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Forced to Be Bad: The Positive Impact of Low-Autonomy Vice Consumption on Consumer Vitality

FANGYUAN CHEN
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This research examines the vitality produced by vices—products that offer immediate gratification at the cost of long-term adversity. While vices are intrinsically enjoyable, they also induce guilt. Our conceptualization incorporates these opposing forces to argue that vice consumption is unique in that lowering the consumer's sense of autonomy actually results in higher vitality—in contrast to the positive relationship between autonomy and vitality that has been robustly documented in the literature. An examination of the vitality construct further suggests that low-autonomy vice consumption should consequently result in improved creativity as well as self-regulation. A set of four studies provides support for these and related implications. The obtained findings advance knowledge regarding vitality and its consequences, while they also provide insights into when and why vice consumption might actually be beneficial.

Most of us do not like being forced to do things; conversely, the idea of being allowed to behave as we please is an appealing one. Indeed, just as having to perform mandated chores seems to drain us of energy, freedom of action has the opposite effect: it energizes us and elevates our sense of well-being (Deci and Ryan 2000). This increased psychological energy, technically termed *vitality*, is also associated with a number of positive consequences, ranging from better task performance to improved physical health (Nix et al. 1999; Ryan and Deci 2008).

This research, in contrast, presents a context in which vitality (and its resultant benefits) can in fact be enhanced by lowering the individual's sense of freedom and autonomy. In particular, this novel prediction is examined in relation to *vices*—hedonic temptations that are intrinsically

pleasurable but carry adverse later consequences (Rook and Fisher 1995; Wertenbroch 1998). Such temptations abound, for example, the delicious but fattening dessert that will ruin one's diet program or the stylish but extremely expensive pair of jeans in a store whose purchase will break one's budget. We argue that when it comes to the purchase and consumption of vices such as these, reducing an individual's sense of free choice and autonomy actually boosts vitality because lowered autonomy detracts from the guilt otherwise associated with succumbing to temptation.

In building and testing an overall conceptualization of how vices affect vitality, this research makes three contributions. First, it informs theoretical perspectives on vitality by identifying a novel influence of decision autonomy. Second, it shows when and why it might actually be beneficial to indulge in vices. Third, we identify vitality-related benefits of vice consumption, such as improved self-regulation and heightened creativity. Collectively, these three aspects enrich our understanding of not only vices but also of vitality—a construct that possesses clear relevance to consumer behavior but that has been surprisingly neglected by the field (see Laran and Janiszewski [2011] for a recent exception).

THEORETICAL BACKGROUND

Vices: Guilt-Ridden Pleasures

The consumer literature defines vices as objects associated with tempting immediate pleasures but possibly adverse later

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consequences (e.g., tasty but unhealthy snacks). These are often contrasted with virtues (e.g., less tasty but healthy snacks), which are relatively nonenjoyable in themselves, even though they yield more substantial long-term benefits (Read, Loewenstein, and Kalyanaraman 1999; Werthenbroch 1998). Because the purchase and consumption of vices involves giving in to immediate pleasures while ignoring later negative consequences, such behavior is seen as being normatively “bad” (Hoch and Loewenstein 1991; Rook 1987). Succumbing to vices accordingly induces guilt (Mukhopadhyay and Johar 2009; Ramanathan and Williams 2007). This negative view of vices is understandable: giving in to hedonic temptations, especially when done frequently, can produce seriously debilitating consequences, such as obesity, lowered self-esteem, penury, and addiction (see Rook [1987] for a review).

An unequivocally negative view of vice consumption may not, however, present a complete picture. The present article argues that vices can, in certain conditions, enhance a key psychological resource: vitality. (Note that because our arguments hold for both vice consumption and purchase, we use the phrase “vice consumption” to refer to both cases—the empirical section examines purchase as well as consumption.)

Self-Determination Theory (SDT) and Vitality

Subjective vitality refers to the positive feeling of having energy available to the self (Ryan and Deci 2008; Ryan and Frederick 1997). Vitality has been succinctly described as “guilt-free energy” (Ryan and Frederick 1997) or “calm energy” (Thayer 1987), which is enhanced to the extent that “one is free of conflicts, unburdened by external controls, and feeling capable of effecting action” (Ryan and Frederick 1997, 530). While it has been shown to be conceptually and empirically distinct from sheer positive affect (Nix et al. 1999), vitality is associated with mental and physical well-being (Deci and Ryan 2000; Thayer 1987). Further, a large body of work has shown that it produces favorable consequences, such as improved task performance (Nix et al. 1999), task persistence (Ryan, Koestner, and Deci 1991), and self-regulation (Muraven, Gagné, and Rosman 2008).

Although vitality can be influenced by somatic factors such as pain and fatigue, our interest here is in its psychological antecedents, for which self-determination theory (SDT; Ryan and Deci 2000, 2008) provides the best-known conceptual platform. The theory makes a distinction between intrinsically motivated behaviors and extrinsically motivated behaviors. An intrinsically motivated activity is inherently enjoyable and thus represents a pleasurable end in itself (e.g., running for the sheer joy of it) rather than serving as a means to an end. Because such inherently enjoyable behaviors are self-determined and experienced as an expression of oneself, they enhance one’s sense of vitality. In contrast, extrinsically motivated tasks are driven by either internal pressures (e.g., running in order to lose weight) or external ones (e.g., running to comply with a trainer’s orders) rather than being enjoyable for their own

sake. Because they are experienced as demands to act in a certain way, such behaviors drain the self of vitality (Deci and Ryan 1985; Nix et al. 1999).

Of importance, however, SDT argues that vitality can be fostered even for extrinsically motivated tasks by enhancing situational autonomy—that is, the extent to which the context allows the individual to believe that they have freely chosen to do the task themselves rather than being forced into it (Nix et al. 1999; Ryan and Deci 2000). One illustrative study examined this premise in the context of asking participants to resist the temptation to eat chocolate cookies (Muraven et al. 2008). Exerting such self-control is a classic example of an extrinsically motivated task because people typically engage in it as a means to an end (e.g., a healthier lifestyle) rather than for the intrinsic pleasure of resisting temptation. The study investigated how a situational manipulation of perceived autonomy might influence vitality for such a task. Thus, the experimenter was either supportive and considerate and framed the task as a request in which participants’ cooperation was sought (high autonomy support) or was comparatively clinical and indifferent and framed the task as more of an “order” that the participants had to comply with (low autonomy support). Results revealed that high-autonomy support enhanced subjective perceptions of personal volition and free choice, thereby enhancing vitality.

The premise that situational autonomy support increases the vitality obtained from extrinsically motivated tasks (e.g., regulatory behaviors) has received widespread support across different domains (Kasser and Ryan 1999; Muraven, Rosman and Gagné 2007; Nix et al. 1999). The current research presents a complementary view and informs SDT by positing that in the context of vice consumption (which, as discussed below, is an intrinsically motivated behavior), the opposite is true. Here, lower situational autonomy should heighten vitality—because reduced autonomy will detract from the guilt otherwise associated with succumbing to vices.

