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Price Promotions Are Inherently More Arousing for Interdependents

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ABSTRACT The ubiquity of promotions and price discounts has prompted much research to understand how consumers respond to deals. In this research, we present an affective perspective for why some consumers may be more deal prone than others. Specifically, we propose that for interdependents (vs. independents), chancing upon a deal leads to heightened arousal and greater purchase intention for the discounted product. We further propose that this effect arises because interdependents (vs. independents) are more likely to possess a comparative mindset. Findings from five studies provide converging evidence to support our propositions. Across the studies, we adopt different operationalizations of self-construal (via country, cultural prime, self-construal scale and prime), measures of arousal (skin conductance and self-report measures) and use different product categories. We further show that when a comparative mindset is made salient for independents and interdependents, the observed effect dissipates.

Consumers are frequently bombarded with the lure of price promotions or discounts. Advertisements of clearance sales, moving out sales, or festive (e.g., Thanksgiving) sales are evident throughout the year. Despite reports stating that consumers are experiencing promotion fatigue (Shaw 2011; Tan 2018), such sale promotions still appear to work for some groups of consumers (Staff 2014). Intuitively, one would expect socioeconomic status to be a strong predictor of how a consumer would respond to deals. However, prior research has shown that such deals also appeal to middle- and high-income consumers (Blattberg et al. 1978; William 2017). For instance, middle- and high-income consumers in Singapore frequently queue for sale items, even though the per capita income level in that country is among one of the highest globally (William 2017). In Hong Kong, rich "tai-tais" (wives of wealthy men) have also been reported to buy counterfeit luxury bags in China, despite being able to afford the authentic version. This suggests that deals may evoke an unconscious desire or affective reaction among some consumers that goes beyond financial utility.

In a bid to understand why some consumers are more deal prone, the literature has examined the impact of various individual characteristics (e.g., value consciousness, price consciousness) and situational/behavioral variables (e.g., number of coupons redeemed per month, type of coupons) on consumers' deal proneness (Lichtenstein, Netemeyer, and Burton 1990; Chandon 1995; Ramaswamy and Srinivasan 1998; Saini, Rao, and Monga 2010). An emerging area of interest within this field is the impact of cultural orientation on consumers' responses to deals (Pattaratanakun and Mak 2015; Lalwani and Wang 2018). For instance, Pattaratanakun and Mak (2015) show that Asians are more motivated to spend time searching for good deals online than their Western counterparts. Lalwani and Wang (2018) further show that consumers with dominant interdependent self-construal are more likely to use coupons than those with dominant independent self-construal. The authors argue that self-construal influences consumers' motivation to self-regulate and make an extra effort to redeem a coupon.

However, coupon redemption requires effort. What happens if a consumer simply chances upon a price discount while shopping? Will self-construal also affect how that consumer reacts to the deal? Although prior research has shown that self-construal moderates consumers' sensitivity to promotions, we argue that the mechanisms have not been completely characterized. This research aims to extend this stream of research by characterizing the role of arousal in the interactive

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effect of self-construal and promotions on consumer behavior. Specifically, we argue that interdependents (vs. independents) will experience a higher level of arousal when they chance upon a deal because interdependents possess a more dominant comparative mindset. Using both skin conductance and self-report measures, we provide corroborating evidence for the propositions.

Findings from this research contribute to the literature on multiple fronts. First, the research findings contribute to the pricing literature by extending our current understanding of the relationship between self-construal and deals. Although prior research has examined the impact of self-construal on coupon proneness (Lalwani and Wang 2018), taking advantage of coupons requires some level of preplanning and effort on the part of consumers. The current research adds to this stream of research by examining the situation whereby consumers just chance upon a deal and delineate how arousal may be an important mechanism that influences interdependents' (vs. independents') responses to deals. This is an effect not previously envisioned in the literature. Second, we also introduce comparative mindset as another important antecedent that may influence how consumers respond to price discounts. Although prior literature has identified a number of antecedents of deal proneness (e.g., Blattberg et al. 1978; Lichtenstein et al. 1990; Ramaswamy and Srinivasan 1998), it has not examined how mindsets, specifically comparative mindset, may influence consumers' reaction to price promotions. Until now, the literature on mindset and deal proneness has evolved fairly independently. We present a first effort to connect these two streams of literature. Third, we also contribute to the literature on self-construal and mindset by showing that interdependents' (vs. independents') tendency to engage in social comparison (Chung and Mallery 1999; Gibbons and Buunk 1999; White and Lehman 2005) also spills over to other nonsocial decision contexts. Finally, we contribute to the cross-cultural literature by presenting an alternative perspective on the impact of self-construal on individuals' self-regulation abilities. Prior research on self-construal has generally suggested that interdependents are better able to regulate their own behavior than independents (Chen, Ng, and Rao 2005; Lalwani and Wang 2018). This research shows an exception to this understanding. Specifically, in the context of price promotions, interdependents (vs. independents) may be less able to regulate their behavior and are more susceptible to sales promotion tactics. Managerially, the findings from this research can inform managers as they design offers and deals to reach out to their target segment in different countries.

THEORETICAL FRAMEWORK

Price Promotions and Deal Proneness

Pricing is one of the most important decisions that marketers need to make. The price of a product not only determines how much revenue it can generate but also impacts the brand image and positioning of the product. Given the prevalence of price promotions and their significant cost to firms (Ailawadi et al. 2006), an extensive stream of research has examined for whom, when, and why price promotions are effective (Montgomery 1971; Kalwani and Yim 1992; Anderson and Simester 2004; Lalwani and Monroe 2005; Saini et al. 2010). For instance, prior research has shown that some consumers are more deal prone than others (Blattberg et al. 1978; Martínez, Montaner, and Pina 2006). Deal proneness has also been shown to be correlated with demographic factors (e.g., income level) or purchasing factors (e.g., number of shopping trips and brands purchased; Webster 1965; Montgomery 1971; Barone and Roy 2010).

