Two Essays on Cross-Cultural Consumer Behavior

by

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A Dissertation Presented in Partial Fulfillment
of the Requirements for the Degree
Doctor of Philosophy

Approved March 2022 by the
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May 2022

ABSTRACT

Using a combination of laboratory experiments, field experiments, and secondary data, this dissertation examines how cross-cultural differences (e.g., thinking style and self-construal) influence the way consumers cope with self-discrepancies (essay 1) and willingness to digitally enhance their appearance (essay 2). The first essay investigates when and why consumers cope with a self-discrepancy by purchasing products in domains that are important to their self-worth, but unrelated to the self-discrepancy (i.e., fluid compensation). I identify thinking style as an important factor that influences fluid compensation and demonstrate that people with a temporarily activated or dispositional holistic thinking style are more likely to engage in fluid compensation than people with an analytic thinking style. This phenomenon occurs because, by perceiving parts as more functionally related to a larger whole, holistic (vs. analytic) thinkers are more likely to view fluid compensation as instrumental to enhancing global self-worth. Holistic (vs. analytic) thinkers' greater propensity to engage in fluid compensation, in turn, better enables them to restore their global self-worth. The second essay examines how cultural differences in self-construal impact consumers' willingness to engage in digital beauty work (e.g., use photo-editing apps to make oneself look better in an image). Building on prior research that shows interdependents see more overlap between themselves and others, I propose and demonstrate that consumers with an interdependent (vs. independent) self-construal also see greater overlap between their own different selves (beautified and true self). More importantly, this effect only occurs when they see both the actual self and the beautified self, side-by-side (e.g., joint presentation mode), but not when consumers see only the beautified self in isolation (e.g., separate presentation

mode). This heightened overlap between the beautified self and the true self, in turn, increases willingness to digitally enhance appearance. Together, this dissertation contributes to the understanding of how cultural values shape consumers' views of the self and consumption preferences to satisfy their goals and motivations, and it helps marketers and policy-makers design interventions to increase consumer well-being and to achieve more success in global market.

DEDICATION

This dissertation is dedicated to my wonderful family (especially my grandparents, my

parents, my husband, and my sweetest daughter) and to my friends for always being there

for me and supporting me in all my pursuits. Thank you so much for your unconditional

love, unwavering support, tremendous understanding and encouragement.

ACKNOWLEDGMENTS

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THINKING STYLE IMPACTS FLUID COMPENSATORY CONSUMPTION

Introduction

People often experience setbacks, mishaps and failures that create discrepancies
between how they perceive themselves in a certain self-domain (i.e., the actual self) and
how they aspire to be in that self-domain (i.e., the ideal self; Higgins, 1987). For
example, students who fail an important exam may view themselves as unintelligent, and
thus experience a self-discrepancy between their current and desired level of intelligence.
Similarly, people who lose a job may view themselves as professionally incompetent, and
thus experience a self-discrepancy between their current and desired level of professional
competence. These self-discrepancies create psychological discomfort (Higgins, 1987;
Packard & Wooten, 2013), trigger ruminative thinking (Lisjak et al., 2015), and
undermine people's sense of self-worth (Heine, Proulx, & Vohs, 2006; Kim & Gal,
2014). The compensatory consumption literature suggests that consumers may assuage
self-discrepancies through consumption (for a review, see Mandel et al., 2017; Mandel,
Lisjak, & Wang, 2020). Confirming these theoretical assertions, a significant number of
consumers report having engaged in compensatory consumption (Lee et al., 2018; Rucker
& Cannon, 2019).

While extant research suggests that people often cope with a self-discrepancy by
purchasing products that address the domain of the self-discrepancy (Kim & Gal, 2014;
Mead et al., 2011; Rucker & Galinsky, 2008), we examine when and why people

compensate by purchasing products in domains that are important to their self-worth, but *unrelated* to the self-discrepancy (i.e., fluid compensation). For example, a person who feels professionally incompetent may purchase new athletic clothing to affirm their athleticism. Although such fluid forms of compensation do not address the self-discrepancy (Stone, Wiegand, Cooper, & Aronson, 1997), they may enable individuals to enhance their global self-worth (Sherman & Cohen, 2006).

We propose that a critical factor that influences peoples' propensity to engage in fluid compensation is their thinking style (holistic vs. analytic) (Nisbett, Peng, Choi, & Norenzayan, 2001; Oyserman & Lee, 2007; Shavitt & Barnes, 2019). We predict and show that when experiencing a self-discrepancy in a certain domain (e.g., professional competence), holistic thinkers are more likely to engage in fluid compensation than analytic thinkers. By perceiving objects as part of a greater whole, holistic thinkers are more likely to view consumption that can affirm the self in discrepancy-unrelated domains (e.g., athleticism or physical appearance) as instrumental to enhancing their global self-worth. Thus, given an opportunity to compensate fluidly, holistic thinkers are more likely to seize such opportunity than analytic thinkers, and thus should be better able to restore their global self-worth.

The present theory and findings contribute to existing literature in at least three important ways. First, this research contributes to the compensatory consumption literature (Mandel et al., 2017; 2020) by identifying thinking style as a critical factor that influences fluid compensation. Second, this research contributes to the thinking style research (Nisbett et al., 2001; Oyserman & Lee, 2007; Shavitt & Barnes, 2019). Whereas prior literature has primarily focused on how thinking style influences the extent to which people perceive

relations among objects, this research shows that thinking style also influences the extent

to which people perceive different self-domains as instrumental to self-worth

enhancement. Third, this research represents one of the first attempts to investigate the

psychological processes that underlie fluid compensation. We show that holistic (vs.

analytic) thinkers are more likely to engage in fluid compensation because they view it as

more instrumental to enhancing global self-worth. Finally, our findings suggest important

implications for marketers and policy makers by identifying market segments that are

more receptive to fluid products, as well as messaging that could facilitate fluid

compensation.

Theoretical Framework

Self-Discrepancy and Compensatory Consumption

The term "self-discrepancy" refers to a gap or inconsistency between one's actual

self and ideal self (Higgins, 1987). For example, an individual might perform poorly at

their new job, creating a discrepancy between how competent they feel and how competent

they would ideally like to be in the professional competence domain (Higgins, 1987). We use

the term "self-domain" or "domain" to refer to a specific value, trait, or goal from which

people derive self-worth (Crocker & Wolfe, 2001). Individuals base their global self-

worth on their perceived standing in these important domains (or contingencies of self-

worth), such as professional or academic competence, athleticism, appearance, and

altruism (Crocker & Wolfe, 2001; Sherman & Cohen, 2006; see figure 1). People have

stable, chronic levels of both global and domain-specific self-worth, and their momentary

(state) levels can vary around these chronic levels (Crocker & Wolfe, 2001). For

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example, an external event (e.g., a threat) may temporarily activate a self-discrepancy in a domain, which momentarily undermines their global self-worth (Kim & Gal, 2014; Heatherton & Vohs, 2000; Sherman & Hartson, 2011). Individuals may also possess a chronic self-discrepancy in a domain, which erodes their global self-worth.

Figure 1

Chapter 1 – Global Self-Worth as a Function of Important Domains
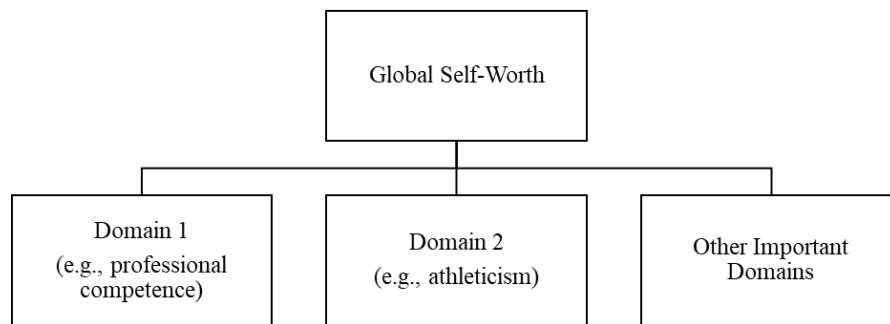
Previous research has shown that consumers often rely on products or activities to ameliorate the negative effects of a self-discrepancy, using a broad set of goal-oriented strategies known as compensatory consumption (for a review, see Mandel et al., 2017, 2020). Thus far, the majority of the literature has examined cases in which people compensate for a self-discrepancy in a domain by seeking products that bolster their perceived standing in the same domain. Consumers may achieve this bolstering through products that directly enhance the self in the domain of the self-discrepancy (direct resolution; e.g., Mead et al. 2011), or through products that merely signal success in the domain of the self-discrepancy (symbolic self-completion; Wicklund & Gollwitzer, 1981). For example, studies show that participants who felt less intelligent than desired (vs. control) had higher willingness to pay for intelligence-signaling products (Kim & Rucker, 2012).

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An alternative way to compensate for a self-discrepancy in a particular domain (e.g., domain 1 in figure 1) involves seeking products or activities that affirm the self in other domains that are important to one's global self-worth yet unrelated to the self-discrepancy (e.g., domain 2; Mandel et al., 2017; Rucker & Cannon, 2019). The main premise behind such fluid compensation is that although it does not address the specific self-discrepancy, it reminds people of their existing worth in other important domains, thereby enabling them to experience more positive self-worth at a global level. Indeed, scholars (Heine et al. 2006; Steele, 1988) have argued that fluid compensation restores global self-worth because it allows people to focus on important domains that are unrelated to the threat and realize that their global self-worth does not hinge merely on the threatened domain. Consistent with this possibility, Hoegg and colleagues (2014) found that participants who felt unattractive (vs. control) were more likely to purchase intelligence-related products. Similarly, Goor, Keinan, and Ordabayeva (2021) showed that participants who felt insecure (vs. secure) about their status were more likely to signal their meaningful relationships and support for personally relevant social causes. While these findings suggest that fluid compensation can occur, little is known about *which* consumers are relatively more versus less likely to embrace fluid compensation and why. We propose that one important antecedent of fluid compensation is the consumer's thinking style (holistic vs. analytic), as explained in the next section.

Thinking Style, Instrumentality, and Fluid Compensation

Individuals differ in the extent to which they think in a holistic or analytic manner. Holistic thinking is the tendency to attend to relationships between the focal object and the

context or field as a whole, whereas analytic thinking is the tendency to focus on the focal object itself and its attributes (Nisbett et al., 2001). To illustrate, holistic thinkers are more likely to view an object and the table on which it is displayed as parts of a larger whole, whereas analytic thinkers view the product and the table as separate pieces of data (Zhu & Meyers-Levy, 2009). Similarly, when presented with a large letter "L" made of small letter "E"s, holistic thinkers are faster at identifying the large letter "L" (i.e., the "whole") than analytic thinkers (Rozin, Moscovitch, & Imada, 2016). Previous research has identified cross-cultural differences in thinking style, with Asian and Latin Americans tending to think more holistically and American consumers tending to think more analytically (Choi, Choi, & Norenzayan, 2004; Nisbett et al., 2001). While thinking style varies cross-culturally, within any culture individuals display dispositional and temporary differences in holistic thinking (Lalwani & Shavitt, 2013). In addition to culture, self-construal, which refers to an individual's tendency to view the self as an independent or interdependent entity (Markus & Kitayama, 2010), is an antecedent of thinking style (Lalwani & Shavitt, 2013). Whereas interdependent self-construals promote holistic thinking, independent self-construals promote analytic thinking (Nisbett et al. 2001). Building on this literature, we propose that individuals' propensity to engage in fluid compensation differs for holistic and analytic thinkers.

As noted above, an individual has multiple important domains that contribute to global self-worth (figure 1). By definition, the compensatory consumption process starts when a self-discrepancy occurs in a specific domain (Mandel et al., 2017). Prior research has shown that when a domain-specific self-discrepancy occurs, a self-discrepancy also

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occurs at the global level (Kim & Gal, 2014; Heatherton & Vohs, 2000; Sherman & Hartson, 2011). For example, feeling unintelligent also leads to a decrease in global self-worth, undermining the perception that one is a good and worthy person (Kim & Gal, 2014).

We argue that when consumers experience a self-discrepancy, holistic (vs. analytic) thinkers will be more likely to view discrepancy-unrelated, fluid domains, and thus the products and activities linked to these domains, as more related to the global self, thereby offering more opportunities to repair the global self. We support these predictions based on four aspects that characterize holistic thinking style (Choi, Dalal, Kim-Prieto, & Park, 2003). First, holistic thinkers are more likely to pay attention to the relations between different objects and the larger "whole," whereas analytic thinkers pay more attention to individual objects (Choi, Koo, & Choi, 2007). As a result, when motivated to self-enhance, holistic thinkers may be more likely to view fluid products and domains as functionally related to their broader self-worth than analytic thinkers. Second, when making judgments, holistic thinkers are more likely to assume complex causalities, and thus they tend to consider more information as relevant in their decision-making (Choi et al., 2003). It follows that when faced with a self-discrepancy in one domain, holistic (vs. analytic) thinkers may be more likely to view products in unrelated domains as relevant to self-worth enhancement at the global level. Third, holistic thinkers are more likely to embrace change, and to view things, including their global self-worth and its sources, as dynamic and malleable (Spencer-Rodgers et al., 2009). Therefore, when faced with a self-discrepancy in one domain, holistic thinkers may be more likely to consider fluid, discrepancy-unrelated domains as alternative, viable

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sources of global self-worth. Finally, holistic thinkers are more accepting of contradictions, and are thus more likely to accept both positive and negative aspects of themselves (Spencer-Rodgers et al., 2009), which may enable them to more flexibly seek alternatives sources of global self-worth.

Building on this reasoning, we propose that in the presence of a self-discrepancy, which undermines feelings of global self-worth (Sherman & Hartson, 2011), holistic thinkers will be more likely than analytic thinkers to view fluid compensation as instrumental to their global self-worth enhancement. Instrumentality refers to the perceived probability that means will satisfy a goal (Vroom, 1964). In this research, we operationalize instrumentality as the belief or perceived probability that affirming the self in an unthreatened domain (i.e., fluid compensation) will successfully reduce a self-discrepancy at the global level. A large body of research suggests that when a goal is activated, people assess the extent to which objects and products are instrumental to achieving that goal (Lewin, 1935). The greater the association between the products and the goal, the greater the perceived instrumentality of these products (Shah & Kruglanski, 2003). Because fluid products are means to affirm the self in fluid domains, we predict that when confronted with a self-discrepancy in a domain, holistic (vs. analytic) thinkers will be more likely to perceive products in other important domains unrelated to the self-discrepancy as instrumental to enhance their self-worth at the global level, even though such products are not helpful at addressing the domain of the self-discrepancy.

Further, we propose that holistic (vs. analytic) thinkers' greater propensity to view fluid domains as instrumental to enhancing the global self-worth will facilitate fluid

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compensation. Indeed, prior research suggests that when a goal is activated, people like and want objects perceived as instrumental to attaining that goal (Kopetz et al., 2012; Lewin, 1935). To illustrate, Fitzsimons and Shah (2008) found that participants whose achievement goal was activated felt closer to their friends who were instrumental to their achievement goal than to those who were not. Ferguson and Bargh (2004) found that thirsty participants evaluated products that were more instrumental to their thirst-quenching goal (e.g., water) more positively than products of lower instrumentality (e.g., coffee). Applying the same logic, we predict that in the presence of a self-discrepancy, holistic thinkers will be more likely to engage in fluid compensation than analytic thinkers, because they perceive fluid products as more instrumental to enhancing their global self-worth.

H1: In the presence of a self-discrepancy, holistic thinkers will be more likely to engage in fluid compensation than analytic thinkers. In the absence of a self-discrepancy (control condition), thinking style will not have such an effect.

H2: Holistic (vs. analytic) thinkers' propensity to engage in fluid compensation will be mediated by the perceived instrumentality of fluid compensation in enhancing global self-worth.

We further aim to conceptually and empirically distinguish our proposed process from two other accounts that may produce similar effects. A first possibility is that, because holistic (vs. analytic) thinkers may be more likely to view self-domains as related to each other, a self-discrepancy in one domain may create discrepancies in other important domains (i.e., a spillover effect). If this explanation is true, fluid compensation may "solve" the problem by restoring a self-discrepancy that has occurred incidentally in

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an otherwise unthreatened domain. This account is consistent with some aspects that characterize holistic thinking (i.e., a focus on complex causalities and interrelationships among things), but less consistent with other aspects that characterize holistic thinking (e.g., a focus on the "whole"). While our instrumentality account is perhaps more parsimonious and consistent with all four aspects that characterize thinking style (Choi et al. 2007), we empirically test this alternative account in study 4 and follow-up study B.

A second possibility is that because holistic thinkers view their self-domains as more related to their global self, a domain-specific self-discrepancy may cause a larger global self-discrepancy for them than for analytic thinkers. This larger global self-discrepancy might make holistic thinkers more willing to compensate by any means available, such as fluid compensation. This account seems inconsistent with prior literature showing that Asian Canadians (holistic thinkers) and Caucasian Canadians (analytic thinkers) experienced similar level of threat to the self after reading an article that threatened them in a domain (White, Argo, & Sengupta, 2012). Nevertheless, we also examine this account empirically in study 4 and follow-up study B.

Self-Worth Restoration

A natural next question is whether and how a self-discrepancy gets restored following fluid compensatory consumption. In particular, does the magnitude of the self-discrepancy decrease, at either the domain level, the global level, or both? Prior research suggests that while fluid compensation does not restore the self-discrepancy in the threatened domain (Stone et al., 1997; Garbinsky, Mead, & Gregg, 2021), it can restore the self-discrepancy at the global level (Sherman & Cohen, 2006; Townsend & Sood,

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2012). Multiple studies that experimentally induced participants to engage in fluid compensation found that this strategy can effectively repair the global self (McQueen & Klein, 2006; Townsend & Sood, 2012). Building on our theory and these prior findings, we propose that after experiencing a self-discrepancy in a one domain and having the opportunity for fluid compensation in another domain, people with a holistic thinking style will demonstrate higher global self-worth than people with an analytic thinking style.

H3: After having the opportunity to engage in fluid compensation, holistic thinkers will have higher global self-worth than analytic thinkers.

Distinctions from Related Areas of Research

The construct of thinking style is related albeit conceptually distinct from construal level. Individuals with high-level construals represent events more in terms of their abstract and decontextualized features, relative to individuals with low-level construals (Lee, Keller, & Sternthal, 2010; Trope & Liberman, 2003). While at first blush it may seem that holistic thinkers represent events at high-level construals, their tendency to represent objects and events as part of a broader context (rather than in a decontextualized manner) seems inconsistent with such possibility.

The construct of holistic thinking is also conceptually distinct from self-complexity, which refers to the number of self-aspects a person has *and* the amount of overlap among those self-aspects (Linville, 1985). Compared to people low in self-complexity, people high in self-complexity possess a higher number of self-aspects and greater distinctions among these aspects (i.e., less overlap). While one may argue that holistic (vs. analytic) thinkers

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have higher self-complexity, their tendency to perceive objects as interrelated might results in higher overlap between various domains, and thus lower self-complexity.

Research Overview

We conducted five studies and three follow-up studies to test our predictions. Studies 1-2 examined the prediction that after experiencing a self-discrepancy, holistic (vs. analytic) thinkers are more likely to engage in fluid compensation (H1), by using different fluid domains and different types of incentive-compatible measures. Study 3 showed that following a self-discrepancy, holistic (vs. analytic) thinkers were selectively more likely to purchase a fluid product, but not more likely to purchase a self-neutral product. A follow-up field study, conducted on Facebook, provided externally valid evidence that holistic (vs. analytic) thinkers are more likely to engage in fluid compensation. Study 4 along with two follow-up studies provided evidence for the proposed mediating role of instrumentality (H2) and ruled out two alternative accounts. Study 5 examined whether holistic (vs. analytic) thinkers' greater propensity to engage in fluid compensation was effective at restoring global self-worth (H3). We report the study stimuli and measures of all the studies in Appendix A. Studies 2 - 5 were pre-registered.

Study 1

The objective of study 1 was to test the causal effect of self-discrepancy and thinking style on fluid compensation by manipulating both thinking style and self-discrepancy in the professional competence domain (H1). We measured fluid compensation in an important domain unrelated to the self-discrepancy (athleticism) using a consequential measure. We selected these domains (and the domains used in other studies)

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based on the results of a pretest, which showed that participants generally find these domains valuable (see also Hoegg et al., 2014; Sobol & Darke, 2014; Stone et al., 1997; for a review see Crocker & Wolfe, 2001). In addition, this pretest revealed that these domains are similarly valuable among holistic and analytic thinkers. Hence, any divergent pattern on these two constructs cannot be explained by domain importance. We predicted that in the presence of a professional competence self-discrepancy, holistic thinkers would be more likely to engage in fluid compensation in the athleticism domain than analytic thinkers, but not in the control condition.

Method

Three hundred M-Turk participants (39.3% female; median age = 32) completed this study in exchange for a small payment. Because we activated self-discrepancy in the domain of professional competence, we only recruited participants who were employed at the time of the survey. Participants were randomly assigned to conditions in a 2 (self-discrepancy: professional competence self-discrepancy vs. control) × 2 (thinking style: holistic vs. analytic) between-subject design.

We first manipulated thinking style by using an Embedded Figures Task (Lalwani & Shavitt, 2013; Monga & John, 2008). Participants viewed a black-and-white line drawing of a scene in which 14 objects (e.g., fish, key, and bird) were embedded. In the holistic thinking condition, we showed participants the scene and asked them to focus on the relationships and interactions between the objects and the background of the picture. Participants then wrote a story illustrating how the different objects and the background of the picture were connected. In the analytic thinking condition, we showed participants

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the same picture of the black-and-white line drawing, as well as a separate picture with the 14 objects displayed on a white background. We asked participants to find as many objects embedded in the scene as possible. Participants viewed an example illustrating the instructions before completing the actual task. Previous research has shown that instructing people to think (vs. not to think) about relationships between objects and the larger picture activates holistic (vs. analytic) thinking (Kühnen, Hannover, & Schubert, 2001). A pretest validated the manipulation by showing that it influenced thinking style, but not other constructs, such as construal level, the number of salient identities, or self-construal.

Next, we manipulated self-discrepancy in the domain of professional competence by using an essay-writing task (e.g., Lisjak et al., 2015; Rucker & Galinsky, 2008). Specifically, in the self-discrepancy condition participants described a time in their professional career that made them feel less professionally competent and knowledgeable than desired. Participants in the control condition recalled a time during their professional career that made them feel as competent and knowledgeable as desired. To ensure the effectiveness of the self-discrepancy manipulation, we assessed whether the self-discrepancy increased participants' level of psychological discomfort (Lisjak et al., 2015). Specifically, participants indicated on a 7-point scale (1 = Not at all, 7 = Very much) the extent they were feeling uneasy, bothered, and uncomfortable while recalling the event ($\alpha = .967$; Elliot & Devine, 1994).

Finally, to assess fluid compensation in the athleticism domain (i.e., an unthreatened domain), we told participants that as a "thank you" for their participation,

they would be entered in a raffle to receive a $25 bonus. They could choose to redeem part or the entire amount of the bonus as a gift card for the brand Nike or as cash. Thus, we used the amount of money participants decided to redeem in the form of the Nike gift card as an indicator of fluid compensation in the athleticism domain. In other words, participants could use Nike athletic clothing or gear to affirm their athleticism.