Vices, Virtues, and Vitality

Vices, by definition, afford immediate enjoyment—thus, their purchase and consumption is “motivated mainly by the desire for sensual pleasure, fantasy, and fun” rather than being prompted by “the desire to accomplish a functional task” (Strahilevitz and Myers 1998, 436). For instance, there is an intrinsic pleasure in eating a deliciously rich piece of cake (as opposed to the more virtuous behavior of eating a healthy but nontasty snack in order to stick to a diet). Viewed through the SDT lens, therefore, vice consumption is an exemplar of an intrinsically motivated behavior, and it should accordingly enhance vitality.

This does not capture the full story, however. Because vices carry unfavorable normative connotations, people feel guilty and conflicted when yielding to them (Kivetz and Simonson 2002; Ramanathan and Williams 2007). Following from the definition of vitality as positive energy that is “free of guilt” (Ryan and Frederick 1997), such feelings of

guilt should lower vitality. Indeed, ego psychologists from Freud (1923/1962) to Hartmann (1939/1958) have converged on the idea that guilt-ridden conflict drains the positive energy available to the ego, that is, it reduces vitality. Empirical evidence is also supportive of this view, with a negative correlation having been documented for guilt and vitality (Ryan and Deci 2008; Ryan and Frederick 1997). We posit, therefore, that consuming a vice exerts two opposing effects on vitality. The intrinsic enjoyment of vice consumption has a positive influence on vitality, but this does not come free of psychological cost: the guilt produced by yielding to a vice lowers vitality.

Note that this two-force perspective treats the intrinsic enjoyment of vice consumption as a separable outcome from the guilt it produces. That is, while guilt is held to lower vitality, it does not detract from vice enjoyment itself. This independence of guilt and enjoyment is consistent with recent work (Ramanathan and Williams 2007; Xu and Schwarz 2009), which argues that because the act of indulgence focuses attention on the pleasurable features of the indulgence, enjoyment itself is determined simply by these intrinsic features. Thus, even when guilt is experienced, it exists separate of the enjoyment afforded by the indulgence (Xu and Schwarz 2009). Convergent with this premise, Ramanathan and Williams (2007) found that following an indulgence, even though prudent people experienced significantly greater guilt than impulsives, these two types of individuals reported equally high levels of pleasure from the indulgence. In the same vein, we argue and show that vice consumption is associated both with guilt and intrinsic enjoyment; these two constructs exist independently of each other and exert conflicting effects on vitality.

The Moderating Role of Perceived Autonomy: A Departure from SDT

This two-force conceptualization of vice-induced vitality suggests that the facilitating effect of vice consumption on vitality will be observed if the negative impact of guilt can be minimized (Kivetz and Simonson 2002; Kivetz and Zheng 2006; Mukhopadhyay and Johar 2009). In particular, we predict that lowered perceived autonomy, because it provides a justification for the act of vice consumption, will yield enhanced vitality. For example, if eating a chocolate cake can be explained away on the grounds of having to comply with external instructions (as opposed to freely choosing to eat the cake oneself), guilt will be reduced. However, the enjoyment afforded by the vice should not be affected by this lowered sense of autonomy because vice-enjoyment is based simply on the intrinsic features of the vice. In sum, lowered autonomy should reduce vice-guilt without detracting from vice-enjoyment. The positive impact of vice consumption on vitality is therefore more likely to be observed in this case than when the vice is freely chosen.

This prediction thus offers a complementary view to a key premise of SDT, which holds that behaviors performed under high situational autonomy produce more vitality than those

that are externally mandated (Deci and Ryan 2000). While this beneficial impact of autonomy on vitality is well documented in the context of extrinsically motivated regulatory behaviors (Kasser and Ryan 1999; Nix et al. 1999), we propose that the vice consumption context is a qualitatively different one, with correspondingly different implications for the autonomy-vitality relationship. With regulatory behaviors, the task being engaged in (such as resisting temptation) is not enjoyable in itself and thus requires the active exercise of self-control. For such tasks, autonomy-support from the environment helps vitality by increasing the individual's sense of self-determination. With vice consumption, in contrast, the task itself is pleasurable, but it induces guilt. A controlling, low-autonomy environment, for example, the sense that one has to comply with a request, allows the individual to attribute a potentially guilt-inducing behavior to external factors. Thus, precisely because it is inimical to the belief that the behavior was freely chosen, a relatively nonautonomous environment (vs. an autonomy-supportive environment) should increase vitality rather than detract from it. Support for such a prediction would inform SDT by documenting a different relationship between autonomy and vitality than has been observed thus far.

The Benefits of Vice-Induced Vitality

While the study of vitality is important in itself, it is even more consequential because of its associated benefits (Ryan and Deci 2008). Thus, although the major goal of this research is to show that low-autonomy vice consumption can increase vitality, a secondary goal is to show that this then produces other positive outcomes. We focus on two benefits in particular: better self-regulation and enhanced creativity.

Self-Regulation. Arising from the fundamental conceptualization of vitality as the subjective feeling of possessing energy, SDT research suggests that increased vitality enhances regulatory strength and, relatedly, self-control (Muraven et al. 2008; Ryan et al. 1991). For instance, in a study described earlier (Muraven et al. 2008), participants who exhibited greater vitality because of autonomy support on an initial self-control task (resisting a tempting snack) did better on a subsequent task of concentration, which has also been found to require self-control (see also Laran and Janiszewski 2011).

We predict similar effects of enhanced vitality in the current context. The difference, however, is that the initial activity in our context involves yielding to a vice rather than exerting self-control. Thus, rather than vitality being heightened by greater autonomy support on this initial act of vice consumption, it should actually be heightened—and subsequent self-regulation therefore improved—by lowering autonomy.

Creativity. Apart from improved self-control, we further argue that heightened vitality can also produce greater creativity. Unlike with self-control, the relationship between vitality and creativity has not thus far been systematically explored. However, several strands of reasoning support

such a prediction. First, scholars working in the self-determination tradition have argued that increased vitality is associated with better brain functioning and cognitive flexibility (Deci and Ryan 1985, 2000). Such flexibility should positively influence creativity, which essentially involves departing from conventional practices and adopting new ways of thinking (Dahl and Moreau 2007; Hirschman 1980). Second, past literature on creativity suggests that to generate truly creative ideas, a high degree of persistence is often called for (Amabile 1996; Moreau and Dahl 2005). Increased vitality has itself been shown to enhance task persistence (Moller, Deci, and Ryan 2006; Ryan et al. 1991), which suggests that higher vitality should increase creativity.

A final supportive argument stems from a stream of research showing that people perform more creatively when engaged in a task for its own sake rather than for external reasons (such as the pursuit of a task-contingent reward; Amabile 1983; Sheldon 1995). Although vitality was not measured in these studies, research on SDT, as noted earlier, has established a robust link between intrinsic motivation and vitality (Deci and Ryan 2000). It seems plausible, therefore, that the creativity effects observed in these studies were driven by differences in vitality.

Applying these arguments to the current context, we predict that when vice consumption increases vitality, for example, under low autonomy, it should also improve creativity. Support for this hypothesis would not only identify another benefit of low-autonomy vice consumption but would also add to the growing literature on consumer creativity (e.g., Burroughs et al. 2011; Mehta, Zhu, and Cheema 2012; Moreau and Dahl 2005).

