempt to measure or define these differences in adoption of an identity. We demonstrate, consistent with the model assumptions, that consumers who belong to the same category do indeed integrate the social identity into their self-concepts

to different degrees and that these differences have implications for choice. Further, our approach to identity-based consumption provides a psychological explanation for what it means to adopt a social identity (i.e., integrating the social identity into the self-concept via causal connections to other features).

Further, our results extend our understanding of consumers' causal knowledge as essential to category representation and reliance on subjective categories in decision making. While previous research has examined the role of causal centrality in categorization judgments (Ahn et al. 2000; Sloman et al. 1998) and consumer perceptions of products (Gershoff and Frels 2015), we have demonstrated that differences in causal centrality can explain differences in identity-relevant consumption decisions. Our findings demonstrate the value in going beyond explorations of how the categorization of products and situations influence choice (e.g., Chen, Ross, and Murphy 2014; Moreau, Markman, and Lehmann 2001) to investigate how the complex *representation* of these categories motivates behavior. For example, future research on mental accounting could go beyond how money is categorized and explore whether differences in consumers' representations of the relationships between different mental accounts motivate allocation of funds into them. Additionally, as consumers' beliefs about the causal relationships that exist between the features of a brand influence perceptions of the brand's identity and purchase intentions (Chen and Urminsky, working paper), future research could explore how causal beliefs about brands may interact with causal beliefs about the consumer's own self-concept to motivate the development of brand–consumer relationships.

Future Directions

By gaining a greater understanding of the psychological basis of identity importance, we were able to develop a manipulation of causal centrality that increased identity importance and identity-based consumption (study 3). These results are proof-of-concept that marketers may build consumer loyalty by prompting their consumers to think about how a brand-user or product-relevant identity is causally connected to other identities. In fact, recent requests for alumni donations from Princeton University and Dartmouth College prompt alumni to think about the causal centrality of the university identity (e.g., reminding alumni they would not have the same friends and opportunities without their university identity). Further, these requests include quotes from alumni explaining why they donate to the university, some of which describe the university identity as causally connected to other aspects of the self-concept, suggesting that seeing the university identity as causally central may motivate some to donate (figure 5). Conversely, marketers targeting conversions could prompt competitors' customers to think about how

FIGURE 5

EXAMPLES OF CAUSAL CENTRALITY IN DONATION CONTEXTS
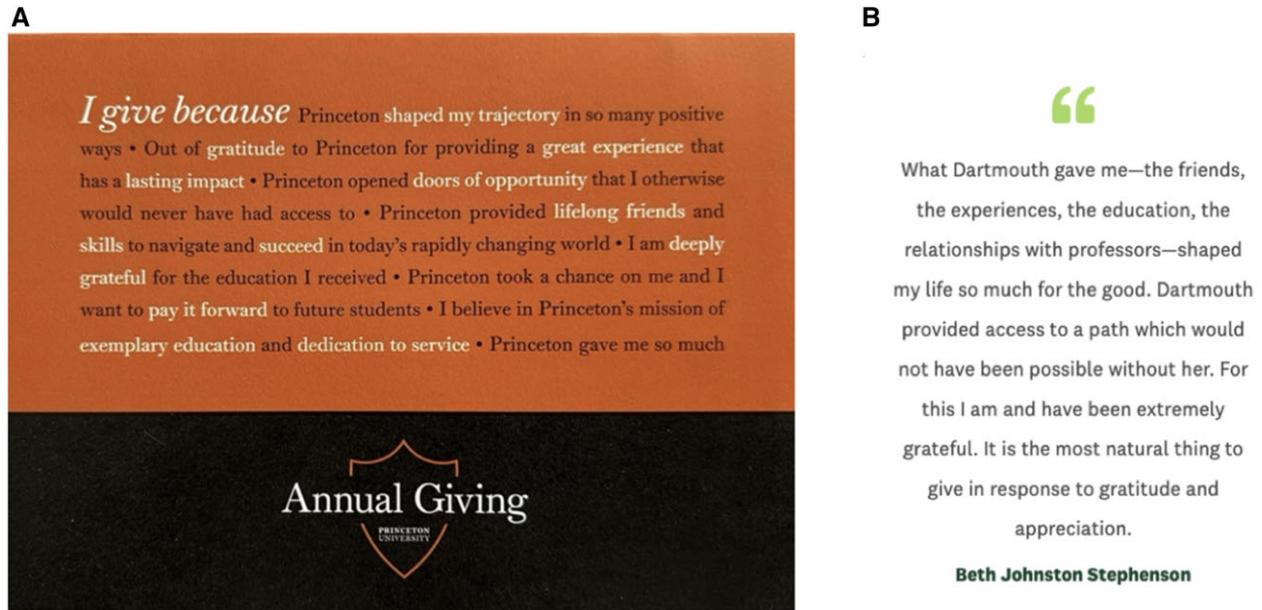
NOTES.— (A) Mailing from Princeton University. (B) A donor explaining why they gave to Dartmouth College, from the Dartmouth College fundraising website (https://calltolead.dartmouth.edu/your-impact/donors?page=1, accessed June 12, 2023).

the brand-user identity is independent of other identities—for example, if Adidas is trying to convert Nike customers, they could remind customers that they would still have been athletes even if they had never been a Nike-user.

Additionally, understanding that causal centrality underlies identity importance provides specific strategic insights for how to tailor marketing appeals to target different segments of consumers. For example, the understanding that both causes and effects determine causal centrality and identity importance provides insight on how to customize the donation requests in figure 5 for alumni at different life stages. As the consequences of a social identity must develop after the identity is acquired, appeals that highlight the effects of the university alumni identity (like those in figure 5A, e.g., lifelong friends, skills for a successful career) may be better suited for older alumni for whom the effects have had more time to develop. For younger alumni (and potentially, current students), it may be more effective to use appeals that highlight the aspects that caused the university identity (e.g., intelligence, hard work, talent).

Furthermore, as the self-concept is a dynamic concept that can change over time, marketers can increase motivation to use their products by fostering connections to multiple identities. For example, to make a brand-user identity more important, brands may invest in becoming integrated with other aspects of the self-concept—for example,

sponsoring a local kids' sports team. Thus, over time, the brand-user identity may become connected to a consumer's identity as a parent and thus, more causally central and important. In fact, contrary to a common view of sponsorship as merely a vehicle for attention and brand recall, our findings suggest that sponsorships related to events that are relevant to causal identity links may be more valuable.

To further develop these implications for marketers, additional research is needed to identify the most effective strategies and possible boundary conditions. For example, having consumers think about what other aspects of the self-concept an identity is causally connected to (as we did in study 3) may have no effect (or even potentially backfire) among consumers who hold a social identity but fail to identify what it is causally connected to (possibly making the identity seem *less* important). We speculate that this may be more likely to occur for social identities that consumers do not self-select into (e.g., gender or age) than for those that consumers self-select into (like those studied in this article). For social identities that consumers do not choose, some consumers who hold the identities (because they are members of the social category) may nevertheless not think that the identity is representative of who they are.