Because people tend to like cash more than gift cards of the same value, we specified that the amount they would choose to redeem as a Nike gift card would be doubled—a valuation that was determined based on a separate pretest conducted with participants from the same population. For example, participants were told that "If you choose to redeem $10 of your bonus as a Nike gift card and $15 in cash, you will actually get a $20 Nike gift card and $15 in cash. If you choose to redeem the entire amount as a Nike gift card, you will get a $50 Nike gift card and $0 in cash." After reading these examples, participants indicated how they wanted to redeem the bonus if they were to receive it. Specifically, they indicated the amount they wanted to redeem as a Nike gift card and the amount they wanted to redeem as cash. The sum had to equal $25. At the end, we measured participants' demographic information. After the data collection was complete, we gave the bonus to a randomly chosen participant.

Results and Discussion

Exclusion Criteria

In this and all other pre-registered studies in which we activated/manipulated professional competence self-discrepancy, we excluded participants who reported that they were not employed for wages or self-employed and those who did not complete the

self-discrepancy manipulation. In this study, nine participants did not meet these criteria, leaving a sample of 291 participants. All results remained significant without any exclusions.

Self-Discrepancy Manipulation Check

A 2 (self-discrepancy) × 2 (thinking style) ANOVA on psychological discomfort revealed the expected main effect of self-discrepancy ($F(1, 287) = 112.632, p < .001, \eta_p^2 = .282$), such that participants in the self-discrepancy condition reported higher psychological discomfort ($M = 4.32, SD = 1.76$) than those in the control condition ($M = 2.11, SD = 1.74$). The main effect of thinking style and the self-discrepancy × thinking style interaction were not significant (p's $> .479$). These results suggest that the self-discrepancy manipulation was successful.

Hypothesis Testing

A 2 (self-discrepancy) × 2 (thinking style) ANOVA on the amount of bonus redeemed in the form of the Nike gift card revealed a significant two-way interaction ($F(1, 287) = 5.367, p = .021, \eta_p^2 = .018$; see figure 2 top panel). When experiencing a professional competence self-discrepancy, holistic thinkers redeemed a larger portion of their bonus in the form of the Nike gift card ($M = \$9.37, SD = 10.45$) than analytic thinkers ($M = \$5.72, SD = 7.79; F(1, 287) = 6.004, p = .015, \eta_p^2 = .020$). In the control condition, holistic thinkers ($M = \$5.47; SD = 8.08$) and analytic thinkers ($M = \$6.75; SD = 9.66$) did not differ in the portion of the bonus they redeemed in the form of the Nike gift card ($F(1, 287) = .707, p = .401, \eta_p^2 = .002$). The main effects of thinking style and self-discrepancy were not significant (p's $> .178$).

Discussion

By using an incentive-compatible measure of fluid compensation, study 1 showed that when feeling professionally incompetent, holistic thinkers decided to redeem a greater portion of their bonus in the form of an athleticism-related gift card than analytic thinkers. This difference did not occur in the control condition. These results provide support for H1, that holistic (vs. analytic) thinkers are more likely to engage in fluid compensation.

Study 2

In study 2, we sought to provide convergent evidence for our focal prediction (H1). Whereas in study 1 we examined the effect of a professional competence self-discrepancy on fluid compensation in the athleticism domain, in study 2 we examined the effect of an athleticism self-discrepancy on fluid compensation in the intelligence domain. In addition, we measured self-discrepancy instead of manipulating it. Finally, we sought to test the robustness of our effect by using a different consequential measure of fluid compensation: interest in winning an intelligence-related t-shirt. Consistent with H1, we predicted that holistic thinkers would be more likely to compensate in the intelligence domain than analytic thinkers when experiencing a high athleticism self-discrepancy, whereas there would be no such difference when experiencing a low athleticism self-discrepancy.

Method

Participants were 515 students (50.3% female; median age = 20) from a large U.S. university who completed this study in exchange for course credit. We used an

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athleticism self-discrepancy (continuous) × 2 (thinking style: holistic vs. analytic) design, whereby the first factor was measured and the second factor was manipulated between subjects. This study was pre-registered.[1]

We first manipulated holistic versus analytic thinking style as in study 1. Next, we measured self-discrepancy in the domain of athleticism (adapted from Kim & Rucker, 2012). Specifically, we asked participants to indicate their current level and desired level of fitness on a 10-point scale (1 = Not fit at all, 10 = Extremely fit). Next, we displayed participants' self-discrepancy score, which was calculated by subtracting the current level from the desired one, with a higher number indicating greater self-discrepancy in the athleticism domain.

To measure fluid compensation, we told participants that we had an optional 2-minute writing task; if they completed the task, they would be entered into a drawing for an intelligence-related t-shirt with the inscription "Because Science." Specifically, five participants who completed the optional task would be selected to get the t-shirt. A pretest confirmed that participants viewed the t-shirt as intelligence-related, rather than athleticism-related, and thus an indicator of fluid compensation. Participants indicated whether they would like to complete the writing task (0 = No, I would not like to complete the writing task, 1 = Yes, I would like to complete the writing task). We reasoned that participants who are more motivated to engage in fluid compensation would be more willing to exert effort (e.g., engage in an extra task) to obtain a fluid product (Vroom, 1964; Scholl, 2002). At the end, we measured participants'

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[1] Pre-registration link: https://osf.io/t3esv/?view_only=64163b08cb8942dfbcb1fd9f6994b598

demographic information and debriefed them. After the data collection was complete, we

conducted the lottery and awarded the t-shirt to the winners.

Results and Discussion

Hypothesis Testing

After confirming that the thinking style manipulation did not impact the self-

discrepancy measure ($F(1, 513) = .309$, $p = .578$, $\eta_p^2 = .001$), we conducted a binary

logistic regression with athleticism self-discrepancy (mean centered), thinking style (1 =

holistic thinking, -1 = analytic thinking), and their interaction as independent variables,

and willingness to complete the extra writing task for an intelligence-related t-shirt as the

dependent variable. Consistent with H1, the analysis revealed the predicted two-way

interaction ($b = .168$, $z = 2.324$, $p = .020$; see figure 2 middle panel). Among participants

with a high athleticism self-discrepancy (1 SD above the mean), holistic thinkers were

more willing to engage in fluid compensation (complete an extra task for an intelligence-

related t-shirt) than analytic thinkers ($b = .465$, $z = 2.634$, $p = .008$). In contrast, among

participants with a low athleticism self-discrepancy (1 SD below the mean), there was no

difference between holistic and analytic thinkers ($b = -.111$, $z = -.646$, $p = .518$). The

simple effects of thinking style and athleticism self-discrepancy were not significant

(p's > .149).

Discussion

Study 2 provides further evidence that thinking style influences people's reliance

on fluid compensation. Specifically, participants with higher athleticism self-discrepancy

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were more willing to complete an extra task for an intelligence-related product in the

holistic thinking condition than in the analytic thinking condition.

Figure 2

Chapter 1 – Studies 1-3 Results: Fluid Compensation
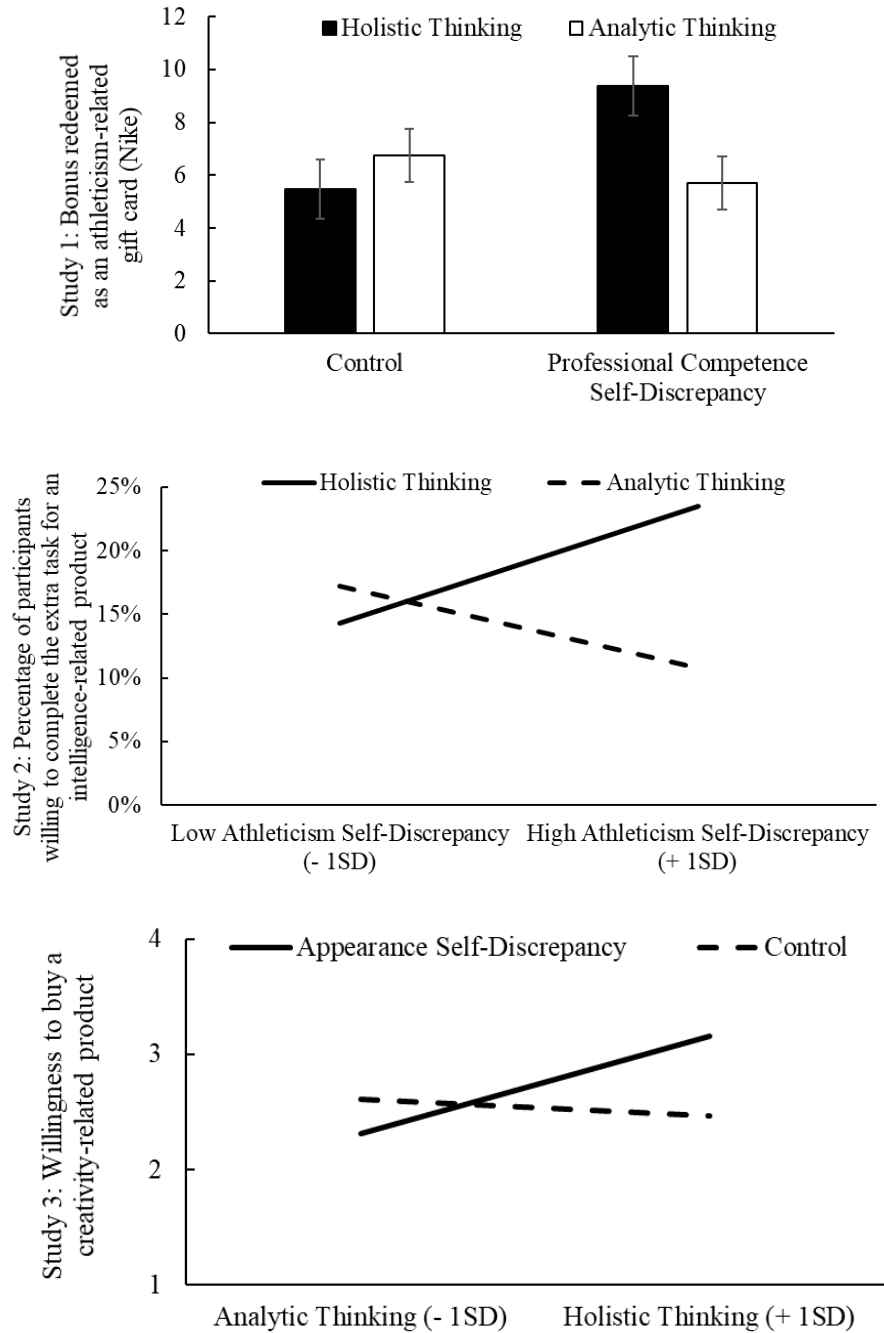
Study 3

Thus far, our findings provide evidence for H1 in the domains of professional competence and athleticism. In study 3, we examined whether our effects would generalize to other important domains. In addition, we manipulated self-discrepancy by using a more neutral control condition than in study 1, and we measured rather than manipulated thinking style.

A final goal of study 3 was to test the alternative explanation that our focal effect is driven by holistic (vs. analytic) thinkers' desire to distract themselves or restore their mood by buying more things in general (i.e., escapism; Mandel et al. 2017), rather than their desire to fluidly restore their self-worth. Previous research has shown that the mere act of buying something can operate as a distraction, thereby removing the focus on oneself and one's inadequacies (Mandel & Smeesters, 2008). Consistent with this idea, negative mood increases the amount people are willing to pay for a commodity (Cryder, Lerner, Gross, & Dahl, 2008). Furthermore, engaging in unplanned purchases and consumption can successfully repair one's mood (Atalay & Meloy, 2011). Therefore, it is possible that holistic thinkers may simply want to buy more products in general to distract themselves, rather than only fluid products. To examine this possibility, we manipulated a self-discrepancy in the domain of physical appearance (Park & Maner, 2009), and we then assessed participants' purchase intent for a creativity-related product (fluid compensation) and a neutral product that is unrelated to any important self-domains (distraction). Our prediction was that after experiencing a self-discrepancy in the appearance domain, holistic (vs. analytic) thinkers would display higher purchase intent

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for a creativity-related product. We did not expect the same effect on participants'

purchase intent for a self-neutral product.

Method

Participants were 282 U.S. university students (50.7% female; median age = 24

[two did not report gender and three did not report age]) who completed this study in

exchange for course credit. We used a 2 (self-discrepancy: appearance self-discrepancy

vs. control) × thinking style (continuous) design, whereby the first factor was

manipulated between subjects and the second factor was measured. This study was pre-

registered. [2]

Following prior research (Park & Maner, 2009), we first manipulated self-

discrepancy in the appearance domain by asking participants to think about one aspect of

their physical appearance/body/face that they do not like, and to write a brief essay about

it. In the control condition, participants recalled and wrote about what they did yesterday.

Next, we gave participants an ostensibly unrelated survey, which assessed their

willingness to purchase a creativity-related product (a set of tools to foster creativity and

problem-solving skills) on a 7-point scale (1 = Definitely do not want to purchase, 7 =

Definitely want to purchase), which we used as an indicator of fluid compensation in the

creativity domain. We also measured participants' willingness to purchase a self-neutral

product (a keychain). We counterbalanced the presentation order of the creativity-related

product and the self-neutral product. A pretest confirmed that the selected creativity-

related product functioned as means of fluid compensation and the keychain used in the

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[2] Pre-registration link: https://osf.io/w3h54/?view_only=c0a9221323e04f28beb6a2a98b5b99bf

study was self-neutral. Finally, we administered the 10-item analytic-holistic thinking scale (Choi et al., 2003). Participants indicated their agreement with items such as "Everything in the universe is somehow related to each other" and "Nothing is unrelated", on a 7-point scale (1 = Strongly disagree, 7 = Strongly agree; α = .776). At the end, participants reported their demographic information.

Results and Discussion

Exclusion Criteria

Following our pre-registered exclusion criteria and consistent with prior studies, we excluded nine participants, leaving a sample of 273 participants. All results remained significant without any exclusions.

Hypothesis Testing

We first confirmed that the self-discrepancy manipulation did not impact the thinking style measure ($F(1, 271)$ = .635, p = .426, η_p^2 = .002) and product order did not interact with thinking style and self-discrepancy (p's > .336). We then collapsed the data across product order. Next, we regressed participants' purchase intent for the creativity-related (fluid) product on self-discrepancy (1 = appearance self-discrepancy, -1 = control), thinking style (mean-centered), and their interaction. The results revealed a marginally significant simple effect of thinking style (b = .228, $t(269)$ = 1.688, p = .093, ß = .102). The simple effect of self-discrepancy was non-significant (p = .333). More central to our prediction (H1), the analysis revealed a significant self-discrepancy × thinking style interaction (b = .319, $t(269)$ = 2.366, p = .019, ß = .143; see figure 2 bottom panel). When experiencing an appearance self-discrepancy, holistic thinkers (1

SD above the mean) indicated higher purchase intent for the fluid (creativity) product than analytic thinkers (1 SD below the mean; $b = .547$, $t(269) = 2.738$, $p = .007$, $\beta = .245$). In contrast, in the control condition, holistic and analytic thinkers' purchase intent for the fluid product did not differ ($b = -.092$, $t(269) = -.505$, $p = .614$, $\beta = -.041$). We conducted the same regression on purchase intention for the self-neutral product (keychain) and, as expected, did not find any significant main effects or interaction effect (p's > .175).

Discussion

The findings of study 3 provide convergent evidence for our hypothesis (H1) that holistic thinking increases people's willingness to engage in fluid compensation. These results conceptually replicate studies 1 and 2 by activating a self-discrepancy in a different domain, thus increasing our confidence in the proposed effect. Furthermore, study 3 shows that holistic thinkers had greater purchase intent for a product that could fluidly restore their self-worth, but not for a self-neutral product that offers little opportunity for self-enhancement.

Follow-Up Study A

To provide further evidence for our phenomenon in the field, we conducted a Facebook study to test whether holistic thinkers rather than analytic thinkers engage in fluid compensation in the creativity domain in a realistic setting when experiencing a power self-discrepancy (versus not). We conducted two Facebook A/B split testing studies among users in two Western countries that differ in their thinking style (Choi et al., 2004): Mexico (holistic thinking) and United States (analytic thinking). In each country, we manipulated

self-discrepancy in the power domain in an ad for a free online course on creativity. Specifically, in the self-discrepancy condition participants read the tagline "Feeling powerless?" whereas in the control condition they read the tagline "Feeling Powerful?" (adapted from Dubois, Rucker, & Galinsky, 2012). A pretest validated the self-discrepancy, thinking style, and fluid product manipulations. A Facebook A/B split test among Mexican users (total impression = 311340 and total clicks = 4391) revealed that the click-through-rate was higher in the power self-discrepancy condition (1.46%) than in the control (1.36%; β = .076, SE = .030, Wald χ^2 = 6.232, p = .013), suggesting that Mexicans (holistic thinkers) engage in fluid compensation. The same test among American users (analytic thinkers; total impression = 73581 and total clicks = 406) did not reveal such differences (.57% vs. .53%; β = .070, SE = .100, Wald χ^2 = .498, p = .48).

Study 4

The objective of study 4 was twofold. First, we tested our proposed psychological process that holistic (vs. analytic) thinkers are more likely to engage in fluid compensation because they perceive fluid products as more instrumental to self-worth enhancement (H2). To test this prediction, we manipulated self-discrepancy in the professional competence domain, measured thinking style, and then examined their joint effect on fluid compensation in the athleticism domain, and the perceived instrumentality of the athleticism-related activity to self-worth enhancement.

Second, we tested our psychological account vis-à-vis two alternative accounts. One possibility is that, for holistic (vs. analytic) thinkers, a professional competence self-discrepancy may spill over to the athleticism domain, thus leading to higher willingness

to compensate in the athleticism domain. A second possibility is that a professional

competence self-discrepancy causes a larger global self-discrepancy for holistic (vs.

analytic) thinkers, thus leading to higher willingness to engage in fluid compensation in

the athleticism domain. To test these different psychological accounts, we measured the

effects of the self-discrepancy manipulation on participants' perceived standing in the

fluid domain and their perceived global self-worth.

Method

We recruited 402 participants (50.2% female; median age = 37) on M-Turk, using

the same prescreening criterion as in study 1. We used a 2 (self-discrepancy: professional

competence self-discrepancy vs. control) × thinking style (continuous) design, where the

first factor was manipulated between subjects and the second factor was measured. This

study was also pre-registered.[3]

We first manipulated professional competence self-discrepancy using the same

writing task as in study 1, except that in the control condition participants recalled what

they did yesterday. Next, we measured participants' willingness to engage in an

athleticism-related activity (share workout tips and insights with others) on a 7-point

scale (1 = Not at all, 7 = Very much) as an indicator of fluid compensation in the

athleticism domain. To measure our instrumentality account, we asked participants to

indicate the extent to which engaging in the fluid activity would increase their self-worth,

using a 5-item scale adapted from Crocker and colleagues (2003). Participants indicated

the extent to which engaging in the athleticism-signaling activity would: (1) make them

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[3] Pre-registration link: https://osf.io/yzd8n/?view_only=5668f44ff6a44841ac3afef7e2c438aa

feel good about themselves, (2) raise their self-esteem, (3) increase their sense of self-worth, (4) give them a sense of self-respect, and (5) make them feel worthwhile (1 = Not at all, 7 = Very much; α = .979).

To test the effectiveness of the self-discrepancy manipulation more directly, we asked participants to think back to the writing task and indicate how it made them feel in terms of their professional competence (1 = Not competent at all, 10 = Extremely competent). To examine alternative accounts, we asked participants to report how the writing task made them feel in terms of their athleticism (1 = Not athletic at all, 10 = Extremely athletic), and global self-worth (1 = Extremely low self-worth, 10 = Extremely high self-worth). Finally, participants completed the 10-item analytic-holistic thinking measure (Choi et al., 2003; α = .861).

Results and Discussion

Exclusion Criteria

Following our pre-registered exclusion criteria and consistent with other studies, we excluded five participants, leaving a sample of 397 participants. All results remained significant without any exclusions.

Self-Discrepancy Manipulation Check

A regression analysis with competence self-discrepancy (-1 = control, 1 = self-discrepancy), thinking style (mean-centered), and their interaction as predictors of participants' self-evaluation of professional competence revealed a significant simple effect of self-discrepancy (b = -1.063, t(393) = -8.786, $p < .001$, ß = -.399), such that participants felt less professionally competent after experiencing a competence self-

discrepancy versus control. The simple effect of thinking style was also significant (b = .528, $t(393)$ = 4.165, $p < .001$, ß = .191), suggesting that holistic thinkers felt more professionally competent than analytic thinkers. However, the self-discrepancy × thinking style interaction was non-significant ($p = .511$), which means that the reduction in the perceived level of professional competence caused by the self-discrepancy manipulation did not differ based on thinking style.

Hypothesis Testing

After ensuring that the self-discrepancy manipulation did not impact the thinking style measure ($F(1, 395)$ = .529, $p = .467$, η_p^2 = .001), we conducted a regression analysis with competence self-discrepancy (1 = self-discrepancy, -1 = control), thinking style (mean-centered), and their interaction as predictors of participants' willingness to engage in the athleticism-related activity. The results revealed a significant simple effect of thinking style (b = .414, $t(393)$ = 3.990, $p < .001$, ß = .197), such that holistic thinkers had a higher willingness to engage in the athleticism-related activity than analytic thinkers. The simple effect of competence self-discrepancy did not reach significance ($p = .578$).

More importantly and consistent with H1, the results revealed the predicted self-discrepancy × thinking style interaction (b = .364, $t(393)$ = 3.513, $p < .001$, ß = .173; see figure 3). When experiencing a professional competence self-discrepancy, holistic thinkers (1 SD above the mean) indicated higher willingness to engage in the athleticism-related activity than analytic thinkers (1 SD below the mean; b = .778, $t(393)$ = 4.982, p

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$< .001$, ß $= .370$). In contrast, there was no difference between holistic and analytic thinkers in the control condition ($b = .049$, $t(393) = .362$, $p = .717$, ß $= .024$).

Psychological Mechanism

We conducted the same regression analysis on instrumentality and found a simple effect of thinking style ($b = .473$, $t(393) = 5.122$, $p < .001$, ß $= .250$), such that holistic thinkers viewed the athleticism-related activity as more instrumental to self-enhancement than analytic thinkers. The simple effect of competence self-discrepancy was not significant ($p = .462$). More importantly, the self-discrepancy $\times$ thinking style interaction was significant ($b = .295$, $t(393) = 3.197$, $p = .001$, ß $= .156$; see figure 3), supporting H2. When experiencing a competence self-discrepancy, holistic thinkers (1 SD above the mean) were more likely to view the fluid activity as instrumental to enhancing global self-worth than were analytic thinkers (1 SD below the mean; $b = .768$, $t(393) = 5.524$, $p < .001$, ß $= .407$). In contrast, there was no difference between holistic and analytic thinkers in the control condition ($b = .178$, $t(393) = 1.462$, $p = .144$, ß $= .094$).

