

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

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Abstract

We propose 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-concepts. More specifically, we propose that consumers who believe that an identity, a social category that they belong to, is *causally central* (has influenced or was influenced by many other features of the self-concept) are more likely to both believe that the identity is important and engage in behaviors consistent with that identity than those who believe that the same identity is *causally peripheral* (has influenced or was influenced by fewer other features). Across six studies, we provide evidence for the role of causal centrality in identity-based choice. We demonstrate that among consumers who belong to the same social category, those who believe that the associated identity is more causally central are more likely to engage in behaviors consistent with 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*

People’s identities, the social categories that they belong to, are the basis of a broad range of consumer behaviors (see Reed II et al. 2012 for a detailed review). Theoretical and empirical work has examined how the norms associated with social identities drive behavior, suggesting that those 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 1987). 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. While this approach to identity-based behavior provides a good explanation for behavior at the category level, individual differences in behavior among members of the same group are less well understood.

How can we predict which members of a social category are more likely to act in identity-consistent ways? The literature suggests two answers: salience and importance. First, research has found that people are more likely to display identity-consistent behavior when the social identity is salient (e.g., Brough et al. 2016; Forehand, et al. 2002; LeBoeuf, Shafir, and Bayuk 2010; Reed II 2004). Second, theoretical and empirical work suggests consumers who perceive a social identity as important are more likely to act in identity-consistent ways (LeBoeuf, Shafir, and Bayuk 2010; Markus and Wurf 1987; Reed II 2004).

While these explanations provide important insight into how identity drives behavior, they only provide a partial answer. Identity salience cannot explain why consumers who hold the same social identity and are in similar situations, resulting in similar salience of identity, often display different levels of identity-consistent behaviors. While identity importance is useful in

predicting which consumers are more or less likely to act in identity-consistent ways, the account does not explain how social identities become important or how importance might be influenced.

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, independent of situational identity salience, a consumer who sees a given social identity as causally central—causally connected to other important features of people'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 identity as an Apple-user 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. Further, our research provides answers to key questions about consumers' representation of the self-concept and how it relates to choices by exploring how stable the causal centrality of an identity is and whether causal centrality can predict identity-consistent choice over time.

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, specifically 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, Shafir, and Bayuk 2010; Markus and Wurf 1987; Oyserman 2009). Thus, increasing the salience of one social identity, either through priming, identity threat, or social distinctiveness (i.e., making members of that social identity the numerical minority in the decision context), prioritizes the norms associated with that social identity. As a result, group members will be more likely to perform behaviors consistent with the social group norms than when the social identity is not salient (Brougns et al. 2016; Chen, Ng, and Rao 2005; Forehand, Despande, and Reed II 2002; LeBoeuf, Shafir, and Bayuk 2010; Oyserman et al. 2007; Shang, Reed, and Croson 2008).

While situational factors powerfully influence people's tendency to display identity-consistent behaviors, two people facing the same situational constraints may nevertheless demonstrate very different behaviors. A key construct that has been used to explain individual differences in identity-based consumption among consumers who share a social identity is identity importance, sometimes referred to as strength of identification. Unlike the transient effects of identity salience on choice, 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 that predicts how likely a consumer is to act in identity-consistent ways (Markus and Wurf, 1987). For example, Reed II (2004) found that people who

rate a social identity as more important have more favorable attitudes towards products geared towards that social identity. Furthermore, people who believe a social group is more important to who they are show greater sensitivity to identity salience effects on behavior (LeBoeuf, Shafir, and Bayuk 2010).

Despite the fact that identity importance is a critical construct in the identity-based consumption literature, its explanatory power and researchers' ability to influence it are limited because the psychological underpinnings are not well understood. For example, scales that measure identity importance are quite general, asking things like, "How much does [social identity] describe who you are?" and "How much do you identify with [social identity]?" (Luhtanen and Crocker 1992; Reed II 2004). While these measures seem to capture useful differences in how people think about a given social identity, the importance construct 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 explains 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, Chen, Urminsky, and Bartels 2020 for a review). Some views have defined continuity of the self in terms of specific features, particularly memories (Locke 1694/1979; Blok, Newman, and Rips 2005; Nichols and Bruno 2010) and moral qualities (Strohming and Nichols 2014, 2015). Alternatively, research on psychological connectedness to the future self suggests that a person's self-concept is defined by a wide range of psychological traits (see Urminsky 2016 for a review). Indeed, research has found that inducing people 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

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.

Causal relationships are used to understand the world and structure knowledge (Keil 2006; Murphy and Medin 1985), 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 high quality, have great customer service, and are expensive but also incorporates theories about how these features are causally related—e.g., Apple products are expensive *because* they are high quality and have great 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. Inspired by literature from cognitive psychology on conceptual representation, Chen, Urminsky, and Bartels (2016) suggested and found that features of the self-concept are seen as defining of the self to the extent that they are seen as causally central—i.e., causally linked to many other features of the self-concept, either as a cause or as an effect (Ahn et al. 2000; Rehder and Hastie 2001; Rehder 2003; Sloman et al. 1998). Consistent with the prediction that people perceive features to be defining of the self-concept to the extent they are causally central, 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 defines 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 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

We operationalize causal centrality as the number of other features of the self-concept a social identity is linked to as, either *as a cause or as an effect*, and we do not prioritize causes over effects. 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. Prior research is split on the role of causes and effects in causal centrality, with some models suggesting that only causes matter for determining feature importance (e.g., Ahn et al. 2000; Sloman et al. 1998) but others suggesting that causes and effects matter similarly (e.g., Rehder and Hastie 2001; Rehder 2003).

From the perspective of psychological essentialism (Medin and Ortony 1989), the essence that defines category membership is the deepest cause in the chain, and therefore causes will be closer than effects to the essence and thus, more important to category representation. However, since the self-concept is a concept of an *individual* (a single item) and not a concept of a category (a set of items), essentialist arguments may not be relevant to the role of causal centrality in the representation of the self-concept. 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 the relationship between them, both could contribute to conceptual representation (Rehder 2003; Rehder and Hastie 2001).

Based on these theories, effects are also important to the self-concept because when an effect is missing, there is a violation of expectations: a feeling that a person has not become what they were meant to or expected to be. For example, consider a person who seems to have many aspects that one would expect to cause him to become a football fan: he played football as a child, his parents were football fans, and all his friends are football fans. If that person doesn't become a football fan, it may seem like there's something missing about that person.

There is also an important implication of whether or not we assume that causes are more important than their effects in the self-concept. Since causes always occur before their effects, assuming that causes are more important than their effects would imply that people are generally more defined by the things that happened or by the features that developed earlier in life. In fact, in the models of causal centrality in which causes are more important than effects, it is impossible for effects to become more important than their causes (Ahn et al. 2000, Sloman et al. 1996). By also including the number of times a given feature is an effect of a cause in our calculation of causal centrality, what is most defining of the self can change over time—i.e., features that develop later in life (e.g., culminating identities, such as a profession, or becoming a parent) can more easily become more defining of the self-concepts than their causes. This view is consistent with conceptualizations of the self-concept, in particular, as a changing and dynamic entity (Reed II and Forehand 2016).

For these reasons, we will start from the baseline assumption that both causes and effects are important to the self-concept, consistent with previous work on causal centrality in concepts of individuals (Chen et al 2016; Chen and Urminsky 2019). However, we will also treat the relative importance of causes and effects as an empirical question to be tested directly.

Causal Centrality as an Explanation of Identity-Consistent Behavior

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

In our approach, each person'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 will be more willing to spend money for the latest version of the iPhone or to select Apple over other brands (i.e., follow the norms of being an Apple-user) than Mark will be. 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 brand specific gift card.

In this paper, we test our causal centrality approach to explaining differences in identity-based consumption. Across six studies (and five additional studies reported in appendix B), we demonstrate that—among people 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 study 1, we test whether a consumer's subjective causal centrality of a brand-user identity predicts incentive-compatible choices of that brand. Next, we examine the relationship between causal centrality (measured in study 2 and manipulated in study 3) and identity importance in predicting willingness to spend on an identity-relevant experience, among football fans. 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.