Further, while many approaches to understanding differences in consumer's identity-based behavior have utilized individual difference scales (e.g., identity importance,

identity esteem, self-brand connection), our approach to understanding identity-based consumptions has been based on a more basic psychological process. As demonstrated in our exploration of identity importance and identity esteem in study 2, it can be difficult to differentiate some of these scales. The scales measure the attitudinal consequences of identity importance, whereas we argue that causal centrality measures the basis of identity importance. Further, it may be that different items in a single scale may, while generally correlated with one another and an effective proxy for measuring differences in identity importance, may not be influenced by the same underlying psychology. As discussed earlier, it may be that the admiration question may not be based on causal centrality the same way the identification and reflection questions are (and in fact, this item is not included in all identity importance scales, e.g., LeBoeuf et al. 2010).

Additionally, future research could further explore the relationship between causal centrality and identity salience effects on identity-based behaviors. As salience highlights the norms of a focal identity, it may also highlight the norms of identities that are strongly causally connected to the focal identity, which may result in different effects on different consumers, depending on which other identities a focal identity is connected to. For example, the impact of a making football fan identity salient may differ depending on the norms associated with the other identities (e.g., family vs. professional) causally connected to the football fan identity.

Our investigation of identity-based consumption has focused on choices between options that clearly relate to strong identity-relevant norms. However, some behaviors that are *associated* with identities may not represent norms and may therefore not be predicted by the causal centrality of the identity even when causal centrality makes an identity important to a consumer. For example, while many environmentalists likely drive Priuses, it is not clear that there is a norm for them to drive Priuses (certainly not descriptively, but perhaps not even prescriptively). In more extreme cases—when consumers' beliefs about what behaviors are identity-consistent conflict with behaviors that are associated with the identity (via marketing efforts or otherwise)—causal centrality may even predict the opposite behavior. For example, when marketers attempt to position visiting Times Square as the prototypical New York experience to tourists, instead of building an identity-related norm, that marketing may decrease the willingness of consumers with a more causally central New Yorker identity from going there.

Similarly, some attempts to market products to women have famously backfired (Grose 2013)—for example, the Bic Pen for Her (pink and pastel pens) or the Della computer for women (marketed by emphasizing its ability to aid with stereotypically female activities like cooking). In fact, it may be that to the extent that female consumers see their gender identity as including more progressive values, a more causally central female identity might be related to a higher likelihood of rejecting such unnecessarily gendered products, as violating one's personal gender norms. Consistent with the idea that consumer beliefs about norms influence the relationship between causal centrality and choice, in studies A6 and A11 (web appendix B), we found preliminary evidence that greater causal centrality of an identity that has weak norms may not predict choices. Thus, future research should examine how consumers' views regarding the relationships between behaviors and an identity may moderate the effects of causal centrality of the identity, particularly in the absence of a consensus norm.

While we have focused our exploration on consumers who share a social identity, our approach to identity-based behavior also has implications for understanding how the multiple social identities within a single consumer interact and relate to behavior. As consumers have multiple social identities with potentially conflicting norms (LeBoeuf et al. 2010; Markus and Wurf 1987; Oyserman 2009; Reed et al. 2012), it would be useful to explore *which* of a consumer's social identities is most likely to influence her behavior. Our approach would predict that in cases where a consumer's social identities have conflicting and equally strong norms about behavior, a social identity would be more likely to influence a consumer's behavior the more central it is relative to the other competing social identities, either overall or within the relevant decision context. More generally, providing a cognitive foundation for identity importance as arising from the perceived causal relationships between specific features of identity can help clarify and explain prior research findings, identify important relationships between identity and consumer decision-making, and point the way to promising new research directions.

DATA COLLECTION STATEMENT

The second and third authors managed data collection for study 1A in the fall of 2019. The first and third authors jointly analyzed these data. The first and second authors managed data collection for study 1B with the assistance of a research assistant in the spring of 2023. The first author analyzed the data. The second author managed data collection for study 2, wave 1, using an online commercial marketing-research panel (Research Now) in the winter of 2016. These data were analyzed by the first author. The first and second authors supervised data collection for study 2, wave 2 by a research assistant in the winter of 2017. These data were analyzed by the first author. The first author managed data collection for study 3 in the spring of 2021 and analyzed the data. The first author supervised data collection for part 1 of study 4 by a research assistant in the spring of 2020 and analyzed the

data. The first author managed data collection for part 2 of study 4 in the spring of 2021 and analyzed the data. The first and second authors managed data collection for study 5 by a research assistant in the summer of 2023. These data were analyzed by the first author. The first author managed data collection for study 6 in the winter of 2022 and analyzed the data. For all studies, Qualtrics survey software presented the survey and recorded responses. All studies with the exception of study 2, wave 1, study 3, study 4, and study 6 were collected online using Amazon Mechanical Turk for participant recruitment. Participants in study 2, wave 1 were recruited from an online panel (Research Now). Only residents of Colorado and North Carolina were eligible for this study. Participants in studies 3, 4 and 6 were recruited from Prolific Academic. For studies 4 and 6, only participants in the United States and participants who had previously answered that they were concerned about environmental issues (reported 4 or 5 on a five-point scale) were eligible for the studies. Data files and study materials for all studies can be found at: https://osf.io/6zcbp/.

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Web Appendix

We Do What We Are: Representation of the Self-Concept and Identity-Based Choice

Stephanie Y. Chen, Oleg Urminsky, and Jiaqi Yu

Table of Contents

All materials, data, and regression tables can be found on OSF. Extra analyses and additional studies are also reported in full here: https://osf.io/6zcbp/

APPENDIX A: DESCRIPTIVE STATISTICS, REGRESSION TABLES, AND EXTRA ANALYSES[1]

Study 1A

TABLE 1

Study 1A: Descriptive statistics, brand-user identity

	Mean	Median	*SD*	Range
Causal centrality	3.15	2	2.59	0-12
Additional (non-causal) associative links	1.49	1	1.21	0-6

TABLE 2

Study 1A: Mean causal centrality for all features

Feature	Centrality	Std	n*
Brand-user identity (target feature)	3.15	2.59	230
Aesthetic preferences	3.36	1.69	83
Romantic relationships	10.50	1.87	138
Favorite hobbies	5.64	1.69	194
Close friendships	10.39	1.83	173
Intelligence level	3.38	1.80	185
Memories of life milestones	6.18	1.95	154
Level of honesty	6.96	1.64	195
Knowledge of music	3.11	1.47	79
Memories of time with family	5.74	1.92	165
Important childhood memories	6.27	2.12	128
Level of loyalty	4.98	1.80	181
Goals for personal life	13.1	2.29	189
Reliability	8.91	1.81	189
Level of wholesomeness	4.72	1.96	121
Knowledge of math	2.86	1.54	50
Level of shyness	4.12	2.12	76

*Participants selected the 10 most important non-target features and completed the "listing causal relationships" task with these 10 features and the target feature (included for all participants).

TABLE 3

Study 1A: Linear regression predicting choice of brand gift card, controlling for income

Factor	β	SE	*t*	*p*
Constant	5.50	.58	9.51	<.001
Brand-user causal centrality	.32	.09	3.35	<.001
Total number of links	-.03	.02	-1.62	.107
Income	.00	.00	.69	.489

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[1] A full set of regression tables and extra analyses can be found at: https://osf.io/6zcbp/

Study 1B

Descriptive Statistics. On average, participants reported that 3.24 causal links between the brand-user identity and the other aspects of the self-concept, from an average total of 31.86 links. The average number of choices of the brand gift card was 7.35 (out of 10).