In sum, our conceptualization explains when and why consuming vices will positively influence vitality, along with associated improvements in creativity as well as self-regulation. The predictions arising from this conceptualization are tested in a set of four experiments. While our focus throughout is on how lowered autonomy enhances vice-induced vitality, a baseline comparison is provided by showing that autonomy does not exert such an influence for equivalent actions that are less likely to cause guilt (i.e., relatively virtuous behaviors).

EXPERIMENT 1: LOW-AUTONOMY VICE CONSUMPTION ENHANCES VITALITY

Experiment 1 provided an initial test of our ideas in the context of snack consumption. We argue that lowered autonomy should increase the vitality induced by consuming a vice (a tasty but relatively unhealthy snack) but not when consuming a relatively virtuous snack (that is healthy but not tasty). As in all studies reported here, participants were drawn from an undergraduate subject pool at the Hong Kong University of Science and Technology (HKUST). The study featured a 2 (type of task: vice/virtue—eating a chocolate brownie vs. eating a carrot) \times 2 (task instructions: high/low autonomy) between-subjects design. Upon arrival, participants ($n = 80$, 41.3% female) were randomly exposed

to one of two snacks placed on the table in front of them: either a small piece of chocolate brownie or a baby carrot. Each student was in a different cubicle and could not see which snack had been given to the other participants. A pretest confirmed that the chocolate brownie was deemed to be an enjoyable but unhealthy vice, while the carrot was perceived to be a less enjoyable but healthy virtue (see online app. B for pretest details).

Participants in the main study were asked to eat the snack they had in front of them and evaluate its taste on a 1 (not at all tasty) to 7 (very tasty) scale. The consumption task was carried out in a context that fostered either a high or a low sense of autonomy. In the low-autonomy conditions, participants were simply asked to sample the snack as part of the experiment. In contrast, following past research (Muraven et al. 2008; Nix et al. 1999), the high-autonomy instructions fostered a sense of free choice. Participants were given the option of choosing between the food sampling task and another task that had been pretested as being somewhat aversive, namely, writing a 300-word essay on current relations between China and the United States. All participants given these instructions still chose the food-sampling task; however, because they had the option of engaging in another task, perceived autonomy should be higher than when they were not provided an alternate activity. Note that even in low-autonomy conditions, while the degree of autonomy was lower, it was not nonexistent. Rather, it was emphasized to participants that they could walk away from the study at any time.

Dependent measures were collected in the following order. First, participants reported their subjective experience of vitality using the standard Subjective Vitality Scale (SVS; Ryan and Frederick 1997). The SVS contains seven statements (“At this moment, I feel alive and vital”; “At this time, I have energy and spirit”; etc.; see app. A for the full set of items). Participants indicated how true each statement was for them on a scale ranging from 1 (not at all true) to 7 (very true). The average of the seven items formed a subjective vitality score ($\alpha = .59$). They then completed a series of manipulation check questions. First, to assess intrinsic task enjoyment, participants were asked to indicate how much they had enjoyed the food sampling task. Responses were collected on a seven-item measure of task enjoyment (e.g., “The food-sampling task was fun to do”; see app. A for all items; $\alpha = .90$; higher scores = more task enjoyment). These seven items together constitute a standard measure of intrinsic task enjoyment (Muraven et al. 2008; Ryan et al. 1991).

Next, participants indicated the extent to which they felt happy when doing the food sampling task, on a 7-point scale ranging from 1 (not at all) to 7 (very much). This item was measured in order to rule out the possibility that our predicted results for vitality are simply driven by happiness, which is a specific form of positive affect that has been found to be empirically correlated with vitality (Purcell 1982; Ryan and Frederick 1997; Shaver et al. 1987). Despite empirical overlap, the two constructs are conceptually dis-

tinct (as Nix et al. [1999] clarify in detail). Happiness is driven primarily by the pleasantness of an outcome, while vitality, as discussed earlier, is also influenced by the extent to which the behavior producing the outcome is deemed to be relatively autonomous. In the current context, therefore, we expect that while the autonomy instructions should influence vitality, they would not influence happiness, which should only vary as a function of intrinsic task enjoyment (greater happiness for vice vs. virtue consumption).

Perceived autonomy was then assessed using a four-item measure also taken from Ryan et al. (1991). Higher scores indicated greater perceived autonomy (e.g., "I believe it was my own choice as to sample the food or not"; see the full list of items in app. A; $\alpha = .69$). Finally, we measured how hungry participants felt after the snack task (1 = not hungry at all; 7 = very hungry). This was to rule out the possibility that the food sampling influenced participants' felt hunger, which in turn, might affect their subjective experience of vitality.

Results

As expected, the chocolate brownie was rated as being more tasty than the baby carrot ($M: 5.46$ vs. 2.56 ; $F(1, 78) = 102.64$, $p < .001$). There was no difference in felt hunger following the consumption of the two snacks ($M_{\text{brownie}} = 3.54$, $M_{\text{carrot}} = 3.17$; $F(1, 78) < 1$). These patterns—the vice tasted better than the virtue, with no later difference in hunger—also obtain in experiment 2 (which uses similar stimuli) and are not discussed further.

Task Enjoyment and Happiness. A 2 (snack type: vice/virtue) \times 2 (autonomy instructions: high/low) ANOVA on task enjoyment revealed only the anticipated effect of snack type ($M_{\text{brownie}} = 5.44$, $M_{\text{carrot}} = 4.00$; $F(1, 76) = 40.43$, $p < .001$). No other effect was significant ($F < 1$), showing that task enjoyment was not influenced by perceived autonomy or its interaction with snack type. The results for happiness paralleled those for task enjoyment. As anticipated, a 2 \times 2 ANOVA on feeling of happiness revealed only a significant main effect of snack type ($M_{\text{brownie}} = 5.05$, $M_{\text{carrot}} = 4.29$; $F(1, 76) = 8.83$, $p < .01$). Again, this effect was not influenced by perceived autonomy or its interaction with snack type ($F < 1$). Neither happiness nor task enjoyment, therefore, would on its own be able to account for the predicted interaction effect on vitality.

Perceived Autonomy. Participants' perceptions of autonomy yielded the predicted effect of task instructions. Those who sampled the food in order to comply with experimental instructions perceived less task autonomy than when they were given the option of writing an essay instead ($M: 3.45$ vs. 4.71 ; $F(1, 76) = 26.27$, $p < .001$). Sampling a chocolate brownie also led to somewhat higher perceived autonomy than sampling a carrot ($M: 4.35$ vs. 3.85 ; $F(1, 76) = 3.13$, $p = .08$). Importantly however, the interaction of snack type and autonomy instructions was not significant ($F < 1$); again,

therefore, differences in perceived autonomy would not solely be able to account for an interaction pattern on vitality.