STUDY 1: CAUSAL CENTRALITY OF BRAND-USER IDENTITY

Study 1 provides an initial incentive-compatible test of our hypothesis that 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 consumer's identities at the group and personal level (Belk 1988; Berger and Heath 2007; Escalas and Bettman 2003, 2005; Swaminathan, Page, and Gurhan-Canli 2007), we had participants report a brand that they not only use, but also 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 consequential choices between receiving a gift card for the brand or an Amazon gift card.

In this study, we 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 that beliefs about causal relationships appear to be 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 has 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 this study, 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 from U.S. Mechanical Turk participants after pre-registered exclusions for failing an attention check, giving inconsistent answers in the choice task, or duplicate IP addresses. Pre-registration links for all studies (excluding study 2 which was not pre-registered) can be found in appendix C. Details of analyses, additional analyses, and all data and materials are posted on OSF.²

Screening and Design. We screened participants to identify a brand that they saw as part of their self-concept. In the screening task, participants reported whether they were users of any of a list of 12 brands (“Are you a user of this brand?”) and whether they identified with any of the 12 brands (“Do you consider being a user of this brand a part of your identity?”). Only

² https://osf.io/k735u/?view_only=d25d024522d24a8a9000770cae5ec083

participants who answered yes to both questions for at least one brand proceeded to the rest of the study. Participants then confirmed that the single qualifying brand (the target brand in the study, randomly selected if multiple brands matched the criteria) was part of their self-concept.

The study consisted of four main tasks: participants 1) made choices between receiving an Amazon gift card and a gift card from the target brand that was identified as part of their identity (shown on the confirmation page), 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).

Choice Task. We informed participants that ten participants would have one of their choices picked at random and would receive the option that they had selected in that choice. Participants then made ten choices between receiving an Amazon gift card and receiving a gift card for the target brand. The value of the Amazon gift card ranged from \$5 to \$50 in increments of \$5 and the value of the brand gift card was always \$50 (see appendix C).

This consequential task measures the premium people 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 value brand spending more than those who see the 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 study 1, 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; Strohmingner 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, in which that feature was the target (e.g., in 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 (see 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).

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 caused by 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

From this series of questions, we calculated each feature's causal centrality—the number of causal relationships that a feature participates in, as a cause (the number of other features selected in the trial in which that feature was the target) or as an effect (the number of times the feature was selected across all the other trials in which it was an option listed under the target). Our measure of causal centrality was the sum of these cause and effect links for each feature.

Measuring Non-Causal Associations. 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 (appendix C).

Measuring Self-Brand Connection. As an exploratory exercise, we examined whether our causal centrality measure was distinct from, and would predict, choices above and beyond a different measure of integration of a brand into the self-concept, the self-brand connection scale (Escalas and Bettman 2003). The scale consists of seven statements ($\alpha = .922$) 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 consider brand X to be “me”*, see appendix C). Participants reported how much each statement described them on 7-point scale ($1 = \text{Not at all}$, $7 = \text{Extremely well}$).

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 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 appendix A.

Relationship Between Causal Centrality and Brand Choice. Consumers who saw the brand-user identity as more causally central were willing to pay a higher premium for the Amazon gift card than those who saw the identity as more peripheral. On average, higher causal centrality consumers (based on a median split) selected the brand gift card approximately one more time than low centrality consumers ($M_{\text{central}} = 6.37$, $M_{\text{peripheral}} = 5.40$, $t(228) = 2.27$, $p = .024$, 95% CI of the difference = [.13, 1.8]). 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 suggest 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 than those who saw the identity as more causally central.

To test the continuous relationship, we fit a linear regression predicting the number of choices of the branded gift card by the causal centrality of the brand-user identity, controlling for total number of links (to account for a general tendency to report more links as a potential confound). The linear 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 ($B = .32$, $SE = .09$, $p < .001$). In this study (and all our other studies), the relationship between causal centrality and behavior remained significant controlling for income ($B = .32$, $SE = .09$, $p = .001$). Follow-up analyses also found no significant difference between the effects of cause links vs. effect links, when included in the regression as separate predictors (see table 7 appendix A). We return to this distinction in the General Discussion.

Distinguishing Causal Centrality from Related Constructs. 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 ($B = .31$, $SE = .09$, $p = .001$), controlling for the number of non-causal associative links to the brand, which was not a significant predictor ($B = -.17$, $SE = .18$, $p = .360$). 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.

We also found no evidence that self-brand connection explains the relationship between causal centrality and gift card choice. Self-brand connection was correlated with both the number of brand choices ($r = .160$, $p = .016$) and centrality of the brand-user identity ($r = .344$, $p < .001$). However, a linear regression predicting choices of the brand gift card found that causal centrality of the brand-user identity was a significant predictor ($B = .27$, $SE = .10$, $p = .007$), but revealed no significant additional effect of self-brand connection ($B = .26$, $SE = .18$, $p = .150$).³

Discussion

The results of study 1 support our main hypothesis: consumers who see a social identity as more causally central are more likely to make identity-consistent choices in an incentive-compatible task. Specifically, consumers who reported more 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 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.

³ Although the two variables were correlated, the variance inflation factor suggested that collinearity was not an issue ($VIF = 1.34$).

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

In study 2, we test our framework with a new social category, 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. 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.

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

As previously described, the subjective importance of an identity to an individual consumer has been shown to moderate the effect of that social identity’s salience on identity-consistent choice (LeBoeuf, Shafir, and Bayuk 2010) and to predict more favorable attitudes towards identity-relevant products (Reed II 2004). In wave 2 of study 2, we build on these findings and explore whether, when a social identity is highly salient, identity importance predicts willingness to pay for an identity-relevant experience, tickets to the Super Bowl. We

included an identity importance scale (Reed II 2004) to test our predictions that causally central identities feel more important than causally peripheral identities and that importance will mediate the relationship between perceived causal centrality and identity-consistent choice.

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 not responding) or their willingness to pay (specifically, WTP of \$1,000,000,000,000,000), the survey yielded 253 valid responses. Results all remain significant when all participants are included in the analysis (table 3 in appendix A).

In wave 2, approximately 4.5 to 2.5 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 ten 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 one additional feature, “level of hunger”.

Participants indicated the causal links to the other features for both 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 participants had

listed (wave 1) or their “level of hunger,”⁴ (wave 2), to account for potential differences in the general tendency to report more or fewer features of the self-concept as causally linked.

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 only), 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 identity importance (Reed II 2004) and identity esteem scales (Shang, Reed II, and Croson 2008; Luhtanen and Crocker 1992) for their football fan identity (see appendix C). The importance scale asked how much participants felt being a fan of a team describes who they are, how much they identify with that group, and how much they

⁴ “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.

admire the group. The esteem scale asks four questions intended to measure the participants' perceived standing in the group (e.g., how worthy a group member they are, how much they have to offer the group).

We focus on identity importance in our analyses because causal centrality represents how much someone has integrated an identity into their self-concept (measured by the number of causal connections the identity has with other aspects of the self-concept) which is likely an antecedent of identity importance (how much a consumer identifies with a social group). As identity esteem also captures something about performance—i.e., how good a group member a consumer is—the predicted relationship between causal centrality and identity esteem is unclear. Nevertheless, we included the esteem scale as an exploratory measure because previous literature on identity-based choice had found greater identity congruency effects among those with high identity esteem (Reed II, Shang, and Croson 2008).

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, those who perceived being a fan as more causally central were willing to pay significantly more than those who perceived being a fan as more causally peripheral ($B = .14$, $SE = .03$, $p < .001$).

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 ($B = .09$, $SE = .03$, $p = .002$), 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 that spent on sports per week. Even after adding these additional controls, causal centrality was a highly significant predictor of log-WTP ($B = .09$, $SE = .03$, $p = .004$).