Beyond these factors, an emerging stream of research shows that consumers' deal proneness may also differ across cultures (Maxwell et al. 2009; Chang and Yi 2014; Pattaratanakun and Mak 2015; Lalwani and Wang 2018). Specifically, a handful of research has explored the impact of self-construal on deal proneness. For instance, Lalwani and Wang (2018) show that interdependents' (vs. independents') motivation to self-regulate leads to higher coupon usage. It is argued that coupon redemption is an effortful process, and consumers who possess greater self-regulation ability are more conscientious in engaging in action that facilitates coupon redemption (e.g., cutting and keeping the coupons).

There are many situations in which taking advantage of a deal may not require any preplanning or effort. For instance, one may chance upon a 50% discount on an item while shopping. What is unclear is how consumers respond to such deals, and whether self-construal influences consumers' reactions. Drawing from prior findings that exposure to promotions may induce spontaneous affective responses in consumers (Naylor, Raghunathan, and Ramanathan 2006), we argue that chancing upon such deals may lead to different levels of arousal among independents and interdependents.

Self-Construal and Comparative Mindset

Self-construal is defined as how people view "the relationship between the self and others and, the degree to which they see themselves as separate from others or as connected with others" (Markus and Kitayama 1991, 226). The extant literature shows that interdependents (vs. independents) are more concerned with communal goals, relationship

roles, and social obligations (Triandis 1989; Markus and Kitayama 1991; Heine 2001). In contrast, those with a dominant independent self-construal are more autonomous, agentic, and individualistic (Singelis 1994; Heine et al. 1999).

One of the key differences between independents and interdependents highlighted in prior research is the extent to which individuals are sensitive to others' perspectives and prone to engage in social comparison (Chung and Mallery 1999; Gibbons and Buunk 1999; White and Lehman 2005). While most people, at one point or another, would have engaged in some form of social comparisons, prior research argues that interdependents are more likely to do so than independents (White and Lehman 2005). Independents focus more on their own desires and pay less attention to the context or environment (Kühnen, Hannover, and Schubert 2001). On the other hand, interdependents are more likely to believe that elements in the world are intertwined. Thus, an event or object can be understood only in the context of the broader environment (Nisbett et al. 2001; Monga and John 2006). This makes them more attentive to social contexts (Markus and Kitayama 1991), more concerned about others' behaviors and feelings (Markus and Kitayama 1991) and more likely to engage in social comparison (Chung and Mallery 1999; Gibbons and Buunk 1999; White and Lehman 2005). Furthermore, prior research also shows that people who define themselves relative to a reference group are more likely to engage in social comparison (Taylor, Wayment, and Carillo 1996; Heine et al. 2001; White and Lehman 2005).

Building on the above research, we propose that interdependents' (vs. independents') greater tendency to engage in social comparison also spills over to a nonsocial setting. Our argument follows from Xu and Wyer (2007, 859) who show that "making any type of comparative judgment appears likely to give rise to a comparative-judgment mindset," which may influence decisions in subsequent unrelated tasks. In their article, Xu and Wyer (2008) show that when participants were asked to make a comparative judgment in a nonproduct setting, it also influenced their subsequent consumption decision. Paralleling this line of argument, we argue that interdependents' (vs. independents') tendency to engage constantly in social comparison also spills over to other decision contexts, resulting in a chronically more salient comparative mindset. This will, in turn, affect how they respond to price promotions.

Hypotheses

As mentioned, prior research in the price promotion literature has shown that chancing upon a deal can evoke spontaneous affective reactions among consumers and simplify a complicated decision-making process by making it more heuristically driven (DelVecchio 2005; Naylor et al. 2006). We argue that since price promotion is essentially a comparison of a discounted price with the original retail price, simply seeing a price promotion should trigger thoughts of the comparison.[1] We further argue that such thoughts map closely to the comparative mindset interdependents' (vs. independents') possess, leading to a stronger affective reaction when interdependents chance upon a price discount. Findings from the mindset literature provide theoretical support for our predictions.

Research in the mindset literature shows that people are more likely to be aroused when a stimulus matches their underlying mindset or goal (Reber, Winkielman, and Schwarz 1998; Duley et al. 2005). For instance, prior research shows that when a message frame matches a person's thinking style, the message feels easier to process and the person experiences a "subjective ease" of fluency. This experience of fluency leads to a more favorable evaluation and affective response of subsequent stimulus (Reber et al. 1998; Winkielman and Cacioppo 2001; Oppenheimer 2006; Alter and Oppenheimer 2009). Lee and Aaker (2004) also show that a high level of fit between a message and individuals' regulatory focus leads to more fluent processing of the message and positive evaluation because the feeling of subjective ease is transferred to the target object as a result of source confusion (Camacho, Higgins, and Luger 2003). Thus, processing fluency appears to lead to more positive evaluations, independent of the content (Schwarz et al. 1991).

Many contexts may lead to such feeling of fluency: retrieval ease (Kelley and Lindsay 1993), visual ease (Reber and Zupanek 2002), and imagination ease (Mandel, Petrova, and Cialdini 2006). Following this stream of research, we propose that since evaluating a deal is essentially a comparative process (i.e., comparing the discounted price with the original retail price or reference price), the fact that interdependents (relative to independents) are more likely to possess a comparative mindset, the match in the context and their chronic mindset would also make processing the price discount more fluent. Schwarz (2004, 338) said that "theoretically, any . . . variable that increases processing fluency should have the same effect." Our prediction is also consistent with prior research in the social comparison literature,

1. It is not necessary for the actual act of comparing the price between the regular price and the discounted price to take place. We argue that seeing the discount is enough to trigger thoughts of price comparisons.

which found greater neural activity in Korean (vs. American) participants' brains when they were presented with information about the partners' performance in a gambling task (Kang et al. 2013). The authors argue that such neural activity shows that Korean (vs. American) participants are more sensitive to comparative information and that such responses are spontaneous.