Vitality. The vitality index revealed a main effect of snack type ($M_{\text{vice}} = 4.41$, $M_{\text{virtue}} = 3.76$; $F(1, 76) = 14.59$, $p < .001$). Of note, this effect was qualified by an interaction with task autonomy ($F(1, 76) = 4.07$, $p = .05$; see table 1). As predicted, lowering perceived autonomy increased the vitality resulting from sampling the brownie ($M_{\text{low-autonomy}} = 4.71$, $M_{\text{high-autonomy}} = 4.12$; $F(1, 76) = 5.64$, $p < .05$). Autonomy did not make a difference to vitality when sampling the relatively virtuous carrot ($M_{\text{low-autonomy}} = 3.70$, $M_{\text{high-autonomy}} = 3.81$; $F < 1$).

Discussion

Experiment 1 provided the first test of our basic prediction regarding the beneficial effects of lowered autonomy in the context of vices. The vitality resulting from consuming an unhealthy but tasty snack (a chocolate brownie) was found to be greater given lower (vs. higher) perceived autonomy. This finding offers a complementary view to the standard SDT perspective regarding the positive impact of autonomy on vitality (Muraven et al. 2008; Ryan and Deci 2008). Further, in line with our conceptualization, the beneficial effect of lowered autonomy only manifested for the vice food (the brownie), not the relatively virtuous carrot.

Process measures from the study were also supportive. The measure of task enjoyment revealed that vice consumption is indeed intrinsically enjoyable (e.g., compared to virtue consumption), thus creating the grounds for vice-induced vitality. Next, the measure of perceived autonomy not only showed that the autonomy manipulation worked as intended but also revealed that enjoyment of the snack in itself is not influenced by perceived autonomy. Thus, it is not the case that lower autonomy improved vice-related vitality by enhancing the intrinsic enjoyment of vice consumption. Rather, our rationale is that, for guilt-ridden pleasures, lower autonomy influences vitality by reducing guilt

TABLE 1

EXPERIMENT 1: EFFECTS OF SNACK TYPE AND AUTONOMY INSTRUCTION ON TASK ENJOYMENT, HAPPINESS, PERCEIVED AUTONOMY, AND SUBJECTIVE VITALITY

Autonomy	Vice		Virtue	
	Low	High	Low	High
Task enjoyment:				
<i>M</i>	5.41	5.47	3.98	4.01
SD	.78	.60	1.01	1.47
Happiness:				
<i>M</i>	5.16	4.95	4.25	4.33
SD	.69	.76	1.41	1.46
Perceived autonomy:				
<i>M</i>	3.69	5.01	3.26	4.42
SD	1.40	.87	.97	1.03
Subjective vitality:				
<i>M</i>	4.71	4.12	3.70	3.81
SD	.46	.78	.81	.93

(a premise we examine subsequently), allowing the positive influence of intrinsic enjoyment to be manifested.

Note that in addition to the key interaction between snack type and autonomy, a main effect of snack type (greater vitality for vice vs. virtue) was also observed. It cannot be ruled out that this effect, apart from being driven by the greater enjoyment of consuming a vice, was also facilitated by physiological factors, for example, higher sugar in a brownie (vs. a carrot). But if such factors were the only ones driving the vitality findings, perceived autonomy should not have influenced the vitality resulting from vice consumption since physiological intake remains the same whether the vice is consumed under low or high autonomy.

While the focus of our research is on the effect of autonomy for vices, the pattern of results observed for virtues (the carrot snack) bears discussion. Unlike for vices, one might expect the usual effect of autonomy for virtues—higher vitality given greater autonomy, as predicted by self-determination theory. Our results, however, revealed no effect of autonomy for virtue-induced vitality. The reason for this, we believe, has to do with a key difference in the current procedure with that of extant research in the area (e.g., Muraven et al. 2008). In the latter, the virtuous behavior, for example, resisting a tempting but unhealthy snack, requires substantial self-control resources (Muraven et al. 2008; Nix et al. 1999). Facilitating the exercise of such self-control by increasing situational autonomy counteracts depletion and increases vitality. In the current case, it arguably does not require much self-control to choose the healthy snack (the carrot) over writing a long essay. Absent the draining effect that the exercise of self-control has on vitality (Ryan and Deci 2008), participants no longer require the helping hand of situational autonomy to counteract that negative effect.

The virtue condition in our study nevertheless provided a useful baseline in showing that, as theorized, the beneficial impact of lower autonomy is limited to vices. Experiment 2 seeks to replicate this result, and it also provides additional insights into the process underlying the moderating role of autonomy on vice-induced vitality. We have argued that lowered autonomy of vice consumption enhances vitality because it reduces guilt. To examine this account, experiment 2 measured guilt and related conflict. Another goal of this study was to investigate a downstream consequence of vitality, namely self-control.

EXPERIMENT 2: VICES, VITALITY, AND SELF-CONTROL

Design and Procedure

The study used a 2 (snack type: vice/virtue) \times 2 (autonomy instruction: high/low) between-subjects design plus a control condition ($n = 111$, 61.6% female). Participants in the four experimental conditions, drawn from an undergraduate subject pool at Hong Kong University of Science and Technology (HKUST), followed the same initial procedure as in experiment 1, sampling either a baby carrot or a chocolate cake (which replaced the brownie as the vice snack) under high

or low autonomy. The same autonomy manipulation that had been validated in experiment 1 was used in this study. Participants then completed the seven-item vitality index. Next, instead of reporting enjoyment and autonomy (as had been done in experiment 1), participants were asked to indicate how guilty they felt about sampling the snack on an 11-point scale (1 = not at all; 11 = extremely). They also indicated how conflicted the snack consumption task had made them feel on a set of three items: torn, conflicted, and ambivalent (1 = not at all; 7 = extremely; $\alpha = .87$). Finally, all participants proceeded to a computer-based concentration test. Past research has shown that self-control (or its equivalent here, self-regulation) can be assessed via performance on concentration tasks (Barkley 1997; Muraven et al. 2008; Quay 1997). Thus, following Muraven et al. (2008), a computer program presented 30 numbers on the screen, one at a time, for 500 milliseconds each. Participants were asked to tap the space bar every time the number “6” appeared after the number “4.” The number of errors—missing the target number or hitting the space bar when a nontarget number was shown—indicates how successful participants were in regulating their attention, and it thus serves as a measure of self-control. Participants in the control condition did not complete any initial food-sampling task; instead, they went directly to the vitality and self-control measures.

Results

Vitality. A 2 (vice vs. virtue) \times 2 (high vs. low autonomy) ANOVA, without the control condition, replicated previous findings. A main effect of snack type on vitality ($M_{\text{vice}} = 3.89$, $M_{\text{virtue}} = 3.26$; $F(1, 75) = 6.53$, $p = .01$) was qualified by a significant interaction with autonomy ($F(1, 75) = 11.91$, $p = .001$). As before, lowering autonomy had a positive effect when sampling a chocolate cake ($M_{\text{low-autonomy}} = 4.38$, $M_{\text{high-autonomy}} = 3.39$; $F(1, 75) = 8.44$, $p < .01$). This was not the case when sampling carrots; indeed, the pattern of findings followed the reverse direction ($M_{\text{low-autonomy}} = 2.91$, $M_{\text{high-autonomy}} = 3.61$; $F(1, 75) = 3.47$, $p = .07$; see table 2). It is also worth noting that when examining the comparison across product type, the vitality induced by vices versus virtues differs only under low autonomy ($F(1, 75) = 24.53$, $p < .001$), not under high autonomy ($F < 1$, $p > .10$). This follows from our conceptualization: under high autonomy, the positive impact of vice-enjoyment on vitality is nullified by the negative impact of vice-guilt; it is under low autonomy that the positive impact is observable because the effect of guilt is diluted.