Moderated Mediation Analysis

To test our proposed theoretical model, we conducted moderated mediation analysis (Hayes, 2017, model 7, with 10,000 bootstrap resamples) with self-discrepancy as the independent variable, thinking style as the moderator, instrumentality to self-enhancement as the mediator, and willingness to engage in the athleticism-related activity as the dependent variable. The index of moderated mediation was significant ($b = .250$, CI_{95}: .0787, .4267). Specifically, among holistic thinkers (1 SD above the mean), instrumentality mediated the effect of competence self-discrepancy on willingness to

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engage in athleticism-related activity (b = .295; CI$_{95}$: .0643, .5271), but not among

analytic thinkers (1 SD below the mean; b = -.185; CI$_{95}$: -.3998, .0206).

Alternative Accounts

To test the possibility that a self-discrepancy in the competence domain may be

more likely to spill over to other domains for holistic (vs. analytic) thinkers, we

conducted the same regression on participants' self-evaluation in the athleticism domain.

No effect was significant (p's > .674). That is, a competence self-discrepancy did not

create an athleticism self-discrepancy for either holistic or analytic thinkers, ruling out a

discrepancy spillover account.

To test the possibility that a self-discrepancy in the competence domain may be

more likely to reduce global self-worth for holistic (vs. analytic) thinkers, we conducted

the same regression on participants' global self-worth level after the self-discrepancy

manipulation task. The results revealed a significant simple effect of self-discrepancy on

global self-worth (b = -1.058, t(393) = -9.091, p < .001, ß = -.408), such that participants'

global self-worth was lower after experiencing a competence self-discrepancy versus

control. The simple effect of thinking style was also significant (b = .589, t(393) = 4.833,

p < .001, ß = .219), suggesting that holistic thinkers reported higher self-worth than

analytic thinkers. More importantly, the self-discrepancy $\times$ thinking style interaction was

non-significant (p = .845). Consistent with our theory, holistic and analytic thinkers

experienced similar reductions in global self-worth following a competence self-

discrepancy.

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Figure 3

Chapter 1 – Study 4 Results: Fluid Compensation (Top) and Instrumentality of Fluid

Means to Self-Enhancement (Bottom)
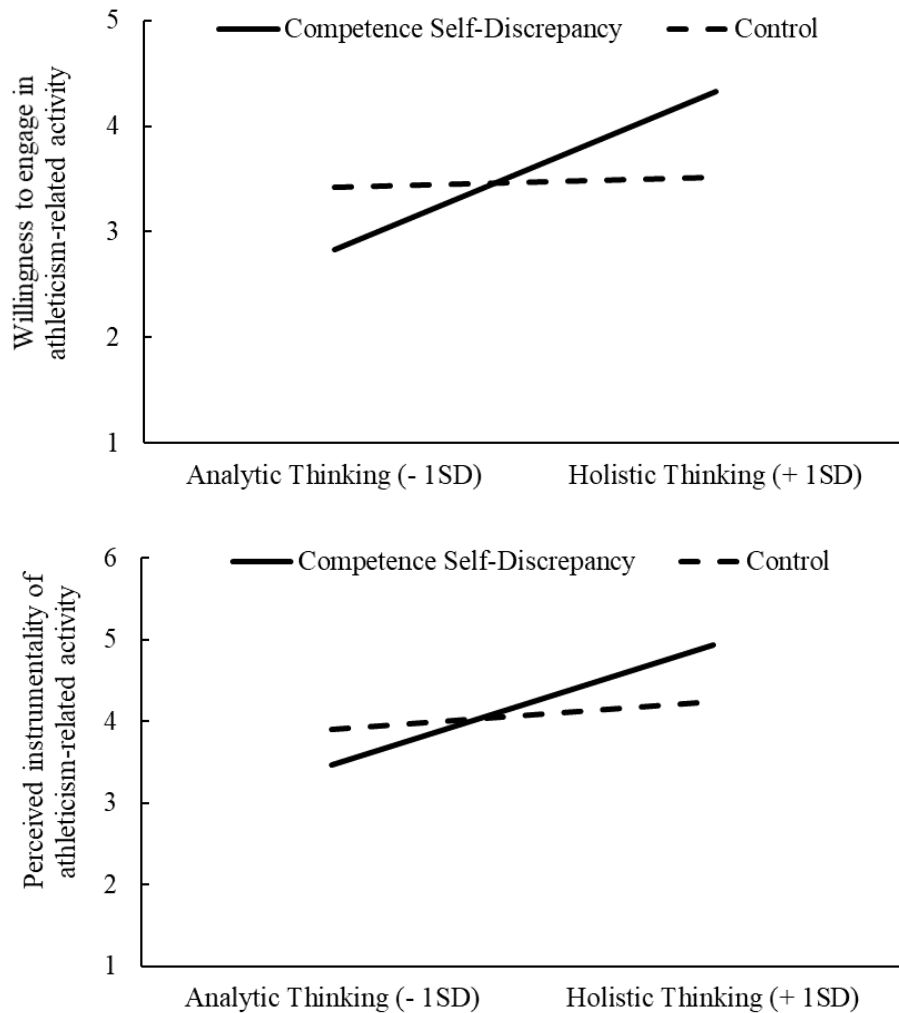
Discussion

Study 4 provides evidence that in the presence of a self-discrepancy, holistic (vs.

analytic) thinkers are more likely to engage in fluid compensation because they perceive

fluid products and activities as more instrumental to global self-worth enhancement than

analytic thinkers (H2). Further, this study shows that the self-discrepancy did not spill

over to the fluid domain. While in this study we assessed the impact of the self-discrepancy on the fluid domain after participants were provided with an opportunity to engage in fluid compensation, we further test the spillover account in follow-up study B, in which we measured participants' self-perception in the fluid domain immediately after the self-discrepancy manipulation.

Follow-Up Study B

We randomly assigned 288 undergraduate students to either the academic competence self-discrepancy condition or the control condition to complete the same writing task as in study 4. Immediately after this task, we measured participants' self-evaluations (1) in the domain of the self-discrepancy (academic competence; 1 = Not competent at all, 10 = Extremely competent), (2) in a fluid domain (athleticism; 1 = Not athletic at all, 10 = Extremely athletic), and (3) in terms of their global self-worth (1 = Extremely low self-worth, 10 = Extremely high self-worth). Finally, participants completed the 10-item analytic-holistic thinking measure (Choi et al., 2003) as in study 3. Consistent with the results observed in study 4, we found that the self-discrepancy manipulation (vs. control) lowered participants' self-evaluation in the domain of the discrepancy ($b = -.241$, $t(284) = -2.064$, $p = .040$, $\beta = -.121$). The discrepancy $\times$ thinking style interaction was not significant ($p = .999$), suggesting that the decrease in self-evaluation in the domain of the self-discrepancy did not differ based on thinking style. Further, we found that the self-discrepancy manipulation (vs. control) lowered participants' self-evaluation of their global self-worth ($b = -.281$, $t(284) = -2.233$, $p = .026$, $\beta = -.129$). This effect did not differ by thinking style ($p = .848$). To examine the

spillover account, we conducted the same analysis with self-evaluation in the fluid domain as the dependent measure. None of the effects were significant ($p's > .242$), ruling out a discrepancy spillover account.

Follow-Up Study C

Further, we sought to provide more nuanced evidence on how fluid compensation affects global self-worth via the fluid domain. One possibility is that holistic (vs. analytic) thinkers are more likely to believe that fluid products will *remind* them of their worth in the fluid domain, and in turn increase their global self-worth, a possibility consistent with literature on fluid compensation (Heine et al. 2006; Steele, 1988). Another possibility is that holistic (vs. analytic) thinkers are more likely to believe that fluid products will *boost* their worth in the fluid domain. To test these possibilities, we recruited 261 undergraduate students and activated a self-discrepancy in the academic competence domain among all participants. Afterwards, we measured participants' (1) propensity to engage in fluid compensation (dependent variable), (2) belief that the fluid activity will remind them about their abilities and worth in this domain (mediator 1), (3) the belief that the fluid activity will boost their worth in the fluid domain (alternative mediator 1), and (4) the belief that the fluid activity will increase their global self-worth (mediator 2), using a 7-point scale (1 = Not at all, 7 =Very much). A serial mediation analysis (Hayes, 2017, model 6, with 10,000 bootstrap resamples) revealed that the indirect effect of thinking style on fluid compensation was serially mediated by the belief that the fluid activity would remind participants of their existing worth in the fluid domain and in turn enhance global self-worth ($b = .153$; CI_{95}: .0385, .2694). A second

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serial mediation analysis showed that the indirect effect of thinking style on fluid compensation was not serially mediated by the belief that the fluid activity would increase their self-worth in the fluid domain and enhance global self-worth ($b = .011$; CI_{95}: -.1015, .1357).

Study 5

In study 5, we examined whether holistic (vs. analytic) thinkers' perception that fluid products are instrumental to self-enhancement is correct, and thereby enables them to enhance their self-worth at the global level (H3). In addition, we tested the possibility that fluid compensation enhances global self-worth by affirming existing levels of self-worth in fluid domains but not by boosting self-worth in these domains, as observed in follow-up study C. Finally, we examined whether, consistent with prior literature (Garbinsky et al., 2021; Stone et al., 1997), the act of fluid compensation might enhance global self-worth without changing one's perceived standing in the threatened domain.

Method

Participants were 619 university students (58.4% female; median age = 21 [one did not report gender and four did not report age]) who completed this study in exchange for course credit. We used a 2 (self-discrepancy: academic competence self-discrepancy vs. control) × thinking style (continuous) design, whereby the first factor was manipulated between-subjects and the second factor was measured. This study was pre-registered. [4]

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[4] Pre-registration link: https://osf.io/89w2z/?view_only=7f372951ffe04bd68cce174587eb7287

We first manipulated an academic competence self-discrepancy using the same writing task as in study 4. To measure fluid compensation in the athleticism domain, we presented participants with an ad for a fitness club named Fitness on Demand and measured their intention to subscribe to the advertised fitness club (1 = Definitely not subscribe, 4 = Definitely subscribe). After expressing their intention to subscribe, participants indicated their self-ratings of their athleticism (1 = Not athletic at all, 10 = Extremely athletic), academic competence (1 = Not competent at all, 10 = Extremely competent), and global self-worth (1 = Extremely low self-worth, 10 = Extremely high self-worth). Even though participants did not actually subscribe or complete any workouts, we reasoned that simply expressing their subscription intentions might remind them of their existing worth in the athleticism domain and/or restore their global self-worth. In a separate survey, participants completed the same analytic-holistic thinking scale as in study 3 (Choi et al. 2003; α = .815).[5] At the end, participants reported their demographic information.

Results and Discussion

Exclusion Criteria

Following our pre-registered exclusion criteria and consistent with other studies, we excluded seventeen participants, leaving a sample of 602 participants. All results remained significant without any exclusions.

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[5] To minimize the potential for this measurement to impact the actual study, the order of the main study and the survey measuring thinking style were randomized along with all other studies conducted in a one-hour lab session.

Hypothesis Testing

After confirming that the self-discrepancy manipulation did not impact the thinking style measure ($F(1, 600) = .743$, $p = .389$, $\eta_p^2 = .001$), we conducted a regression analysis with self-discrepancy (1 = competence self-discrepancy, -1 = control), thinking style (mean centered), and their interaction as predictors of participants' willingness to subscribe to the fitness club. The results revealed a significant simple effect of thinking style ($b = .082$, $t(598) = 2.228$, $p = .026$, ß $= .090$) and a significant simple effect of competence self-discrepancy ($b = .083$, $t(598) = 2.781$, $p = .006$, ß $= .112$). More importantly, the results revealed the predicted thinking style $\times$ competence self-discrepancy interaction ($b = .096$, $t(598) = 2.599$, $p = .010$, ß $= .105$; see figure 4 top panel). After experiencing a competence self-discrepancy, holistic thinkers (1 SD above the mean) indicated higher willingness to subscribe to the fitness club than analytic thinkers (1 SD below the mean) ($b = .177$, $t(598) = 3.311$, $p = .001$, ß $= .195$), replicating our effect (H1). In contrast, there was no difference between holistic and analytic thinkers in the control condition ($b = -.014$, $t(598) = -.271$, $p = .786$, ß $= -.015$).

Global Self-Worth After Compensation

The same regression analysis on global self-worth revealed a significant simple effect of thinking style ($b = .252$, $t(598) = 2.873$, $p = .004$, ß $= .117$). The simple effect of competence self-discrepancy was not significant ($p = .231$). More importantly, the results revealed a marginally significant thinking style $\times$ competence self-discrepancy interaction ($b = .154$, $t(598) = 1.759$, $p = .079$, ß $= .071$; see figure 4 bottom panel). After experiencing a competence self-discrepancy and being offered the opportunity to

subscribe to a fitness club, holistic thinkers (1 SD above the mean) reported higher global self-worth than did analytic thinkers (1 SD below the mean) ($b = .406$, $t(598) = 3.177$, $p = .002$, $\beta = .188$), supporting H3. In contrast, there was no difference between holistic and analytic thinkers in the control condition ($b = .098$, $t(598) = .813$, $p = .416$, $\beta = .045$).

The same analysis on the academic competence self-evaluation revealed a marginally significant simple effect of self-discrepancy ($b = -.111$, $t(593) = -1.757$, $p = .079$, $\beta = -.072$; five responses missing), suggesting that participants who experienced a competence self-discrepancy still perceived a lower academic competence level than those who did not experience a self-discrepancy, as consistent with prior literature (Garbinsky et al., 2021; Stone et al., 1997). No other effect was significant (p's > .185). The same analysis on the athleticism self-evaluation did not reveal any significant results (p's > .257), corroborating the results of follow-up study C.

Moderated Mediation Analysis

We then conducted moderated mediation analysis (Hayes, 2017, model 7, with 10,000 bootstrap resamples) with self-discrepancy as the independent variable, thinking style as the moderator, willingness to subscribe to the fitness club as the mediator, and global self-worth as the dependent variable. The index of moderated mediation was significant ($b = .023$; 95% CI: [.0013, .0575]). Specifically, for holistic thinkers, the indirect effect was significant ($b = .039$; 95% CI: .0053, .0841]), while for analytic thinkers, the indirect effect was not significant ($b = .001$; 95% CI: [-.0214, .0215]).

Figure 4

Chapter 1 – Study 5 Results: Fluid Compensation (Top) and Global Self-Worth after Compensation (Bottom)
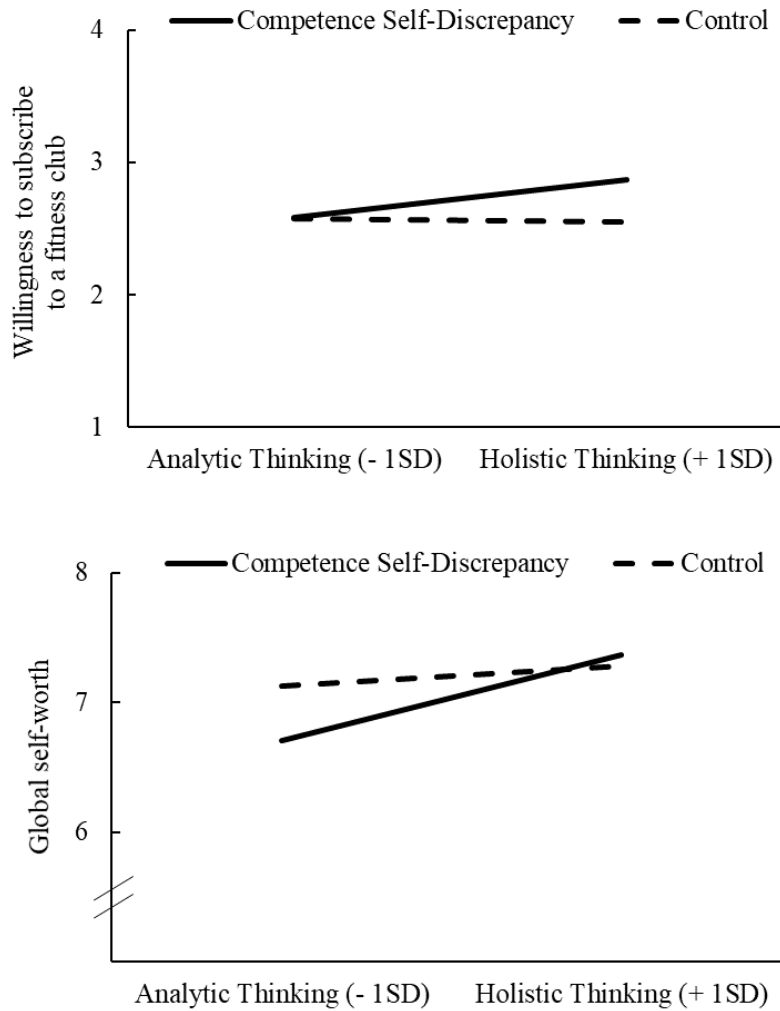
Discussion

Study 5 further demonstrates that holistic thinking increases people's willingness to engage in fluid compensatory consumption. Additionally, this study shows that after experiencing a self-discrepancy and having the opportunity to compensate fluidly, holistic thinkers indicated higher levels of global self-worth than analytic thinkers. These

results support the notion that fluid compensation (even when hypothetical) can successfully restore global self-worth, even though it does not repair the self in the domain of the self-discrepancy. Along with the findings from follow-up study C, the results suggest that fluid compensation helps people restore their self-worth at the global level by affirming rather than enhancing the self in fluid domains. That is, by engaging in fluid compensation, people are reminded of their positive self-worth in fluid domains, which in turn increases their global self-worth.

General Discussion

Across five studies and three follow-up studies, we demonstrated that holistic thinkers are more likely than analytic thinkers to rely on fluid compensation to cope with a self-discrepancy. When holistic (vs. analytic) thinkers experience a self-discrepancy, they are more likely to view fluid products as instrumental to enhancing their global self-worth, which enables fluid compensation. This effect is robust across different operationalizations of thinking style (manipulated and measured), different operationalizations of self-discrepancy (manipulated and measured), self-discrepancy domains (athleticism, competence, physical appearance, and power), domains of fluid compensation (athleticism, intelligence, and creativity), decision-making tasks (hypothetical, incentive-compatible, and real behavior), and populations (undergraduate students, online panel participants on M-Turk, and Facebook users). Finally, we showed that holistic (vs. analytic) thinking, by facilitating fluid compensation, enables people to more effectively restore self-worth at the global level.

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Theoretical Implications

Our findings contribute to the literatures on compensatory consumption, thinking style, and consumer well-being. First, whereas most research on compensatory consumption has examined consumption in the domain of the self-discrepancy (Mandel et al., 2017, 2020), this research examines when people compensate more indirectly via fluid compensation. We show that holistic thinkers are more likely to embrace fluid consumption than analytic thinkers.

Second, this research contributes to the literature on thinking style. Whereas prior literature has primarily focused on how thinking style influences the extent to which people perceive relations among objects (see Shavitt & Barnes, 2019 for a review), this research shows that thinking style also influences the extent to which people perceive different self-domains as instrumental to enhancing global self-worth. As such, holistic thinking could be viewed as a resource that enables people to more flexibly respond to self-discrepancies by taking advantage of the compensatory opportunities available.

Finally, this research contributes to the compensatory consumption literature by identifying a novel psychological process that leads to fluid compensation. Specifically, this research shows that fluid compensation is driven by the perceived instrumentality of fluid products in self-worth enhancement. Thus, highlighting the instrumentality of fluid products in self-worth enhancement should prompt people (both analytic thinkers and holistic thinkers) to adopt these products, enabling them to flexibly assuage self-discrepancies.

Implications for Public Policy Makers, Consumers, and Managers

According to the American Psychological Association (2017), approximately 75% of Americans reported experiencing stress in the last month. Further, studies show that many individuals use compensatory consumption to cope with stress, often caused by self-discrepancies (Lee et al. 2018). The current research shows that holistic thinking, by enabling individuals to seize the fluid compensatory opportunities at hand, successfully restores global self-worth. Thus, marketers and policy makers interested in consumer well-being can gently nudge consumers toward fluid compensation in their messaging, by highlighting the instrumentality of products in enhancing global self-worth or encouraging more holistic thinking. For examples, marketers may use visuals that prompt consumers to identify interconnections among objects and events, similar to the thinking style manipulation in study 1.

Our findings have also managerial implications for advertising. The Facebook field study shows that customer segments that have a more holistic thinking style find messages that portray products as opportunities to compensate fluidly as more compelling than segments that have a more analytic thinking style. Furthermore, marketers who advertise in magazines that showcase idealized models that make consumers feel deficient in some domains (beauty, athleticism, etc.), may use segmentation strategies to encourage fluid compensation among holistic thinkers, such as Asian or Latin consumers. That is, when advertising in media that have a more holistic readership (e.g., Asians, Latin), advertisers may choose to accompany editorial content that is likely to trigger a self-discrepancy in one domain (such as a profile of an idealized

athlete triggering an athleticism self-discrepancy or a highly successful business executive triggering a professional competence self-discrepancy) with advertisements that could affirm readers in alternative domains.

Limitations and Future Research Directions

While there are reasons to believe that all four aspects that characterize analytic-holistic thinking (i.e., causality, locus of control, perception of change, and attitudes towards contradictions) may drive the focal effect, we have not examined this issue empirically. To gain some preliminary insights on this issue, we examined how individual dimensions of holistic/analytic thinking may influence fluid compensation in the studies in which thinking style was measured (studies 3, 4 and 5). In these studies, we measured thinking style using the 10-item scale, which captures two dimensions of thinking style: causality and locus of attention (Choi et al., 2003). Consistent with our intuition that both dimensions of thinking style may underlie our focal effect, we found a significant self-discrepancy $\times$ causality interaction on fluid compensation in all three studies (p's < .018). Similarly, we found a marginally significant discrepancy $\times$ locus of attention interaction on fluid compensation in two studies (p's < .087) The pattern was consistent in the third study, although it did not reach conventional levels of significance (p = .243). To gain power, we collapsed the data across studies and found that both the self-discrepancy $\times$ causality interaction (b = .248, $t(1268)$ = 4.880, p < .001, ß = .135) and the discrepancy $\times$ locus of attention interaction (b = .132, $t(1268)$ = 2.566, p = .010, ß = .071) were significant. Together, these results provided preliminary evidence that both causality and locus of attention dimensions are driving the effect. Future research can

delve deeper into the role of all four dimensions of thinking style in shaping compensatory consumption (Choi et al. 2007).

Future research could identify other factors that influence one's propensity to engage in fluid compensation. One such factor relates to whether a self-discrepancy activates approach or avoidance motivation. Prior research has found that distinct self-discrepancies may elicit either approach (e.g., self-discrepancies in the intelligence) or avoidance motivations (e.g., loss of personal control), and thus lead consumers to take different coping strategies (Han, Duhachek, & Rucker, 2015). Specifically, a self-discrepancy linked to approach motivations fosters more problem-focused coping (i.e., managing the source of the self-discrepancy), whereas a self-discrepancy linked to avoidance motivations encourages more emotion-focused coping (i.e., regulating emotional responses). To the extent to which fluid compensation may be viewed as an emotion-focused strategy, people may be more likely to engage in fluid compensation when experiencing a self-discrepancy that elicits avoidance motivation. In contrast, compensation within the domain of the self-discrepancy is more likely to be viewed as a problem-focused strategy, thus people may be more likely to adopt this strategy when experiencing a self-discrepancy that elicits approach motivation.