Thus, findings from the pricing literature suggest that price promotion may evoke affective reactions from consumers (Naylor et al. 2006), and findings from the mindset literature suggest such reactions would be more intense when the context matches the individuals' mindset (Lee and Aaker 2004; Schwarz 2004). Drawing from these findings, we argue that chancing upon a price promotion triggers thoughts of comparison and this maps into the comparative mindset interdependents' (vs. independents') possess. The match between the context and the mindset would make interdependents (independents) approach a price discount in a more affective manner and exhibit stronger level of arousal.[2]

H1: Interdependent (vs. independent) consumers will exhibit a heightened degree of arousal when they encounter a discounted deal.

H2: The heightened arousal that interdependent (vs. independent) consumers experience is driven by a match in the price promotion context and their underlying comparative mindset.

If deals indeed lead to heightened arousal in interdependents (vs. independents), then are there any downstream consequences? Although the causes and types of arousal may vary, there is general consensus that heightened arousal impairs regular memory capacity and leads to selective processing of cues that are more salient (Pham 1996). Individuals who are aroused are more persuaded by peripheral cues and rely less on cognitive demanding cues (e.g., argument strength; Mano 1992; Pham 1996; Fedorikhin and Patricks 2010). Thus, individuals who are aroused have also been shown to be less able to resist temptation and exhibit a greater tendency to engage in impulse purchase[3] (Cools, Schotte, and McNally 1992; Pham 1996; Gorn, Pham, and Sin 2001; Fedorikhin and Patrick 2010). Deals make people focus on how they feel about a purchase instead of the merits of the purchase. This is why, at times, consumers may buy a promotional item they do not need. Consistent with this stream of research, we argue that the heightened arousal that interdependents (vs. independents) experience should also lead to a stronger urge to purchase the product. Thus, we predict:

H3: Interdependent (vs. independent) would exhibit higher purchase intentions for a discounted (vs. nondiscounted) deal.

Before proceeding, we would like to clarify two aspects of our propositions. First, we acknowledge that consumers' reactions to deals may be influenced by other individual and environmental factors (e.g., familiarity with promotions and/or household demographics; Blattberg et al. 1978; Martínez et al. 2006). What we are arguing is that holding these factors constant, we would still expect self-construal to exert a significant influence on consumers' reactions to sales promotions. Second, it is important to clarify that we are not suggesting independents are immune to sales promotion. All we are proposing is, relatively speaking, interdependents would exhibit a stronger affective response to the same price deal, relative to independents.

A series of five studies was conducted to test our propositions. The first study used a cross-country design to show consumers in an interdependent (vs. independent) culture do indeed experience different levels of arousal when they come across a deal. To control for potential differences in a cross-country comparison and provide evidence of causality, study 2 replicated the findings of study 1 by priming participants' self-construal directly. Study 3 built on the findings of studies 1 and 2 by providing physiological evidence that interdependents indeed showed greater arousal than independents when they chance upon a deal. Study 4 showed that heightened arousal for interdependents (vs. independents) leads to greater purchase intention. Study 5,

2. Arousal is defined as an automatic physiological response in reaction to a stimulus (Oxendine 1970; Sanbonmatsu and Kardes 1988; Pham 1996). It is a state of "intense emotional experience" (Pham 1996), identified by heightened sensations of "energy," "vigor," or "excitement" (Thayer 1989).

3. Arousal differs in valence and intensity (Lang, Dhillon, and Dong 1995). Thus, arousal is not always a positive response. However, in the context of a price discount, research has shown that arousal tends to lead to positive arousal and a greater impulse to purchase (e.g., Cools et al. 1992; Pham 1996).

through moderation, provided evidence for the mechanism of comparative mindset driving interdependents (vs. independents) heightened arousal and preference for discounted items.

STUDY 1: EXTERNAL VALIDITY STUDY

Objective and Participants

The objective of study 1 is to test whether interdependents exhibit higher levels of arousal than independents when presented with a price promotion (hypothesis 1). Following prior research, we used country as a proxy for differences in self-construal (Markus and Kitayama 1991). Although a cross-country design invariably brings in potential confounds due to differences in socioeconomic environment, this study sought to minimize this issue by statistically controlling for differences in these variables. One hundred and eighty-four participants from Amazon Mechanical Turk (MTurk) India (proxy for interdependents) and Amazon MTurk United States (proxy for independents) were recruited for this study. A 2 (country: India vs. US) $\times$ 2 (sale: no sale vs. sale) between-subjects design was employed.

Pretest

To ensure Indian and American participants were equally familiar with price discounts, 81 participants from Amazon MTurk USA and India were recruited for a pretest. In the survey, participants were asked to indicate how familiar they were with price discounts and how often they encountered price discounts ($\alpha = .80$). ANOVA on the mean of the two items revealed no significant difference in familiarity with discounts across both countries ($M_{\text{USA}} = 5.70$ SE $= .154$; $M_{\text{India}} = 5.79$, SE $= .117$; $F(1, 79) = .174$, $p > .1$).