TABLE 4

Study 1B: Linear regression predicting choice of brand gift card, controlling for income

Factor	β	SE	t	p
Constant	6.69	.36	18.77	<.001
Brand-user causal centrality	.13	.06	2.23	.026
Total number of links	.00	.11	-.03	.979
Income	.00	.00	1.21	.228

Study 2

Descriptive Statistics. On average, participants reported that 3.03 other features were causally linked to their football fan identity and that 6.52 other features were causally linked to the control feature. The average WTP to see their team in the Super Bowl was $475.77. The average interest in football was 1.6 on a 4-point scale (1 = very interested, 4 = very uninterested), confirming that our sample was made up of football fans.

TABLE 5

Study 2: Linear regression predicting log-WTP for ticket to watch favorite team in Super Bowl, including outlier and participants who failed attention check and reported duplicate IPs

| Factor	β	SE	t	p
Constant	4.71	.18	26.51	<.001
Football fan causal centrality	.23	.03	6.62	<.001
Control causal centrality	-.07	.02	-3.10	.002

TABLE 6

Study 2: Linear regression predicting log-WTP for ticket to watch favorite team in Super Bowl, controlling for income

| Factor	β	SE	t	p
Constant	4.41	.20	22.32	<.001
Football fan causal centrality	.13	.03	4.28	<.001
Control causal centrality	-.03	.02	-1.71	.088
Income	.00	.00	2.87	.004

FIGURE 1

IDENTITY IMPORTANCE MEDIATES RELATIONSHIP BETWEEN FOOTBALL FAN
CAUSAL CENTRALITY AND LOG-WTP, STUDY 2
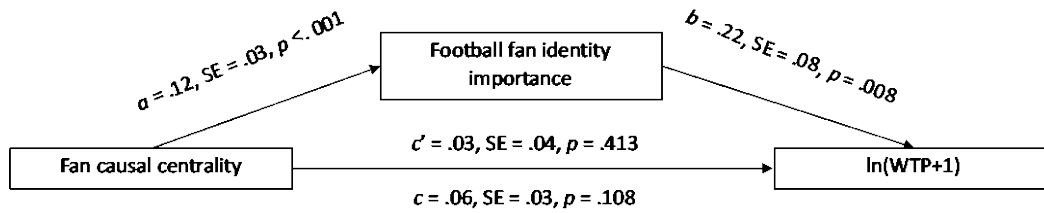
NOTE—Mediation analysis performed using the PROCESS bootstrapping macro (model 4)
with 5,000 resamples and total number of links as a covariate. A 95% confidence interval was
computed to test the indirect effect (95% CI of the indirect effect = [.00 .06]). Control feature
links was included as a covariate.

FIGURE 2

IDENTITY ESTEEM MEDIATES RELATIONSHIP BETWEEN FOOTBALL FAN
CAUSAL CENTRALITY AND LOG-WTP, STUDY 2
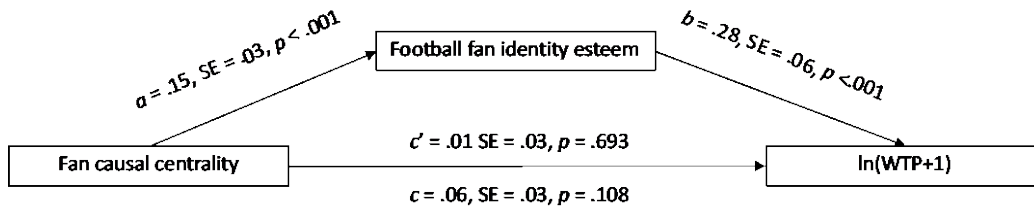
NOTE—Mediation analysis performed using the PROCESS bootstrapping macro (model 4)
with 5,000 resamples and total number of links as a covariate. A 95% confidence interval was
computed to test the indirect effect (95% CI of the indirect effect = [.02 .07]). Control feature
links was included as a covariate.

Factor Analysis. We factor analyzed (with varimax rotation) the questions from the Identity

Importance (Reed II 2004) and the Identity Esteem Scales (Shang, Reed II, and Croson 2008;

Luhtanen and Crocker 1992), using the scree plot and eigenvalues > 1 to determine the

underlying components. The analysis yielded two factors explaining a total of 71.24% of the

variance in the data. Only the two reverse-coded items (Identity Esteem Scale) did not load

onto the first factor (see table 7), suggesting that the two scales are not distinct in our data.

TABLE 7

Study 2: Rotated Component Matrix

	Component	
Scale Item	1	2
How much does [group] describes who you are*	.817	
How much you identify with [group]*	.881	
How much you admire [group]*	.827	
I am a worthy member of the group	.637	.492
I don't feel that I have much to offer the group (reverse coded)	.136	.901
I am a cooperative member of the group	.684	.307
I often feel like a useless member of the group (reverse coded)		.897

*items from the Identity Importance Scale, all other items are from the Identity Esteem Scale

Study 3

TABLE 8

Study 3: Summary of main results

Factor	$M_{\text{HighCentrality}}$	$M_{\text{LowCentrality}}$	$t(902)$	p
WTP	584.16	476.01	2.10	.036
Ln WTP+1	5.76	5.60	2.30	.022
Identity Importance	4.72	3.86	7.86	<.001

TABLE 9

Study 3: Linear regression predicting log-WTP for ticket to see favorite team in Super Bowl

Factor	β	SE	t	p
Constant	5.22	.13	40.77	<.001
Condition	.17	.07	2.42	.016
Income	.00	.00	3.34	<.001

NOTE—Low centrality condition = 1, High centrality condition = 2

Study 4

Descriptive Statistics. On average, participants reported 3.27 links to the environmentalist identity, out of an average total of 19.91 links. Environmentally-friendly items were seen as significantly better for the environment than conventional ones (part 1 Ms ≥ 4.35 vs. midpoint of 3, ts > 27.83, ps $< .001$; part 2 Ms ≥ 4.51 vs. midpoint of 3, ts > 24.48, ps $< .001$).

TABLE 10

Study 4: Linear regression predicting choice of environmentally-friendly products, controlling for income

Factor	β	SE	t	p
Constant	1.91	.10	19.78	<.001
Environmental causal centrality	.10	.02	4.46	<.001
Total number of links	-.02	.01	-2.98	.003
Income	.00	.00	2.24	.026

Study 5

Descriptive Statistics. On average, participants reported 2.36 links to the environmentalist identity, out of an average total of 18.38 links. In each pair of options in the choice task, the environmentally-friendly item was rated as significantly better for the environment than the conventional item ($Ms \geq 4.33$ vs. midpoint of 3, $ts > 41.69$, $ps < .001$).

TABLE 11

Study 5: Linear regression predicting choice of environmentally-friendly products, controlling for income

Factor	β	SE	t	p
Constant	1.86	.10	17.96	<.001
Condition	.27	.03	8.39	<.001
Environmental causal centrality	.07	.02	3.82	<.001
Total number of links	-.01	.00	-1.99	.047
Income	.00	.00	.13	.897

NOTE—Control = -1, Environmentalist-salient condition = 1

FIGURE 3

STUDY 5: IDENTITY IMPORTANCE MEDIATES THE RELATIONSHIP BETWEEN CAUSAL CENTRALITY AND CHOICE
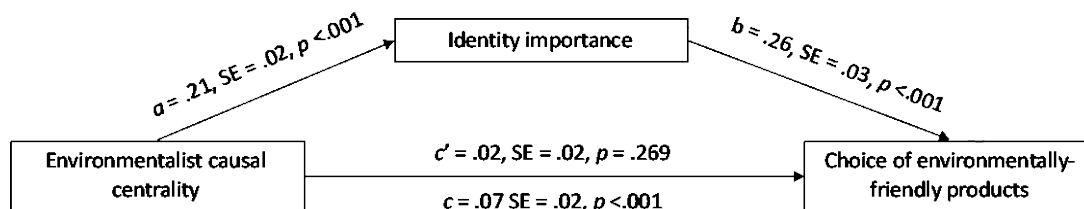
NOTE—Mediation analysis performed using the PROCESS bootstrapping macro (model 4) with 5,000 resamples. A 95% confidence interval was computed to test the indirect effect (95% CI of the indirect effect = [.04, .07]). Total links was included as a covariate.