Identity Esteem and Importance as Mediators We conducted mediation analyses with the wave 2 data (in which we measured identity importance and esteem) to explore how the effects of causal centrality relate to prior findings suggesting that identity-consistent behaviors are influenced by these factors (Reed II 2004; Shang, Reed II, and Croson 2008).

We conducted a mediation analysis to test whether some of the relationship between causal centrality and valuation operates via importance of being a football-team fan, controlling for the control feature links. We found a significant indirect effect of causal centrality on log-WTP via fan identity importance ($B = .03$, $SE = .01$, 95% Bootstrapped CI = [.00, .06], figure 1 in appendix A). Importance mediated 50% of the effect of causal centrality on log-WTP (total

effect of causal centrality on log-WTP: $B = .06, p = .108$). Causal centrality did not significantly predict log-WTP when controlling for importance ($B = .03, SE = .04, p = .413$). Identity esteem was strongly correlated with importance ($r = .47, p < .001$) and also mediated the effect (figure 2 in appendix A). However, the two scales were not disassociable in a factor analysis, suggesting that both scales may measure the same construct (table 4 in appendix A).

Discussion

Consistent with the results of 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. 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. Further, as the study took place around a real-world event that made the football fan identity salient, differences in WTP are unlikely to be explained by differences in situational salience of the social identity but were instead predicted by differences in the internal representations of the social identity's place in the broader self-concept. We replicate this finding with an experimental manipulation of identity salience in studies 4 and 5.

Finally, we found that both identity importance and identity esteem mediated the relationship between causal centrality and log-WTP. Complementing previous findings that identity importance predicts attitudes towards identity-relevant products (Reed II 2004), these results suggest that identity importance predicts identity-consistent behavior even when identity salience is high and that causal centrality explains identity-consistent behavior, in part, because more causally central identities are seen as more important. We further explore the possibility 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 identity-consistent behaviors (studies 1 and 2), and for the relationship between an identity's causal centrality and its perceived importance (study 2, wave 2). Thus far, we have studied causal centrality of an identity as a relatively stable individual difference. Consistent with this view, recent research has found, in a panel study of 171 undergraduate students over the course of their freshman year, that the causal centralities of identities are highly stable (average test-retest reliability $r = .60$; Chen and Urminsky 2020). However, given that causal centrality is based on a subjective perception, even if deeply held, it may be possible to experimentally increase 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 or focus on how that social identity is independent from other aspects of the self-concept. Further, based on our theorizing, if causal centrality underlies identity importance, successfully manipulating causal centrality should influence identity importance.

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

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, where she grew up, 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 more surface-level features.

Method

Participants. We collected a total of 904 valid surveys from football fans on Mechanical Turk, 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 how their football fan identity was either related to or independent from other features of their self-concept (the causal centrality manipulation), and then reported their WTP and completed the identity importance scale (Reed II 2004, used in study 2, wave 2), with the order of reporting WTP and the scale counter-balanced. Our findings were not moderated by task order so, in our analyses, we collapse across the two different task orders.

To manipulate 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 other aspects of their self-concept. 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) other aspects of their self-concept. 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

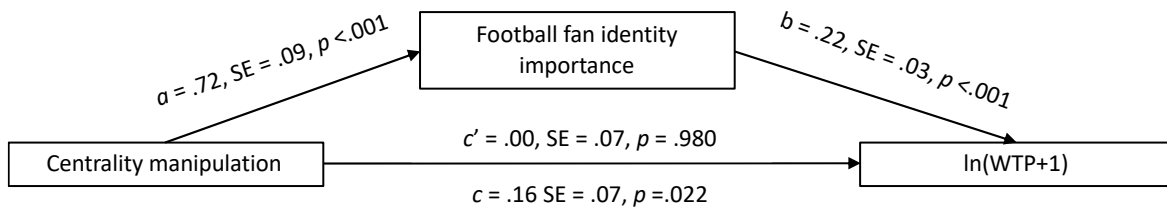
Effect of the Causal Centrality Manipulation on WTP. Consistent with our prediction, participants in the high centrality condition reported a higher log-WTP to see their favorite team in the Super Bowl than did those in the low centrality condition ($M_{\text{HighCentrality}} = 5.76$, $M_{\text{LowCentrality}} = 5.60$, $t(902) = 2.30$, $p = .022$, 95% CI of the difference [.02, .30]). Results were similar when using raw WTP (see table 5 in appendix A). A linear regression predicting log-WTP by condition (high centrality 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 ($B = .17$, $SE = .07$, $p = .016$).

Effect of the Causal Centrality Manipulation on Importance. Participants in the high centrality condition reported significantly higher football fan identity importance than those in the low centrality condition ($M_{\text{HighCentrality}} = 4.72$, $M_{\text{LowCentrality}} = 3.86$, $t(902) = 7.86$, $p < .001$, 95% CI of the difference [.64, 1.06]).

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 ($B = .16$, 95% Bootstrapped CI = [.11, .22]). Importance mediated almost 100% of the effect of causal centrality on log-WTP (total effect of causal centrality on log-WTP: $B = .16$, $p = .980$). The relationship between log-WTP was mediated by importance and was no longer significant when controlling for importance ($B = .002$, $SE = .07$, $p = .980$, see figure 2).

FIGURE 2

STUDY 3: IDENTITY IMPORTANCE MEDIATES THE RELATIONSHIP BETWEEN THE CAUSAL CENTRALITY MANIPULATION AND LN(WTP+1)



NOTE—Centrality manipulation was coded as follows: low centrality = 1, high centrality = 2. 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, .22]).

Discussion

The results of study 3 (and a second study, study A1, reported in appendix B) 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),

participants perceived the football fan identity as more important and were willing to pay more for an identity-relevant experience.

Additionally, replicating the results of wave 2 of study 2, identity importance mediated the influence of causal centrality on WTP. This provides further support for our theorizing that causal centrality of an identity underlies identity importance and impacts identity-consistent behaviors, in part by making that identity subjectively more important.

Finally, the manipulation in study 3 highlights the usefulness of understanding how social identities fit into the broader self-concept. By understanding that causal centrality is a determinant of identity importance, we were able to design a manipulation that influenced identity importance which has almost exclusively been examined as a stable individual difference (e.g., Dalton and Huang 2014; Forehand et al. 2002; LeBoeuf et al. 2010; Mazodier et al. 2018). While Reed II (2004) also manipulated identity salience with a manipulation that also highlights connections between the target identity and another identity, our causal centrality account provides the first theoretical basis for why the manipulation influenced importance.

STUDY 4: IDENTITY SALIENCE AND CAUSAL CENTRALITY

In study 4, we contrast causal centrality of an identity with identity salience, and 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 participants make a series of hypothetical purchase decisions between a more expensive environmentally-friendly product and a cheaper conventional product.

Prior research has found that the salience of an environmentalist identity impacts consumer choice and judgments (Bolton and Reed II 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. We have posited that causal centrality of a social identity guides behavior because consumers generally value their own behavior that is consistent with their more causally central 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 social identity (football fandom) was highly salient (the day of the Super Bowl in study 2, after writing about the identity in study 3). However, we have not directly tested for a potential role of identity salience in the effects of causal centrality.

In order to examine whether identity salience drives the relationship between causal centrality and behavior, in part 1 of study 4, we manipulated the salience of the environmentalist identity with a task used in prior literature that 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 behavior, we would expect the salience manipulation to increase both causal centrality of the environmentalist identity and identity-consistent behavior. If, instead, identity salience and causal centrality are separable, we would expect each construct to independently predict behavior.

To further test the distinction between salience and causal centrality, we investigated not only immediate effects, but also the longer-term relationship. Assuming that causal centrality is relatively stable over time, 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 of the study 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, 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 (study A3 in appendix B).