Also of note, the vitality obtaining in the control condition ($M = 3.44$), in which participants did not consume any snack, did not differ from either of the carrot conditions ($p > .10$), but was indeed lower than the vice/low-autonomy condition, which is where we predicted a vitality increase ($M_{\text{low-autonomy-vice}} = 4.38$, $M_{\text{control}} = 3.44$; $t(106) = 3.08$, $p < .01$).

Guilt and Conflict. The findings on these two measures revealed why lowered perceived autonomy increased the

TABLE 2

EXPERIMENT 2: EFFECTS OF SNACK TYPE AND AUTONOMY INSTRUCTION ON SUBJECTIVE VITALITY, GUILT, FELT CONFLICT, AND CONCENTRATION PERFORMANCE

Autonomy	Vice		Virtue	
	Low	High	Low	High
Subjective vitality				
<i>M</i>	4.38	3.39	2.91	3.61
SD	.84	1.49	.86	1.00
	Note that in baseline condition, <i>M</i> = 3.44, <i>SD</i> = 1.01			
Guilt:				
<i>M</i>	1.50	4.43	1.58	1.68
SD	.83	2.66	.90	1.34
Felt conflict:				
<i>M</i>	1.78	3.43	2.47	2.54
SD	1.08	1.66	1.19	1.32
Concentration performance (number of errors; fewer errors = higher self-control):				
<i>M</i>	4.10	9.43	8.89	8.16
SD	4.58	9.87	7.82	7.34
	Note that in baseline condition, <i>M</i> = 9.31, <i>SD</i> = 8.80			

vitality ensuing from vice consumption. When sampling the chocolate cake, participants felt less guilty ($M = 1.50$) when they were following instructions (low autonomy) than when they freely chose the cake instead of the optional activity (high autonomy; $M = 4.43$; $F(1, 75) = 32.78$, $p < .001$). No such difference in autonomy-induced guilt obtained for those consuming a virtue ($M_{\text{low-autonomy}} = 1.58$, $M_{\text{high-autonomy}} = 1.68$; $F < 1$). The two-way interaction was significant ($F(1, 75) = 14.67$, $p < .001$).

Exactly the same pattern obtained for felt conflict. A significant two-way interaction ($F(1, 75) = 6.85$, $p = .01$) revealed that the conflict caused by sampling the cake was reduced when autonomy was lower ($M_{\text{low-autonomy}} = 1.78$, $M_{\text{high-autonomy}} = 3.43$; $F(1, 75) = 15.52$, $p < .001$), but no such difference obtained when sampling the carrot ($M_{\text{high-autonomy-virtue}} = 2.54$, $M_{\text{low-autonomy-virtue}} = 2.47$; $F < 1$). Because guilt and conflict yielded parallel results and because they also loaded on to the same factor, we measured only guilt in subsequent studies.

Self-Control Outcome. The number of errors that participants made on the concentration task served as the measure of self-control—thus, low means indicate higher self-control. We predicted that self-control performance should follow the pattern obtained on the vitality index. A 2×2 ANOVA revealed a marginally significant interaction between autonomy and snack type ($F(1, 75) = 3.08$, $p = .08$). Planned contrasts then showed that, as predicted, sampling the cake improved regulatory performance in the low-autonomy ($M = 4.10$) versus high-autonomy conditions ($M = 9.43$; $F(1, 75) = 4.94$, $p < .05$). In contrast, participants who sampled the carrot performed equivalently across conditions ($M_{\text{low-autonomy}} = 8.89$, $M_{\text{high-autonomy}} = 8.16$; $F < 1$). Comparisons with the no-snack control condition followed the pattern of the vitality results. The performance of control participants ($M = 9.31$) did not differ from either of the carrot conditions ($p > .10$ in each case), but it was signif-

icantly worse than performance in the vice/low-autonomy condition ($t(106) = -2.28$, $p < .05$).

We conducted a mediation analysis to test whether the effect of autonomy (0 = high, 1 = low) on self-regulatory performance (higher number = more errors, i.e., worse performance), which was observed in vice conditions, was driven by vitality (under virtue conditions, autonomy did not influence either vitality or self-regulatory performance). A positive effect of autonomy was obtained on the vitality mediator ($\beta = .99$, $t = 2.60$, $p < .05$). Also, the mediator significantly influenced self-regulation, such that greater vitality led to fewer errors in the concentration test ($\beta = -2.57$, $t = -2.72$, $p < .01$). Bootstrapping analyses then found that the direct effect of autonomy on self-regulation performance was not significant ($\beta = -2.78$, $p > .10$), while the indirect effect through vitality was negative and significant ($\beta = -2.55$), with a 95% confidence interval excluding zero (-6.26 to -0.57). Collectively, these results document that in the context of vice consumption, the effect of autonomy on self-regulation was fully mediated by vitality.

Discussion

Experiment 2 replicates our earlier findings, demonstrating the beneficial effects of lowered autonomy for vice consumption. It also extends these findings along two important directions. First, this study provides insights into why, contrary to the usual findings relating to self-determination theory, lower autonomy in the context of vices enhances vitality. As predicted, lowered autonomy reduces the vice-induced guilt that would otherwise negatively impact vitality. Second, experiment 2 examines an important downstream consequence of vitality: self-control. Consistent with the premise that vitality enhances regulatory resources, we find that en-

hanced vitality in the vice/low-autonomy case improves self-control.

Of interest, several investigations on self-control have documented a compensatory effect of “balancing,” whereby past indulgence leads to improved subsequent self-control (e.g., Fishbach and Dhar 2005; Mukhopadhyay, Sengupta, and Ramanathan, 2008; see also the “licensing” effect, Khan and Dhar 2006). Improved performance on the concentration task after yielding to a vice, as documented in experiment 2, is consistent with such a compensatory process. However, the mechanism proposed and supported here—which involves a heightening of vitality and a consequent enhancement of regulatory resources—is a novel one. Further, this vitality-based account identifies unique boundary conditions. For example, a balancing account would not be able to explain why vice consumption leads to improved regulation under lower (vs. higher) perceived autonomy. If anything, it would predict the reverse, that is, it is when individuals feel they have freely chosen to yield to temptations that they are more likely to compensate for this behavior by exerting subsequent self-control. Our results are inconsistent with this prediction, but they are supportive of a vitality-based account. A likely reason that a balancing account does not hold in our study is that the two tasks, food consumption and visual concentration, were in completely different domains. Balancing typically manifests when there is a greater domain overlap between the two tasks, allowing individuals to compensate for indulgence in the first task with restraint in the second, for example, by eating unhealthy food and then exercising (Fishbach and Dhar 2005).