Procedure and Measures

In the study, participants were shown an advertisement promoting a digital camera (see app. A, available online). To increase realism, they were told the promotion would be launched in a store near them soon, and they would be given an opportunity to enjoy the promotion at a later period. In the sale condition, the price was presented as 60% off the suggested retail price (which was pegged to the average price in each country). In the nonsale condition, the price shown was presented as the suggested retail price. Within each country, the absolute price a consumer needed to pay for the product was kept constant across both conditions. After looking at the advertisement, participants were asked to indicate their responses on a three-item arousal scale (i.e., I feel aroused/alert/excited when I read about this deal) adapted from Thayer (1989) and Novak, Hoffman, and Yung (2000). They also indicated their age, average income level, and how much they thought the camera cost. Although participants were given the price of the camera, prior research shows that people's internal reference price may differ from the price exhibited (Thomas and Menon 2007). These variables will be used as control variables in the subsequent analysis.

Results: Arousal

A mean was taken of the three-item arousal scale ($\alpha = .89$). ANOVA on participants' arousal showed a significant main effect of country (country: $F(1, 177) = 10.649$, $p < .01$) and a significant two-way interaction effect on arousal (country $\times$ sale: $F(1, 177) = 5.95$, $p < .01$), after controlling for age, income, and internal reference price. Notably, in the sale condition, Indian participants ($M = 3.77$, SE $= .076$) exhibited a significantly higher level of arousal than their US counterparts ($M = 3.32$, SE $= .073$; $F(1, 177) = 17.19$, $p < .01$). Similar comparison in the "no sale" condition was not significant ($M_{\text{India}} = 3.55$, SE $= .080$; $M_{\text{USA}} = 3.46$, SE $= .077$; $F(1, 177) = .008$, $p > .1$).

Discussion

Consistent with expectations, Indian participants experienced significantly higher levels of arousal, than those from the United States, when they were presented with a promotional stimulus. The effect remained after we controlled for differences in income levels, age, and internal reference price for the item. Thus, this study provided preliminary evidence for our proposition. However, given that the participants came from different countries, with very different socioeconomic landscape, there may be other cross-county differences we were not able to control for. Study 2 aims to control for possible cross-country differences by priming self-construal directly.

STUDY 2: SELF-CONSTRUAL PRIME

Objectives and Participants

Study 2 aimed to provide a more internally valid examination of the proposed effect by priming participants' self-construal directly. This study also aimed to test the generalizability of the effect by using a different focal product—a beanbag. To this end, our study employed a 2 (self-construal prime: interdependent vs. independent) $\times$ 2 (promotion: sale vs. no sale) between-subjects design. Two hundred and twenty-six participants from Amazon MTurk (US) were recruited for this study.

PROCEDURE AND MEASURES

The cover story informed participants that they would be asked to complete a few unrelated studies. First, participants were asked to complete a self-construal prime via a pronoun-checking task taken from Gardner, Gabriel, and Lee (1999). They were told to read a passage about a trip to the city, and those in the independent self-construal prime condition were asked to circle the independent-self related words (e.g., "I", "me"). For the interdependent self-construal prime, participants were asked to circle the interdependent-self related words (e.g., "we" and "us") in the given text. After completing the self-construal manipulation, participants proceeded to an ostensibly unrelated task. For the second study, participants were shown a promotional advertisement for a beanbag (see app. B). In the sale condition, participants were offered 60% off the suggested retail price. In the no-sale condition, the same price was shown, but it was not presented as a promotional price. After viewing the advertisement, participants were asked to indicate how "aroused," "excited," and "alert" ($\alpha = .89$) they felt. Finally, participants provided their demographics.

RESULTS: AROUSAL

ANOVA on the mean of the three items (aroused, excited, and alert) showed a significant interaction between self-construal and promotion on arousal ($F(1, 222) = 5.22$, $p = .02$). The main effect of self-construal ($F(1, 222) = .548$, $p > .05$) and promotion ($F(1, 222) = 1.20$, $p > .05$) was not significant. Contrasts showed that in the sale condition, interdependents ($M = 5.25$, SE $= .228$) exhibited significantly higher level of arousal than independents ($M = 4.48$, SE $= .230$; $F(1, 222) = 5.74$, $p < .05$). A similar comparison was not significant in the no-sale condition ($M_{\text{interdependent}} = 4.56$, SE $= .238$; $M_{\text{independent}} = 4.83$, SE $= .220$; $F(1, 222) = .702$, $p > .05$).

DISCUSSION

Replicating the findings obtained in study 1, study 2 showed that interdependents, relative to independents, indicated significantly higher levels of arousal when they encounter a deal. Since self-construal was primed in this study, the study provided stronger causal evidence to support hypothesis 1.[4] In addition, the fact that the effect was obtained in a different product category demonstrates the generalizability of the effect.

STUDY 3: AROUSAL AND SKIN CONDUCTANCE

Objective and Participants

The aim of this study was twofold. First, the study aimed to provide a more objective measure of arousal (see fig. 1). Building on the self-reported measures used in studies 1 and 2, this study measured arousal using a skin conductance sensor. A skin conductance sensor measures the level of nervous system activity, and such physiological signals have generally been used as an indication of arousal level (Davis and Cowles 1989). Prior research has shown that galvanic skin response, an indicator of skin conductance, increases in a linear fashion with a person's level of arousal (Nakasone, Prendinger, and Ishizuka 2005). The advantage of using skin conductance is that it does not rely on participants' self-reported emotion. Extensive prior research has provided much evidence to support the use of skin conductance to measure arousal (see Wilson 1990; Bradley et al. 1992; Nakasone et al. 2005). Second, we also aimed to replicate the findings in studies 1 and 2 by adopting a different operationalization of self-construal. Prior research has shown that an Eastern (Western) cultural orientation is generally linked to interdependent (independent) self-construal, and self-construal may be primed by increasing the salience of different cultural orientations (Hong et al. 2000; Chen et al. 2005). Following this stream of research, in this study, cultural orientation was used as a proxy for self-construal. Participants' cultural orientation was primed by showing them a list of cultural icons as per prior studies (Hong et al. 2000). Experimentally, this study employed a 2 (cultural orientation: Eastern vs. Western) $\times$ 2 (promotion: "no sale" vs. "sale") between-subjects design. A total of 56 students of Chinese ethnicity were recruited from Nanyang Technological University to participate in this study.