Another interesting avenue for future research is to examine the consequences of engaging in fluid compensation on holistic thinkers' subsequent desire to improve themselves in the domain of the self-discrepancy. On one hand, fluid compensation could increase holistic (vs. analytic) thinkers' reliance on fluid domains as sources of self-worth, and in turn reduce their reliance on the domain of the self-discrepancy (Lisjak,

Lee, & Gardner, 2012; Vohs, Park, & Schmeichel, 2013). As a result, after compensating fluidly, holistic (vs. analytic) thinkers may be less likely to seek products that could repair themselves in the domain of the discrepancy. On the other hand, however, because fluid compensation does not address the self-discrepancy, holistic thinkers may still seek opportunities to repair themselves in the domain of the self-discrepancy.

Future research could also examine the implications of the current findings on the extent to which holistic and analytic thinkers view different products as substitutable in nature. Prior research shows that if a desired product is unavailable, people are more likely to choose within-category substitutes than cross-category substitutes (Hamilton et al., 2014; Huh, Vosgerau, & Morewedge, 2016). However, studies show that cross-category substitutes might be more effective (Huh et al., 2016). For example, Huh et al. (2016) found that when participants were craving a gourmet brand of chocolate that was unavailable, more participants selected a supermarket brand of chocolate (within-category substitute) than a granola bar (cross-category substitute), even though it was tested to be inferior in taste (less preferred) to the granola bar. Future research could examine whether holistic thinkers are more likely to choose cross-category substitutes than analytic thinkers.

CHAPTER 2

DIGITAL DISHONESTY OR AN EXTENSION OF THE SELF? HOW SELF-
CONSTRUAL SHAPES WILLINGNESS TO DIGITALLY ENHANCE APPEARANCE

Introduction

Consumers of the digital era of today often need to present their images online in various contexts (e.g., profile photos for different online platforms, photos shared on social media, video conferencing). With the advances of technology, a variety of powerful and simple-to-use digital appearance-enhancing tools such as photo editing apps, beauty cameras, and on-camera lighting are available in the market, enabling consumers to engage in digital beauty work and look the best possible in these contexts. Distinct from the beauty work people engage in real life on their faces and bodies (IRL beauty work) such as wearing makeup, digital beauty work enhances people's physical attractiveness in digital images or videos with no effort, because most of the digital appearance enhancement tools have default settings which provide instantaneous beauty enhancement with the click of a button.

Prior research has shown that women are judged negatively for engaging in effortful IRL beauty work to transform their appearance and consequently they are hesitant to purchase cosmetic products that require higher levels of effort (Samper, Yang, & Daniels, 2018). Recent research further demonstrated that consumers may actually spend more money on IRL beauty work for constructing an appearance of naturalness to signal low effort to others (Smith et al., 2022). However, no research has yet examined how consumers view the effortless digital beauty work and what psychological and

contextual factors are at play in shaping consumers' responses to such transformations. The present research addresses this gap with a dynamic view of cultural influence on digital beauty work and more specifically, we examine when distinctions in cultural values (e.g., interdependent vs. independent self-construal) would influence consumers' willingness to engage in digital appearance enhancement and when this effect would not be exhibited.

Evidence from the industry and prior research suggests that there are cultural differences in consumers' willingness to digitally enhance their appearance. For instance, Meitu, the world's top beauty app developer, reported that the total monthly active users in June 2021 were about 245.78 million, of which about 162.02 million users were from mainland China whereas only 83.76 million users were from all other countries. Similarly, Ma et al. (2017) found that more selfies (78%) collected from a Chinese microblogging platform, Sina Weibo, showed signs of digital editing, especially on individuals' appearance, than selfies collected from an American microblogging platform, Twitter (36%). Consistent with this finding, in a pilot study we conducted with 200 US undergraduates (128 Westerners and 72 Easterners), significantly more Easterners (36.1%) than Westerners (19.5%) reported that they had ever used one or more photo-editing apps prior to taking the survey ($\chi^2(1) = 6.67$, $p = .01$). While these findings suggests that Asians (interdependents) are more likely to engage in digital beauty work than Westerners (independents), we argue that this cultural influence is dynamic and propose that the inclination of interdependent (vs. independent) consumers to use digital appearance-enhancing tools to make themselves look better in photos or

videos only arises when they see both the original and beautified images side-by-side (i.e., joint presentation mode), but not when they see only the beautified image in isolation (i.e., separate presentation mode).

Allowing consumers to see both the actual self (as conveyed with the original image) and the ideal self (as conveyed with the beautified image) at the same time (joint presentation) is unique to the context of digital beauty work (vs. IRL beauty work). When a moderate enhancement of appearance is made, although joint presentation most clearly conveys the effectiveness of the enhancement tool in a traditional problem-solution framework (Hoyer, Maclnnis, & Pieters, 2016), it also makes the discrepancy between the actual and beautified (ideal) self even more salient, which can elicit greater concerns about the degree to which one feels they are reflecting their true self to others and thus make the tension between a desire to look good and a desire to be true to the self salient. We propose that this divergence elicits different responses from interdependents (vs. independents) such that interdependents see a desirable, beautified image as closer to who they truly are because they view the self as more malleable and value consistency much less whereas independents see the self as stable, believing that there is one "true" nature to a person or "real" self (Cross, Gore, & Morris, 2000). As a result, we propose that interdependents will be more likely than interdependents to digitally enhance the self under joint presentation. This response is consistent with the tendency of interdependents to be less likely to compare themselves to close others, but instead to bask in their reflected glory (Gardner, Gabriel, & Hochschild, 2002; Cheng & Lam, 2007). In contrast, we propose that there is no difference in how interdependents vs. independents view

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themselves or their desire to use digital appearance enhancement tools under separate presentation, when consumers only see the beautified (ideal) self in isolation, because the discrepancy between actual and idea self is not salient in this context and the tension between a desire to look good and the desire to be true to the self is not evident.

The present research makes several important contributions to the literature. First, consumer research within the realm of beauty work is scant and the few existing articles examine effortful IRL beauty work that people, specifically women, engage with samples only from western cultures (e.g., Samper et al., 2018). The current research is among the first to investigate the effortless digital beauty work that both women and men can engage in to digitally enhance their appearance, while not making any changes to their actual appearance. Such a context also allows people to be in joint presentation mode and see both the actual and ideal selves simultaneously, which we argue is a condition that activates different responses to digital beauty work from interdependent and independent consumers. In contrast, this cultural influence is not exhibited under separate presentation mode. Second, while previous research suggests that consumers value authenticity and want to present their true and authentic selves (Wood et al., 2008; Beverland & Farrelly, 2010), we show that what consumers view as their true self differs based on their sense of self-construal (independent vs. interdependent) and presentation mode. Third, we demonstrate that consumers' perceived overlap between their beautified self and their true self is a key determinant of their willingness to use digital appearance-enhancing tools to make themselves look better digitally. Fourth, this research adds to the self-construal literature by illustrating that not only do interdependents see more

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connections and overlap between themselves and their significant others (Markus &

Kitayama, 1991), they also see larger overlap between their own different selves (e.g.,

their true and beautified self). Finally, our findings suggest important implications for

marketers that a typical problem-solution strategy (Hoyer et al., 2016) they often use in

marketing campaigns of digital appearance enhancement tools (e.g., present consumers

with original and beautified faces of models side-by-side in ads) can sometimes be

detrimental to the company, especially in markets where consumers have a more

independent self-construal, such as in western cultures.

Theoretical Framework

Fundamental Motivations in How People Want to be Perceived

There are two fundamental motivations in how people want to be perceived by

others that are activated in the process of deciding whether to digitally enhance one's

appearance or not. First, self-presentation motives are the intentional and tangible

components of identity (Goffman, 1959). People often engage in self-presentation to

project a desired impression and communicate the desired self to others (Goffman, 1959;

Schau & Gilly, 2003; Williams & Bendelow, 1998). In the offline world, consumers

often engage in beauty work, such as complex skincare routines and intricate make-up

regimens, to convey desired impressions to others in different contexts (Kwan &

Trautner, 2009; Samper et al., 2018, Smith et al., 2022). In the online world, virtual and

computer-mediated environments allow individuals to selectively present themselves

(Walther, 1996) almost effortlessly; most of the digital appearance enhancement tools

have default settings which provide instantaneous beauty enhancement with the click of a

button. These technological advances satisfy people's needs to enhance their appearance in photos and videos that are shared online, thereby selectively presenting a better self that is congruent with the desired self (Schau & Gilly, 2003) but that may differ from their actual physical, offline image (Mendelson & Papacharissi, 2010; Turkle, 1995; Hancock & Toma, 2009; Chae, 2017).

The second motivation activated is the desire to present the true self. While the technology now exists to digitally enhance one's appearance to near-ideal levels, it is well-documented that people also want to present their true self, or their perception of how they think they really are, to others, because they perceive it as more authentic and virtuous (Newman, Freitas, & Knobe, 2015; Strohminger, Knobe, & Newman, 2017; Gino, Kouchaki, & Galinsky, 2015). However, a critical impasse arises when people use digital appearance enhancement tools to make themselves look better because these digital improvements in appearance can be viewed as a distortion of the truth—the beautified photo/video presents an image to others that is different from the original, and by extension, from the actual self (Chae, 2017; Bij de Vaate et al., 2018).

In sum, people may want to digitally enhance their appearance to present the best-looking version of themselves due to self-presentation concerns, yet they are also motivated to present their true self. This creates a tension between a desire to look good and a desire to be true to the self, which is even more evident when original and beautified digital images are presented side-by-side (i.e., joint presentation). We argue that the degree to which people see the beautified self as overlapping with their true self

helps to reconcile this tension, and predicts willingness to digitally enhance appearance via beauty apps and other tools, as we discuss next.

Self-Overlap and Digital Appearance Enhancement

Previous research has shown that people have many different facets of the self (Whitman, [1855] 1964; Markus & Nurius, 1987; Higgins, 1987), such as the actual self, the ideal self, and the true self (see table 1 for definitions). When using tools such as a beauty app to digitally enhance one's appearance, we argue that the original photo and the beautified photo represent physical manifestations of the actual self and the ideal self, respectively. Unlike both the actual and the ideal self which could exist physically (Bargh, McKenna, & Fitzsimons, 2002), the true self exists psychologically, and it represents how people think they really are, deep down inside (Rogers, 1951). People tend to view their true self as the most authentic and virtuous (Newman, Bloom, & Knobe, 2013).

Table 1

Chapter 2 – Definitions of Various Self-Concepts

Self-concept	Definition	Image Representation	Applied Existence
Actual self	The way in which you actually see yourself now (Higgins, 1987).	The self represented in the original photo.	Physically
Ideal self	The way in which you would like to see yourself (Higgins, 1987).	The self represented in the beautified photo.	Physically
True self	Who you really are, deep down inside (Rogers, 1951).	Perception varies based on self-construal.	Psychologically

To date, little research has considered how people view the actual and ideal self as related to the true self, and the downstream consequences of these relationships. We propose that the psychological connectedness of these selves—in other words, the

overlap between the ideal self (also referred to as the beautified self) and the true self—influences consumers' intentions to digitally enhance the self via beauty apps and other digital appearance enhancement tools (see figure 5 for illustration of a small vs. large self-overlap). When consumers see larger overlap between their beautified and true selves, using tools to enhance their appearance digitally satisfies both their desire to look good and to be true to themselves. Because the beautified and true self are overlapping, there is no tension in the motivation to look good and the motivation to be authentic. As a result, when the beautified and true self are overlapping, consumers will be more likely to use digital appearance enhancement tools to improve their image. As described below, we further identify two factors—self-construal and presentation mode—that interact to change information processing and consequently the degree of overlap that consumers perceive between their beautified and their true selves.

Figure 5

Chapter 2 – Illustration of Small vs. Large Self-Overlap
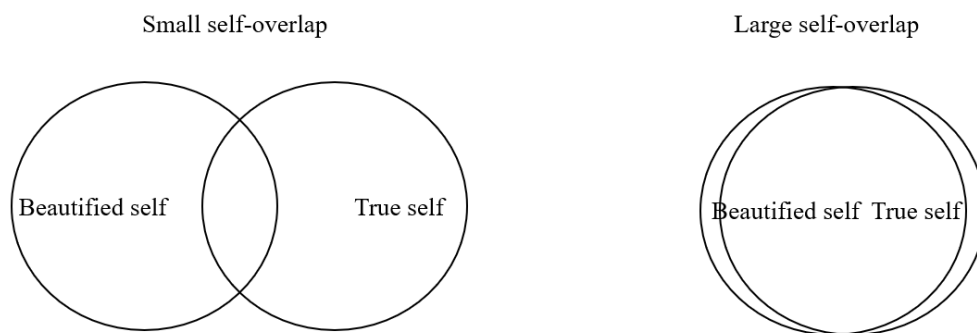
Self-Construal, Presentation Modes, and Self-Overlap

People differ in how they view themselves in relation to close others. Individuals with a more interdependent self-construal view themselves as more interconnected and closely interwoven with others than those with a more independent self-construal (Markus & Kitayama, 1991). Consistent with this notion, a large body of cross-cultural research shows that Eastern (e.g., Chinese) consumers are more collectivist and have an interdependent self-construal, whereas Western (e.g., American) consumers are more individualistic and have an independent self-construal (Morris & Peng, 1994; Oyserman & Lee, 2008). One's level of interdependent versus independent self-construal can vary not just by culture, but also by dispositional differences (Singelis, 1994), demographic traits such as gender (Cross & Madson, 1997), religion (Cohen, 2015), geographic region within the United States (Cohen, 2009; Vandello & Cohen, 1999), or decision context (for a review, see Oyserman & Lee, 2008). For example, working-class Americans score higher on interdependence and display more interdependent values such as adjusting and responding to others, connecting to others, and being part of a social group than middle- or upper- class Americans (Stephens et al., 2012). Importantly, an individual's sense of self-construal may determine cognitive and motivational processes in the service of maintaining connectedness with close others (Nisbett et al., 2001), and may also affect a range of consumer behaviors, including risk-taking (Mandel, 2003), impulsive consumption (Zhang & Shrum, 2009), and price-quality judgments (Lalwani & Shavitt, 2013).

In the current work, we propose that self-construal also shapes people's willingness to digitally enhance the self as well as how they respond to different types of ad appeals for digitally enhancing products. Specifically, we demonstrate that the way beautified digital images are presented (i.e., with or without the original image in separate vs. joint evaluations) interacts with self-construal to impact people's willingness to digitally enhance their appearance. This work builds on and extends recent research showing that interdependents (vs. interdependents) are more interested in appearance-enhancing products due to greater conformity to social norms (Madan et al., 2018). Our work examines this question beyond social norms and from a more dynamic constructivist approach (Morris & Peng, 1994; Briley, Morris, & Simonson, 2000), focusing specifically on presentation type and the role of perceived overlap with the true self.

Prior research has shown that consumers' preferences can shift or even reverse when viewing stimuli separately vs. jointly (Bazerman, Loewenstein, & White, 1992; Hsee & Leclerc, 1998; Hsee et al., 1999). This occurs because the attributes of stimuli vary in their evaluability—some attributes are easy to evaluate independently (e.g., one's physical attractiveness in a photo), whereas others are difficult to evaluate independently (e.g., the extent to which one's appearance has been altered in an edited photo). According to the evaluability hypothesis, in separate presentation mode, easy-to-evaluate attributes play primary roles and difficult-to-evaluate attributes have little impact, while in joint presentation mode, difficult-to-evaluate attributes become easier to evaluate and hence play a stronger role (Hsee et al., 1999). Applying the evaluability hypothesis to the

current context, when consumers are in joint presentation mode and can see both the actual self and the ideal (beautified) self side-by-side at the same time, the discrepancy between the selves becomes much more salient. In contrast, in separate evaluation mode when consumers only see the ideal self in isolation, apart from the actual self, the discrepancy between the selves is not evident. We argue that the degree of salience of the discrepancy between the two selves elicits different responses towards using digital appearance enhancement tools from independents versus interdependents.

More specifically, we contend that joint presentation polarizes responses based on self-construal. Joint presentation highlights the very attractive ideal self and the actual self, making the discrepancy between the two selves evident, which magnifies the tension between a desire to look good and the desire to be true to the self. Thus, we posit that when interdependents (vs. independents) see the actual self and the ideal (beautified) self side-by-side (joint presentation), the salient discrepancy allows them to recognize and appreciate the enhancement of their attractiveness to a greater degree. Furthermore, because interdependents (vs. independents) are more comfortable with and hold a more expansive view of the self (Cross et al., 2002; Markus & Kitayama, 1991), they perceive their true self to be more proximal to the beautified self. As a result, interdependents (vs. independents) see the beautified self as overlapping more with the true self and the larger overlap helps reconcile the tension between the desire to look good and the desire to be authentic. Since they believe their beautified self overlaps with their true self, they can look good while also presenting what they view as their authentic self. Thus, in joint

presentation, we propose that interdependents (vs. independents) should be more likely to digitally enhance their appearance.

We argue this happens for several reasons. First, prior research has shown that consistency is less valued and emphasized in collectivist than individualistic cultures, such that while independents tend to believe there is one "true" nature to a person, interdependents see the self as more malleable (see review by Cross, Bacon, & Morris, 2000). For interdependents, maintaining self-integrity is more the result of fitting into the expectations of specific roles and situations as opposed to consistency across situations (Cross et al., 2003). Attesting to their ability to expand the self and what it comprises, interdependents also do not appear threatened by comparisons to a close other, but instead are more likely to bask in their reflected glory (Cheng & Lam, 2007; Gardner, et al., 2002). To illustrate, when comparing themselves to fellow schoolmates who performed better than them in a reading comprehension test, interdependents reported reflected-glory assimilation from these excellent fellow schoolmates and experienced more positive self-evaluations (Cheng & Lam, 2007). By applying the same logic, we predict that when they see a comparison of the actual self and the beautified self, interdependents (vs. independents) are more likely to appreciate and feel closer to the beautified self.

Finally, previous research suggests that when a self-discrepancy is salient, interdependents are more likely to exhibit a self-improvement orientation in the relevant domain since they view the threatened aspect of the self as improvable and the ideal self as attainable (Heine et al., 2001). In contrast, independents view their attributes as stable

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and constant across situations (Cross et al., 2000; Markus & Kitayama, 1991) and exhibit

a stronger self-verification (people pursue highly certain self-knowledge) motivation than

interdependents (Spencer-Rodgers et al., 2009). Thus, when the discrepancy between the

actual and ideal self becomes salient in joint presentation, interdependents (vs.

independents) should tend to see the beautified self as the attainable self and thus

internalize it as the true self, whereas independents should tend to focus on the actual

self, and thus view the beautified self as an inaccurate representation of themselves.

Based on these reasons, we propose that interdependents (vs. independents) see greater

overlap between their own different selves (beautified and true self), and thus are more

willing to digitally enhance their appearance when they are in a joint presentation mode.

In contrast, when consumers see the ideal (beautified) self in isolation in separate

presentation mode, the discrepancy between the actual self and the beautified self is not

salient. Without the opportunity to compare the two photos side-by-side, it is more

difficult to judge the extent to which the photo has been modified (Nightingale et al.,

2017), especially when only subtle or relatively moderate enhancements of appearance

are made. As a result, the overall attractiveness of the modified image is the primary

attribute shaping consumers' self-overlap perception and subsequent responses to digital

appearance enhancement tools. Because all consumers are motivated to maintain a

positive self-view (Steele, 1988) and *want* their true self to be as consistent with their

ideal self as possible (Ellison, Heino, & Gibbs, 2006), when presented with the beautified

self in isolation, both independents and interdependents are equally likely to accept the

beautified self as their true self. Put another way, all consumers want their true self to

look like their ideal self, so when they are only presented with one (beautified) photo that does not make the discrepancy between their true and ideal self salient, they choose to believe that it is an accurate representation of their true self. Formally, we predict:

H1: There will be an interactive effect of consumers' self-construal and presentation mode (joint vs. separate) on consumers' willingness to digitally enhance their appearance.

     a. In joint presentation mode, when consumers see both the actual and beautified images, interdependent (vs. independent) consumers are more willing to digitally enhance their appearance via beauty enhancement tools.

     b. In separate presentation mode, when consumers only see the beautified images, interdependent and independent consumers are equally willing to digitally enhance their appearance via beauty enhancement tools.

H2: In joint presentation mode, the perceived overlap between the beautified self and the true self mediates the effect of interdependent (vs. independent) self-construal on consumers' willingness to digitally enhance their appearance.

Notably, the interaction between self-construal and presentation mode suggests these effects are not simply due to greater tendencies for interdependents (vs. independents) to conform to social norms (Trafimow et al., 1991; Ybarra & Trafimow, 1998), or more greatly value physical appearance (Madan et al., 2018). Further, the mediation by perceived overlap specifically highlights the role of the self in driving these effects. We test the role of social norms and the importance of enhancing one's physical appearance digitally to rule out these alternatives empirically.

Research Overview

We test our predictions across six studies including a Facebook field experiment, Google Trends analysis and lab experiments. Specifically, Study 1 provides initial correlational evidence for the predicted effect under joint presentation, by demonstrating that interdependents (vs. independents) are more willing to choose a beautified (vs. original) photo for a potential ID card to be used by the lab when they see both versions of the photo at the same time. Studies 2 and 3 then test the interaction effect of self-construal and presentation mode on willingness to digitally enhance appearance, while also providing support for the underlying process. Study 4 provides further evidence for the proposed psychological mechanism and reveals a boundary condition by manipulating the degree of discrepancy between the original and beautified self. Finally, studies 5 and 6 provide evidence with data from the field that under joint presentation mode, consumers from cultures characterized as interdependent (vs. independent) are more interested and attracted to digital appearance enhancement tools. Together, these studies provide converging evidence for our proposed conceptual model. We report the study stimuli and measures of all the studies in Appendix C. Studies 4 and 6 were pre-registered.

Study 1

The objective of study 1 is to provide initial evidence showing that under joint presentation mode, when consumers view the original and beautified image side by side, interdependent (vs. independent) self-construal positively correlates with consumers' willingness to digitally enhance their appearance, by measuring dispositional self-

construal and using a consequential measure. To this end, we create a context in which

lab participants have the opportunity to choose an original or beautified photo of

themselves for a "Lab ID card" that is being considered at the university. Thus, we use

self-construal as the independent variable and the choice of the beautified (vs. original)

photo as an indicator of willingness to digitally enhance their appearance. We predict that

in this context, participants with a more interdependent (vs. independent) self-construal

will be more likely to choose the beautified (vs. original) photo for the lab ID card.

Because we are asking participants to select between two photos that they see side by

side, the study only examines responses under joint presentation. Notably, the context of

selecting a profile photo to display to others is very common with the undergraduate

population.

Method

Participants were 308 students (49.7% female; median age = 21) from a large US

university who completed this correlational study in exchange for course credit.