Study 6

Descriptive Statistics. On average, participants reported 2.71 links to the environmentalist identity, out of an average of 18.37 total links. In each pair of options, the environmentally-friendly item was rated as significantly better for the environment than the conventional item (Ms > 4.38 vs. midpoint of 3, ts > 41.71, ps < .001).

TABLE 12

Study 6: Linear regression predicting choice of environmentally-friendly products, controlling for expensive choices (control task) and income

Factor	β	SE	t	p
Constant	1.96	.15	13.45	<.001
Condition	-.55	.07	-7.96	<.001
Environmental causal centrality	.08	.02	4.37	<.001
Total number of links	.00	.00	-.67	.504
Number of expensive choices	-.12	.04	-2.77	.006
Income	.00	.00	-.03	.721

NOTE—Price condition = 1, Quality condition = 2

TABLE 13

Study 6: Linear regression predicting choice of environmentally-friendly products, controlling for income, quality condition only

Factor	β	SE	t	p
Constant	1.18	.14	8.72	<.001
Environmental causal centrality	.07	.03	2.35	.019
Total number of links	.00	.01	.42	.676
Number of expensive choices	1.18	.14	-6.22	<.001
Income	.00	.00	-.88	.380

TABLE 14

Study 6: Linear regression predicting choice of environmentally-friendly products, controlling for income, price condition only

Factor	β	SE	t	p
Constant	1.10	.13	8.30	<.001
Environmental causal centrality	.09	.03	3.39	<.001
Total number of links	-.01	.01	-1.10	.271
Number of expensive choices	.13	.06	2.08	.038
Income	.00	.00	.87	.385

Cause vs Effects Analysis

TABLE 15

Study 1A: Linear regression predicting brand choices, links with brand-user identity as cause and links with brand-user identity as effect separated

Factor	β	SE	t	P
Constant	5.70	.50	11.43	<.001
Total number of links	-.02	.02	-1.43	.155
Brand-user identity as cause	.17	.16	1.10	.275
Brand- user identity as effect	.49	.17	2.80	.006

A bootstrap analysis (1000 resamples) revealed that the difference in the effect coefficient and the cause coefficient in the above regression was not significantly different (95% bootstrapped CI of the difference = [-.21 .87]).

TABLE 16

Study 1B: Linear regression predicting brand choices, links with brand-user identity as cause and links with brand-user identity as effect separated

Factor	β	SE	t	p
Constant	6.91	.30	22.86	<.001
Total number of links	.00	.01	.02	.986
Brand-user identity as cause	.19	.10	1.97	.050
Brand- user identity as effect	.05	.10	.55	.581

A bootstrap analysis with 1000 resamples revealed that the difference in the effect coefficient and the cause coefficient in the above regression was not significantly different (95% bootstrapped confidence interval of the difference = [-.46 .19]).

TABLE 17

All Studies: Linear regression predicting identity-consistent choice with cause and effect links to target identity separated*

Factor	β	SE	t	P
Constant	0.00	.017	0.00	1
Total number of links	-.08	.022	-3.40	<.001
Target identity as cause	.08	.022	3.77	<.001
Target identity as effect	.16	.023	7.38	<.001

*Dependent variable and all predictors were z-scored within each study before combining the data across studies

A bootstrap analysis (1000 resamples) revealed that the effect coefficient was significantly larger than the cause coefficient (95% bootstrapped CI of the difference = [.01 .15]).

PILOT STUDY A1: MANIPULATING CAUSAL CENTRALITY

Pilot study A1 is an initial exploration of the study 3 causal centrality manipulation.

Method

The procedure and study materials were the same as those used in study 3.

Results

Effect of the Causal Thinking Manipulation on Importance and WTP. Participants in the high centrality condition reported significantly higher football fan identity importance and log-WTP to see their favorite team in the Super Bowl than those in the low centrality condition (importance: $M_{HighCent} = 5.20$, $M_{LowCent} = 4.56$, $t(382) = 4.07$, $p < .001$, 95% CI of the difference [.33, .94]; log-WTP: $M_{HighCent} = 5.90$, $M_{LowCent} = 5.70$, $t(382) = 2.01$, $p = .045$, 95% CI of the difference [.00, .41]).

Mediation Analysis. There was a significant indirect effect of the causal thinking manipulation on log-WTP via fan identity importance ($B = .14$, 95% Bootstrapped CI = [.07, .23]). The relationship between log-WTP was mediated by importance and not significant when controlling for importance ($B = .06$, SE = .10, $p = .538$, see figure 4).

FIGURE 4

STUDY A1: IDENTITY IMPORTANCE MEDIATES RELATIONSHIP BETWEEN
THE CAUSAL CENTRALITY MANIPULATION AND LN(WTP+1)
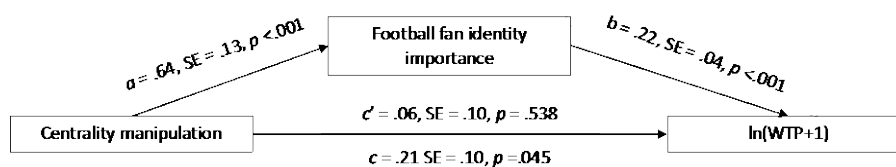
NOTE—Centrality manipulation was coded as follows: high centrality = 2, low centrality = 1. Mediation analysis performed using the PROCESS bootstrapping macro (model 4) with 5,000 resamples. A 95% confidence interval was computed to test the indirect effect (95% CI of the indirect effect = [.07, .23]).

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[2] Additional studies are reported in full at: https://osf.io/6zcbp/

META-ANALYSIS OF STUDIES 3 AND A1

To further examine whether the causal thinking manipulation influenced willingness to pay among football fans, we performed a meta-analysis, combining studies 3 and A1. Results

Effect of the Causal Thinking Manipulation on Importance and WTP. Participants in high centrality condition ($M = 4.96$) reported significantly higher football fan identity importance than those in the low centrality condition ($M = 4.26$, $t(1286) = 9.26$, $p < .001$, 95% CI of the difference [.55, .84]). Similarly, participants in the high centrality condition reported a higher log-WTP ($M = 5.80$) than those in the low centrality condition ($M = 5.63$, $t(1286) = 3.00$, $p = .003$, 95% CI of the difference [.06, .29]).

Mediation Analysis. There was a significant indirect effect of the manipulation on log-WTP via identity importance ($B = .16$, 95% Bootstrapped CI = [.11, .20]). The relationship between log-WTP and centrality was fully mediated by importance and was no longer significant when controlling for importance ($B = .02$, SE = .06, $p = .732$, see figure 5).