4. Since deals and discounts may convey a negative impression of cheapness (Argo and Main 2008), one may argue that independents are more likely to avoid deals to maintain a good impression of oneself (Ashworth, Darke, and Schaller 2005). To ensure that the findings were not influenced by different levels of impression management concerns between interdependents and independents consumers, we also conducted another study whereby we primed self-construal and showed participants a price discount for a MacBook. Participants indicated their level of arousal and extent they were concerned about appearing cheap or stingy. Analysis showed no significant interaction of self-construal and promotion on impression management concerns. More importantly, analysis showed the impact of self-construal on arousal holds even after controlling for impression management concerns.

	Interdependent self-construal	Independent self-construal
Sale	0.601	-0.02
No-Sale	-0.04	0.17

Figure 1. Skin conductance responses (arousal) based on self-construal and experimental conditions.

Procedure and Measures

The experiment was conducted one participant at a time. Before the experiment, participants were told a skin conductance sensor would be attached to their fingers. They were then shown pictures of the sensor. Next, in the experiment room, Ag/AgCl electrodes were attached to the surface of the medial phalanx of the middle and index fingers of the participants' nondominant hand. Skin conductance levels were continuously sampled at 256 Hz. This led to 256 records per second of the individuals' skin conductance levels (see app. F for more details).

After attaching the skin conductance sensor, participants were given 2 minutes to rest before they started the study. After 2 minutes, the participants were first presented with demographic questions to establish the baseline conductance. Next, the cover story told participants that we were interested in how much people knew about cultures. They were asked to carefully examine the cultural picture collage presented on the next screen and were told they would be asked questions about it later. On the next screen, a cultural collage, taken from Chen et al. (2005), was shown for 60 seconds. In the interdependent prime condition, the collage showed pictures of Chinese cultural icons, whereas in the independent prime condition, the collage showed pictures of US cultural icons (see app. D). The total number of pictures and type of pictures (e.g., symbols, architecture) in both collages were kept as comparable as possible. After viewing the collage, participants were shown a blank screen for 10 seconds in the guise of letting them take a break. After the break, the participants were told on-screen that the next page would feature an ongoing promotion organized by a local electronics retailer in collaboration with the university. The participants were told they could enjoy the promotion after the session. To give greater realism to our cover story, stacks of iPad boxes were placed at a visible corner in the room. Next, participants were shown an advertisement for a new iPad. Those in the "sale" condition saw an advertisement offering a 60% discount on the iPad. In the "no sale" condition, the same absolute price as that in the "sale" condition was shown, although the price was presented as the regular retail price. The advertisement was shown on the screen for 30 seconds. As the participants examined the stimulus, their skin conductance levels were measured (see fig. 1). After they had seen the advertisement, to be consistent with the cover story, the participants responded to some questions about the products and other filler tasks before being debriefed.

Pretest

Although the cultural collage was used in prior research (Chen at al. 2005), before adopting the collage, we pretested it with 50 participants from the same pool as our main experiments. In the pretest, participants were shown the collage and subsequently, asked to indicate the extent to which they were thinking about themselves and their friends and family on two separate 7-point scales (1 = not at all, 7 = a lot). MANOVA showed that participants shown the Chinese collage thought more about their friends and family ($M = 4.13$, SE = .29) than those shown the Western collage ($M = 3.22$, SE = .26; $F(1, 48) = 5.39$, $p < .05$). On the other hand, participants in the American collage condition thought more about themselves than those in the Chinese collage condition did ($M_{\text{Chinese}} = 2.91$, SE = .29; $M_{\text{US}} = 4.18$, SE = .26; $F(1, 48) = 8.94$, $p < .01$). The pretest supported the use of the cultural collage as a self-construal prime.

Results: Skin Conductance

As different individuals may have different baseline skin conductance levels, the level of arousal was measured by calculating the difference between the peak latency of skin conductance response (phasic SCL) when they were viewing the promotional advertisement and the mean skin conductance (tonic SCL) during the last 10 seconds when the control questions were answered.[5] The skin conductance level measured when participants answered the control questions served as the baseline, which is in line with prior psychophysiology research (Bechara et al. 1996; Crone et al. 2004; Norris, Larsen, and Cacioppo 2007).

5. See app. F for more details on the skin conductance measures and robustness checks.

ANOVA with the skin conductance responses (baseline corrected) as the dependent variable, and self-construal prime and promotion as independent factors showed that both main effects were not significant (self-construal: $F(1, 52) = 1.01$, $p > .1$; promotion: $F(1, 52) = .11$, $p > .1$). However, the two-way interaction was significant ($F(1, 52) = 4.04$, $p < .05$). Specifically, participants in the interdependent prime condition exhibited a significantly higher level of conductance level in the "sales" ($M = .601$, SE $= .221$) versus the "no-sales" condition ($M = -.04$, SE $= .186$; $F(1, 53) = 4.97$, $p < .05$). On the other hand, the participants primed with independent self-construal did not show any difference in their responses across both conditions ($M_{\text{sale}} = -.02$, SE $= .205$; $M_{\text{no sale}} = .17$, SE $= .213$; $F(1, 53) = .38$, $p > .1$). The contrast between independents and interdependents in the sale condition was also significant ($F(1, 53) = 4.30$, $p < .05$).