As pre-registered,⁵ 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 want to be an environmentally-friendly person 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 “listing causal relationships” task to measure causal centrality and, 3) the

⁵ Part 2 of study 4 was not part of the original experimental design and was not included in the pre-registration.

environmental-products choice task. The salience manipulation was adapted from Coleman and Williams (2013). Participants were randomly assigned to either write about their environmental identity (environmentalist-salient condition) or to write about what they had done the previous day (control condition, see 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, Strohming 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 additional features 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 (see figure 3). Participants chose between buying an environmentally-friendly version and a cheaper conventional version in each of three product categories: light bulbs, shopping bags, and batteries. To ensure any results were not based on brand loyalty rather than a greater willingness to pay for environmentally-friendly products, the conventional and environmentally-friendly products were from the same brand, with the exception of the shopping bags which were unbranded. The placement of the choice options (environmentally-friendly vs. conventional) on the screen was randomized. After choosing, participants rated which of the two products in each choice set they thought was better for the environment on a five-point scale. In all studies using environmentally-friendly vs. conventional product choice sets, participants consistently rated

environmentally-friendly products as better for the environment than the conventional products in all studies in which they were used (see appendix A).

Eleven months after part 1, all participants who were still active on Prolific were recruited 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.

FIGURE 3

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

	GE 60-watt, 4-pack A19 light bulbs for \$4
OR	
	GE LED 4-pack replacement 60-watt light bulbs for \$19.99
	Single-use plastic bag for \$0.10
OR	
	Re-useable canvas bag for \$3.99
	Energizer 4-pack of AA alkaline batteries for \$4.99
OR	
	Energizer 4-pack of AA rechargeable batteries for \$13.99

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, comparing participants who wrote about their environmentalist identity ($M = 3.45$) to those who completed the control writing task ($M = 3.10$, $t(409) = 1.15$, $p = .249$, 95% CI of the difference = [-.24, .94]). A linear regression predicting causal centrality by condition, controlling for total number

of links, also confirmed that condition had no effect on causal centrality ($B = .16$, $SE = .18$, $p = .370$). Despite high statistical power (80% power to detect $d = .28$), 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 (study A4 in appendix B), we likewise found no effect of salience on centrality using the abbreviated listing causal relationships task from study 2 ($n = 434$, $M_{\text{environmental}} = 5.27$, $M_{\text{control}} = 4.91$, $t(434) = 1.04$, $p = .300$, 95% CI of the difference = $[-.32, 1.04]$). These results suggest that the lack of relationship between the salience manipulation and causal centrality is robust to the length of the listing causal centrality task.

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 ($M = 1.96$, $t(409) = 1.83$, $p = .068$, 95% CI of the difference = $[-.01, .32]$), 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 ($B = .10$, $SE = .02$, $p < .001$), controlling for total number of links. This generalizes our prior findings to the environmentalist identity and to choices between consumer products. The relationship between causal centrality and choice holds both in the environmentalist-salient condition ($B = .10$, $SE = .03$, $p = .004$) and in the control condition ($B = .10$, $SE = .03$, $p = .001$).

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 ($B = .10$, $SE = .02$, $p < .001$), controlling for a directional non-

significant effect of salience condition ($B = .13$, $SE = .08$, $p = .102$), 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 a salience condition x causal centrality interaction term. The near-zero interaction ($B = .00$, $SE = .04$, $p = .928$), 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 ($B = .12$, $SE = .14$, $p = .001$), while the identity salience condition did not ($B = -.17$, $SE = .14$, $p = .229$).

Discussion

Study 4 replicated the findings of the previous studies with a new 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 short-term result was also replicated in two additional studies that used the same choice task as study 4. In both studies A2 ($n = 96$) and A3 ($n = 292$), causal centrality of the environmental identity predicted choice of environmentally-friendly products, controlling for total number of reported links (study A2: $B = .139$, $SE = .05$, $p = .005$; study A3: $B = .09$, $SE = .03$, $p = .004$; see Appendix B). Further, the results in the environmentalist-salient condition show that even when a social identity is experimentally manipulated to be salient,

centrality still predicts behavior—consistent with our study 2 finding that centrality of the football fan identity predicted behaviour, even when a real-world event made it highly salient.

The results of study 4 (and study A3 in appendix B) were also consistent with prior findings that experimentally manipulating an identity to be more salient increases consumers' identity-consistent choices (pooled $B = .09$, $p < .001$, see appendix B). However, we found no evidence that the influence of the salience manipulation on choice differs depending on the causal centrality of the environmental identity, suggesting that the salience manipulation is equally effective among consumers who see the identity as central and peripheral.

These results suggest that causal centrality and salience of an identity are dissociable and have separate influences on identity-consistent behavior. The salience manipulation had no influence on causal centrality, and salience and causal centrality both independently predicted choices. Further, the lack of an interaction between salience and causal centrality goes against an alternative explanation of our earlier findings, in which higher causal centrality of an identity motivates identity-relevant choices by making that identity more chronically salient.

The results of part 2 revealed that the causal centrality of the environmentalist identity predicts choice made nearly a year after measuring centrality. This is consistent with our view that, while subjective causal centrality can be shifted somewhat by specific contextual cues (study 3), the causal centrality of social identities is nevertheless a largely stable individual difference, such that current choices are still predicted by past causal centrality (study 4). Thus, although the causal links in the self-concept do not appear to be entirely chronically salient as the manipulation used in study 3 suggests that there is room to make the causal centrality of an identity stronger, the results of study 4 suggest that causal links are stable and drive choice by making identities seem important.

STUDY 5: THE STABILITY OF CAUSAL CENTRALITY IN PREDICTING CHOICES

Study 5 was designed to address 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, raising the possibility that participants' decisions and causal centrality ratings may have been influenced by a desire to keep responses consistent across tasks.

Study 4 partially addressed this concern, because participants made choices 11 months after they had reported causal centrality in part 1. However, participants had previously 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 among all participants could have reduced the potential effect of the salience manipulation on choices by making the environmental identity salient even in the control condition or distracting participants. To address these limitations, in part 1 of study 5, we manipulated salience and participants made choices, with no reference to causal centrality. Then, one week later, only causal centrality was measured in part 2.

Method

Participants. We collected valid surveys from 208 Mechanical Turk participants, after pre-registered exclusions for duplicate IP addresses or worker IDs, or failing the attention check.

Design. The experiment consisted of two parts that were one week apart. With the exception of the salience manipulation (see below), the tasks used in study 5 were the same as those used in study 4 but presented in a different order. In part 1, participants answered the initial screener questions about what social identities they possessed, wrote about either their environmentalist or frugal identity (the salience manipulation), and made choices between

environmentally-friendly and conventional products. In part 2, a week later, participants were given a second survey, in which they completed the “listing causal relationships” task.

Part 1, Initial Identity Questions. As in study 4, participants first reported whether they agreed with a series of six identity-related statements, including two that related to the target identities: “I want to be an environmentally-friendly person” and “I am a frugal person.” Only participants who answered “yes” to both questions were invited to complete the study. The other four questions were unrelated to the two target identities and served to mask the survey’s intention so that participants could not strategically answer to qualify for the survey.

Part 1, Manipulating Identity Salience. Participants were randomly assigned to one of two conditions that manipulated the salience of the social identity: the environmentalist-salient condition or the frugal-salient condition. Following previous research on identity salience (e.g., Coleman and Williams 2013; Reed II 2004), to manipulate identity salience, participants wrote five sentences about either their environmentalist or frugal identity. Specifically, they were asked to “express any thoughts you have about this aspect of your identity that you listed earlier, and describe how it has affected you” (see appendix C). Thus, both the experimental and control conditions of the salience manipulation involved writing about one of their identities (compared to study 4, in which the control group wrote about what they had done the previous day).

Part 1, Choice Between Environmentally-Friendly and Conventional Products. Directly after the writing task, participants made the same three hypothetical purchasing decisions as in study 4 (see figure 3) and then rated which of the two products in each choice set they thought was more environmentally-friendly. 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, Listing Causal Relationships Task. As in study 4, participants 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). Participants then completed the same “listing causal relationships” task used in study 4. Finally, participants answered a few questions about their attitudes about the environment, buying environmentally-friendly products, and how financially constrained they felt.