FIGURE 5

META-ANALYSIS OF STUDIES 3 AND A1: IDENTITY IMPORTANCE MEDIATES RELATIONSHIP BETWEEN THE CAUSAL CENTRALITY MANIPULATION AND LN(WTP+1)
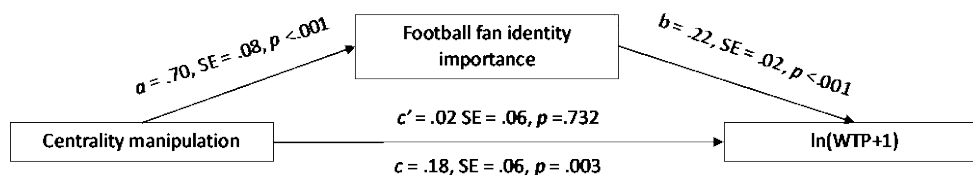
NOTE—Centrality manipulation was coded as follows: high centrality = -1, low centrality = 1. Mediation analysis performed using the PROCESS bootstrapping macro (model 4) with 5,000 resamples. A 95% confidence interval was computed to test the indirect effect (95% CI of the indirect effect = [.11, .20]).

PILOT STUDY A2: ENVIRONMENTALIST IDENTITY AND CHOICE

Using the choice task from studies 4 and 5, study A2 was a preliminary exploration of the relationship between environmental goals and choices between more expensive

environmentally-friendly products and cheaper conventional versions of the same products. Participants in study A2 were not screened to ensure that they held the environmentalist identity.

Method

Study A2 consisted of two tasks: the listing causal relationships task and a choice task. The choice task was identical to the choice task used in studies 4 and 5. The listing causal relationships task was the same as the version of the task used in studies 4 and 5 except that it included two features related to participants' environmental goals (instead of the environmentalist identity overall): desire to purchase environmental products and desire to protect the environment.

Results

A linear regression predicting the number of environmentally-friendly choices based on the causal centrality of the average number of links reported for desire to purchase environmentally-friendly products and desire to protect the environment, controlling for total number of links, reported revealed that participants who saw their environmentalist goals as more causally central selected more environmentally-friendly products than those who saw the same identity as more causally peripheral ($B = .13$, SE $= .05$, $p = .014$).

PILOT STUDY A3: IDENTITY SALIENCE

In pilot study A3, we examined two manipulations of the salience of the environmentalist identity. In the first manipulation of salience, participants wrote about one of two social identities, their environmental identity or their frugal identity. In the second manipulation of salience, participants wrote about their environmental identity either before or after doing the causal centrality task. Following the writing and casual centrality tasks,

participants made the same choices between environmentally-friendly products and cheaper conventional products as they did in studies A2, 4, and 5.

Method

Only participants who reported both being frugal and wanting to be an environmentally-friendly person completed the full study. The study consisted of three tasks in which participants 1) performed the listing causal relationships task, 2) wrote about one of the target identities and, 3) made choices between environmentally-friendly and conventional products. The order of the listing causal relationships task and the writing task was counterbalanced.

The design resulted in four cells: 1) environmental identity, writing first, 2) environmental identity, causal centrality first, 3) frugal identity, writing first, and 4) frugal identity, causal centrality first. Participants in cell 1 were the only participants for which the environmental identity was salient when causal centrality was measured. By comparing cells 1 and 2, we could determine whether writing about the environmental identity vs. not writing about any social identity before the listing causal relationships task influenced the causal centrality of the environmentalist identity. By comparing cells 1 and 3, we could determine whether writing about the frugal vs. environmental identity (prior to the listing causal relationships task) influenced the causal centrality of the environmental identity. As all participants did *both* the causal centrality and the writing tasks *before* the choice task, we collapse task order conditions for the choice analysis.

Results

Causal Centrality Analysis. We examined each of the manipulations of causal centrality separately. First, we examined whether writing about the frugal identity vs. the environmentalist identity influenced causal centrality of the environmental identity. Among participants who completed the writing task before the causal centrality task only, we

compared the causal centrality of the environmentalist identity reported by participants who wrote about the frugal identity to that reported by participants who wrote about the environmental identity. Those who wrote about their environmental identity reported marginally more links to the environmentalist identity than those who wrote about their frugal identity (M_{env} = 3.44, M_{frugal} = 2.61, $t(146)$ = 1.74, p = .085, 95% CI = [-.12, 1.77]).

Second, we examine whether writing about the environmental identity vs. not writing about a social identity influenced the causal centrality of the environmentalist identity. Among participants who wrote about their environmental identity only, we compared the causal centrality of the environmentalist identity reported by those who did the writing task *before* the causal centrality task to those who did the writing task *after* the causal centrality task. Participants who wrote before the causal centrality task reported more links to that identity than those who wrote after the causal centrality task ($M_{writingfirst}$ = 3.44, $M_{centralityfirst}$ = 2.34, $t(139)$ = 2.21, p = .029, 95% CI = [.11, 2.08]).

Power Analysis for Study 4. As the second salience manipulation appeared to be more effective than the first, we planned to use this manipulation (writing about the environmentalist identity vs. not writing about any social identity) in study 4 with two modifications. First, to better equate the writing component of the two tasks, participants in the control condition of study 4 would perform another writing task (write about what they did the previous day, adapted from Coleman and Williams 2013) prior to the causal centrality task. Second, as we aimed to explore whether salience influenced choice via causal centrality, we would not have any participants write about their environmental identity after the causal centrality task since we would not be able to detect if or how the salience manipulation influenced causal centrality if the manipulation came after causal centrality was measured.

To determine the sample size of study 4, we performed a power analysis to determine the sample size needed to detect an effect with 95% power with a two-tailed independent

groups t-test using G*Power software. The effect size determined from the pilot study was d = .37. The sample size calculated by G*Power was 191 participants per condition.

Choice Analysis. Participants chose more environmentally-friendly products when the environmentalist identity was salient (M = 2.17) than when the frugal identity was salient (M = 1.89; $t(290)$ = 2.54, p = .011, 95% CI = [.06, .50]). A linear regression predicting environmentally-friendly choices based on causal centrality of the environmentalist identity and condition (environmentalist vs. frugal identity salient), controlling for total number of links, confirmed that both condition (B = .25, SE = .11, p = .026) and environmentalist causal centrality (B = .08, SE = .03, p = .011) were significant predictors of choice. Further the interaction between causal centrality and condition was not significant (B = .02, SE = .06, p = .685), suggesting that the effects of identity salience and causal centrality are distinct.

META-ANALYSIS: INFLUENCE OF IDENTITY SALIENCE ON CAUSAL CENTRALITY

To further examine whether manipulating identity salience had an effect on causal centrality, we performed a meta-analysis, combining study 4 and the conditions used for the power analysis from study A3. We performed a linear regression predicting the causal centrality of the environmentalist identity with condition (environmental-identity-salient vs. control), total number of links, and a study dummy-code (environmentalist condition of study A3 vs study 4). This analysis revealed that combining both studies (n = 552), there was a marginally significant effect of the salience manipulation on causal centrality (B = .27, SE = .16, p = .089). Thus, the results across both studies suggest that there may be a small marginal effect of salience on causal centrality that yielded inconsistent results across study 4 and study A3. However, a power analysis suggests that reliably detecting this effect (e.g., with 80% power) would require a very large sample size (n = 1572).