EXPERIMENT 3: CHOOSING A NONFOOD VICE

Experiment 3 aims to extend our core findings in four important ways, all of which bolster confidence in the underlying conceptualization. First, while all the studies described previously have examined vice behavior in the context of snack consumption, experiment 3 extended our investigation to a nonfood purchase context. Participants used a gift voucher to choose between two books: a “lowbrow” book that offered entertainment but little by way of long-term educational or cultural benefits and a “highbrow” book that was less pleasurable to read but that was of educational utility in the long term. Those who choose the former (vs. the latter) are choosing short-term gratification over long-term benefits, accordingly engaging in a vice behavior. Likewise, choosing the useful book (over the entertaining one) qualifies as a virtue. The highbrow/lowbrow choice scenario has been similarly used in the past to operationalize vice versus virtue; for instance, Khan and Dhar (2006) asked participants to choose between magazines like the *Economist* (virtue) versus gossip magazines (vice; see also Kivetz and Zheng 2006; Read et al. 1999).

Second, instead of using the earlier procedure in which participants were exposed to only the vice option or only the virtue option, experiment 3 employed a choice paradigm

that simultaneously exposed participants to both options under either low autonomy (choice was externally assigned) or high autonomy (free choice). This procedure allowed us to extend our findings to the context of choosing between a vice and a virtue, a trade-off that consumers often have to make (see Shiv and Fedorikhin 1999). As explained later, the procedure also enabled a broader demonstration of the beneficial effect of low-autonomy vices, that is, increased vitality as compared to autonomous choice in general, regardless of whether the product chosen autonomously is a vice or a virtue.

Third, while our earlier studies had measured either task enjoyment and autonomy (experiment 1) or guilt (experiment 2), experiment 3 assessed all these process variables together. Fourth, in order to extend our findings regarding the positive consequences of increased vitality, this study measured task creativity.

Method

Design and Procedure. The study used a one-factor between-subjects design with three experimental levels (choice type: autonomous choice vs. assigned vice vs. assigned virtue). The study also included a control condition, which we describe later. Participants were drawn from an undergraduate subject pool at Hong Kong University of Science and Technology (total $n = 257$; 61.7% female).

In the three experimental groups, participants were first led to a shopping task that ostensibly studied undergraduates' reading behavior. The task required participants to make a purchase decision between two books; a brief sample of each book was provided to all participants (see online app. C). A celebrity photo album was used as the lowbrow book and a computer programming tutoring book as the highbrow book. A pretest showed that the celebrity album (computer book) was perceived as a relative vice (virtue; please see online app. B for pretest details).

To simulate a purchase environment, before exposure to the task above, all participants were given a gift voucher of 100 HK dollars. They were told that they could buy one of the two books using this voucher. For realism, each book was priced at 98.50 HKD (thus, all participants got to retain 1.50). Participants in the high-autonomy condition were told to make their purchase decision freely (autonomous-choice). We expected that some participants would yield to the temptation of the lowbrow but more enjoyable book, while others would resist the temptation and buy the less entertaining but more useful (highbrow) book. Indeed, 54.8% of high-autonomy participants selected the highbrow book, that is, they acted virtuously. Participants in the low-autonomy conditions (assigned-vice and assigned-virtue) also got the gift voucher and were exposed to both book options. However, they were told that in order to balance the number of individuals who choose each alternative, they were being assigned to the book that was different to the one that had been chosen by the preceding participant (thus, the decision was externally imposed—participants were randomly assigned either the vice or the virtue book).

After this simulated shopping task, participants reported their current levels of vitality, followed by the measure of guilt on 7-point scales. Both vitality and guilt were measured as in experiment 2. Next, participants proceeded to a slogan-generation task that assessed creativity. All participants were given the description of a new polo bike and asked to create an advertising slogan for it. Overall creativity of the generated slogan was assessed by three independent judges ($r = .75$) using standard items of innovativeness and appropriateness (Amabile 1996; Dahl and Moreau 2002; Mehta and Zhu 2009). Each of these items was measured on an 11-point scale (1 = not at all; 11 = very much). Higher scores on the combined index (inter-item $r = .90$) indicated greater creativity.

Participants then completed manipulation checks for task enjoyment and perceived autonomy of the shopping task they had engaged in. Exactly the same items were used as in the equivalent questions for the snack consumption task in experiment 1, as adapted to the shopping context (see app. A for details). Note that, as in experiment 1, we expected the choice of vice (the celebrity album) to be associated with greater enjoyment than the choice of virtue (the computer programming book). We predicted this even though (unlike in experiment 1), there was very little actual usage of the vice/virtue before choice and such usage in any case was the same across conditions. That is, all participants were only exposed to a brief sample of each book. We expect, however, that task enjoyment in this case should be driven by the anticipated pleasure offered by the chosen book, which itself would be based on the intrinsic features of that book (see the impulse purchasing literature for a parallel argument; Alba and Williams 2013; Hirschman and Holbrook 1982). As with actual consumption, therefore, enjoyment of the choice task should be greater when the more pleasurable option is chosen.

Finally, participants were given the following vice/virtue definition: "A vice is something that is enjoyable initially, but has a negative effect in the long run, whereas a virtue is something that may not be as enjoyable initially, but has a positive effect in the long run" (see Kivetz and Zheng 2006; Read et al. 1999). Based on this definition, they were asked to indicate the extent to which they perceived each of the two books as a vice or a virtue (1 = strictly vice, 5 = strictly virtue). Within-subjects analysis of this item showed that across conditions, the celebrity album was perceived more as a vice and the computer programming book more of a virtue ($M_{\text{celebrity album}} = 1.54$, $M_{\text{computer programming book}} = 4.41$; $F(1, 255) = 781.30$, $p < .001$). This difference was not influenced by the between-subject choice type factor ($p > .10$).

Participants in the control condition did not fill out measures of task enjoyment, guilt, and perceived autonomy. Instead, they reported their subjective vitality immediately after they arrived at the lab, followed by the creativity measure. After that, they were given the book shopping task, that is, they were asked to choose between the computer book and the celebrity book just as in the autonomous-choice

condition. As we explain later, this control condition served to rule out the possibility of a priori differences in vitality and creativity between those who autonomously choose the vice versus the virtue.

Results

The study design comprised a three-level choice factor: autonomous choice (i.e., the high-autonomy condition) versus assigned-vice versus assigned-virtue (i.e., two low-autonomy conditions). The analyses were accordingly based on the corresponding three-way ANOVA. Note that initial analyses (details available with the authors) revealed that with one exception discussed later, the two autonomous choice conditions (autonomous-vice vs. autonomous-virtue) did not differ significantly for any of the dependent variables, thereby justifying the use of a single pooled autonomous-choice condition (see Jonas, Diehl, and Bromer 1997). Accordingly, the focal comparison in this study, for the key variables of vitality and creativity, was between the assigned-vice condition and the pooled autonomous-choice condition (rather than the narrower comparison of assigned-vice with autonomous-vice alone). We were thus able to examine how being assigned to a vice improves vitality and creativity compared to autonomous choice in general, regardless of which product (vice or virtue) was chosen autonomously.