Results

Effects of Identity Salience. Because the identity salience writing task occurred a week before the “listing causal relationships” task, the salience manipulation was unlikely to influence causal centrality, particularly given the disassociation found in study 4. A t-test confirmed that there was no difference in reported links to the environmental identity between the two groups ($M_{\text{environmental}} = 2.51$, $M_{\text{frugal}} = 1.99$, $t(206) = 1.48$, $p = .140$, 95% CI of the difference = [-.17 1.21]). Consistent with study 4 and prior research, participants in the environmentalist-salient condition chose more environmentally-friendly products than in the frugal-salient condition ($M_{\text{environmental}} = 2.29$, $M_{\text{frugal}} = 1.80$; $t(206) = 3.95$, $p < .001$, 95% CI of the difference = [.25, .74]).

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. frugal) 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 ($B = .08$, $SE = .04$, $p = .041$). This analysis also confirmed the main effect of the salience-manipulation condition ($B = .49$, $SE = .13$, $p < .001$). Results were robust to excluding participants who did not follow the instructions for the writing task (table 6 in appendix A).

Further, the main effect of causal centrality of the environmentalist identity remained significant when controlling for the centrality of the frugal identity and income ($B = .08, p = .031$).

In a follow-up regression, we included a condition x causal centrality interaction term, which was not significant ($B = -.04, SE = .07, p = .587$). 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 subsequently measured causal centrality was robust to the salience of the focal (environmental) identity at the time of choice (i.e., a similar relationship between causal centrality and choice was found in the environmentalist-salient and frugal-salient conditions).

Relationship Between Frugal Causal Centrality and Choice. To examine the effect of the causal centrality of the frugal identity on choice, we fit a linear regression predicting the total number of environmentally-friendly choices based on identity-salience condition (frugal vs environmental) and measured causal centrality of the frugal identity, controlling for the total number of links. This analysis 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 (A5, N=113, reported in appendix B), in which we measured agreement with purchasing norms for the two groups (e.g., “Someone who is an environmentalist ought to buy more expensive environmentally-friendly products rather than less expensive conventional products.”). Consistent with our hypothesis, we found that participants more strongly agreed with purchasing norms 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]).

We also asked participants which option a person who considers herself equally an environmentalist and frugal should do: either 1) purchase more expensive environmentally-friendly products, 2) purchase cheaper conventional products or, 3) neither. Participants were more likely to choose the environmentalist norm than the frugal norm (38% selected option 1 vs. 20% for option 2, $p = .019$ binomial sign test; excluding the 42% for option 3). Thus, the follow-up study suggests an important boundary condition: the group norms must be sufficiently strong for the causal centrality of that social identity to predict choice.

Discussion

Study 5 again finds that consumers with higher causal centrality of their environmentalist identity were more likely to choose environmentally-friendly products. Further, as the choice and the subsequent measurement of causal centrality tasks were separated by a week, the relationship between choice and causal centrality was unlikely to be explained by self-generated validity. The results of study 5 further confirm that salience and causal centrality of identity represent distinct psychological processes. Replicating study 4, the effect of identity salience was distinct from causal centrality, shifting choices whether the social identity was causally-central or not.

Furthermore, causal centrality predicted identity-relevant choices whether or not the social identity was manipulated to be salient at the time of choice.

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 II 2004; LeBoeuf et al. 2010). Our studies investigated how differences in identity relate to behavior specifically among people who hold that identity, screening participants to ensure that they considered themselves environmentalists. The interaction found in prior research using general unscreened samples (e.g., Bolton and Reed II 2004) is likely driven by salience increasing norm-consistent preferences and behavior only among those who hold the identity, with low importance ratings indicating either absence of the identity or holding a contrary identity (e.g., anti-environmentalist). Consistent with this interpretation, the interaction found in LeBoeuf et al. (2010, study 3) is driven consumers who don't identify with an social group showing a different pattern than mid- and high-identifiers; low identifiers actually made more identity-*inconsistent* choices when an identity was salient than when it was not.

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. Money may have a particularly strong connection to morality (Gino and Mogilner 2014; Kouchaki et al. 2013), an important part of consumers' self-concepts (Aquino and Reed II 2002). Therefore, trade-offs involving money may be particularly sensitive to the causal centrality of consumers' social identities.

In study 6, we test whether our findings extend to trade-offs between identity-relevance and quality. As in studies 4 and 5, we examine the trade-offs environmentalists make between environmentally-friendly products and their conventional counterparts. Participants in study 6 chose between environmentally-friendly products and conventional products with either higher quality ratings or with lower prices, 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 how willing consumers are 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 who had previously reported caring about environmental issues (in the Prolific panel screening questions, answering a 4 or 5 on a 1-to-5 scale to the question, “How concerned are you 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.

Procedure. As in studies 4 and 5, in the screener at the beginning of the study, participants 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.” 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 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 apply to shopping bags, they were replaced with Ikea food storage containers (see figure 4). The placement of the choice options (environmentally-friendly vs. conventional) on the screen was randomized.







Participants were randomly assigned to either a price-trade-off condition (similar to studies 4 and 5) or a quality-trade-off condition. Participants in the price condition made choices between more expensive environmentally-friendly products and cheaper conventional products. Participants in the quality condition made choices between lower-rated environmentally-friendly products and higher-rated conventional products, based on ratings from 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, 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 (with no mention of the products being environmentally-friendly and using high and low prices from studies 4 and 5). We used the quality scores from the indifference points as the ratings for the more expensive products in the quality condition (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 that had a higher average rating and a cheaper product that had a lower average rating (see figure 4). Our causal centrality account of identity-based consumption predicts that the centrality of an identity should predict choice only when the choices are identity-relevant, but not for the control choices.

FIGURE 4

STUDY 6: EXAMPLE CHOICE SETS

Example environmentally-friendly choice set			
Price Condition		Quality Condition	
Two Ikea 1.5 liter glass/bamboo containers for \$16.99	Two Ikea 1.5 liter plastic containers for \$8.50	Two Ikea 1.5 liter glass/bamboo containers	Two Ikea 1.5 liter plastic containers
			
Example control choice set			
OXO corkscrew for \$16.99		OXO corkscrew for \$7.99	
			

Finally, participants rated which of the two products in each of the environmentally-friendly choice sets they thought was better for the environment on a scale of 1 to 5.

Results

Environmentally-Friendly Products Choice Analysis. 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 ($B = .08, SE = .02, p < .001$) and revealed a main effect of the trade-off condition (more environmental choices in the price-trade-off condition: $B = -.53, SE = .07, p < .001$).

In a follow-up regression which included a trade-off condition x causal centrality interaction term, the interaction was not significant ($B = .02$, $SE = .03$, $p = .437$). This suggests that the relationship between choice and causal centrality was similar whether participants were considering price or quality trade-offs. The relationship between causal centrality and choice was significant both in the price condition ($B = .09$, $SE = .03$, $p < .001$) and in the quality condition ($B = .08$, $SE = .03$, $p = .006$).

Control Products Choice Analysis. For the control products, the relationship between causal centrality and choice was not significant ($B = .01$, $SE = .02$, $p = .726$), suggesting that causal centrality does not predict price and quality trade-offs in general but only when the trade-offs are identity-relevant (i.e., involve environmental-friendliness).