META-ANALYSIS: INFLUENCE OF IDENTITY SALIENCE ON CHOICE

To further examine whether manipulating identity salience had an effect on choice, we performed a meta-analysis, combining studies 4 and A3. We performed a linear regression predicting the number of environmentally-friendly products choices with condition (environmental-identity salient vs. control), total number of links, and a study dummy-code (environmentalist condition of study A3 vs study 4 from the main manuscript). This analysis revealed that combining both studies (n = 703), there was a significant effect of the salience manipulation on choice (B = .18, SE = .07, p = .007) and a significant effect of the environmentalist causal centrality on choice (B = .09, SE = .02, p < .001).

STUDY A4: IDENTITY SALIENCE, IMPORTANCE AND CHOICE

The goal of study A4 was to provide a stronger test of whether identity salience influences causal centrality. Specifically, study A4 aimed to address the possibility that study 4 may have found no relationship between the salience manipulation and causal centrality because 1) the two tasks are separated by having participants write about the features of their self-concept and, 2) the length of the listing causal relationships task. To address the first, we had participants write about the different features of their self-concept *before* the salience manipulation so the task no longer separated the manipulation from the measurement of causal centrality. Additionally, we had participants complete the identity importance scale directly after the salience manipulation to examine whether salience influences importance. To address the second possibility, after the identity importance scale, participants completed the much shorter abbreviated listing causal relationships task (from study 2).

Method

The study consisted of four tasks: 1) writing about the important features of the self-concept (to be used in the abbreviated "listing causal relationships" task), 2) the writing task

(the salience manipulation used in study 4), 3) completing the identity importance scale (used in studies 2 and 3) and, 4) the abbreviated "listing causal relationships" task (from study 2)

Results

With this stronger test of whether identity salience influences identity importance and causal centrality, we found no effect of salience on either identity importance (M_{Env} = 5.29, $M_{Control}$ = 5.34, $t(432)$ = .50, p = .616, 95% CI of the difference = [-.24, .14]) or on the causal centrality of the environmentalist identity (M_{Env} = 5.27, $M_{Control}$ = 4.91, $t(432)$ = 1.04, p = .300, 95% CI of the difference = [-.32, 1.04]).

STUDY A5: SEPARATION OF CAUSAL CENTRALITY AND CHOICE TASKS

Study A5 explores the relationship between the causal centrality of the environmentalist identity and choice when the two tasks are separated by one week.

Method

The procedure and study materials were the same as those used in study 5.

Results

Participants in the environmentalist-salient condition chose more environmentally-friendly products than those in the control condition (M_{env} = 2.31, $M_{control}$ = 1.83; $t(583)$ = 6.49, p < .001, 95% CI of the difference = [.34, .63]).

A linear regression predicting environmentally-friendly choices with the causal centrality of the environmentalist identity and identity salience condition, controlling for total number of links, confirmed the main effect of condition (B = .24, SE = .04, p < .001) and revealed that participants who saw their environmental identity as more central chose marginally more environmentally-friendly products (B = .04, SE = .02, p = .059). In a follow-up regression which included a condition x causal centrality interaction term, the interaction was not significant (B = .01, SE = .01, p = .661).

STUDY A6: SEPARATION OF CAUSAL CENTRALITY AND CHOICE TASKS
(CHOICE TASK FIRST)

Study A6 is an additional two-part study that explores the relationship between causal centrality of the environmentalist identity and choice when the two tasks are separated.

Method

The method of study A6 is that same as that of studies 5 and A5 with the following exceptions. First, the tasks were performed in the reverse order. The writing task (the salience manipulation) and choice task were completed during the first session. The causal centrality task was completed one week later in the second session. Second, in the control condition of the writing task, participants wrote about their frugal identity (instead of what they did the previous day as in studies 5 and A5). Participants in study A6 were screened to ensure that they held both the environmentalist and frugal identities. Finally, study A6 did not include the identity importance scale.

Results

Identity Salience and Choice. Participants in the environmentalist-salient condition chose more environmentally-friendly products than in the frugal-salient condition (M_{env} = 2.29, M_{frugal} = 1.80; $t(206)$ = 3.95, $p < .001$, 95% CI of the difference = [.25, .74]).

Environmentalist Causal Centrality and Choice. A linear regression predicting environmentally-friendly choices with the causal centrality of the environmentalist identity and condition, controlling for total number of links, confirmed the main effect of condition (B = .49, SE = .13, $p < .001$) and revealed that participants who saw their environmental identity as more central made significantly more environmentally-friendly choices (B = .08, SE = .04, p = .041). In a follow-up regression which included a condition x causal centrality interaction term, the interaction was not significant (B = -.01, SE = .03, p = .837).

Frugal Causal Centrality and Choice. A linear regression predicting environmentally-friendly choices with the causal centrality of the frugal identity and condition, controlling for total number of links, revealed that there was no main effect of the centrality of the frugal identity on choice ($B = .03$, SE $= .03$, $p = .310$). While the focus of study 5 was on the environmental identity, the lack of a significant relationship between the frugal identity and choices warrants further discussion. Our framework for identity-based consumption would predict that those who see their frugal identity as more causally central should be *less* likely to select the expensive environmentally-friendly product. We hypothesized post-hoc that the lack of relationship between the causal centrality of the frugal identity and choice could be because the norms associated with a frugal identity are not as strong as for the environmentalist identity, at least in the context of the choices tested.

To examine the relative strength of the norms of the environmentalist group vs. the frugal groups, we ran study an additional pre-registered study (A11), in which we measured agreement with purchasing norms for the two groups and found, consistent with our hypothesis, participants more strongly agreed with purchasing norms for the environmentalist identity than for the frugal identity ($M_{env} = 5.27$, $M_{frugal} = 4.82$, $t(112) = 2.18$, $p = .031$, 95% CI of the difference $= [.04, .85]$, see study A11 for more details). Thus, Study A6 also reveals an important boundary condition: the strength of association between identity and norms. More specifically, the more weakly related an identity is to norms, the less the identity's centrality may predict following that norm, particularly when a consumer holds another identity with a conflicting norm like they did in study A6 (i.e., the norms of the environmentalist and frugal identities suggest different choices in study A6).

STUDY A7: SEPARATION OF CAUSAL CENTRALITY AND CHOICE TASKS
(CHOICE TASK FIRST)

Study A7 is an additional two-part study that explores the relationship between causal centrality of the environmentalist identity and choice when the two tasks are separated.

Method

Study A7 uses the same tasks as studies 5 and A5 in the reverse order. The writing task (the identity salience manipulation) and the choice task were completed in session 1 and the causal centrality task was completed approximately one week later in session 2.

Results

Participants in the environmentalist-salient condition chose more environmentally-friendly products than those in the control condition (M_{env} = 2.32, $M_{control}$ = 1.76; $t(480)$ = 6.58, $p < .001$, 95% CI of the difference = [.39, .72]).

A linear regression predicting the total number of environmentally-friendly choices with the causal centrality of the environmentalist identity and identity salience condition, controlling for total number of links, confirmed the main effect of condition (B = .28, SE = .04, $p < .001$) and revealed that there was no significant relationship between the causal centrality of the environmentalist identity and choice (B = .00, SE = .02, $p = .833$).