To retain consistency with our earlier terminology, note that the term "high autonomy" is used interchangeably in this study with "autonomous" and "low autonomy" is used interchangeably with the two "assigned" conditions (assigned-vice and assigned-virtue).

Manipulation Checks: Task Enjoyment. Our theorizing predicts an effect of product type on task enjoyment: obtaining a vice should produce greater enjoyment than obtaining a virtue. A main effect of the three-level choice type factor was observed on task enjoyment ($F(2, 206) = 3.53$, $p < .05$). In the context of this three-way ANOVA, support for our theorizing obtains if task enjoyment is higher for the assigned vice versus the assigned virtue (task enjoyment for the autonomous choice case cannot be predicted a priori since this condition contains a mix of the two product types). In support, a planned contrast revealed the predicted difference between the two low-autonomy conditions as a function of product type ($M_{\text{assigned-vice}} = 4.51$, $M_{\text{assigned-virtue}} = 3.95$; $t(206) = 2.58$, $p < .05$; enjoyment for the autonomous-choice condition lay in between: $M_{\text{autonomous-choice}} = 4.33$). For completeness, along with providing cell means for these three conditions, table 3 also reports the separate cell means for autonomous-vice and autonomous-virtue conditions for all dependent variables.

Manipulation Checks: Perceived Autonomy. The three-way ANOVA revealed a main effect of choice type on perceived autonomy ($F(2, 206) = 21.00$, $p < .001$). A planned contrast indicated that, as would be expected, participants who were allowed to make their own choice

TABLE 3

EXPERIMENT 3: EFFECTS OF CHOICE TYPE ON TASK ENJOYMENT, PERCEIVED AUTONOMY, GUILT, VITALITY, AND CREATIVITY

	Choice type				
	Autonomous vice	Autonomous virtue	Pooled autonomous choice	Assigned vice	Assigned virtue
Task enjoyment:					
<i>M</i>	4.50	4.19	4.33	4.51	3.95
SD	1.07	1.17	1.16	1.07	1.05
Perceived autonomy:					
<i>M</i>	4.92	5.23	5.09	4.10	3.68
SD	1.35	1.23	1.29	1.35	1.54
Guilt					
<i>M</i>	3.17	1.44	2.22	1.93	1.94
SD	1.75	.96	1.62	1.30	1.27
Subjective vitality:					
<i>M</i>	4.08	4.31	4.21	4.60	3.99
SD	1.06	1.16	1.11	.96	1.12
		Note that in baseline condition, $M = 4.08$, $SD = 1.01$			
Slogan creativity:					
<i>M</i>	5.50	5.58	5.54	6.42	5.72
SD	1.33	1.39	1.36	1.49	1.17
		Note that in baseline condition, $M = 5.61$, $SD = 1.48$			

($M_{\text{high-autonomy}} = 5.09$) perceived more task autonomy than those who were externally assigned to purchase a particular book—either the computer book ($M_{\text{low-autonomy-virtue}} = 3.68$) or the celebrity book ($M_{\text{low-autonomy-vice}} = 4.10$; $t(206) = 6.30$, $p < .001$). The latter two did not differ from each other ($p > .10$).

Guilt. In an initial analysis, a planned contrast using a four-level choice factor (high-autonomy-vice/high-autonomy-virtue/assigned-vice/assigned-virtue) revealed higher guilt for the high-autonomy vice ($M = 3.17$) versus the high-autonomy virtue ($M = 1.44$; $t(205) = 6.60$, $p < .001$)—as indeed, we would expect. Note that the equivalent planned contrast in the context of the four-way ANOVA did not attain significance for any of the other dependent variables, allowing the use of the three-way ANOVA for all those variables.

For guilt alone, however, given the difference between the two autonomous conditions, choice type had to be treated as a four-level factor, and the four-way ANOVA described above was used to analyze the findings. A main effect of the four-level choice type factor was obtained ($F(3, 205) = 15.35$, $p < .001$). Our theorizing predicts that for a vice, lower autonomy should reduce guilt. A planned contrast within the two vice conditions revealed the predicted difference ($M_{\text{high-autonomy-vice}} = 3.17$, $M_{\text{assigned-vice}} = 1.93$; $t(205) = 4.69$, $p < .001$). In contrast, for a virtue, there should be no such impact of autonomy on guilt, and these two conditions indeed did not differ significantly ($M_{\text{high-autonomy-virtue}} = 1.44$, $M_{\text{assigned-virtue}} = 1.94$; $p > .10$).

Vitality. A main effect of the three-level choice factor, with the two autonomous-choice conditions once again pooled together, was obtained on vitality ($F(2, 206) = 4.39$, $p < .05$). Our key prediction is that being assigned the vice will enhance vitality. A planned comparison of the two assigned

(i.e., low-autonomy) conditions provided an initial indication that this was the case ($M_{\text{low-autonomy-virtue}} = 3.99$, $M_{\text{low-autonomy-vice}} = 4.60$; $t(206) = 2.89$, $p < .01$). More importantly, the vitality produced in the low-autonomy vice condition was also found to be higher than that in the pooled autonomous choice condition ($M_{\text{high-autonomy}} = 4.21$; $t(206) = 2.18$, $p < .05$). Thus, when it comes to vices, lowered autonomy produces higher vitality than that resulting from allowing participants to freely make their own choices regardless of whether it is a vice or a virtue that is freely chosen. This result provides even broader support for the vitality enhancement we have documented earlier for low-autonomy vice consumption (in those earlier studies, such an enhancement was shown via a narrower comparison with the autonomous-vice condition alone).

Slogan Creativity. A main effect ($F(2, 206) = 7.64$, $p < .01$) of the three-level choice factor was obtained on slogan creativity. Planned contrasts then showed that creativity performance in the assigned-vice condition ($M_{\text{low-autonomy-vice}} = 6.42$) was not only higher than in the assigned-virtue condition ($M_{\text{low-autonomy-virtue}} = 5.72$; $t(206) = 2.67$, $p < .01$) but again it was also higher than in the pooled autonomous choice condition ($M_{\text{high-autonomy}} = 5.54$; $t(206) = 3.86$, $p < .001$). Thus, as with vitality, creativity also benefited from being assigned a vice, as compared to allowing participants a free choice between the vice and the virtue.

A mediation analysis tested whether this effect, that is, the creativity boost for the assigned-vice versus the autonomous-choice condition—was indeed driven by vitality. First, a significant effect of choice type (assigned vice vs. autonomous choice) was obtained on the vitality mediator ($\beta = .39$, $t = 2.21$, $p < .05$). Second, participants with greater vitality performed more creatively in the slogan generation task ($\beta = .27$, $t = 2.65$, $p < .01$). Bootstrapping analyses then showed that the direct effect of choice type

on creativity was significant ($\beta = .77, t = 3.27, p < .01$). Importantly, the indirect effect through vitality was also positive and significant ($\beta = .11$), with the 95% confidence interval excluding zero (.0235, .2934), showing that the effect of choice type on creativity was at least partially driven by vitality. This is consistent with our theorizing, which simply argues that vitality represents one path (but not necessarily the only one) by which low-autonomy vices benefit creativity. We return to this partial mediation result in the general discussion.