Discussion

The results of study 6 replicated the results of studies 4 and 5. The causal centrality of the environmentalist identity predicted choices when participants had to trade off environmental-friendliness for price. Further, the results of study 6 suggest that causal centrality predicts a wider range of trade-offs that consumers have to make, beyond only choices that involve price trade-offs. We found that the causal centrality of the environmentalist identity also predicted choices when participants had to trade off environmental-friendliness for quality. Two additional studies, studies A7 and A8 in appendix B, also examined the role of causal centrality in quality vs. 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 quality for environmental-friendliness (pooled $B = .07$, $p < .001$, see 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 consumer's identity-based behaviors and for identity importance. Across multiple consumer-relevant identities, using both measured and manipulated causal centrality, we find that among people who belong to the same social category, those who perceived that social identity as more causally central are more likely to act in identity-consistent ways, compared to those who perceived the same social identity as more causally peripheral. We additionally provide evidence that causally central identities tend to be perceived as more important (study 2), that increasing the causal centrality of a social identity increases identity importance (study 3) and that importance mediates the effects on behavior. Further, we demonstrate that the relationship between a social identity's causal centrality and identity-consistent behaviors cannot be explained by mere (non-causal) associations between a social identity and other features of the self-concept (study 1), self-brand connection (study 1), involvement in identity-related activities (study 2), identity salience (studies 2, 4, and 5), or self-generated validity (studies 4 and 5).

Theoretical Implications

While causal centrality has been a very influential construct in understanding *category* representation (sets of individuals), few studies have investigated its role in representations of *individuals* and even less is known about its role in decision making. Chen and Urminsky (2019) presented correlational evidence that people who saw their political identity (political party or nationality) as more causally central were more likely to support candidates and policies associated with that identity. While broadly consistent with our theory, these preliminary

findings were 1) limited to the role of political identities, 2) in choices or preferences that (unlike most consumer choices) lack clear trade-offs and did not, 3) distinguish centrality from identity salience or, 4) identify the underlying mechanism. As a result, whether and how causal centrality would impact consumer choices and identity importance remained unanswered questions. In this research, we have found that causal centrality predicts and causes both identity importance and consumer choices, even when identity-consistent choices involve trade-offs with price or quality, across multiple consumer identities.

This research provides the first full theoretical framework for the role of causal centrality of identity in decision making. We provide the first experimental evidence that successfully manipulating the causal centrality of a social identity influences consumer decisions and identity importance (study 3 and study A1 in appendix B) and that the effects of causal centrality of an identity are distinct from (and independent of) the effects of identity salience (studies 4 and 5). Further, we provide the first evidence of the identity importance-based mechanism by which causal centrality influences choice (studies 2 and 3), and rule out alternative mechanisms. We also demonstrated the stability of causal centrality by separating measurement of causal centrality and choice, and finding that causal centrality is a strong predictor of choice over time (and a much stronger predictor than identity salience at the time of choice, studies 4 and 5).

Our novel approach to understanding identity-consistent behavior also theoretically advances the identity-based consumption literature more broadly. First, by focusing on internal representations, we can account for otherwise unexplained variance in behavior across consumers who hold the same social identity and are in situations which make that social identity similarly salient. We demonstrate that the greater causal centrality of an identity predicts identity-consistent behavior whether or not the social identity is salient, either due to the real-

world context (study 2) or an experimental manipulation (studies 4 and 5). Second, our approach reconciles differences between cognitive approaches to the self-concept, which focus on individual-level characteristics, and consumer research on identity-based consumption, which focus on social categories. 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-based norms in behavior.

Finally, our approach provides a novel psychological explanation of the basis for identity importance, a key determinant of an identity's influence on behavior. It is important, however, to note that causal centrality and identity importance, while related, are conceptually distinct. Identity importance involves both a positive evaluation of the group (high reported admiration of the group) and identification with the group (high reported identification with the group and reporting that group membership is a good description of who they are, Reed II 2004). A social identity's causal centrality, in contrast, is the extent that consumers perceive that social identity as having influenced or been influenced by other aspects of the self, regardless of the valence of a consumer's evaluation or degree of identification with the social identity.

It is therefore theoretically possible for a consumer to see an aspect as not important, as measured by the identity importance scale, but nevertheless causally central. For example, a consumer could see her social identity as an alumna of the college she went to as causally central because her undergraduate experience shaped her career, where she went to graduate school, and gave her the opportunity to study abroad. However, if that consumer doesn't have a positive evaluation of the alumna identity (she chose to study abroad and go to graduate school at a different university because she didn't like her undergraduate institution), she may not see her identity as an alumna as important. Our framework predicts that she would still see the social

identity as defining of her self-concept (i.e., if she had not went to that college, she would be a very different person). This is an interesting potential direction for future research.

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 people 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 people's causal knowledge as essential to their representation of categories and reliance on subjective categories in decision-making. While previous research has examined the role of causal centrality in categorization judgments (e.g., Ahn et al. 2000; Rehder and Hastie 2001; 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 decision making. Going beyond prior explorations of how categories influence choice, which have mostly focused on how consumers categorize their choices or the situations in which they make choices (e.g., Chen, Ross, and Murphy 2014; Henderson and Peterson 1992; Moreau, Markman, Lehmann 2001; Ülkümen et al. 2010), we have demonstrated

that understanding the conceptual representation of the self-concept provides insight into which social identities will motivate behavior.

Finally, we provide insight into the long-debated issue of whether both causes and effects matter (Rehder 2003; Rehder and Hastie 2001) or only causes matter (Ahn et al. 2000; Sloman et al. 1996) for determining causal centrality. As noted in the discussion of study 1, we found no evidence that only causes mattered (see table 7 in appendix A). To further examine this issue, we performed a meta-analysis across all the studies in this paper (excluding study 3 as we did not measure cause and effect links). 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 separately, controlling for the total number of links. All choice dependent measures and predictors were z-scored within each study prior to compiling the regression data. Consistent with our operationalization of causal centrality as including both cause and effect links and with models of causal centrality that include both causes and effects, the regression revealed that both the number of times the target identity was a cause ($B = .08$, $SE = .03$, $p = .003$) and the number of times the target identity was an effect ($B = .19$, $SE = .03$, $p < .001$) were significant predictors of choice (see table 8 in appendix A). A bootstrap analysis revealed that, for the above regression, the effect coefficient was significantly larger than the cause coefficient (95% bootstrapped confidence interval of the difference = [.03 .20], see appendix A), further confirming that effects are a key determinant of causal centrality.

Future Directions

This investigation of identity-based consumption has focused on behaviors relating to clear group 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. 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, Times Square may be associated with New Yorkers but a real New Yorker knows never to go there.

Similarly, some attempts to market products to women have famously backfired (Grose 2013)—e.g., 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). Although marketers were communicating an association between these products and the female identity, that association was seemingly rejected by consumers. In fact, it may be that to the extent that female consumers see their gender identity as including more progressive values, more casual centrality of the female identity might be related to a higher likelihood of rejecting such unnecessarily gendered products, as violating one’s personal gender norms. Our study on environmentalist vs. frugal identity purchasing norms suggest that, indeed, greater casual centrality of an identity that has weak norms does not predict choices, when the consumer also holds an identity with stronger opposing norms. Thus, future research should examine how individual views regarding the relationships between behaviors and an identity may moderate the effects of causal centrality of the identity, in the absence of a consensus norm.

By gaining a greater understanding of what it means, psychologically, for an identity to be important, we were able to develop a manipulation of causal centrality that increased identity importance and identity-based consumption (study 3). The results of study 3 suggest that, if the goal is to increase identity-based consumption, marketers may be able to use messages and

tactics that prompt consumers to think about how an identity is causally connected to other identities. For example, a university that uses alums to solicit donations from other alums, could use a message that reminds the alums that they are friends *because* they went to university together. Conversely, marketers may also be able to use messages that prompt customers to think about how an identity is independent from other identities—e.g., If Adidas is trying to convert Nike customers, they could remind customers that they would be athletes regardless of whether they used Nike or not.

While our results have implications for marketers, further research is necessary to understand more precisely how to most effectively execute such strategies and to identify possible boundary conditions. For example, having people 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 people who hold a social identity but have a hard time thinking of 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 people do not self-select into (e.g., gender or age) than for social identities that people self-select into (which we have studied in this paper). For such social identities that people do not chose, some people who hold the identities (are members of the social category) may nevertheless not think the social identity is representative of who they are.