Discussion

Using a more objective measure of arousal, this study replicated the findings in studies 1 and 2 by showing that individuals with a salient interdependent (vs. independent) self-construal are physiologically more aroused when they encounter a price promotion. By showing that interdependents (vs. independents) exhibit greater skin conductance when they chance upon a deal is significant because it shows interdependents' response to price discounts may have a physiological basis.

STUDY 4: DOWNSTREAM EFFECT

Objectives and Participants

Building on the findings of studies 1–3, the objectives of study 4 are to (1) test if heightened arousal leads to greater purchase intention (hypothesis 3) and (2) test whether the effect is idiosyncratic to how the deal is framed. Until now, we have presented the deal in terms of percentage discount. Prior research shows that the way deals are framed may affect how consumers respond to them (Yin and Dubinsky 2004). To demonstrate that the effect is not idiosyncratic to the way the deal is presented, in this study, participants were presented with different framings of the same promotion. To this end, this study employed a 2 (self-construal: interdependent vs. independent) $\times$ 2 (frame: 1-for-1 vs. 50% off for two) between-subjects design. Eighty-four students from Nanyang Technological University participated in this study. Self-construal was measured using the scale from Singelis (1994).

Procedure and Measures

As in the earlier studies, participants were shown a promotional advertisement. To increase the realism of the story, they were told the promotion was currently ongoing and that they could purchase the product after the experiment if they were interested. The advertisement presented a 1-for-1 (or 50% off for two) dining deal at a restaurant in a Marriott hotel. Note that both deals were financially equivalent, except for the way they were framed. After seeing the advertisement, participants were asked to indicate how they felt upon seeing the deal on a three-item (alert, aroused, excited; $\alpha = .73$) and their purchase intention on a three-item scale (e.g., I would be keen to take advantage of this promotion; $\alpha = .93$). Finally, individuals' self-construal was measured using the self-construal scale (Singelis 1994).

Results: Arousal

ANOVA was run on the mean of the three-items arousal scale, with self-construal and promotion as independent variables. Following prior research (e.g., Suh, Diener, and Updegraff 2008), participants' self-construal was measured by taking the difference between the mean of the interdependent subscale ($\alpha = .857$) and the independent subscale ($\alpha = .841$), with a higher score indicating a stronger interdependent self. Analysis showed that interdependents demonstrated significantly higher degree of arousal than independents for both price frames (1-for-1 condition: $M_{\text{independent}} = 3.67$, SE $= .289$; $M_{\text{interdependent}} = 4.42$, SE $= .264$; $F(1, 80) = 5.90$, $p < .05$; percent-off condition: $M_{\text{independent}} = 4.07$, SE $= .264$; $M_{\text{interdependent}} = 5.39$, SE $= .305$; $F(1, 80) = 12.80$, $p < .01$). The interaction effect ($F(1, 80) = .18$, $p > .1$) and main effect of promotion ($F(1, 80) = .01$, $p > .1$) were not significant.

Purchase Intention

ANOVA on the mean of the three-items purchase intention scale revealed similar pattern of results (1-for-1 condition: $M_{\text{independent}} = 3.92$, SE $= .321$; $M_{\text{interdependent}} = 4.80$, SE $= .306$; $F(1, 80) = 10.84$, $p < .01$; percent-off condition: $M_{\text{independent}} = 4.08$, SE $= .293$; $M_{\text{interdependent}} = 5.32$, SE $= .338$; $F(1, 80) = 11.67$, $p < .01$). Paralleling the arousal findings, the interaction effect ($F(1, 80) = .004$, $p > .1$) and main effect of promotion ($F(1, 80) = .04$, $p > .1$) were not significant.

Mediation

Mediation analysis further showed that the effect of self-construal on purchase intention was mediated by arousal

in both conditions (1-for-1 condition: 95% confidence interval [CI]: .15 to .77; percent-off condition: 95% CI: .21 to 1.16).

Discussion

This study showed that heightened arousal when interdependents (vs. independents) chance upon a deal does have important downstream consequences. It leads to higher purchase intention and the findings hold regardless of how the discount is framed.

STUDY 5: UNDERLYING MECHANISM OF COMPARATIVE MINDSET

Objectives and Participants

Study 5 aimed to show that the effect is driven by a differential salience in comparative mindset between these two groups of consumers. To provide evidence for the underlying role of comparative mindset, we adopted a process-by-moderation approach. If heightened arousal is indeed driven by a differential salience of comparative mindset between independents and interdependents, making the comparative mindset momentarily salient for both groups of consumers should eliminate the observed difference. Two hundred and eleven participants from Amazon MTurk (US) were recruited for this study. A 2 (Self-construal: Independent vs. Interdependent) × 2 (Mindset: Comparative vs. Control) between-subjects design was employed. Since for this study, we were interested in how self-construal and comparative mindset influence consumers' responses to deals, all participants were shown the sale item. Mindset was manipulated whereas self-construal was measured using the Singelis (1994) scale.

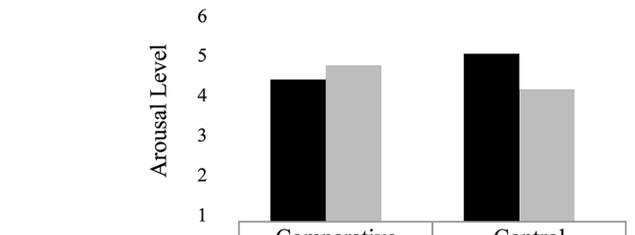
Procedure and Stimuli

In the cover story, participants were told they would be asked to complete a few unrelated studies. First, participants were asked to complete the comparative mindset prime. To manipulate comparative mindset, we adopted the stimuli used in Xu and Wyer (2008). Participants were given a list of 10 pairs of animals (e.g., elephants vs. hippos) and asked to state which animal they prefer. In the control condition, participants were asked to solve 10 word-completion problems about animal names (e.g, H __ p __ __, etc.; Xu and Wyer 2008; Moorman, Xu, and Qin 2013). After completing this task, participants moved on to an ostensibly unrelated second study.