META-ANALYSIS: STABILITY OF CAUSAL CENTRALITY IN PREDICTING CHOICES

To further examine whether the causal centrality of the environmentalist identity predicted choice when the measurement of centrality and the choice task were separated by approximately one week, we performed a meta-analysis combining all the studies we collected in which centrality and choice were separated in time (studies 5, A5, A6, and A7). A linear regression predicting the number of environmentally-friendly product choices with the causal centrality of the environmentalist identity, total number of links, identity salience condition, and a study dummy-code revealed that, when combining the four studies (n =

2153), there was a highly significant relationship between the causal centrality of the environmentalist identity and choice ($B = .05$, SE $= .01$, $p < .001$).

STUDY A8: TITRATION STUDY

The goal of study A8 was to ensure that the price and quality trade-offs used in study 6 were comparable. Study A8 is a titration test in which participants made a series of trade-offs between purchasing a lower quality product at a lower price and a higher quality product at a higher price (with no mention of the products being environmentally-friendly).

Procedure

For each product, participants made six choices between a 2-star cheap product and an expensive product (none of the products were environmentally-friendly, see table 18). Prices for the batteries and the light bulbs are the same as the prices used in studies 4-6. The quality rating for the expensive product ranged from 2.5 to 5 stars in increments of half a star.

Results

To calculate the indifference point for each choice set, we calculated the mean number of choices of the 2-star product (see table 18).

TABLE 18

Study A8: Product descriptions and mean number of low-priced choices

Choice Set	High Price	Low Price	Mean Number of Choices of Low-Priced Option
Four Pack of Energizer Batteries	$4.99	$13.99	4.35
Four pack of A19 GE Light Bulbs	$4.00	$19.99	4.39
13 Gallon Glad Trash Bags	$10	$20	4.25
Two 1.5 Liter Ikea Food Containers	$8.50	$16.99	4.12

PILOT STUDY A9: QUALITY TRADE-OFFS

Study A9 provided a preliminary exploration of the relationship between the causal centrality of the environmentalist identity and hypothetical choices between lower-quality environmentally-friendly products and higher-quality conventional ones.

Method

Participants completed the "listing causal relationships task" and made choices between environmentally-friendly and conventional versions of the same product (as in study 6).

Participants were randomly assigned to either the same condition or the different condition. In the same condition, the price and quality rating of the environmentally-friendly and the conventional products were the same. In the different condition, the quality rating of the environmentally-friendly product was one star lower than the quality rating of the conventional product (light bulbs: 3.5 stars vs. 4.5 stars, for batteries: 3 stars vs. 4 stars).

Results

A linear regression predicting the total number of environmentally-friendly choices based on condition (same vs. different) and the causal centrality of the environmentalist identity, controlling for the total number of links, revealed a significant main effect of condition, participants in the same condition chose more environmentally-friendly products than those in the difference condition (B = .60, SE = .10, $p < .001$). The causal centrality of the environmentalist identity was not a significant predictor of choice ($B = -.01$, SE = .02, $p = .686$). In a follow-up regression which included a condition x causal centrality interaction term, the interaction was not significant ($B = .04$, SE = .04, $p = .337$).

STUDY A10: LARGE AND SMALL QUALITY DIFFERENCES

Study A10 explores trade-offs between quality and environmental-friendliness when the difference in quality between the environmentally-friendly and the conventional products are large (~2.5-star difference) and when the quality difference is small (1-star difference).

Method

As in study 6, participants completed the "listing causal relationships" task and then made three choices between an environmentally-friendly and a conventional product (see figure 6 in appendix C). Participants were randomly assigned to either the large difference condition (same as the quality-trade-off condition in study 6) or the small difference condition (1-star difference in rating).

Results

Participants chose more environmentally-friendly products when the quality difference was smaller ($M = .93$) than when the quality difference was larger ($M = .63$; $t(771) = 5.54$, $p < .001$, 95% CI = [.20, .42]). A linear regression predicting environmentally-friendly choices with the causal centrality of the environmentalist identity and condition, controlling for total number of links, confirmed the main effect of condition ($B = .30$, SE = .06, $p < .001$) and revealed that participants who saw their environmentalist identity as more causally central chose significantly more environmentally-friendly products ($B = .03$, SE = .02, $p = .041$). In a follow-up regression which included a condition x causal centrality interaction term, the interaction was not significant ($B = .01$, SE = .02, $p = .600$).

META-ANALYSIS: QUALITY TRADE-OFFS

To further examine whether the causal centrality of the environmentalist identity predicted choice when quality and environmental-friendliness were traded-off, we performed a meta-analysis, combining studies 6 (quality trade-off condition only), A7, and A8 (total n = 1370). A linear regression predicting the number of environmentally-friendly product choices with the causal centrality of the environmentalist identity, total number of links, and a study dummy-code revealed that there was a significant relationship between the causal centrality of the environmentalist identity and choice ($B = .03$, SE = .01, $p = .014$).

STUDY A11: PUCHASING NORMS

The results of study A6 revealed that the causal centrality of the environmentalist identity predicted participant choice in trade-offs between environmental-friendliness and price but that the causal centrality of the frugal identity did not. Study A11 examines whether the results of study A6 were due to a difference in the strength of purchasing norms for trade-offs involving environmental-friendliness and price across the two social identities.

Method

The study consisted of two tasks in which participants reported 1) their agreement with purchasing norms for the environmentalist and frugal identities and, 2) what they thought a consumer who was equal parts environmentalist and frugal should do in a situation in which they had to trade off environmental-friendliness and price. For the two identities, participants rated their agreement with statements about purchasing norms—e.g., "Someone who is frugal ought to buy less expensive conventional products rather than more expensive environmentally-friendly products." Participants then answered a multiple-choice question about what a person who considers themselves equal parts environmentalist and frugal should do: 1) buy more expensive environmentally-friendly products, 2) buy less expensive conventional products and, 3) it is not clear what they should do.

Results

Participants believed that the purchasing norms were stronger for environmentalists than for frugal people (M_{env} = 5.27, M_{frugal} = 4.82, $t(112)$ = 2.18, p = .031, 95% CI of the difference = [.04, .85], higher numbers indicate stronger agreement with norm). Additionally, the proportion of participants who believed that a consumer who is equal parts environmentalist and frugal should buy more expensive environmentally-friendly products (n = 43) was significantly larger than the proportion who believed that the consumer should buy cheaper conventional products (n = 23, p = .019, binomial sign test).

APPENDIX C: PRE-REGISTRATION LINKS AND EXAMPLE MATERIALS[3]

TABLE 19

Pre-registration information

Study	Registration Number	Link
Study 1A	AsPredicted.org, #22324	https://aspredicted.org/8c7zs.pdf
Study 1B	AsPredicted.org, #132257	https://aspredicted.org/bf5iw.pdf
Study 3	AsPredicted.org, #64404	https://aspredicted.org/jb5ec.pdf
Study 4	AsPredicted.org, #42944	https://aspredicted.org/ia6r4.pdf
Study 5	AsPredicted.org, #135380	https://aspredicted.org/kr5u3.pdf
Study 6	AsPredicted.org, #86055	https://aspredicted.org/w3v3f.pdf
Study A4	AsPredicted.org, #87445	https://aspredicted.org/9s5qv.pdf
Study A5	AsPredicted.org, #129173	https://aspredicted.org/pj3w7.pdf
Study A6	AsPredicted.org, #35322	https://aspredicted.org/7zb8h.pdf
Study A7	AsPredicted.org, #120876	https://aspredicted.org/pk7xt.pdf
Study A10	AsPredicted.org, #86893	https://aspredicted.org/wc3hd.pdf
Study A11	AsPredicted.org #92240	https://aspredicted.org/x223h.pdf

Study 1, Choice Task

For the following scenarios, please choose between receiving an Amazon digital gift card and a [Brand] digital gift card.