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 II 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 an individual's social identities have conflicting norms about behavior, a social identity would be more likely to influence an individual's behavior the more central it is relative to the other competing social identities (perhaps also depending on the centrality of other social identities whose norms are consistent with the focal social identity's norms and the strength of these norms). Examining these predictions is an important avenue for future research.

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APPENDIX A: DESCRIPTIVE STATISTICS, REGRESSION TABLES, AND EXTRA ANALYSES

A full set of regression tables and extra analyses can be found at:
https://osf.io/k735u/?view_only=d25d024522d24a8a9000770cae5ec083

Study 1

TABLE 1

Study 1: Descriptive statistics, brand-user identity

	Mean	Median	<i>SD</i>	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 1: 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).

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.

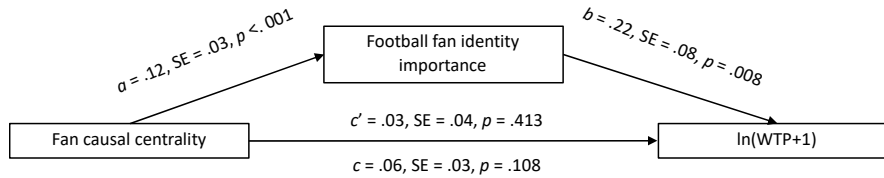
TABLE 3

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

FIGURE 1

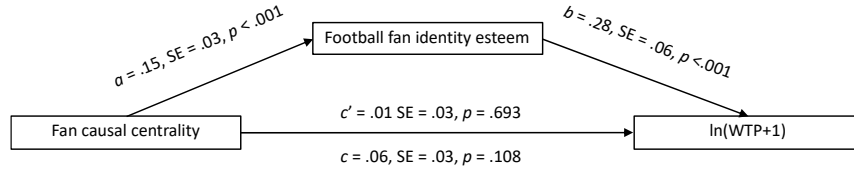
IDENTITY IMPORTANCE MEDIATES RELATIONSHIP BETWEEN FOOTBALL FAN CAUSAL CENTRALITY AND LOG-WTP, STUDY 2



NOTE—Mediation analysis performed using the PROCESS bootstrapping macro (model 4) with 5,000 resamples. A 95% confidence interval was computed to test the indirect effect (95% CI of the indirect effect = [.00 .06]). Total number of links was included as a covariate in the analysis.

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. A 95% confidence interval was computed to test the indirect effect (95% CI of the indirect effect = [.02 .07]). Total number of links was included as a covariate in the analysis. *Factor Analysis.* We factor analyzed (with varimax rotation) the seven questions from the

Identity Importance Scale (Reed II 2004) and the Identity Esteem Scale (Shang, Reed II, and Croson 2008; Luhtanen and Crocker 1992). We used 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. The only factors that did not load onto the first factor were the two reverse-coded items from the Identity Esteem Scale (see table 4 below) suggesting that the two scales are not distinct in our data.

TABLE 4

Study 2: Rotated Component Matrix

Scale Item	Component	
	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 5

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

Study 4

Descriptive Statistics. On average, participants reported 3.27 links to the environmentalist identity, out of an average total of 19.91 links. The environmentally-friendly items were considered significantly better for the environment than the conventional item in both part 1 ($M_s \geq 4.35$ vs. midpoint of 3, $t_s > 27.83$, $p_s < .001$) and part 2 ($M_s \geq 4.51$ vs. midpoint of 3, $t_s > 24.48$, $p_s < .001$).

Study 5

Descriptive Statistics. Participants reported on average 2.24 links between the environmentalist identity and other features of identity (the causal centrality of the environmentalist identity), relative to an average total of 16.32 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 ($M_s \geq 4.45$ vs. midpoint of 3, $t_s > 26.59$, $p_s < .001$).

TABLE 6

Study 5: Linear regression predicting choice of environmentally-friendly products, excluding participants who did not follow writing task instructions*

Factor	β	SE	t	p
Constant	1.81	.18	10.16	<.001
Condition	.65	.15	4.24	<.001
Environmental causal centrality	.08	.05	1.72	.088
Total number of links	-.02	.01	-1.69	.094

NOTE—Frugal condition =0, Environmental condition = 1

*following the pre-registration, 67 participants were excluded for either not writing five sentences as the task instructed or spending less than 45 seconds on the writing task.

Study 6

Descriptive Statistics. Participants reported on average 2.71 links between the environmentalist identity and other features of identity (the causal centrality of the environmentalist identity), relative to an average total of 18.37 links. In each pair of options, the environmentally-friendly item was rated as significantly better for the environment than the conventional item ($M_s > 4.38$ vs. midpoint of 3, $t_s > 41.71$, $p_s < .001$).

Cause vs Effects Analysis

TABLE 7

Study 1: 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 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 = [-.21 .87]).

TABLE 8

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

Factor	β	SE	<i>t</i>	<i>P</i>
Constant	0.00	.02	0.00	1
Total number of links	-.10	.03	-3.67	<.001
Target identity as cause	.08	.03	2.95	.003
Target identity as effect	.19	.03	7.11	<.001

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

A bootstrap analysis with 1000 resamples revealed that the effect coefficient was significantly larger than the cause coefficient (95% bootstrapped confidence interval of the difference = [.03 .20]).

APPENDIX B: ADDITIONAL STUDIES AND META-ANALYSES

Additional studies and meta-analyses are reported in full at:
https://osf.io/k735u/?view_only=d25d024522d24a8a9000770cae5ec083

PILOT STUDY A1: MANIPULATING CAUSAL CENTRALITY

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

Method

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

Participants were football fans and causal centrality was manipulated by having them write about how their football fan identity was either causally related to (high centrality condition) or independent from (low centrality condition) other aspects of their self-concept. Participants then completed the identity importance scale and reported WTP.

Results

Effect of the Causal Thinking Manipulation on WTP. Participants in the high centrality condition reported a higher log-WTP to see their favorite team in the Super Bowl than those in the low centrality condition ($M_{\text{HighCentrality}} = 5.90$, $M_{\text{LowCentrality}} = 5.70$, $t(382) = 2.01$, $p = .045$, 95% CI of the difference [.00, .41]).

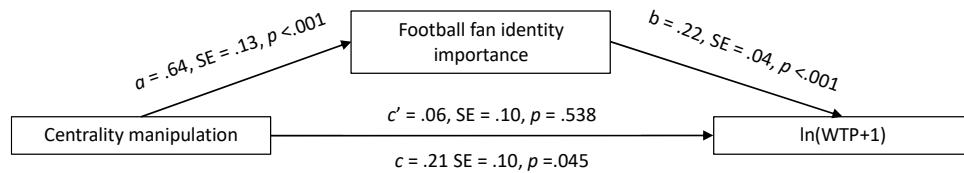
Effect of the Causal Thinking Manipulation on Importance. Participants in the high centrality condition reported significantly higher football fan identity importance than those in the low centrality condition ($M_{\text{HighCentrality}} = 5.20$, $M_{\text{LowCentrality}} = 4.56$, $t(382) = 4.07$, $p < .001$, 95% CI of the difference [.33, .94]).

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 3).

FIGURE 3

STUDY A3: 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]).

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 A3.

Results

Effect of the Causal Thinking Manipulation on WTP. Participants in the high centrality condition reported a higher log-WTP ($M_{\text{HighCentrality}} = 5.80$) than those in the low centrality condition ($M_{\text{LowCentrality}} = 5.63$, $t(1286) = 2.79$, $p = .003$, 95% CI of the difference [.06, .29]).