We told participants that the lab was considering providing each participant with a

lab ID card and wanted to get their feedback on the design of the card and the style of the

photo to print on the card. Next, a research assistant directed each participant to a

separate room where a green photo backdrop was set up. The research assistant then took

a photo of the participant on a laboratory smartphone using the BeautyPlus app, set on

"Beauty Camera" mode, which enhances and beautifies people's appearance

automatically as it takes a picture. We set the app to also save the original, unbeautified

photo so that participants could see their beautified and original photos at the same time,

side by side. After reviewing both photos, participants chose whether they wanted the original or beautified photo for their lab ID card. This choice was used as an indicator of their desire to digitally enhance their appearance. To bolster our cover story, we also gave participants two ID card designs to choose from. These two designs are the same except that one is in landscape format and the other is in portrait format. We also measured how much participants liked the idea of a lab ID card on a 7-point scale (1 = Not at all, 7 = Very much). By doing so, we also aim to test whether self-construal is associated with participants' aesthetic preference more broadly, or just the preference of presenting a beautified image on their lab ID card.

In a separate survey conducted as part of the lab session, participants responded to a dispositional measure of self-construal (Singelis, 1994), in which participants rated the extent to which they agreed with 30 items such as "I feel my fate is intertwined with the fate of those around me" and "I enjoy being unique and different from others in many respects" on a 7-point scale (1 = Strongly disagree, 7 = Strongly agree). We computed the mean scores of the 15 items measuring interdependence ($M = 4.86$, $SD = .76$, $\alpha = .82$) and the 15 items measuring independence ($M = 4.96$, $SD = .78$, $\alpha = .82$). Next, we subtracted the independence from the interdependence score so that higher numbers indicated more interdependence (Hong & Chang, 2015). At the end, participants also reported their demographic information, including their ethnicity.

Results and Discussion

A binary regression with self-construal as the independent variable and participants' choice of photo (0 = the original photo, 1 = the beautified photo) as the

dependent variable revealed that self-construal had a significant positive association with participants' choice of beautified photo ($b = .353$, Wald χ^2 (1) = 6.855, $p = .009$). Interdependent participants were more likely to choose the beautified ID photo than independent participants. The same analysis on participants' choice of lab ID card design didn't reach significance ($p = .366$), suggesting that self-construal is only associated with participants' preference of presenting a beautified ID photo, but not their general aesthetics preference. Self-construal does not have a significant correlation with participants' liking of the lab ID card idea either ($p = .934$). We also test the correlation of choice with ethnicity (Asian vs. Westerner) as another possible operationalization of self-construal and thus provide further evidence for the prediction. [6]

       In sum, study 1 documents the association between self-construal and willingness to digitally enhance appearance when participants are presented with both options by showing that interdependent (vs. independent) individuals are more likely to select a beautified (vs. original) photo of themselves for a lab ID card. As described, participants were in joint presentation mode due to the nature of making a choice between photos. Notably, such a presentation mode is quite common: many digital appearance-enhancing tools such as the BeautyPlus app from this study present side-by-side original and beautified photos in ad appeals, thereby displaying the actual and the ideal self

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[6] Previous research has shown that East Asians are more interdependent whereas Westerners are more independent (Morris & Peng, 1994; Oyserman & Lee, 2008). To further validate this effect, we categorized participants as Westerners (n = 216) and Asians (n = 78) based on their ethnicity (14 participants who did not report ethnicity or indicated mixed ethnicity were excluded from analyses) and tested the correlation of choice with ethnicity (Asian vs. Westerner) as another possible operationalization of self-construal. Analysis revealed significantly more Asians (53.8%) chose the beautified photo than Westerners (23.1%; Wald χ^2 (1) = 24.972, $p < .001$).

simultaneously. On the other hand, other apps and some mobile devices offer built-in features that automatically enhance consumers' appearance once they take a picture, thereby displaying only the beautified photo (i.e., separate presentation). While joint presentation highlights the app effectiveness, it may be less appealing to some consumers if the discrepancy in the images makes consumers feel less authentic. An alternative is to display the products in separate presentation mode, where people see only the final, digitally enhanced image, an option chosen by many Beauty App Cameras (e.g., BeautyCam, Selfie Camera). Thus, in the next study, we test the interaction of dispositional self-construal and joint vs. separate presentation mode on willingness to digitally enhance appearance and explore the underlying process.

Study 2

The objectives of study 2 are threefold. First, we want to test the interactive effect of self-construal and presentation mode on consumers' willingness to digitally enhance their appearance. Second, we test the mechanism that underlies interdependents' (vs. independents') willingness to digitally enhance their appearance. To this end, we give participants the opportunity to directly interact with the BeautyPlus app on a laboratory smartphone and take a beautified selfie with it. To manipulate presentation mode, participants either see only the beautified selfie or both the original and beautified selfies, side by side. Afterwards, we measure their willingness to use the beauty app and the perceived self-overlap between the beautified self and the true self. We predict that participants with a more interdependent (vs. independent) self-construal will be more willing to use the beauty app under joint presentation because they see the beautified self

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as more overlapping with the true self, whereas there will be no such difference among participants in the separate presentation mode. In this study, we also test social norms as an alternative explanation.

Method

This study was conducted before the pandemic, and we recruited 197 participants (49.2% female; median age = 21; ages 18-37) from a large U.S. university to complete this study that involved usage of a beauty app available in the market on a laboratory smartphone in exchange for course credit. We used a 2 (presentation mode: joint vs. separate) × self-construal (continuous) design, whereby the first factor was manipulated between subjects and the second factor was measured.

Participants first completed the self-construal measure in a separate study as in study 1. We then told participants they would be completing a new app testing study. Participants read an introduction to the BeautyPlus app and were asked to try the Beauty Camera feature of the app which enhances and beautifies appearance automatically as it takes a picture. Next, a research assistant led participants to a separate room, one-by-one, and handed them a phone featuring the BeautyPlus Camera and directed them to use it to take one selfie. The beauty setting of the camera was kept the same for all the participants.[7] Afterwards, participants viewed their selfie in the photo gallery on the phone. In the joint condition, we set the app to save both the beautified and original selfies so participants saw both versions in the photo gallery, side by side. In the separate

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[7] The camera was set with the "Ivory" filter at level 60 and with all the retouch features at default levels except that "smooth" was changed to +60.

condition, we set the app to only save the beautified selfie so participants only saw the single beautified selfie. Next, participants completed a 3-item measure of their willingness to use the app ("How much do you like this app in general?", "How much would you like to download this app?", "How much would you like to use this app to edit a photo of yourself?" (1 = Not at all, 7 = Very much; α = .952). Subsequently, participants rated their desire to share the edited (vs. original) photo of themselves using the BeautyPlus app if they were to share one of their selfies on social media (1 = Definitely the original photo, 7 = Definitely the edited photo).

Next, participants indicated how much overlap they perceived between the edited photo of themselves and their true selves, represented by a set of seven circle pairs that varied in the degree of overlap between the two circles (adapted from the self-other overlap measure; Aron, Aron, & Smollan, 1992; Chan & Mogilner, 2017). Participants also rated the extent to which they thought the edited photo reflected who they really are (1 = Does not at all reflect who I am, 7 = Reflects who I am very well) and the degree to which they thought the edited photo was an accurate representation of themselves (1 = Not at all, 7 = 100% accurate). The average of these three items formed an index of perceived self-overlap (α = .826). As a manipulation check of presentation mode, we asked participants how many photos they saw of themselves in the photo gallery (1, 2, or other) and also measured how obvious the discrepancy is between participants' baseline self and how they look in the beautified selfie (1 = Not obvious at all, 7 = Very obvious). To rule out the alternative explanation that interdependents are more likely to use beauty apps to edit their photo because of social norms, we also measured the percentage of students in

the university that participants think use beauty apps (from 0% to 100%) and the social acceptability of using these apps (1 = Not acceptable at all, 7 = Very acceptable). For exploratory purposes, we also included measures such as participants' evaluation of the beautified selfie on three items (bad-good; unfavorable-favorable; not likable-likable) and how uncomfortable they felt while taking the selfie. At the end of the study, participants reported their demographic information.

Results and Discussion

Presentation Mode Manipulation Check

Our manipulation was successful: 93.1% of the participants in the joint presentation mode indicated they saw 2 photos rather than 1 photo or other number, and 93.7% of those in the separate presentation mode indicated they saw 1 photo rather than 2 photos or other number (Wald χ^2 (1) = 159.641, $p < .001$). In addition, a regression analysis with self-construal (mean-centered), presentation mode (-1 = separate presentation, 1 = joint presentation), and their interaction as the predictors of the discrepancy between their baseline self and the self in the beautified selfie revealed a significant simple effect of presentation mode ($b = .273$, $t(193) = 2.482$, $p = .014$, ß = .174), where participants in the joint presentation condition indicated that the discrepancy was more obvious than those in the separate presentation condition. However, the self-construal presentation mode interaction was not significant ($b = -.075$, $t(193) = -.700$, $p = .485$, ß = -.049).

Willingness to Use Beauty App

The same regression analysis on the willingness to use the beauty app revealed a significant interaction ($b = .260$, $t(193) = 2.084$, $p = .038$, $\beta = .148$; see figure 6 top panel). All the other effects were not significant (p's > .583). Simple slope analysis (Aiken & West, 1991) revealed that under joint presentation, people with a more interdependent self-construal (1 SD above the mean) reported marginally higher willingness to use the beauty app than those with a more independent self-construal (1 SD below the mean) ($b = .329$, $t(193) = 1.909$, $p = .058$, $\beta = .188$). In contrast, there was no such effect in the separate presentation mode ($b = -.192$, $t(193) = -1.060$, $p = .290$, $\beta = -.109$).

Desire to Share the Beautified Photo

The same regression analysis on desire to share the beautified photo showed a significant interaction ($b = .318$, $t(193) = 2.456$, $p = .015$, $\beta = .174$; see figure 6 bottom panel). All the other effects were not significant (p's > .643). Under joint presentation, interdependents (1 SD above the mean) were marginally more willing to share beautified photos of themselves on social media than independents (1 SD below the mean) ($b = .336$, $t(193) = 1.880$, $p = .062$, $\beta = .184$). In contrast, there was no such effect when participants were under separate presentation ($b = -.300$, $t(193) = -1.601$, $p = .111$, $\beta = -.165$).

Mediation Analysis

To test its mediating role, we first conducted the same regression analysis on self-overlap. The results revealed a significant presentation mode × self-construal interaction ($b = .308$, $t(193) = 3.026$, $p = .003$, $\beta = .212$). All the other effects were not significant (p's > .369). Simple slope analysis (Aiken and West 1991) revealed that under joint

presentation, interdependents (1 SD above the mean) perceived a larger overlap between the beautified self and the true self than independents (1 SD below the mean) ($b = .373$, $t(193) = 2.659$, $p = .008$, $ß = .258$). In contrast, there was no such effect when participants were in separate presentation mode ($b = -.242$, $t(193) = -1.646$, $p = .101$, $ß = -.167$).

We next conducted a moderated mediation analysis (Hayes, 2017, model 7, with 10,000 bootstrap resamples) with self-construal (mean-centered) as the independent variable, presentation mode as the moderator, self-overlap as the mediator, and willingness to use beauty apps as the dependent variable. The index of moderated mediation was significant ($b = .414$; 95% CI: [.0199, .7755]). Specifically, under joint presentation, the indirect effect was significant ($b = .251$; 95% CI: [.0029, .4964]), while under separate presentation, the indirect effect was not significant ($b = -.163$; 95% CI: [-.3995, .1412]). In other words, self-overlap mediated the effect of self-construal on desire to use the beauty app for participants who saw both the original and beautified selfies side-by side in the joint presentation, but not for participants who only saw the beautified selfie in separate presentation.

Social Norm

The same regression analyses on the percentage of students using beauty apps and on the social acceptability of using beauty apps did not reveal any significant simple effects or interaction effects (p's > .103). In addition, moderated mediation analyses (Hayes, 2017, model 7, with 10,000 bootstrap resamples) with self-construal (mean-centered) as the independent variable, presentation mode as the moderator, social norms as the mediator, and willingness to use beauty app as the dependent variable did not show any significant mediation effects, indicating that the proposed effects were unlikely to be caused by social

norms. Also, the interaction of self-construal and presentation mode on willingness to use the

beauty app remained significant controlling for social norms ($b = .298$, $t(191) = 2.416$, $p =$

$.017$, ß $= .170$).

Figure 6

Chapter 2 — Study 2 Results: Willingness to Use Beauty App (Top) and Desire to Share the Beautified Photo (Bottom)
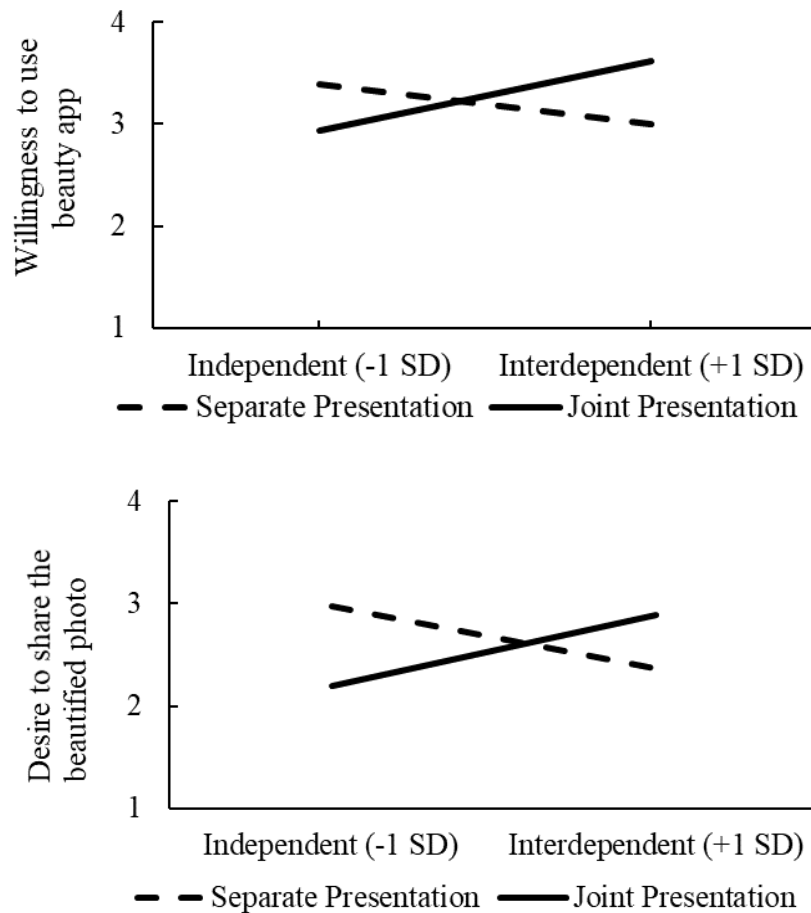
Discussion

The findings of study 2 provide further evidence that interdependents are more

willing to digitally enhance appearance than independents under joint evaluation, when

they see both the original and beautified image side by side. It also shows that under

separate evaluation, the difference is mitigated. Furthermore, interdependents (vs. independents) report a higher willingness to use beauty apps under joint (vs. separate) presentation because they see larger overlap between the beautified and the true self. Together, studies 1 and 2 test our hypotheses in cases where participants had an opportunity to take a real photo of themselves with a beauty app, in which they directly saw their own appearance enhanced.

Importantly, before downloading any beauty app or purchasing any digital appearance-enhancing products, consumers often see ads using models to convey the effectiveness of these products. However, it is unclear what type of presentation (joint or separate) is optimal to attract the most customers to use these products. The first two studies suggest that joint presentation has differing effects on independent and interdependent consumers, yet they do not directly examine how these differences shape the effectiveness of advertisements for digital appearance-enhancing products. The next study addresses this question by using ad appeals, and additionally address causality by manipulating self-construal.

Study 3

Within an ad appeal context, study 3 aims to provide causal evidence of H1 by manipulating self-construal and presentation mode. We predict that participants primed with interdependence will be more willing to use the advertised beauty app than those primed with independence in joint presentation, when the ad shows both the original and beautified faces of a model, whereas this effect is mitigated in separate presentation,

when the ad only shows the beautified face of the model. This study also tests the mediating role of self-overlap.

Method

Participants were 569 students (55.1% female; median age = 21; ages 18-89 [one did not report gender and two did not report age]) from a large U.S. university who completed this study in exchange for course credit. This study used a 2 (presentation mode: joint vs. separate) × 2 (self-construal: independent vs. interdependent) between-subjects design.

We first manipulated self-construal using an established task (Hannover, Birkner, & Pöhlmann, 2006; Lalwani & Shavitt, 2009). Specifically, we asked participants in the interdependent condition to write down what they have in common with their family and friends, while we asked those in the independent condition to write what makes them different from their family and friends. A pretest validated the manipulation. Next, they ostensibly completed a new app testing study in which they saw an ad for the BeautyPlus photo-editing app. Under joint presentation, the ad included a description of the app (introductions of the general function and some specific features) and two photos showing the original and beautified face of the same model. Under separate presentation, the ad appeal showed the same description of the app but only the beautified face of the model (see figure 3 for the stimuli). Then, participants completed the same measures of the willingness to use the beauty app ($\alpha = .934$), desire to share the edited (vs. original) photo of themselves, and self-overlap ($\alpha = .627$), as in study 2. At the end of the study, participants reported their demographic information.

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Results and Discussion

Willingness to Use Beauty App

A 2×2 ANOVA on willingness to use the beauty app revealed a significant interaction effect of self-construal and presentation mode ($F(1, 565) = 5.343$, $p = .021$, $\eta_p^2 = .009$; see figure 7 top panel). Under joint presentation, interdependents indicated higher willingness to use the beauty app than independents ($M_{inter} = 2.97$, $SD = 1.69$ vs. $M_{inde} = 2.47$; $SD = 1.70$; $F(1, 565) = 6.599$, $p = .010$, $\eta_p^2 = .012$). In contrast, under separate presentation, interdependents and independents did not differ in their intentions to use the beauty app ($M_{inter} = 2.63$, $SD = 1.60$ vs. $M_{inde} = 2.77$; $SD = 1.63$; $F(1, 565) = .479$, $p = .489$, $\eta_p^2 = .001$). None of the main effects were significant (p's > .182).

Desire to Share the Beautified Photo

A 2×2 ANOVA on desire to share the beautified photo revealed a significant interaction of self-construal and presentation mode ($F(1, 565) = 3.993$, $p = .046$, $\eta_p^2 = .007$; see figure 7 bottom panel). In joint presentation mode, interdependents indicated a higher desire to share the beautified photo than independents ($M_{inter} = 3.10$, $SD = 1.95$ vs. $M_{inde} = 2.53$; $SD = 1.95$; $F(1, 565) = 6.324$, $p = .012$, $\eta_p^2 = .011$). In contrast, in separate presentation mode, interdependents and independents did not differ in their desire to share the beautified photo ($M_{inter} = 2.71$, $SD = 1.77$ vs. $M_{inde} = 2.78$, $SD = 1.95$; $F(1, 565) = .091$, $p = .763$, $\eta_p^2 < .001$). None of the main effects were significant (p's > .116).

Figure 7

Chapter 2 — Study 3 Results: Willingness to Use Beauty App (Top) and Desire to Share the Beautified Photo (Bottom)
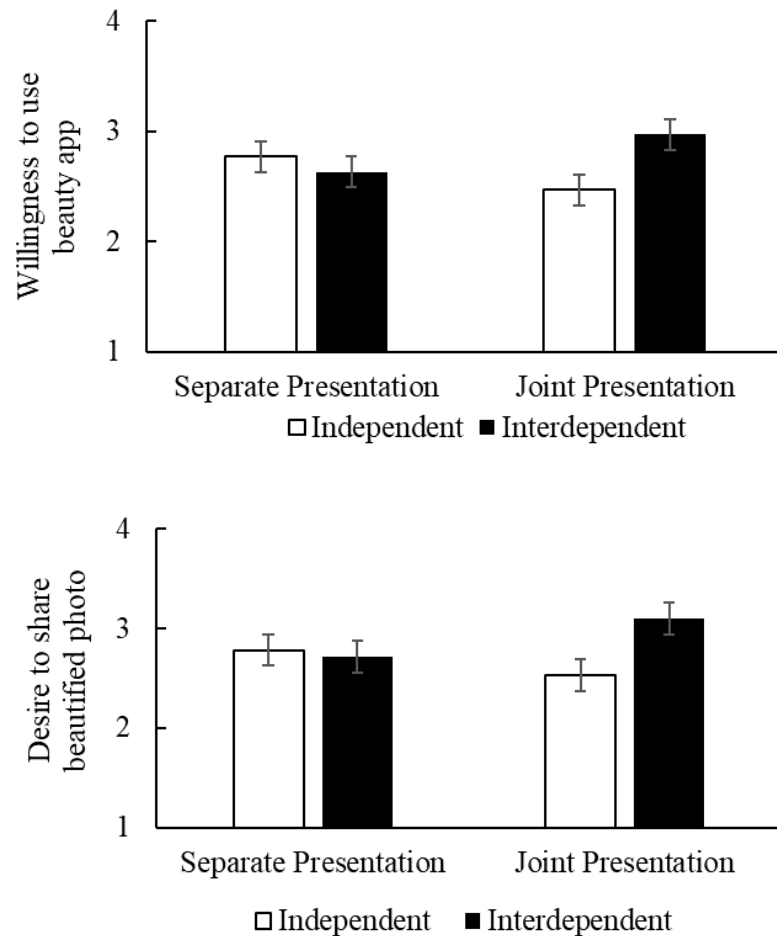
Mediation Analysis

We first conducted a 2 × 2 ANOVA on self-overlap. The results revealed a significant self-construal × presentation mode interaction ($F(1, 565) = 10.290$, $p = .001$, $\eta_p^2 = .018$). In joint presentation mode, interdependents perceived greater overlap between the beautified and true self than independents ($M_{inter} = 3.45$, $SD = 1.28$ vs. $M_{inde} = 2.89$, $SD = 1.37$; $F(1, 565) = 11.708$, $p < .001$, $\eta_p^2 = .020$). In contrast, in separate

presentation mode, interdependents and independents did not differ in their perceptions of self-overlap ($M_{inter} = 3.10$, $SD = 1.54$ vs. $M_{inde} = 3.29$, $SD = 1.34$; $F(1, 565) = 1.221$, $p = .270$, $\eta_p^2 = .002$).

We then conducted the same moderated mediation analysis (Hayes, 2017, model 7, with 10,000 bootstrap resamples) as in study 2 to test our prediction that interdependents are more willing to digitally enhance their appearance using beauty apps than independents because they see larger overlap between their beautified and true self under joint (vs. separate) presentation. The index of moderated mediation was significant ($b = .228$; 95% CI: [.0836, .3815]). Specifically, under joint presentation, the indirect effect was significant ($b = .172$; 95% CI: [.0745, .2781]), while under separate presentation, it was not ($b = -.055$; 95% CI: [-.1593, .0477]). In other words, self-overlap mediated the effect of self-construal on willingness to use beauty app only for participants who saw the original and beautified photos side-by-side.

Discussion

Study 3 conceptually replicates study 2 by using an ad appeal to manipulate presentation model. The findings demonstrate that when seeing both the original and beautified face of the same model in an ad appeal, interdependents are more willing to use the app than independents because they see their beautified self as more overlapped with their true self. However, when seeing only the beautified face of the model, interdependents and independents do not differ in their willingness to use beauty apps. Thus far, we have demonstrated the psychological process by measuring self-overlap in

studies 2 and 3. In the next study, we elucidate the process by manipulating the degree of discrepancy between the original and beautified photos.