Please note that your choices are not hypothetical, and the outcome may happen for real. You may be paid a bonus through a digital gift card based on one of your choices below. That is, if you are selected as one of the ten winners, the system will randomly draw a line from the following. The brand you select on the chosen line will be how you receive the $50 digital gift card.

For example, imagine you are selected as a winner and you chose "$50 Amazon gift card" on the tenth line below. If the system randomly draws this line, you will be paid a $50 gift card from Amazon.

$5 Amazon gift card	○	○	$50 [BRAND] gift card
$10 Amazon gift card	○	○	$50 [BRAND] gift card
$15 Amazon gift card	○	○	$50 [BRAND] gift card
$20 Amazon gift card	○	○	$50 [BRAND] gift card
$25 Amazon gift card	○	○	$50 [BRAND] gift card
$30 Amazon gift card	○	○	$50 [BRAND] gift card
$35 Amazon gift card	○	○	$50 [BRAND] gift card
$40 Amazon gift card	○	○	$50 [BRAND] gift card
$45 Amazon gift card	○	○	$50 [BRAND] gift card
$50 Amazon gift card	○	○	$50 [BRAND] gift card

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[3] Pre-registrations and all materials can be found at: https://osf.io/6zcbp/

Study 1, Question about associative (non-causal) relationships

Earlier, you had indicated which features of your identity caused this identity, **Being a user of [brand],** or were causes of this identity, **Being a user of [brand].**

The features you did NOT select are listed below. Among these identity features, are there any features that are merely associated in some way with this identity, **Being a user of [brand],** but NOT causally related to it?

That is, please select all the features below that you see as somehow connected to or somehow going together with this identity, **Being a user of [brand],** despite not being a cause of or caused by this identity.

Study 1, Brand Connection Scale Participants asked how well each of the following seven statement describes them and answer on a scale from 1 (not at all) to 7 (extremely well).

1) [Brand] reflects who I am. 2) I can identify with [Brand]. 3) I feel a personal connection with [Brand]. 4) I use [Brand] to communicate who I am to other people. 5) I think [Brand] helps me become the type of person I want to be. 6) I consider [Brand] to be "me" (it reflects who I consider myself to be or the way I want to present myself to others). 7) [Brand] suits me well.

Study 2, Identity Importance Scale (adapted from Reed II 2004)

Please tell us how much [football team] describes who you are on a scale of 1 to 7. Where 1 means "does not describe me" and 7 means "describes me perfectly."

Please tell us how much you identify with [football team] fans on a scale of 1 to 7 where 1 means "do not identify with group in any way" and 7 means "strongly identify with group."

Please tell us how much you admire [football team] fans on a scale of 1 to 7 where 1 means "do admire the group" and 7 means "really admire the group."

Study 3, Wording for Writing Task (Manipulation of Causal Centrality)

[BOTH CONDITIONS] In addition to being a fan of the [team], we'd now like you to think a bit about the various aspects of your identity that make you who are you are as an individual (for example, your personality traits, important memories/experiences, relationships with others, moral qualities, values, preferences and desires, demographic characteristics, etc).

[HIGH CENTRALITY CONDITION ONLY] Some aspects are very causally connected to other aspects of your identity. For example, someone who is both a football fan and a physical education teacher may see his/her fandom and profession as having influenced one another. That person may think being a football fan is what led to or shaped his/her choice of profession. Or that being a physical education teacher led to him/her becoming a football fan or shaped how s/he expresses his/her fandom. Or both. Similarly, while a few of her friends may not be fans of the [team], s/he may also think that some of his/her other friendships were influenced (started or strengthened) by being a fan of the [team].

We'd now like you to think a bit about how the various parts of your identity **have caused or been caused by you being** a fan of the [team]. By caused, we simply mean that the aspects have been **influenced or shaped by** you being a fan of the [team] or vice versa.

On a following screen, you will write about how being a fan of the [team] has caused or been caused by various other aspects of your identity (like your personality traits, important memories/experiences, relationships with others, moral qualities, values, preferences and

desires, demographic characteristics, etc.). Please discuss as many aspects that **are causally related to you being a** fan of the [team] as you can.

[LOW CENTRALITY CONDITION ONLY] In addition to being a fan of the [team], we'd now like you to think a bit about the various aspects of your identity that make you who are you are as an individual (for example, your personality traits, important memories/experiences, relationships with others, moral qualities, values, preferences and desires, demographic characteristics, etc).

Some aspects are very independent of other aspects of your identity. For example, someone who is both a football fan and an accountant may see his/her fandom and profession as being very separate from one another. That is, that person may think that being a football fan had no influence on his/her choice of profession--s/he would have been an accountant regardless of whether or not s/he was a football fan. And that being an accountant had no influence on him/her being a football fan or how s/he expresses his/her fandom. Similarly, while a few of his/her friends may also be fans of the [team], s/he may think that being a fan of the [team] is completely unrelated to her relationship with some of her other friends.

We'd now like you to think a bit about how the various parts of your identity **are separate and independent from you being a fan of the [team].**

On a following screen, you will be asked to write about how you being a fan of the [team] is independent from various other aspects of your identity (like your personality traits, important memories/experiences, relationships with others, moral qualities, values, preferences and desires, demographic characteristics, etc.). Please discuss as many aspects that **are independent from and unrelated to** you being a fan of the [team] as you can.

Study 4, Wording for Writing Task (Salience Manipulation)

[ENVIRONMENTALIST CONDITION] We'd now like you to reflect a bit on one of the features of your identity that you just selected.

Please write at least 5 sentences on the following aspect of your identity: I want to be an environmentally-friendly person

Please express any thoughts you have about this aspect of your identity that you listed earlier. For example, you might write about what this aspect means to you, how you would express this aspect, and/or how this aspect has affected you. Please be as specific as possible.

[CONTROL CONDITION] We'd now like you to reflect a bit on what you do with your time.

Please write at least 5 sentences about what you did yesterday.

Please express any thoughts you have about what you did yesterday. For example, you might write about what activities you did, how you did them, and/or how any of those actions affected you. Please be as specific as possible.

Study 5, Wording for Writing Task (Salience Manipulation)

[ENVIRONMENTALIST CONDITION] In the first part of this study that you completed about a week ago, you reported wanting to be an environmentally-friendly person. In the first part of the survey, we would like you to reflect a bit about this aspect of your identity.

Please write 3 to 5 sentences about what being an environmentally-friendly person means to you.

Please think carefully about and express any thoughts you have about wanting to be an environmentally-friendly person. For example, you might write about what this means to you, how you would express this aspect of your identity, and/or how it has affected you. Please be as specific as possible.

[CONTROL CONDITION] In the first part of the survey, we'd like you to reflect a bit about what you do with your time.

Please write 3 to 5 sentences about what you did yesterday.

Please think carefully about and express any thoughts about what you did yesterday. For example, you might write about what activities you did, how you did them, and/or how any of the actions/activities that you did affected you. Please be as specific as possible.

Study 6

FIGURE 6

STUDY 6: EXAMPLE CHOICE SETS