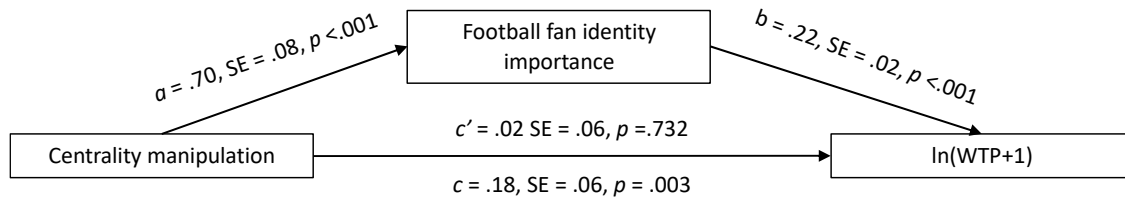
Effect of the Causal Thinking Manipulation on Importance. Participants in high centrality condition ($M_{\text{HighCentrality}} = 4.96$) reported significantly higher football fan identity importance than those in the low centrality condition ($M_{\text{LowCentrality}} = 4.26$, $t(1286) = 9.26$, $p < .001$, 95% CI of the difference [.55, .84]).

Mediation Analysis. There was a significant indirect effect of the causal thinking 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 3).

FIGURE 4

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 provided a preliminary exploration of the relationship between the environmental identity and choices between more expensive environmentally-friendly version and a cheaper conventional version.

Method

Procedure. Study A2 consisted of two tasks: the listing causal relationships task and a choice task. Both tasks were identical to the versions of these tasks used in studies 4 and 5.

Results

A linear regression predicting the number of environmentally-friendly choices based on the causal centrality of the environmentalist identity, controlling for total number of links reported revealed that participants for whom the environmentalist identity was more causally central

selected more environmentally-friendly products than participants for whom the same identity was more causally peripheral ($B = .139$, $SE = .05$, $p = .005$).

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 causal 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

Procedure. 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 (identical to those in study 5 except that they were all completed in one session) 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 before the listing causal

relationships task 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 task *before* the choice task so 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 for whom the environmentalist identity was salient (those who wrote before the causal centrality task) reported more links to that identity than those for whom the identity was

not salient while doing the causal centrality task ($M_{\text{writingfirst}} = 3.44$, $M_{\text{centralityfirst}} = 2.34$, $t(139) = 2.21$, $p = .023$, 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 before the causal centrality task vs. not writing about any social identity before the causal centrality task) 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 made salient by the writing task ($M = 2.17$) than when the frugal identity was made 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 the causal centrality of the environmentalist identity ($B = .08$, $SE = .03$, $p = .011$) 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 people write about the features of their self-concept and, 2) the length of the listing causal relationships task. To address the first, we have 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

Procedure. 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, adapted from Coleman and Williams 2013), 3) completing the identity importance scale (used in studies 2 and 3) and, 4) the abbreviated “listing causal relationships” task. In the abbreviated “listing causal relationships” task, participants

complete two trials, one in which they reported all the features of the self-concept that the environmentalist identity was *caused by* and one in which they reported all the features of the self-concept that the environmentalist identity *caused*.

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 ($M_{\text{Env}} = 5.29$, $M_{\text{Control}} = 5.34$, $t(432) = .50$, $p = .616$, 95% CI of the difference = [-.24, .14]) or the causal centrality of the environmentalist identity ($M_{\text{Env}} = 5.27$, $M_{\text{Control}} = 4.91$, $t(432) = 1.04$, $p = .300$, 95% CI of the difference = [-.32, 1.04]).

STUDY A5: PURCHASING NORMS

The results of study 5 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. The goal of study A5 was to examine whether the results of study 5 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

Procedure. 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 environmentalist identity and the frugal identity, participants rated their agreement with statements about purchasing norms—e.g., “Someone who is [identity] 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. The three choices were: 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). The results of study A5 suggest that the results of study 5 revealed an important boundary condition: The group norms must be sufficiently strong for the causal centrality of that social identity to predict choice, particularly relative to competing norms.

STUDY A6: TITRATION STUDY

The goal of study A6 was to ensure that the price and quality trade-offs used in study 6 were comparable. Study A6 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 9). The quality rating for the expensive product ranged from 2.5 to 5 stars in increments of half a star. The prices for each product set are listed in table 9 (prices for the batteries and the light bulbs are the same as the prices used in studies 4-6).

Results

To calculate the indifference point for each choice set, we calculated the mean number of choices of the 2-star product. The means for each choice set are present in table 9.

TABLE 9

Study A6: 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

STUDY A7: ENVIRONMENTAL-FRIENDLINESS VS. QUALITY TRADE-OFFS PILOT

STUDY

Study A7 provided a preliminary exploration of the relationship between the environmental identity and hypothetical choices between lower-quality environmentally-friendly products and higher-quality conventional ones.

Method

Procedure. Participants completed the “listing causal relationships task” and made three choices between environmentally-friendly and conventional versions of the same product. The

products used were the same as those used in studies 4 and 5 with the exception that the shopping bags were removed because they did not lend themselves to quality ratings.

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 A8: LARGE AND SMALL QUALITY DIFFERENCES

Study A8 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

Procedure. Participants completed the “listing causal relationships” task and then made three choices between an environmentally-friendly and a conventional product using the same products used in study 6 (see figure 5 in the main manuscript). 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 the total number of 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 environmental identity as more 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 ($B = .01$, $SE = .02$, $p = .600$), suggesting that the relationship between the causal centrality of the environmentalist identity and choice was similar across conditions.

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. We performed 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. This analysis revealed that combining the three studies ($n = 1314$), there was a significant relationship between the causal centrality of the environmentalist identity and choice ($B = .07$, $SE = .02$, $p < .001$).

APPENDIX C: PRE-REGISTRATION LINKS AND EXAMPLE MATERIALS

A full set of study materials can be found at:
https://osf.io/k735u/?view_only=d25d024522d24a8a9000770cae5ec083

TABLE 10

Pre-registration information

Study	Registration Number	Link
Study 1	AsPredicted.org, #22324	http://aspredicted.org/blind.php?x=c8mq6i
Study 3	AsPredicted.org, #64404	https://aspredicted.org/blind.php?x=cf39dy
Study 4	AsPredicted.org, #42944	http://aspredicted.org/blind.php?x=hi83xk
Study 5	AsPredicted.org, #35322	https://aspredicted.org/blind.php?x=gf6pa8
Study 6	AsPredicted.org, #86055	https://aspredicted.org/HCF_384
Study A4	AsPredicted.org, #87445	https://aspredicted.org/FBP_WLC
Study A5	AsPredicted.org #92240	https://aspredicted.org/F8Z_N1Q
Study A8	AsPredicted.org, #86893	https://aspredicted.org/KJB_YM9

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	<input type="radio"/>	<input type="radio"/>	\$50 [BRAND] gift card
\$10 Amazon gift card	<input type="radio"/>	<input type="radio"/>	\$50 [BRAND] gift card
\$15 Amazon gift card	<input type="radio"/>	<input type="radio"/>	\$50 [BRAND] gift card
\$20 Amazon gift card	<input type="radio"/>	<input type="radio"/>	\$50 [BRAND] gift card
\$25 Amazon gift card	<input type="radio"/>	<input type="radio"/>	\$50 [BRAND] gift card
\$30 Amazon gift card	<input type="radio"/>	<input type="radio"/>	\$50 [BRAND] gift card
\$35 Amazon gift card	<input type="radio"/>	<input type="radio"/>	\$50 [BRAND] gift card
\$40 Amazon gift card	<input type="radio"/>	<input type="radio"/>	\$50 [BRAND] gift card
\$45 Amazon gift card	<input type="radio"/>	<input type="radio"/>	\$50 [BRAND] gift card
\$50 Amazon gift card	<input type="radio"/>	<input type="radio"/>	\$50 [BRAND] gift card

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)

[SHOWN FOR 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 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).

[SHOWN FOR 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.

[SHOWN FOR 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 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] Please write at least 5 sentences on this feature: **I want to be an environmentally-friendly person**

Please express any thoughts you have about this aspect of your identity that you listed earlier, and describe how it has affected you. Please be as specific as possible.

[FRUGAL CONDITION] Please write at least 5 sentences on this feature: **I am a frugal person**

Please express any thoughts you have about this aspect of your identity that you listed earlier, and describe how it has affected you. Please be as specific as possible.