Study 4

Given the underlying role of self-overlap in driving the willingness to enhance appearance digitally, we expect that manipulating the degree to which the beautified and true self can be seen as overlapping should influence the effect of self-construal on desire to use a beauty app under joint presentation. Thus far, in prior studies, our photo editing manipulations were very subtle in the changes used to enhance appearance. Despite the relatively subtle changes, under joint presentation, the results consistently demonstrated that interdependents see greater overlap between the beautified self and the true self than independents. Previous research has shown that when beauty work results in apparent, transformative, and detectable enhancement in appearance, consumers are more likely to be perceived as misrepresenting themselves (Samper et al, 2018). Thus, if the discrepancy between the appearance in the original photo and in the beautified photo is large and evident, we would expect consumers to see small overlap between the beautified self and the true self, regardless of self-construal level. In this study, we manipulate the discrepancy between the appearance in the original photo and the beautified photo to be large (vs. small) and expect that the effect of self-construal on willingness to digitally enhance appearance will be eliminated when the discrepancy is very large.

Method

Participants were 505 students (52.5% female; median age = 21; ages 18-50) from a large U.S. university who completed this study in exchange for course credit. This study used a 2 (discrepancy: small vs. large) × self-construal (continuous) design, whereby the first factor was manipulated between subjects and the second factor was measured. This study was pre-registered.[8]

Participants first completed the same self-construal measure as in study 1. After completing a filler task, participants were asked to read about a new app named Perfect Finish (fictitious name) and provide feedback on the app. Next, participants saw an ad appeal for the Perfect Finish app that was similar to the ad used in study 3 (see figure 5 for the stimuli), which included a description of the app and a joint presentation depiction: two photos showing the original and beautified face of a model (before vs. after). Across both conditions, the original photo was held constant. In the small discrepancy condition, the model's appearance is slightly different in the beautified photo than in the original photo. Specifically, the model has a slightly slimmer jaw, smoother and tighter skin, and whiter teeth in the beautified photo. In the large discrepancy condition, the model's appearance is largely different in the beautified photo (after version) than in the original photo (before version); the model has a more lifted face with a much slimmer jaw, much smoother and tighter skin, bigger eyes, a smaller nose, and whiter teeth. Next, they completed the same measures of willingness to use the beauty app (α = .932), desire to share the beautified photo, and self-overlap (α = .690), as in

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[8] Pre-registration link: https://osf.io/etfc4/?view_only=2389a6a7a70b49a9aac79261b3775fa5

previous studies. We also measured the extent to which participants think the model looks different in the two photos (before vs. after) as a manipulation check (1 = Not at all different, 7 = Very different). At the end of the study, participants reported their demographic information.

Results and Discussion

Discrepancy Manipulation Check

A regression analysis with self-construal (mean-centered), discrepancy (-1 = small, 1 = large), and their interaction as the predictors of discrepancy rating (one response missing) revealed a significant simple effect of discrepancy (b = .669, t(500) = 12.196, p < .001, ß = .478), whereby participants in the large (vs. small) discrepancy condition thought the model looked more different in the beautified than the original photo. In addition, the discrepancy × self-construal interaction was marginally significant (b = .130, t(500) = 1.857, p = .064, ß = .073). Follow-up analysis revealed that both participants with a more independent self-construal (1 SD below the mean) and a more interdependent self-construal (1 SD above the mean) thought the model looked more different in the beautified than the original photo in the large (vs. small) discrepancy condition, but the effect was relatively stronger for participants with a more interdependent self-construal (b = .771, t(500) = 9.937, p < .001, ß = .551) than for those with a more independent self-construal (b = .567, t(500) = 7.296, p < .001, ß = .405). Because the focal results remain significant after controlling for the discrepancy rating, we will not discuss this further.

Willingness to Use Beauty App

The same regression analysis on willingness to use the beauty app revealed a significant simple effect of self-construal ($b = .281$, $t(501) = 2.952$, $p = .003$, ß $= .130$) and a marginally significant simple effect of discrepancy ($b = -.132$, $t(501) = -1.774$, $p = .077$, ß $= -.078$), which were qualified by a significant discrepancy × self-construal interaction ($b = -.216$, $t(501) = -2.262$, $p = .024$, ß $= -.099$; see figure 8 top panel). Simple slope analysis (Aiken & West, 1991) revealed that in the small discrepancy condition, interdependents (1 SD above the mean) were more willing to use the beauty app than independents (1 SD below the mean) ($b = .497$, $t(501) = 3.775$, $p < .001$, ß $= .229$). In contrast, there was no such effect when participants were in the large discrepancy condition ($b = .066$, $t(501) = .477$, $p = .634$, ß $= .030$). From a different angle, these results suggest that for interdependents (1 SD above the mean), a large discrepancy between the beautified and original photo decreased their willingness to use the beauty app to digitally enhance their appearance ($b = -.301$, $t(501) = -2.857$, $p = .004$, ß $= -.178$). In contrast, for independents (1 SD below the mean), there was no such effect ($b = .037$, $t(501) = .347$, $p = .728$, ß $= .022$).

Desire to Share the Beautified Photo

The same regression analysis on desire to share the beautified photo showed a significant simple effect of self-construal ($b = .299$, $t(501) = 2.592$, $p = .010$, ß $= .114$) and a significant simple effect of discrepancy ($b = -.215$, $t(501) = -2.385$, $p = .017$, ß $= -.105$), which were qualified by a significant discrepancy × self-construal interaction ($b = -.242$, $t(501) = -2.097$, $p = .037$, ß $= -.092$; see figure 8 bottom panel). When in the small discrepancy condition, interdependents (1 SD above the mean) were more willing to share

the beautified photos of themselves on social media than independents (1 SD below the mean) ($b = .541$, $t(501) = 3.395$, $p = .001$, ß = .206). In contrast, there was no such effect when participants were in the large discrepancy condition ($b = .057$, $t(501) = .343$, $p = .732$, ß = .022). From a different angle, these results suggest that for interdependents (1 SD above the mean), a large discrepancy between the beautified and original photos decreased their willingness to share the beautified photo of themselves ($b = -.405$, $t(501) = -3.172$, $p = .002$, ß = -.197). In contrast, for independents (1 SD below the mean), there was no such effect ($b = -.026$, $t(501) = -.201$, $p = .841$, ß = -.013).

Mediation Analysis

To test the mediating role of self-overlap, we first conducted the same regression analysis on self-overlap. The results revealed a significant discrepancy × self-construal interaction ($b = -.198$, $t(501) = -2.438$, $p = .015$, ß = -.108). Simple slope analysis (Aiken and West 1991) revealed that in the small discrepancy condition, interdependents (1 SD above the mean) perceived a larger overlap between the beautified self and the true self than independents (1 SD below the mean) ($b = .228$, $t(501) = 2.027$, $p = .043$, ß = .124). In contrast, there was no such effect for the large discrepancy condition ($b = -.169$, $t(501) = -1.435$, $p = .152$, ß = -.092).

We next conducted a moderated mediation analysis (Hayes, 2017, model 7, with 10,000 bootstrap resamples) with self-construal as the independent variable, discrepancy as the moderator, self-overlap as the mediator, and willingness to use the beauty app as the dependent variable. The index of moderated mediation was significant ($b = -.225$; 95% CI: [-.4300, -.0234]). Specifically, in the small discrepancy condition, the indirect effect was

significant (b = .129; 95% CI: [.0079, .2618]), while in the large discrepancy condition, the indirect effect was not significant (b = -.096, 95% CI: [-.2526, .0700]). In other words, self-overlap mediated the effect of self-construal on desire to use the beauty app when the discrepancy between the original and beautified photos was small, but not when the discrepancy was large.

Figure 8

Chapter 2 — Study 4 Results: Willingness to Use Beauty App (Top) and Desire to Share the Beautified Photo (Bottom)
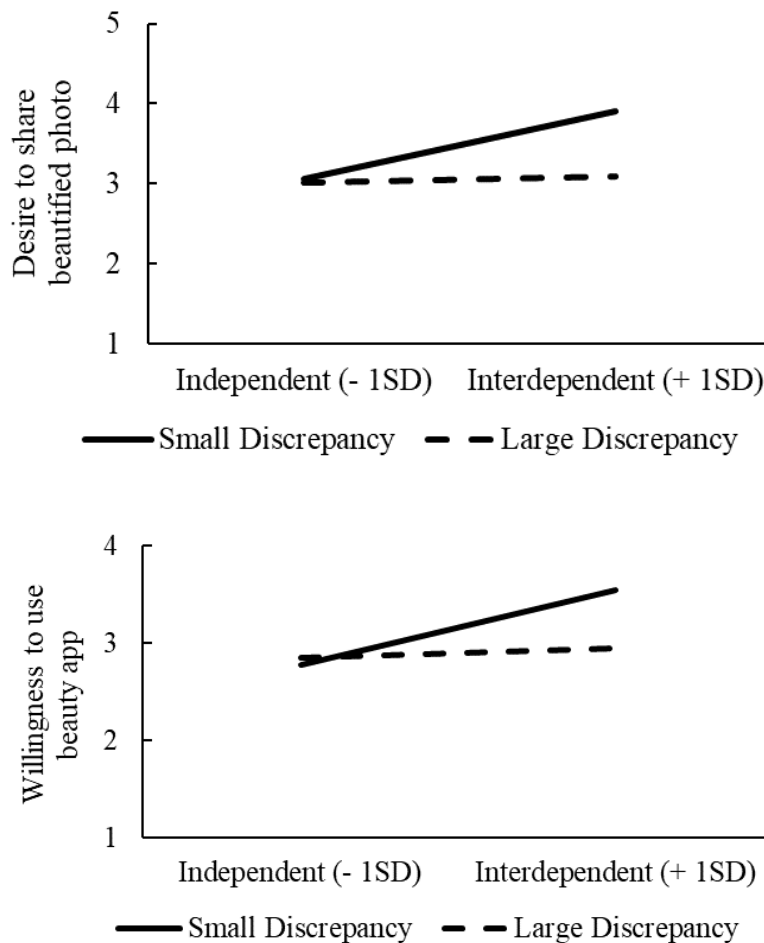
Discussion

These results further support the notion that the perceived overlap between the beautified self and the true self underlies the effect of self-construal on willingness to digitally enhance appearance under joint presentation mode by showing that these effects hold only when the discrepancy between the original and beautified image is small (vs. large). We find this occurs because when the discrepancy between the original and beautified self is evident, people view the beautified self as less overlapping with their true self, regardless of their self-construal level. By making the discrepancy between the original and beautified image evident, interdependents' willingness to use the beauty apps to digitally enhance their appearance was reduced significantly. These results thereby provide further support for our argument that the effect of self-construal and presentation mode on desire to digitally enhance one's appearance is driven by the overlap consumers see between their beautified and true self.

So far, we have established that interdependents and independents differ in their willingness to digitally enhance appearance via tools such as beauty apps under joint presentation mode, and that is by far the most common type of presentation for these beauty apps. Therefore, we would expect to see that interdependents are more likely to seek out these products than independents in real life. Next, in study 5, we show that consumers from U.S. states high (vs. low) in collectivism search digital appearance-enhancing tools more online with Google Trends data. In study 6, we provided further evidence by conducting a Facebook field study with consumers from countries that differ in self-construal: India (interdependent) and United States (independent).

The goal of study 5 is to establish that interdependents are more likely to seek out digital appearance-enhancing products and tools specifically in real life. We test a highly conservative estimate of our effect across the United States. Previous research has shown that consumers' level of interdependent versus independent self-construal varies within the United States (Cohen, 2009; Vandello & Cohen, 1999; Webster et al., 2021). For example, Vandello and Cohen (1999) created an index ranking the 50 United States in terms of collectivism/interdependence versus individualist/independence based on eight indicators (e.g., the percentage of people living alone). Although this index was created 21 years ago, it has still been used in recent research (Webster et al., 2021). In addition, similar state-level personality measures showed high rank-order stability from 1999 to 2015 (Elleman et al., 2018). In this study, we use the 50-state collectivism index as a proxy for self-construal and examine Google Trends indices (relative volume of searches over the search window period in each region) regarding digital appearance-enhancing tools together with the state-level collectivism. Prior research has used Google Trends indices as a good proxy for consumer prepurchase information interest (Hu, Du, & Damangir, 2014; Xu, Bolton, & Winterich, 2021). We expect that consumers from U.S. states high (vs. low) in collectivism are more interested in and thus search more for digital appearance-enhancing tools online.

Method

Using Google Trends, we performed the topic search of six popular digital appearance-enhancing tools (beauty app, filter app, face app, facetune, video lighting, on

camera light) separately across the 50 U.S. states, with the index (0-100) reflecting relative search popularity over the past year since the date we performed the search.[9] We selected these tools based on a pretest which showed that people viewed them as means that could enhance physical appearance in photos or videos. We obtained the state-level collectivism index for the same 50 states from Vandello and Cohen (1999, p. 283, table 1).

Results and Discussion

Analysis revealed that the state-level collectivism index has a significant positive correlation with the search indices of four digital appearance-enhancing tools: facetue ($r = .314$, $p = .026$), face app ($r = .465$, $p = .001$), video lighting ($r = .369$, $p = .008$), on camera light ($r = .443$, $p = .001$), and marginally significant correlations with the remaining two: beauty app ($r = .247$, $p = .084$) and filter app ($r = .266$, $p = .062$) (see table 2), thus providing initial evidence that consumers from a more collectivistic state (those with a more interdependent self-construal) are more interested in digital appearance-enhancing tools. Consistent results were observed using Google Trends data over the past three years and past five years.

Although we cannot guarantee that consumers who search digital appearance-enhancing tools all are under joint presentation mode, the high prevalence of joint depiction in ad appeals of such products suggests that the possibility is high. Our other studies address this issue by eliciting joint presentation or manipulating joint versus separate presentation in the field or in controlled lab settings.

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[9] Search date: 2021/4/5

Table 2

Chapter 2 – Study 5 Results: Correlations Between State-Level Collectivism Index and Google Trends Indexes of Digital Appearance-Enhancing Tools

		Beauty App	Facetune	Filter App	Face App	Video Lighting	On Camera Light
Collectivism Index	Pearson Correlation	0.247	.314[*]	0.266	.465[**]	.369[**]	.443[**]
	Sig. (2-tailed)	0.084	0.026	0.062	0.001	0.008	0.001

Study 6

To provide further evidence that people with a more interdependent self-construal are more interested in digital appearance-enhancing tools than those with a more independent self-construal under joint presentation, we collect real-world data via Facebook's advertising platform among users from an Eastern country characterized with an interdependent self-construal (India) and a Western country characterized with an independent self-construal (United States) (Effron et al., 2018; Hofstede, 1980; Markus & Kitayama, 1991; Lalwani & Shavitt, 2013; Lalwani & Wang, 2019). We present Facebook users in each country with an ad appeal of a digital appearance-enhancing tool (video conference lighting kit) depicted with a joint presentation, where the original and digitally enhanced images were shown side-by-side. We use the lighting kit because it is highly relevant for both genders and has become commonplace with the shift to virtual meetings during the COVID-19 pandemic. Importantly, prior research on beauty work has not yet considered video conference lighting kits as a beauty enhancement tool, while the pretest of study 5 suggests that people perceive it as a tool that could make them look better in photos or videos. Therefore, we extend the literature by considering this popular product. Our focal dependent measure was click-

through-rate (CTR: the number of clicks divided by the number of impressions; Kupor &

Laurin, 2020; Paharia, 2020). We predict that Indian users (interdependents) would have

higher click-through-rates than American users (independents).

Method

We conducted a 2-cell (nationality: Indian vs. American) between-subjects Facebook

field study with an ad appeal for a video conference lighting kit. The ad campaign ran for 48

hours in India and in the United States at the same time. In line with the nature of the product

advertised, we selected Facebook users between 24 and 40 years of age as the target

audience. The total budget was $300 evenly split between the two conditions. Additional

technical specifications appear in Appendix C. This study was pre-registered.[10]

We created—with the help of a professional graphic designer—an ad for a video

conference lighting kit. This product is an LED light which attaches to laptops, tablets, and

Phones to make consumers look better while taking photos or making video calls. The ad

displayed an image of the advertised product and two before- and after-use comparisons

facilitating joint presentation: one of a Western female model and the other of an Asian

female model (see Appendix C for the stimuli). We used models from both Western and

Eastern culture to make sure the ad targets consumers from both cultures. Facebook users

who clicked the ad were sent to a webpage that we created that provided links to similar

products currently available in the market and a debriefing message. Our dependent variable

was CTR. A higher CTR indicates more positive consumer responses toward the

advertisement. Before running the study, we conducted a pilot study online with American

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[10] Pre-registration link: https://osf.io/57zqr/?view_only=954cb763e0eb4d89b46fb7f81fa7cb2e

participants (n = 104) and Indian participants (n = 101) recruited from MTurk controlling for perceived quality, importance of enhancing physical attractiveness, and attractiveness of the women.

Results and Discussion

Our Facebook campaign was viewed by 626,688 users in India (unique clicks = 10,808) and by 47,022 users in United States (unique clicks = 336). The difference in the number of impressions between countries was likely because of variations in marketplace conditions (e.g., ad competition differences) and was consistent with prior research (see Paharia and Swaminathan, 2019; study 1b). We computed click-through-rate (CTR), the number of clicks divided by the number of impressions (Kupor & Laurin, 2020; Paharia, 2020) and analyzed the differences in CTR across the two countries. Results revealed that the CTR among Indian Facebook users (1.72%) was higher than the CTR among American Facebook users (.71%; $\chi^2 = 279.055, p < .001$). These percentages are not unusual, given that the average CTR for Facebook ads across all industries is .9% (Digital Brand Institute, 2018). The results of this field study provide evidence that when a product is marketed with both images side-by-side, in joint presentation mode, consumers with a more interdependent self-construal are more attracted to digital appearance enhancement tools and are more willing to digitally enhance their appearance than those with a more independent self-construal by using nationality (Indian vs. American) as an operationalization of self-construal.

General Discussion

Across six studies, we address the questions of when and why interdependent (vs. independent) consumers are more willing to enhance their appearance via digital appearance-enhancing products. First, we provide initial evidence that consumers with an interdependent self-construal are more willing to digitally enhance their appearance than those with an independent self-construal when they see both the actual self and the beautified self, side-by-side (e.g., joint presentation mode) with correlational and causal evidence by using a consequential measure of willingness to digitally enhance appearance. We then test the interacting effect of self-construal and presentation mode by providing participants with the opportunity to directly interact with a beauty app and directly see different versions of themselves (actual self and beautified self). Findings show that the difference between interdependents and independents in willingness to digitally enhance their appearance goes away under separate presentation, when consumers only see the beautified self in isolation and hence the discrepancy between the actual and ideal self is not salient. In addition, we find that the heightened overlap between the beautified self and true self drives the effect. Next, we tested the effect within an ad appeal context by manipulating self-construal.

Afterwards, we further demonstrate the mediating role of self-overlap between the beautified self and the true self by manipulating the discrepancy between the actual and beautified self and show that when the discrepancy is large, the difference between interdependents and independents in willingness to digitally enhance their appearance gets mitigated because such a large discrepancy causes everyone to view the beautified

self as less overlapping with their true self. Finally, by using the Google Trends index of digital appearance enhancement tools in the 50 U.S. states and state-level collectivism index and a field study conducted on Facebook, we provide evidence that consumers with a more interdependent self-construal are more interested in digital appearance-enhancing tools than consumers with more independent self-construals when they see the original and beautified images side by side, under joint presentation.

Theoretical Implications

Our findings offer significant contributions to the literature on self-overlap, self-construal, and beauty work. First, although enhancing one's appearance digitally via beauty enhancement tools could allow consumers to engage in selective self-presentation and project desired impressions (Yee & Bailenson, 2007; Lowe-Calverley & Grieve, 2018), it could violate consumers' desire to present their true self (Nightingale et al., 2017), thus creating a tension between a desire to look good and a desire to be true to the self. Our research identifies consumers' perceived overlap between their beautified self and their true self as a key factor that could address this tension and thus lead to higher willingness to digitally enhance their appearance. Specifically, consumers who see larger (vs. smaller) overlap between their beautified self and their true self should be more likely to digitally enhance their appearance, since they view the beautified self as more similar to their true self. In revealing this difference in perceived overlap, we also identify a critical insight that demonstrates all consumers want to project their true self and desire to be authentic. Thus, it is not a difference in authenticity that drives some consumers to digitally enhance their appearance and others to refrain; rather, the distinction that drives

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use of such appearance-enhancing products is in whether consumers view the beautified self as the same as the true self or not.

Second, this research contributes to the literature on self-construal. Whereas prior literature has primarily focused on the fact that interdependents view themselves as more interconnected and closely interwoven with others than independents (Markus & Kitayama, 1991) and how this difference affects a wide range of consumer behaviors (Mandel, 2003; Zhang & Shrum, 2009; Lalwani & Shavitt, 2013), this research is the first to show that interdependents also see their own distinct selves (true vs. ideal self) as more interconnected and overlapping. This potential to see greater overlap between the beautified and true selves enables them to make use of new technology to digitally enhance their appearance and more effectively portray their true self. Again, this shows that it is not a difference in the desire to be authentic that drives use of digital appearance-enhancing products, but rather a difference in the overlap between the beautified and true selves between interdependents and independents that results in significant differences in adoption of this technology. Moreover, this cultural difference is dynamic and becomes active only under joint presentation but not under separate presentation.

Finally, this research contributes to the literature on beauty work. While previous research on beauty work focuses on the actual practices people perform on their faces and bodies, such as skincare and make-up (e.g., Samper et al., 2018; Smith, Vandellen & Ton, 2021; Smith et al., 2022), this research is among the first to examine the beauty work in which people engage in virtual environments, such as using beauty apps to edit one's

photographs or a lighting kit to digitally enhance their online appearance. Specifically, we find that the unique feature of beauty work in the virtual environment that allows consumers to see different versions of the self (actual and ideal self) simultaneously could change interdependent (vs. independent) consumers' perception of the self. Specifically, the heightened discrepancy between the actual (unbeautified) and ideal (beautified) self would motivate interdependents to see the ideal self as more connected and overlapping with their true self than independents and thus lead to higher willingness to digitally enhance their appearance. However, this effect it mitigated when consumers can only see the ideal self in isolation, which is common when consumers perform actual beauty work on their faces and bodies.

Practical Implications

In addition to the various contributions to theory, our work also has important practical implications. While a typical problem-solution strategy (Hoyer et al., 2016) suggests that marketers of digital appearance-enhancing tools should present consumers with original and beautified faces of models side-by-side in their ads to highlight the discrepancy and show how effective they can be in improving one's physical attractiveness and many marketers utilize this tactic, our research shows that this practice is less effective in the market of digital appearance-enhancing tools and can sometimes be detrimental to the company. Our findings suggest that only showing the solution (the beautified photo alone) and not the problem (the discrepancy between the original and the beautified photo) leads to higher willingness to use these tools to digitally enhance appearance and thus should generate more benefits for the companies.