In this part of the study, participants were shown a promotional advertisement of an Apple MacBook (see app. E). In the advertisement, the laptop was sold at 40% off the suggested retail price. After examining the advertisement, participants responded to the same three-item arousal scale described in study 1. They were also asked to indicate how likely they would be to buy the item. Finally, participants completed the self-construal scale (Singelis 1994), before being debriefed.

Results: Arousal

A mean was taken of the three-item arousal scale ($\alpha = .87$). Self-construal was computed by taking the difference between the mean score of the interdependent subscale ($\alpha = .87$) and the independent subscale ($\alpha = .84$) with a higher score indicating stronger interdependent self. Moderation analysis with arousal measure as a dependent variable and the comparative mindset (1 = comparative, 0 = control), self-construal score (mean-centered), and their interaction as independent variables, was conducted. Analysis showed a nonsignificant main effect of self-construal ($\beta = .009$, SE = .01; $F(1, 207) = 3.31, p > .05$) and mindset manipulation ($\beta = -.02$, SE = .169; $F(1, 207) = .01$, $p > .05$). The interaction effect was significant ($\beta = -.04$, SE = .01; $F(1, 207) = 19.71$, $p < .01$). Spotlight analysis (see fig. 2) showed that in the control condition, participants with a stronger interdependent self-construal reported significantly higher arousal ($M_{\text{interdependent}} = 4.80$) than those with a stronger independent self-construal ($M_{\text{independent}} = 3.70$; $F(1, 207) = 24.60$, $p < .01$). This result replicated our findings in studies 1–4. On the other hand, when the comparative mindset was primed, there was no significant difference in the level of arousal among independents and interdependents ($M_{\text{interdependent}} = 4.01$; $M_{\text{independent}} = 4.44$; $F(1, 207) = 2.65$, $p > .05$). Thus, making the comparative



	Comparative	Control
Interdependent self-construal	4.01	4.8
Independent self-construal	4.44	3.7

Figure 2. Arousal levels based on self-construal and experimental conditions.

mindset salient attenuated the impact of self-construal on arousal.

Results: Likelihood of Buying

Similar analysis was conducted on likelihood of buying. Analysis showed a marginally significant main effect of self-construal ($\beta = .01$, SE $= .008$; $F(1, 207) = 3.76$, $p = .053$), a nonsignificant effect of mindset manipulation ($\beta = .26$, SE $= .271$; $F(1, 207) = .96$, $p > .05$), and a significant interaction effect ($\beta = -.03$, SE $= .016$; $F(1, 207) = 4.08$, $p < .05$). Spotlight analysis showed that in the control condition, participants with a more dominant interdependent self-construal reported significantly higher purchase intention ($M_{\text{interdependent}} = 3.90$) than those with a more dominant independent self-construal ($M_{\text{independent}} = 2.79$; $F(1, 207) = 9.79$, $p < .05$). On the other hand, when the comparative mindset was primed, there was no significant difference in purchase intention among independents and interdependents ($M_{\text{interdependent}} = 3.61$; $M_{\text{independent}} = 3.62$; $F(1, 207) = .000$, $p > .1$).

Moderated Mediation

To test whether arousal mediated participants' purchase intention, a moderated mediation analysis using model 7 of Preacher and Hayes (2016) was conducted. A bootstrapping analysis with 5,000 resamples indicated an indirect pathway through arousal ($\beta = -.047$, SE $= .011$, 95% CI: $-.024$, $-.067$). Further analyses of the conditional indirect effects revealed that the mediation effect of arousal on purchase intention was significant in the control condition ($\beta = .03$, SE $= .006$, 95% CI: .045, .021) and insignificant in the comparative mindset condition ($\beta = -.01$, SE $= .009$, 95% CI: .007, $-.028$).

Discussion

Building on the findings from studies 1–4, this study provided evidence for the underlying mechanism of comparative mindset. We show that when the comparative mindset was salient, both independents and interdependents were equally aroused when they encounter a deal. What was slightly unexpected was the finding that making a comparative mindset salient led to a reduction in arousal for interdependents. We feel this may be a boomerang effect due to the manipulation. Since comparative mindset is chronically salient in the minds of interdependents, our manipulation may have made interdependents more conscious of their own biases and thus, they corrected for it subconsciously. Our intuition is supported by prior research that shows that people tend to overcorrect for any perceived biases (Wilson and Brekke 1994; Forster and Liberman 2007; Lee, Oyserman, and Bond 2010).

GENERAL DISCUSSION

Summary of Findings

Findings from five studies provide converging evidence to support our proposition that deals are more likely to elicit spontaneous arousal and higher purchase intention from interdependents (vs. independents) for the discounted product. Evidence for our propositions was obtained using different operationalizations of self-construal (via country, cultural prime, self-construal scale, and prime), measures of arousal (skin conductance and self-report measures) and different product categories (digital camera, beanbag, MacBook, iPad, and dining discount). We further show that making comparative mindset salient for both independents and interdependents eliminates the observed effect. Collectively, the five studies provide robust support for our hypotheses that interdependents and independents are aroused differently when they encounter a deal, and the heightened arousal may have important downstream consequences.