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In addition, our work suggests that the typical problem-solutions strategy is even less effective in markets where consumers have a more independent self-construal, such as in western cultures. Based on our findings, when advertising beauty apps or other products that enable consumers to digitally enhance their appearance in media that have a more independent readership (e.g., Westerners), advertisers may choose to only present the beautified faces of the models instead of presenting both the original and beautified faces side-by-side. Alternatively, advertisers could present both the original and beautified faces side-by-side and also prime consumers' interdependent self. For example, displaying images of happy and harmonious families or friends in advertisements could activate interdependence (Hong & Chang, 2015; Lalwani & Shavitt, 2013; Mandel, 2003; Trafimow et al., 1991). Finally, our research suggests marketers should avoid making the discrepancy between the original and beautified faces too large, which could decrease the perceived overlap between the beautified self and the true self and in turn discourage consumers to adopt digital appearance enhancement tools, regardless of their self-construal.

Limitations and Future Research Directions

The current research shows that interdependent (vs. independent) consumers are more likely to digitally enhance their appearance when they are in joint presentation mode and thus see the original and beautified self side-by-side. Future research could examine if this effect is influenced by whether this digital beauty work is performed by consumers themselves or by other people (e.g., a friend or family member uses a beauty app to digitally enhance someone else's appearance in the photo). When the digital

appearance enhancement is performed by someone else, consumers may feel the beautified version of the self is less consistent with their ideal self and even less overlapping with their true self. As such, the difference between interdependents (vs. independents) in their willingness to endorse these digitally enhanced images and their desire to share the beautified self might be reduced.

Previous research has shown that people judge women who engage in higher- (vs. lower-) effort beauty work that is perceived as transformative and transient (e.g., make-up and tanning) as having poorer moral character because of higher perceived misrepresentation (Samper et al., 2018). Due to the advancement of digital enhancement techniques, consumers are able to digitally enhance their appearance in seconds and without investing much effort, but they can also spend longer time applying specific features of the beauty app to enhance specific parts of their face or body. Also, people could choose to digitally enhance their appearance and make themselves look better than they really do in unmodified photographs to varying degrees. Thus, it is unclear whether people view digital appearance enhancement tools as higher- or lower- effort beauty work and whether digital appearance enhancement also leads to negative judgements of moral character. Future research could examine this question.

Prior research has shown that when consumers compare themselves to attractive models in advertisements, they will be less satisfied with their own attractiveness (Richins, 1991). While a large body of research has explored the effect of social comparison on self-evaluation, scant work has explored the effect of self-comparison, which means comparing the actual self with the ideal self. Since digital beauty work

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could lead people to be in the situation where they can see their actual and ideal self side-by-side, which prompts self-comparison, future research could examine whether and how this practice impacts people's self-evaluations and other behaviors.

Finally, while beauty work such as skincare and make-up are typically reserved for women and less common among men, digital appearance enhancement does not seem to be quite as gendered. For example, on-camera lighting targets both female and male consumers and beauty cameras are often included in phones targeted to all consumers. Prior research on actual beauty practices that people perform on their faces and bodies mainly focus on female users (e.g., Samper et al., 2018). In the current research, we examine both male and female consumers' willingness to digitally enhance appearance and do not find gender as a factor influencing the predicted effects. Future research could examine whether and why men might respond differently towards actual beauty practices versus digital appearance enhancement.

In conclusion, our research demonstrates a dynamic cross-cultural difference in consumers' willingness to engage in beauty work in virtual environments that interdependents (vs. independents) are more willing to use digital appearance enhancement tools to make themselves look more attractive in digital media and this effect arises only under joint presentation but not under separate presentation. We also show that the degree to which consumers view the digitally beautified self as overlapping with their true self underlies the process. Future research are encouraged to identify other situational factors that this cross-cultural difference may depend on and the subsequent impacts of virtual beauty practices on consumer behavior.

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APPENDIX A

CHAPTER 1: STUDY STIMULI AND MEASURES

Study 1

Thinking Style Manipulation

Holistic thinking condition:

In this task, you will see a picture that contains different objects. Please focus on the relationships and interactions among the objects and between the objects and the background of the picture. Then write a story illustrating how the different objects and the background of the picture are connected in a meaningful way.

PAGE BREAK

The following is an example. Please read it carefully to make sure you understand the requirement of the task.

Instruction:

In this task, you will see a picture that contains different objects. Please focus on the relationships and interactions among the objects and between the objects and the background of the picture. Then write a story illustrating how the different objects and the background of the picture are connected in a meaningful way.

Picture:

Sample Answer:

It's a cloudy day. A herd of elephants are slowly walking through a valley and searching for food. Two birds flying over the mountains have just noticed the group of elephants. These birds sometimes land on elephants, where they eat lice and other parasites living on elephants' skin and hair.

PAGE BREAK

Now please look at the following picture and spend at least two minutes writing a story illustrating how the different objects and the background of the picture are connected.

Analytic thinking condition:

In this task, you will see two pictures. One picture contains a number of smaller objects embedded in it. The second picture illustrates what these embedded objects are. Please find as many embedded objects in the picture as possible and write down which objects you find.
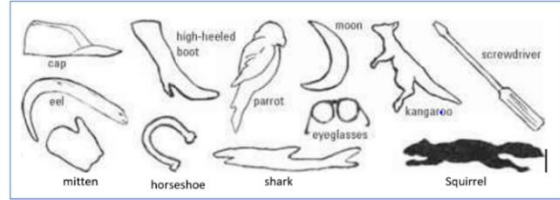
PAGE BREAK

The following is an example. Please read it carefully to make sure you understand the requirement of the task.

Instruction:

In this task, you will see two pictures. There are some smaller objects embedded in the picture on the left. The picture on the right illustrates what these embedded objects are. Please find as many embedded objects in the picture on the left as possible and write down which objects you find.

Picture:

Sample Answer:

The objects I found are: a moon, a kangaroo, a pair of eyeglasses, a cap, and a parrot.

PAGE BREAK

Now please look at the following pictures and spend at least two minutes finding out as many embedded objects in the picture on the left as possible and write down which objects you find.

Self-discrepancy manipulation

STUDY ON MEMORIES

In this study we are interested in understanding how people organize memories about personal events. Much research on this topic asks people to rate personal events using numerical scales. In contrast, we would like to gain a deeper understanding of people's personal events by collecting only open-ended descriptions of their memories, in people's own words.

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Please answer thoughtfully and with as much detail as possible so that someone reading your response would understand what you were thinking and feeling.

<div align="center">PAGE BREAK</div>

Professional competence self-discrepancy condition:

Please recall a time during your professional career in which you felt less professionally competent and knowledgeable than you should have been or desired to be at work.

For example, this could be a project you were involved in that did not succeed, or a time when you did not feel as competent or smart as your co-workers.

Please take a moment to vividly recall the situation, what happened and especially how you felt. Replay it in your mind, and then write about it.

Please be as specific as possible so that someone reading your response would understand what you were thinking and feeling.

No-self-discrepancy condition:

Please recall a time during your professional career in which you felt as professionally competent and knowledgeable as you should have been or desired to be at work.

For example, this could be a project you were involved in that did well as expected, or a time when you felt as competent or smart as your coworkers. Please take a moment to vividly recall the situation, what happened and especially how you felt. Replay it in your mind, and then write about it.

Please be as specific as possible so that someone reading your response would understand what you were thinking and feeling.

<div align="center">PAGE BREAK</div>

Dependent Measure

<u>The amount of bonus redeemed in the form of a Nike gift card</u>

As a thank you for your participation, in addition to your compensation, we will randomly select one participant to receive a $25 bonus.

You can choose to receive the $25 bonus in cash. Alternatively, you can redeem part or the entire amount as a Nike gift card.

The value of the gift card is 200% of the amount you specify. For example, if you choose to redeem $10 of your bonus as a Nike gift card and $15 in cash, you will actually get a $20 gift card and $15 in cash. If you choose to redeem the entire amount as a Nike gift card, you will get a $50 Nike gift card and $0 in cash.

If you were to receive the bonus, how would you like to redeem it?

Cash _____

Nike gift card _____

Total _____

PAGE BREAK

Psychological discomfort (self-discrepancy manipulation check)

Please think back to the event you recalled in the study on memory. How did you feel while recalling this event?

- Uneasy
- Bothered
- Uncomfortable

(1 = Not at all, 7 = Very much)

Study 2

Thinking Style Manipulation (same as in study 1)

Athleticism self-discrepancy measure

Study on Fitness

In this study, we are interested in understanding people's current and desired levels of fitness.

PAGE BREAK

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Please indicate below your current and desired levels of fitness.

- Current level of fitness
- Desired level of fitness

(1 = Not fit at all, 10 = Extremely fit)

Your current fitness level is [PARTICIPANT'S RESPONSE].

Your desired fitness level is [PARTICIPANT'S RESPONSE].

PAGE BREAK

The difference between your current and desired fitness level is: [CURRENT - DESIRED]

Note: A negative number indicates that you feel less fit than you desire to be. A positive number indicates that you feel more fit than you desire to be.

PAGE BREAK

Dependent Measure

Extra Writing Task

We have an extra writing task, which is not part of this session, at the end of this survey. It involves reading an article and writing an essay related to it, and takes about 2 minutes to complete. This is an optional task meaning that you can choose whether to complete the task or not.

If you complete this 2-minute writing task, you will be entered into a drawing for the following t-shirt as a reward. 5 participants will be actually selected to get this t-shirt at the end of this wave.

Would you like to complete the 2-minute writing task?

1 = Yes, I would like to complete the writing task.

0 = No, I would not like to complete the writing task.

PAGE BREAK

Debriefing Statement:

Thank you for your participation in our study! Your participation is greatly appreciated.

Earlier in this study, you indicated that you would like to take part in a 2-minute writing task. Thank you very much for willing to do that! In fact, you don't really need to complete a writing task. But you will still be entered into a drawing for a reward. We will randomly select 5 participants who agreed to participant in the extra task to get a $10 [HOME UNIVERSITY] bookstore gift card.

Study 3

Appearance self-discrepancy manipulation

STUDY ON MEMORIES

In this study we are interested in understanding how people organize memories about personal events. Much research on this topic asks people to rate personal events using numerical scales. In contrast, we would like to gain a deeper understanding of people's personal events by collecting only open-ended descriptions of their memories, in people's own words.

Please answer thoughtfully and with as much detail as possible so that someone reading your response would understand what you were thinking and feeling.

Appearance self-discrepancy condition:

We all have parts of our body or physical appearance that we are dissatisfied with or feel insecure about.

Please take a moment to think about one aspect of your physical appearance/body/face that you do not like about yourself and write a brief essay about it in the space provided below.

Please take a moment to vividly recall the situation, what happened and especially how you felt. Replay it in your mind, and then write about it.

Please be as specific as possible so that someone reading your response would understand what you were thinking and feeling.

Control condition:

Please recall and write down what you did yesterday.

Please take a moment to vividly recall the situation, what happened and especially how you felt. Replay it in your mind, and then write about it.

Please be as specific as possible so that someone reading your response would understand what you were thinking and feeling.

PAGE BREAK

Shopping Scenario Study

On the next screens, you will be presented with a few products. Imagine that you are shopping and indicate how much you would like to purchase the products displayed.

PAGE BREAK

Dependent measure

Willingness to buy a creativity-related product

How much would you like to purchase the following product?

OSMO (a set that includes unique tools, games, and cutting-edge technology to foster inventiveness and problem-solving skills)

(1 = Definitely do not want to purchase, 7 = Definitely want to purchase)

Willingness to buy a self-neutral product

How much would you like to purchase the following product?

A keychain

(1 = Definitely do not want to purchase, 7 = Definitely want to purchase)

PAGE BREAK

10-item analytic-holistic thinking scale (Choi et al., 2003)

Please indicate the extent to which you agree with the statements below.

1. Everything in the universe is somehow related to each other.
2. Even a small change in any element in the universe can lead to substantial alterations in others.
3. Any phenomenon has a numerous number of causes although some of the causes are not known.
4. Any phenomenon has a numerous number of results although some of the results are not known.
5. Nothing is unrelated.
6. It's not possible to understand the pieces without considering the whole picture.
7. The whole is greater than the sum of its parts.
8. Paying attention to the field is more important than paying attention to its elements.
9. A marker of good architecture is how harmoniously it blends with other buildings around it.
10. Sometimes, the empty space in a painting is just as important as the objects.

(1 = Not at all, 7 = Very much)

Study 4

Professional competence self-discrepancy manipulation

STUDY ON MEMORIES

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In this study we are interested in understanding how people organize memories about personal events. Much research on this topic asks people to rate personal events using numerical scales. In contrast, we would like to gain a deeper understanding of people's personal events by collecting only open-ended descriptions of their memories, in people's own words.

Please answer thoughtfully and with as much detail as possible so that someone reading your response would understand what you were thinking and feeling.

Professional competence self-discrepancy condition:

Please recall a time during your professional career in which you felt less professionally competent and knowledgeable than you should have been or desired to be at work.

For example, this could be a project you were involved in that did not succeed, or a time when you did not feel as competent or smart as your co-workers.

Please take a moment to vividly recall the situation, what happened and especially how you felt. Replay it in your mind, and then write about it.

Please be as specific as possible so that someone reading your response would understand what you were thinking and feeling.

Control condition:

Please recall and write down what you did yesterday.

Please take a moment to vividly recall the situation, what happened and especially how you felt. Replay it in your mind, and then write about it.

Please be as specific as possible so that someone reading your response would understand what you were thinking and feeling.

<div align="center">PAGE BREAK</div>

Dependent Measure

<u>Willingness to engage in an athleticism-related activity</u>

Please imagine that in the next hour you could engage in the following activity, and respond to the question.

How much would you like to share workout tips and insights with others (e.g., workout routines, ways to motivate oneself to exercise) in the next hour?

(1 = Not at all, 7 = Very much)

<div align="center">PAGE BREAK</div>

Process Measure

Instrumentality to self-enhancement

To what extent would sharing workout tips and insights with others ...

- make you feel good about yourself
- raise your self-esteem
- increase your sense of self-worth
- give you a sense of self-respect
- make you feel worthwhile

(1 = Not at all, 7 = Very much)

PAGE BREAK

Professional Competence Self-Discrepancy Manipulation Check and Alternative Process Measure

(Self-discrepancy condition) Please think about the task in which you recalled a time you felt professionally incompetent and indicate how you felt in terms of your self-worth after the task.

(Control condition) Please think about the task in which you described what you did yesterday, and indicate how you felt in terms of your self-worth after the task.

Level of self-worth after the writing task

(1 = Extremely low self-worth, 10 = Extremely high self-worth)

PAGE BREAK

Please think about the essay task and what you wrote again and indicate how you felt in terms of your professional competence after the task.

Level of professional competence after the writing task

(1 = Not competent at all, 10 = Extremely competent)

PAGE BREAK

Please think about the essay task and what you wrote again and indicate how you felt in terms of your athleticism after the task.

Level of athleticism after the writing task

(1 = Not athletic at all, 10 = Extremely athletic)

PAGE BREAK

10-item analytic-holistic thinking scale (Choi et al., 2003; same as in study 3)

Study 5

Academic competence self-discrepancy manipulation

<div align="center">STUDY ON MEMORIES</div>

In this study we are interested in understanding how people organize memories about personal events. Much research on this topic asks people to rate personal events using numerical scales. In contrast, we would like to gain a deeper understanding of people's personal events by collecting only open-ended descriptions of their memories, in people's own words.

Please answer thoughtfully and with as much detail as possible so that someone reading your response would understand what you were thinking and feeling.

Academic competence self-discrepancy condition:

Please recall a time during your academic career in which you felt less competent and knowledgeable than you should have been or desired to be.

For example, this could be a time when your performance was poor and you felt dumb and incompetent when applying for college, taking an exam, or interviewing for a job, etc. Please take a moment to vividly recall the situation, what happened and especially how you felt. Replay it in your mind, and then write about it.

Please be as specific as possible so that someone reading your response would understand what you were thinking and feeling.

Control condition:

Please recall and write down what you did yesterday.

Please take a moment to vividly recall the situation, what happened and especially how you felt. Replay it in your mind, and then write about it.

Please be as specific as possible so that someone reading your response would understand what you were thinking and feeling.
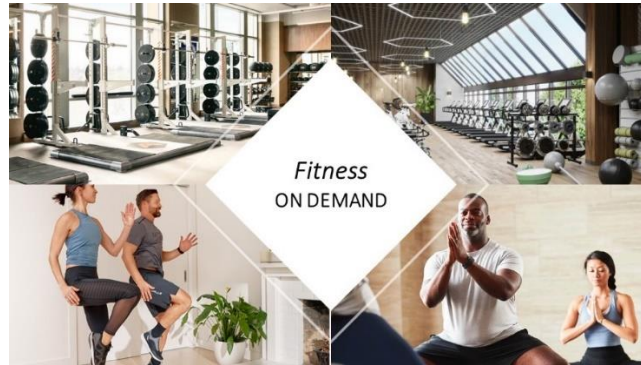
<div align="center">PAGE BREAK</div>

<div align="center">Study on Fitness Clubs</div>

In this study we are interested in understanding consumers' interest in fitness clubs. Please read the introduction of a fitness club on the next screen and answer the questions that follow.

<div align="center">117</div>

FITNESS ON DEMAND is a chain of fitness clubs which offers a high-energy environment, personal training, group fitness classes, tons of fitness equipment, cutting-edge machines, and amenities designed to get you optimal results. It also offers over 1000 streaming cardio, strength, HIIT, core, flexibility classes online. Members can get unlimited access to 12 different fitness programs and hundreds of high-energy, effective workouts. It's great for working out either at one of the club locations or on the go.

Dependent Measure

Willingness to subscribe to the fitness club

How likely will you subscribe to Fitness on Demand?

(1 = Definitely not subscribe, 4 = Definitely subscribe)

To recap, you indicated that you will [PARTICIPANTS' CHOICE TO SUBSCRIBE] to Fitness on Demand.

Self-Worth Restoration Measure

Please indicate how you feel in terms of your athleticism.
(1 = Not athletic at all, 10 = Extremely athletic)

Please indicate how you feel in terms of your academic competence.
(1 = Not competent at all, 10 = Extremely competent)

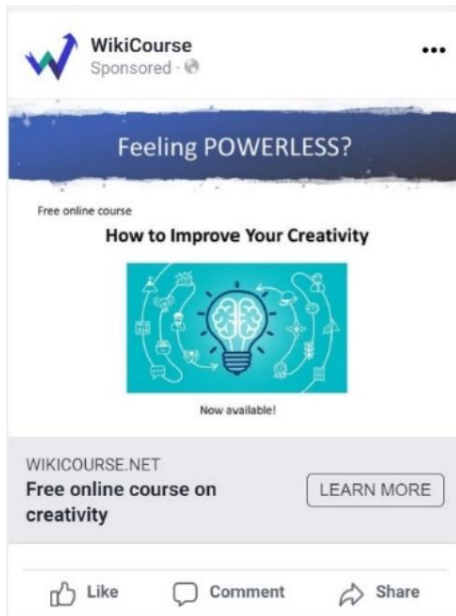Please indicate how you feel in terms of your global self-worth.
(1 = Extremely low self-worth, 10 = Extremely high self-worth)

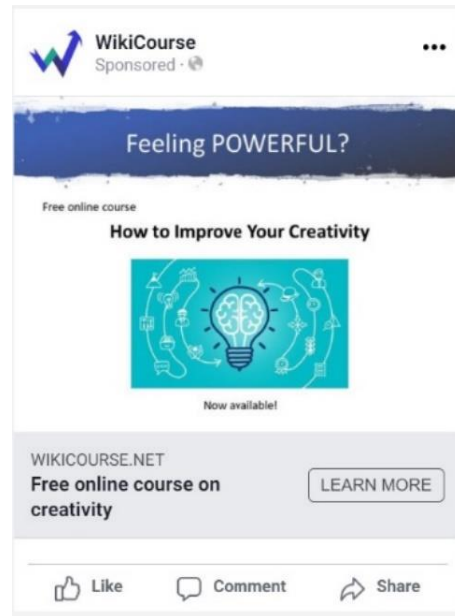**10-item analytic-holistic thinking scale (Choi et al., 2003; same as in study 3; measured in a separate survey)**

Follow-Up Study A

Stimuli for American Facebook users (English version)

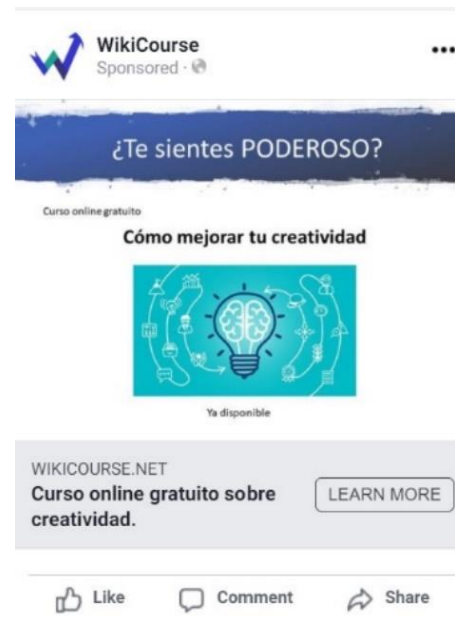*Power self-discrepancy condition*   *Control condition*

Stimuli for Mexican Facebook users (Spanish version)

Power self-discrepancy condition   *Control condition*

Facebook Ads Specifications

Create A/B Test
- Variable: Power self-discrepancy

Audience Details
- Zone: USA/Mexico
- Age: 18-65+
- Detailed targeting: off

Placements
- Automatic placements

Optimization & Delivery
- Optimization for ad delivery: Link Clicks
- Cost-Control: none
- When you get charged: Impression
- Delivery Type: Standard

Campaign Details
- Buying Type: Option
- Objective: Traffic
- Lifetime Budget: $200 per A/B test ($100 per ad)
- Duration: 2 days
- Bid: Lowest cost

Creative Features:
- Single image
- Call for Action: Learn more

Additional Remarks:
- Clicking on the ad or on the "Learn More" button lead to a website that we created for the purpose of the experiment, on which we indicated clearly that the ad campaign was designed for an academic research project. Several links to similar online courses available in the market were also provided on the website.

Follow-Up Study B

Academic competence self-discrepancy manipulation

<div align="center">STUDY ON MEMORIES</div>

In this study we are interested in understanding how people organize memories about personal events. Much research on this topic asks people to rate personal events using numerical scales. In contrast, we would like to gain a deeper understanding of people's personal events by collecting only open-ended descriptions of their memories, in people's own words.

Please answer thoughtfully and with as much detail as possible so that someone reading your response would understand what you were thinking and feeling.

Academic competence self-discrepancy condition:

Please recall a time during your academic career in which you felt less competent and knowledgeable than you should have been or desired to be.

For example, this could be a time when your performance was poor and you felt dumb and incompetent when applying for college, taking an exam, or interviewing for a job, etc. Please take a moment to vividly recall the situation, what happened and especially how you felt. Replay it in your mind, and then write about it.

Please be as specific as possible so that someone reading your response would understand what you were thinking and feeling.

Control condition:

Please recall and write down what you did yesterday.

Please take a moment to vividly recall the situation, what happened and especially how you felt. Replay it in your mind, and then write about it.