Theoretical Contributions

Findings from this research contribute to the literature on multiple fronts. First, this research contributes to the culture and behavioral pricing literature by proposing a previously not envisioned effect of culture on consumers' response to deals. Research on the impact of culture on pricing is just emerging, with some authors examining how cultural orientation influences consumers' responses to price changes (Chen 2009) and price-quality judgments (Lalwani and Shavitt 2013). A few papers have also examined the impact of culture on coupon proneness (e.g., Huff and Alden 1998; Tercia and Teichert 2016; Lalwani and Wang 2018). However, redeeming a coupon is different from chancing upon a deal. Coupon redemption is a more deliberate process. On the other hand, when one chances upon a good deal, the affective responses may be more spontaneous. Prior research has not examined whether self-construal also influences consumers' affective reactions to such price promotions. This research built on existing literature by showing that interdependent (vs. independent) self-construal may also lead to heightened arousal when consumers chance upon a deal, and this has important implications on their purchase decision.

Second, related to the above, we also push the boundaries on the existing understanding of how self-construal influences consumers' ability to regulate their behavior. Prior

research on self-construal has tended to present a view of interdependents as being more in control of their own behavior than independents (Chen et al. 2005; Lalwani and Wang 2018). Lalwani and Wang (2018) showed that interdependents (vs. independents) are better able to regulate their behavior. Chen et al. (2005) showed that Easterners (who tend to be more interdependent) are more patient and exhibit greater self-control than Westerners (who are generally seen as independent). Diverging from this stream of research, our studies show that this may not hold all the time. Although arousal does not always imply uncontrollability, prior research shows that individuals who are aroused may be less able to resist temptation and are more likely to engage in impulse purchase (e.g., Gorn et al. 2001; Fedorikhin and Patrick 2010). Given that interdependents (relative to independents) feel more aroused when they chance upon a deal, they may find it harder to negate the effect of sales promotion and regulate their purchase behavior. Thus, our findings challenge the notion that interdependents are better able to exercise self-control than independents.

Third, we contribute to the literature on self-construal and mindsets by showing that interdependents' (vs. independents) tendency to engage in social comparison (Chung and Mallery 1999; Gibbons and Buunk 1999; White and Lehman 2005) also spills over to other nonsocial decision contexts. This shows that interdependents' tendency to engage in social comparison may have more far-reaching implications than beyond the social context.

Finally, this research introduces comparative mindset as an important variable that may influence how consumers respond to price discounts. The literature on mindset has grown significantly over the past few years (see Freitas, Gollwitzer, and Trope 2004; Meyvis, Goldsmith, and Dhar 2012), but to the best of authors' knowledge, existing research has not examined how mindset, or more specifically, comparative mindset, may influence consumers' response to deals. This research presents a first step in understanding how comparative mindset may play a consequential role in the dynamics of consumer-price interaction and will hopefully spur more research in the future.

Managerial Implications

Findings from this research can inform managers as they try to reach out to their target segments in different countries. Most firms have a presence in overseas markets nowadays, and price promotion is an important tool in their market penetration arsenal. An understanding of how consumers in different cultures respond to price promotion would be crucial in helping firms penetrate markets more effectively. This is especially so if marketers want to enter the Asian markets. Asians are generally perceived to be bargain hunters. Most traditional Asian retailers and stores allow consumers to haggle over the price to pay, and consumers generally spend time trying to get a discount or good deal on a purchase. This research helps marketers better understand why and when they are deal seekers. At a broader level, findings from this research can also help society at large. Anecdotally, we know people frequently buy things they do not need or want simply because it is on promotion. Understanding the emotional component of price promotion may help society deal with overconsumption.

Future Research

Despite the robust findings across five studies, this research has certain limitations that may also present opportunities for future research. First, this research proposes and shows that differential salience of comparative mindset is the underlying mechanism leading to the effect. However, the phenomenon may be multidetermined, and we do not claim that differential salience of comparative mindset is the only mechanism leading to the effect. It will help to expand our understanding of the phenomenon if future research can also explore other factors that may lead to the differential emotional response to price promotion. For instance, it is also possible that interdependents are more aroused when they chanced upon a deal as price promotion, which makes it easier for them to justify their purchase (Zhang and Shrum 2009). This is an interesting and plausible explanation worth exploring in future research.

Second, although a number of papers (e.g., Lalwani and Wang 2018) and our findings show that interdependents are more deal prone, we acknowledge that there may be situations where interdependents are less deal prone (e.g., Barone and Roy 2010). For example, Barone and Roy (2010) show that exclusive deals are more appealing to independents than interdependents. In addition, prior research has also shown that interdependents are more brand conscious than independents (e.g., Erdem, Swait, and Valenzuela 2006; Mandhachitara, Shannon, and Hadjicharalambousn 2007). Findings from this stream of research would suggest that interdependent consumers should be less deal conscious than their independent counterparts as they need to balance a brand name with potential price savings. It will be insightful if future research can explore potential boundary conditions that may help to reconcile the opposing predictions. For instance, it will be interesting to examine

if impression management concerns (e.g., whether a friend is present in the consumption episode) may moderate the effect. Will interdependents be less deal conscious when a friend is in the consumption episode relative to the situation where they are shopping alone? In addition, will the type of brands (e.g., luxury vs. nonluxury brands) moderate the effect? These are all interesting moderators worth exploring.

Third, the discount levels shown in these studies are moderately high. Future research can explore the effect of different magnitudes of discounts on arousal and willingness to pay for different deals. Finally, it is also unclear at this stage whether the act of spending money in an actual consumption context attenuate the positive affect evoked. It would be informative if future research can test if the positive affect carries through to actual purchase.

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