Please be as specific as possible so that someone reading your response would understand what you were thinking and feeling.

PAGE BREAK

Academic Competence Self-Discrepancy Manipulation Check and Alternative Process Measure

Please indicate how you feel in terms of your self-worth right now.
(1 = Extremely low self-worth, 10 = Extremely high self-worth)

Please indicate how you feel in terms of your academic competence right now.
(1 = Not competent at all, 10 = Extremely competent)

Please indicate how you feel in terms of your athleticism right now.
(1 = Not athletic at all, 10 = Extremely athletic)

PAGE BREAK

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10-item analytic-holistic thinking scale (Choi et al., 2003; same as in study 3)

Follow-Up Study C

Academic competence self-discrepancy activation

STUDY ON MEMORIES

In this study we are interested in understanding how people organize memories about personal events. Much research on this topic asks people to rate personal events using numerical scales. In contrast, we would like to gain a deeper understanding of people's personal events by collecting only open-ended descriptions of their memories, in people's own words.

Please answer thoughtfully and with as much detail as possible so that someone reading your response would understand what you were thinking and feeling.

PAGE BREAK

Please recall a time during your academic career in which you felt less competent and knowledgeable than you should have been or desired to be.

For example, this could be a time when your performance was poor and you felt dumb and incompetent when applying for college, taking an exam, or interviewing for a job, etc. Please take a moment to vividly recall the situation, what happened and especially how you felt. Replay it in your mind, and then write about it.

Please be as specific as possible so that someone reading your response would understand what you were thinking and feeling.

PAGE BREAK

Dependent Measure

Willingness to engage in an athleticism-related activity

Please imagine that in the next hour you could engage in the following activity, and respond to the question.

How much would you like to share workout tips and insights with others (e.g., workout routines, ways to motivate oneself to exercise) in the next hour?

(1 = Not at all, 7 = Very much)

PAGE BREAK

Process Measure

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Instrumentality to self-enhancement

To what extent would sharing workout tips and insights with others ...

- make you feel good about yourself
- raise your self-esteem
- increase your sense of self-worth
- give you a sense of self-respect
- make you feel worthwhile

(1 = Not at all, 7 = Very much)

Belief that fluid activity reminds the self-worth in the fluid domain

When deciding on whether to share workout tips and insights with others, to what extent did you think that doing so might ...

- Remind you about your own athletic abilities
- Remind you that you are an athletic person

(1 = Not at all, 7 = Very much)

Belief that fluid activity boosts the self-worth in the fluid domain

When deciding on whether to share workout tips and insights with others, to what extent did you think that doing so might ...

- Increase perception of your won athletic ability
- Increase the belief that you are an athletic person

(1 = Not at all, 7 = Very much)

PAGE BREAK

10-item analytic-holistic thinking scale (Choi et al., 2003; same as in study 3)

APPENDIX B

CHAPTER 1: IRB EXEMPTION

EXEMPTION GRANTED

Monika Lisjak
Marketing
-
Monika.Lisjak@asu.edu

Dear Monika Lisjak:

On 12/1/2016 the ASU IRB reviewed the following protocol:

Type of Review:	Initial Study
Title:	Self-Construal and Compensatory Consumption
Investigator:	Monika Lisjak
IRB ID:	STUDY00005357
Funding:	Name: Marketing
Grant Title:	
Grant ID:	
Documents Reviewed:	• Self-Construal & CC_M-turk Consent Form, Category: Consent Form; • Self-Construal & CC_Lab Consent Form, Category: Consent Form; • Self-Construal & CC_Template , Category: IRB Protocol; • Self-Construal & CC_Sojump English Consent Form, Category: Consent Form; • Self-construal & Compensatory Consumption - Sample Items, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • Self-construal & Compensatory Consumption - Recruitment Letter, Category: Recruitment Materials;

The IRB determined that the protocol is considered exempt pursuant to Federal Regulations 45CFR46 (2) Tests, surveys, interviews, or observation on 12/1/2016.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

Sincerely,

IRB Administrator

cc: Qin Wang
       Qin Wang
       Naomi Mandel

APPROVAL: EXPEDITED REVIEW

Monika Lisjak
WPC: Marketing
-
Monika.Lisjak@asu.edu

Dear Monika Lisjak:

On 1/11/2021 the ASU IRB reviewed the following protocol:

Type of Review:	Initial Study
Title:	A Facebook Study on Cultural Differences in Compensatory Consumption
Investigator:	Monika Lisjak
IRB ID:	STUDY00013140
Category of review:	(7)(a) Behavioral research
Funding:	Name: WPC: Marketing
Grant Title:	
Grant ID:	
Documents Reviewed:	• Facebook Study - culturecc.pdf, Category: Recruitment materials/advertisements /verbal scripts/phone scripts; • Facebook study_culturecc_debrif page.pdf, Category: Other; • IRB Protocol_CultureCC_Facebook study.docx, Category: IRB Protocol;

The IRB approved the protocol from 1/11/2021 to 1/10/2022 inclusive. Three weeks before 1/10/2022 you are to submit a completed Continuing Review application and required attachments to request continuing approval or closure.

If continuing review approval is not granted before the expiration date of 1/10/2022 approval of this protocol expires on that date. When consent is appropriate, you must use final, watermarked versions available under the "Documents" tab in ERA-IRB.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

Sincerely,

IRB Administrator

cc: Qin Wang
        Qin Wang
        Naomi Mandel

APPENDIX C

CHAPTER 2: STUDY STIMULI AND MEASURES

Study 1

Lab ID Card

To help simplify the check-in process and ensure attendance is properly recorded, the lab is considering providing every participant with a lab ID card for free. Before we implement this practice, we would like to get your feedback on the design of the lab ID card and style of the photo to print on the card.

[PAGE BREAK]

- Which of the following lab ID card templates do you like more?
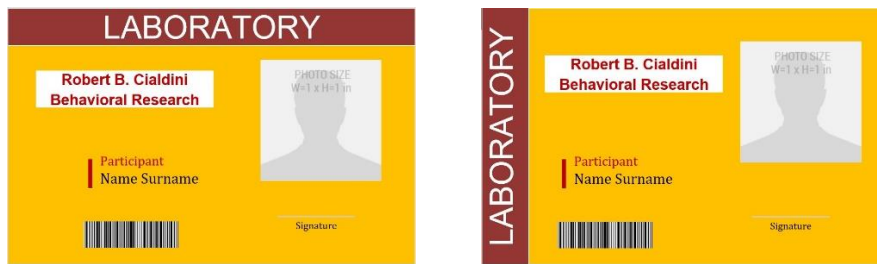
[PAGE BREAK]

Dependent Measure
- Please check your photos in the photo gallery. Which one of the two photos do you want to be used on your lab ID card? (The unbeautified photo/The beautified photo)

[PAGE BREAK]

- How much do you like the idea of providing each participant with a lab ID card? (1 = Not at all, 7 = Very much)

- Do you have any other suggestions on the design of the card or what other information you think should/shouldn't be displayed on the lab ID card?

[PAGE BREAK]

Thanks for providing your feedback on the idea of creating a lab ID card for each participant. We will make a final decision based on the responses we get. If we decide to go for it, the photo you chose will be printed on your lab ID card.

Participants completed the following measure in a separate survey randomized with all the other studies conducted in a one-hour lab session.

Self-Construal Scale (Singelis, 1994)

1. I enjoy being unique and different from others in many respects. (Sing1)
2. I can talk openly with a person who I meet for the first time, even when this person is much older than I am. (Sing2)
3. Even when I strongly disagree with group members, I avoid an argument. (Sing3)
4. I have respect for the authority figures with whom I interact. (Sing4)
5. I do my own thing, regardless of what others think. (Sing5)
6. I respect people who are modest about themselves. (Sing6)
7. I feel it is important for me to act as an independent person. (Sing7)
8. I will sacrifice my self interest for the benefit of the group I am in. (Sing8)
9. I'd rather say "No" directly, than risk being misunderstood. (Sing9)
10. Having a lively imagination is important to me. (Sing10)
11. I should take into consideration my parents' advice when making education/career plans. (Sing11)
12. I feel my fate is intertwined with the fate of those around me. (Sing12)
13. I prefer to be direct and forthright when dealing with people I've just met. (Sing13)
14. I feel good when I cooperate with others. (Sing14)
15. I am comfortable with being singled out for praise or rewards. (Sing15)
16. If my brother or sister fails, I feel responsible. (Sing16)
17. I often have the feeling that my relationships with others are more important than my own accomplishments. (Sing17)
18. Speaking up during a class (or a meeting) is not a problem for me. (Sing18)
19. I would offer my seat in a bus to my professor (or my boss). (Sing19)
20. I act the same way no matter who I am with. (Sing20)
21. My happiness depends on the happiness of those around me. (Sing21)
22. I value being in good health above everything. (Sing22)
23. I will stay in a group if they need me, even when I am not happy with the group. (Sing23)
24. I try to do what is best for me, regardless of how that might affect others. (Sing24)
25. Being able to take care of myself is a primary concern for me. (Sing25)
26. It is important to me to respect decisions made by the group. (Sing26)
27. My personal identity, independent of others, is very important to me. (Sing27)
28. It is important for me to maintain harmony within my group. (Sing28)
29. I act the same way at home that I do at school (or work). (Sing29)
30. I usually go along with what others want to do, even when I would rather do something different. (Sing30)

1 = Strongly disagree, 7 = Strongly agree
Independent Subscale (Independence)
Sing1, Sing2, Sing5, Sing7, Sing9, Sing10, Sing13, Sing15, Sing18, Sing20, Sing22, Sing24, Sing25, Sing27, Sing29

Interdependent Subscale (Interdependence)
Sing3, Sing4, Sing6, Sing8, Sing11, Sing12, Sing14, Sing16, Sing17, Sing19, Sing21, Sing23, Sing26, Sing28, Sing30

Study 2

New App Survey

A company is going to launch a new app named Beauty Plus. In this study, we would like you to try the beauty camera, one of the features of this app, and provide feedback on it.

On the following screens, you will read detailed information about this app. When you are ready, please click to proceed to the next page.

[PAGE BREAK]

Beauty Plus

Beauty Plus is your ideal selfie-taking and retouching app—a tool that is easy to use and provides flawless results!!

With the beauty camera embedded, you can take your best selfie at one click with unique tools to enhance your features: skin smoothing, teeth whitening, skin darkening or brightening, eye enlargement, wrinkle removal, digital makeup, and even height or weight adjustments!

[PAGE BREAK]

Today we would like you to try one feature of the Beauty Plus app, the Beauty Plus Camera, which enhances and beautifies your appearance as it takes a picture.

[PAGE BREAK]

You will take a selfie using Beauty Plus Camera and provide your feedback later.

[PAGE BREAK]

Please RAISE YOUR HAND and the RA will guide you to a separate room to complete the rest of this App testing study.

In a separate room, after taking selfies using Beauty Plus Camera and checking their selfie in photo gallery on the phone, participants completed the following measures.

You have now used the Beauty Plus Camera to take a selfie. Please open your selfie in the photo gallery and keep it open while you are answering the questions on the subsequent screens.

[PAGE BREAK]

Dependent Measure
Willingness to use beauty app
- Overall, how much do you like this app? (1 = Not at all, 7 = Very much)
- How much would you like to download this app? (1 = Not at all, 7 = Very much)
- How much would you like to use this app to edit a photo of yourself? (1 = Not at all, 7 = Very much)

[PAGE BREAK]

Desire to share the beautified photo
- To what extent would you like to share the beautified selfie you just took with Beauty Plus on social media like Facebook or Instagram? (1 = Not at all, 7 = Very much)

[PAGE BREAK]

- How would you rate the beautified selfie you took with Beauty Plus? (1 = Bad, 7 = Good; 1 = Unfavorable, 7 = Favorable; 1 = Not likable, 7 = Likable)

[PAGE BREAK]

- How different is this beautified selfie from the selfies you normally take? (1 = Not at all, 7 = Very much)

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Self-overlap

- If you used this app to beautify your selfie, how much overlap would there be between the edited photo of yourself and your true self?

1 =   (Self) (Edited Photo)   , 7 =   (Edited Self Photo)

- How much do you think the edited photo reflects who you really are? (1 = Does not at all reflect who I am, 7 = Reflects who I am very well)
- To what degree do you think the edited photo is an accurate representation of yourself? (1 = Not at all, 7 = 100% accurate)

[PAGE BREAK]

- Using this beauty app would make me feel like I was trying to put forth an image of someone I was not. (1 = Completely disagree, 7 = Completely agree)
- Using this beauty app would make me feel like I was misrepresenting myself to others. (1 = Completely disagree, 7 = Completely agree)
- Using this beauty app would make me feel like I was trying to present myself as something that I was not. (1 = Completely disagree, 7 = Completely agree)
- Using this beauty app would make me feel like I was misrepresenting my innate self. (1 = Completely disagree, 7 = Completely agree)

[PAGE BREAK]

- How obvious is the discrepancy between your baseline self and how you look in the beautified selfie? (1 = Not obvious at all, 7 = Very obvious)

[PAGE BREAK]

- How did you feel when you were taking the selfie? (1 = Not at all, 7 = Very much)
  Uneasy
  Bothered
  Uncomfortable

[PAGE BREAK]

Presentation mode manipulation check

- How many photos of yourself did you see in the photo gallery? (1/2/other)

Participants completed the same self-construal scale (Singelis 1994) as in study 1 and the following social norm measures in a separate survey randomized with all the other studies conducted in a one-hour lab session.

- What percentage of [University] students do you think use this type of app? (0%-100%)
- How socially acceptable do you think it is to use photo editing apps to beautify photos of oneself? (1 = Not acceptable at all, 7 = Very acceptable)

Study 3

Self-Construal Manipulation:

Writing Task
Please follow the instructions on the next page to write a short essay.

[PAGE BREAK]

- Interdependent condition:
  For the next two minutes, please think of and write down what you have in common with your family and friends. Describe all the ways you are similar to them.

- Independent condition:
  For the next two minutes, please think of and write down what makes you different from your family and friends. Describe all the ways you are different from them.

[PAGE BREAK]
In the next study, we will ask you your thoughts on a new app.

[PAGE BREAK]

New App Survey

A company is going to launch a new app named Beauty Plus. In this study, we are interested in consumers' feedback on this app's design, description, and features.

On the following screens, you will read detailed information about this app. When you are ready, please click to proceed to the next page.

[PAGE BREAK]

Presentation Mode Manipulation:

Separate Presentation

Joint Presentation

Dependent Measure
Willingness to use beauty app
- Overall, how much do you like this app? (1 = Not at all, 7 = Very much)
- How much would you like to download this app? (1 = Not at all, 7 = Very much)
- How much would you like to use this app to edit a photo of yourself? (1 = Not at all, 7 = Very much)

[PAGE BREAK]

Desire to share the beautified photo
- If you were to share one of your selfies on social media like Facebook or Instagram, would you prefer to share the original photo or an edited photo using the Beauty Plus app? (1 = Definitely the original photo, 7 = Definitely the edited photo)

[PAGE BREAK]

Self-overlap

- If you used this app to beautify your selfie, how much overlap would there be between the edited photo of yourself and your true self?

1 = , 7 =

- How much do you think the edited photo reflects who you really are? (1 = Does not at all reflect who I am, 7 = Reflects who I am very well)
- To what degree do you think the edited photo is an accurate representation of yourself? (1 = Not at all, 7 = 100% accurate)

Study 4

Participants first completed the same self-construal scale as in study 1 and a filler task.

New App Survey

A company is going to launch a new app named Perfect Finish. In this study, we are interested in consumers' feedback on this app's design, description, and features.

On the following screens, you will read detailed information about this app. When you are ready, please click to proceed to the next page.

[PAGE BREAK]

Discrepancy Manipulation:
Small discrepancy condition:

Perfect Finish

Perfect Finish is your ideal retouching app—a tool that is easy to use and provides flawless results!!

Imagine professional photo editing at your fingertips, along with unique tools to enhance your features: digital makeup, teeth whitening, skin darkening or brightening, eye enlargement, wrinkle removal, and even height or weight adjustments!

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Large discrepancy condition:

Perfect Finish

Perfect Finish is your ideal retouching app—a tool that is easy to use and provides flawless results!!

Imagine professional photo editing at your fingertips, along with unique tools to enhance your features: digital makeup, teeth whitening, skin darkening or brightening, eye enlargement, wrinkle removal, and even height or weight adjustments!

Dependent Measures

Willingness to use beauty app

- Overall, how much do you like this app? (1 = Not at all, 7 = Very much)
- How much would you like to download this app? (1 = Not at all, 7 = Very much)
- How much would you like to use this app to edit a photo of yourself? (1 = Not at all, 7 = Very much)
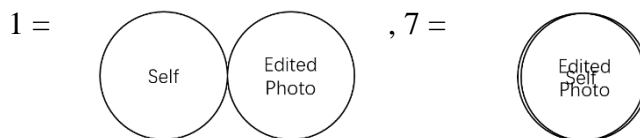
[PAGE BREAK]

Desire to share the beautified photo

- If you were to share one of your selfies on social media like Facebook or Instagram, would you prefer to share the original photo or an edited photo using the Perfect Finish app? (1 = Definitely the original photo, 7 = Definitely the edited photo)

[PAGE BREAK]

Self-overlap

- If you used this app to beautify your selfie, how much overlap would there be between the edited photo of yourself and your true self?

1 =   , 7 =

- How much do you think the edited photo reflects who you really are? (1 = Does not at all reflect who I am, 7 = Reflects who I am very well)
- To what degree do you think the edited photo is an accurate representation of yourself? (1 = Not at all, 7 = 100% accurate)

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Think back to the ad for Perfect Finish that you first saw at the beginning of the study.

- To what extent did it lead you to think the model looks different in the two photos (before vs. after)? (1 = Not at all different, 7 = Very different)

Study 5

The United States Collectivism Index (Vandello & Cohen 1999)

Rank	State	Score	Rank	State	Score
1	Hawaii	91	26	Arizona	49
2	Louisiana	72	27	Alaska	48
3	South Carolina	70	28	Rhode Island	48
4	Mississippi	64	29	West Virginia	48
5	Maryland	63	30	Michigan	46
6	Utah	61	31	Wisconsin	46
7	Virginia	60	32	Massachusetts	46
8	Georgia	60	33	Missouri	46
9	California	60	34	Ohio	45
10	New Jersey	59	35	Maine	45
11	Texas	58	36	New Hampshire	43
12	Alabama	57	37	Oklahoma	42
13	Indiana	57	38	Idaho	42
14	North Carolina	56	39	Vermont	42
15	Tennessee	56	40	Minnesota	41
16	Delaware	55	41	Iowa	39
17	Arkansas	54	42	Kansas	38
18	Florida	54	43	Washington	37
19	New York	53	44	North Dakota	37
20	Kentucky	53	45	Colorado	36
21	Pennsylvania	52	46	South Dakota	36
22	Nevada	52	47	Wyoming	35
23	Illinois	52	48	Nebraska	35
24	New Mexico	51	49	Oregon	33
25	Connecticut	50	50	Montana	31

Note. Higher scores indicate more collectivism.

Google Trends Index: Google Trends gives an index that lies between 0-100 to reflect relative volume of searches over the search window period in each region. This index is a relative scale that has accounted for the total searching volume in each region. In addition, the indexes are also scaled against each other, with the region having the highest search popularity assigned a score of 100 and the other regions scaled relative to it. Therefore, the searching index for each region reflects relative searching popularity and can be compared directly against each other (i.e., higher scores indicate greater searching popularity).

Study 6

Facebook Technical Specifications

- Audience Details
  - Zone: USA/India
  - Age: 24-40
  - Detail targeting: off

- Placements
  - Automatic placement

- Optimization & Delivery
  - Optimization for ad delivery: Link Clicks
  - Cost-Control: none
  - When you get charged: Impression
  - Delivery Type: Standard

- Campaign Details
  - Buying Type: Auction
  - Objective: Traffic
  - Lifetime Budget: $300, $150 in each region
  - Duration: 2 days

- Creative Features:
  - Single image
  - Call to Action: Learn More

- Additional Remarks:
  - Clicking on the ad lead to a website that we created for the purpose of the experiment, on which we indicated clearly that the ad campaign was designed for academic research purposes. Links to a few similar products available in the market and a debriefing message were provided. Knowing that a small minority of users would click more than once, we followed past research, and focused our analyses on "unique clicks".
- Stimuli:

APPENDIX D

CHAPTER 2: IRB EXEMPTION

ASU Knowledge Enterprise Development

EXEMPTION GRANTED

Andrea Ketcham
Marketing
480/965-6122
acmorales@asu.edu

Dear Andrea Ketcham:

On 9/21/2017 the ASU IRB reviewed the following protocol:

Type of Review:	Initial Study
Title:	How do consumers respond to beauty related apps?
Investigator:	Andrea Ketcham
IRB ID:	STUDY00006879
Funding:	Name: Marketing
Grant Title:	
Grant ID:	
Documents Reviewed:	• Mturk consent_Beauty Apps.pdf, Category: Consent Form; • Beauty Related Apps IRB_TemplateACM.docx, Category: IRB Protocol; • Lab Recruitment Script_Beauty Apps.pdf, Category: Recruitment Materials; • Sample items_Beauty Apps.pdf, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • Lab Consent Form_Beauty Apps_behavioral studies.pdf, Category: Consent Form; • Lab Consent Form_Beauty Apps.pdf, Category: Consent Form;

The IRB determined that the protocol is considered exempt pursuant to Federal Regulations 45CFR46 (2) Tests, surveys, interviews, or observation on 9/21/2017.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).
Sincerely,

IRB Administrator

cc: Qin Wang
       Andrea Ketcham
       Adriana Samper
       Qin Wang

ASU Knowledge Enterprise Development

APPROVAL: EXPEDITED REVIEW

Andrea Ketcham
WPC: Marketing
480/965-6122
acmorales@asu.edu

Dear Andrea Ketcham:

On 1/15/2021 the ASU IRB reviewed the following protocol:

Type of Review:	Initial Study
Title:	Cross-cultural differences in willingness to digitally enhance appearance
Investigator:	Andrea Ketcham
IRB ID:	STUDY00013090
Category of review:	
Funding:	Name: WPC: Marketing
Grant Title:	
Grant ID:	
Documents Reviewed:	• Beauty Related Apps IRB_Template_Facebook study.docx, Category: IRB Protocol; • Facebook Study - video conference lighting.pdf, Category: Recruitment materials/advertisements /verbal scripts/phone scripts; • facebook study_age selection.pdf, Category: Recruitment materials/advertisements /verbal scripts/phone scripts; • Facebook study_video lighting_debrif page.pdf, Category: Other; • FB ads_lighting_final.pdf, Category: Recruitment materials/advertisements /verbal scripts/phone scripts;

The IRB approved the protocol from 1/15/2021 to 1/14/2024 inclusive. Three weeks before 1/14/2024 you are to submit a completed Continuing Review application and required attachments to request continuing approval or closure.

If continuing review approval is not granted before the expiration date of 1/14/2024 approval of this protocol expires on that date. When consent is appropriate, you must use final, watermarked versions available under the "Documents" tab in ERA-IRB.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

Sincerely,

IRB Administrator

cc: Qin Wang
        Adriana Samper
        Qin Wang