Assigned-Vice versus Free-Vice: A Specific Comparison. Because the procedure in the high-autonomy (autonomous) condition of this study involved a free choice between the vice and the virtue, the beneficial effect of low-autonomy vices was examined via a comparison with this autonomous-choice condition as a whole. As noted earlier, this comparison provided even more far-reaching evidence of the positive impact of low-autonomy vices, which experiments 1 and 2 had tested through a specific comparison with the high-autonomy vice condition alone.

However, in order to replicate our previous findings, and to provide a comparison that controls for product type, we also conducted a follow-up analysis using a four-way ANOVA (high-autonomy-vice/high-autonomy-virtue/assigned-vice/assigned-virtue). By separating high-autonomy-vice from high-autonomy-virtue, this analysis allows us to test whether the specific comparison of low-autonomy-vice versus high-autonomy-vice replicates earlier results. Reassuringly, we found that this was indeed the case. Thus, planned contrasts in the context of the four-way ANOVA showed that those who were assigned to the vice experienced higher subjective vitality and creativity (low autonomy: $M_{\text{vitality}} = 4.60, M_{\text{creativity}} = 6.42$) than if they chose the vice themselves (high autonomy: $M_{\text{vitality}} = 4.08, M_{\text{creativity}} = 5.50; t > 2.41, p < .05$). In contrast, and also as in past studies, when a virtue was chosen, lower autonomy led to a nonsignificant reduction of vitality ($M_{\text{low-autonomy-virtue}} = 3.99, M_{\text{high-autonomy-virtue}} = 4.31; t(205) = -1.52, p = .13$), and it had no impact on creativity ($M_{\text{low-autonomy-virtue}} = 5.72, M_{\text{high-autonomy-virtue}} = 5.58; t < 1, p > .10$).

Control Condition. The control condition, in which participants completed the vitality and creativity measures before freely choosing between the vice and virtue books, was used to assess an alternate account for our findings. While we argue that being assigned a vice increases vitality (compared to, e.g., freely choosing that vice), this alternate account rests on the reverse causality. Namely, it could be argued that people low in vitality are more inclined to freely choose the vice (vs. the virtue) in the first place because they do not have sufficient resources to resist the vice. A similar self-selection argument could be made for the creativity measure: rather than assigned-vice increasing creativity (vs. freely choosing the vice), it might be that those freely choosing the vice are just inherently less diligent, which makes them both likely to choose the vice and to also display lower creativity.

If this alternate account is true, we should see corresponding differences in vitality and creativity in the control condition: those freely choosing the vice should be lower in a priori vitality (and creativity) than those freely choosing the virtue. In contrast, according to our account, these differences manifest *as a result of choice*—accordingly, they should not be observed when vitality and creativity are measured before the vice-virtue choice task. Reassuringly, findings supported our account rather than the alternate. The vitality obtained in the control condition for those choosing the vice ($M = 4.01$) did not differ from that obtained for those freely choosing the virtue ($M = 4.20; p > .10$). Similarly, the creativity performance of the control-vice participants ($M = 5.62$) also did not differ from that of the control-virtue participants ($M = 5.60; p > .10$).

Discussion

Experiment 3 extended our core vitality findings in several important ways. First, we replicated our key result—the beneficial influence of low autonomy for vices—in the context of nonfood choice. Not only did this generalize the earlier results observed in the context of snack consumption, it further ruled out physiological accounts (to do with increased sugar or calorie consumption) for the findings. Second, this study extended the vitality-related benefits of vice consumption to another consequence: creativity. Third, instead of exposing participants to only one of the two options (vice/virtue), experiment 3 exposed participants to a vice option and a virtue option simultaneously and examined the vitality resulting from a choice between the two. Consumers are often confronted with such vice-versus-virtue decisions, and our theorizing posits that the beneficial effects of low autonomy for vices should hold in such choice contexts as well. Reassuringly, this was found to be the case, both for vitality and the downstream consequence of creativity. Relatedly, these advantages of low-autonomy vice choice (over the autonomous choice condition) were found to hold true regardless of whether autonomous choice led to the selection of a vice or a virtue.

EXPERIMENT 4: CHRONIC GUILT AS A MODERATOR

The final study sought to identify a boundary condition for our core finding (improved vitality resulting from low-autonomy vices) and in so doing provide further insights into a key aspect of the process, namely the role of guilt. Based on our conceptualization, lower autonomy is held to increase the vitality produced by vice consumption/purchase because it lowers guilt. While we have so far provided support for this premise by measuring guilt, experiment 4 examines the moderating influence of individual differences in guilt. Some people are in general less prone to feeling guilty about indulging themselves than are others (Quiles and Bybee 1997). We argue that for such low-guilt individuals, the previously observed moderating impact of autonomy on vice-induced vitality should be attenuated be-

cause even the autonomous choice of vices is less likely to induce guilt. This premise is examined in the context of snack consumption.

Method

Design and Procedure. Participants were drawn from an undergraduate subject pool at Hong Kong University of Science and Technology ($n = 293$, 64.4% female). A 3 (choice type: autonomous-choice vs. assigned-vice vs. assigned-virtue) \times chronic guilt regarding food indulgence (continuous variable) design was employed in this experiment. Upon arrival, participants were randomly assigned to one of three food sampling conditions; the cover story was that the experimenters needed help with evaluating snacks for future studies. Participants in the *assigned-choice* (low autonomy) conditions were exposed to two snacks placed on the table in front of them—a small piece of chocolate brownie and a baby carrot—and they were randomly assigned by the experimenter to sample either one of the two. On the other hand, participants in the *autonomous-choice* (high autonomy) conditions were also presented with the two snacks, and they were asked to freely choose one to sample. Ninety of the 99 participants in this condition chose the brownie. Thus, results in the pooled autonomous-choice condition of this study were driven primarily by the autonomous-vice case.

After completing the food-sampling task, participants completed measures of vitality and guilt, using the same scales as in previous studies. Next, all participants completed a slogan-generation task that assessed creativity, as in experiment 3: they were given a description of a new handbag and asked to create an advertising slogan for it. This was followed by an assessment of self-control, which relied on willingness-to-pay (WTP). Participants were presented with a color image of an automobile along with a brief product description, and they were asked to indicate the actual price they were willing to pay for the car (higher WTP = poorer self-control; Haws, Bearden, and Nankov 2012; Vohs and Faber 2007). Participants then indicated task enjoyment and perceived autonomy regarding the food-sampling task, on the same scales as in experiment 1. Finally, following Kivetz and Zheng (2006), chronic guilt regarding food was measured by asking participants to rate how guilty they tend to feel after eating indulgent foods such as chocolate cakes, ice-cream, and chips, on a 7-point scale from 1 (very unlikely) to 7 (very likely). To ensure that this measure was not biased by the preceding snack task, participants were contacted 2 days later and asked to complete the chronic guilt item once more (see Sengupta and Zhou 2006). Of the original 293 respondents, 57.3% filled out this measure. The test-retest correlation between these two measurements of the chronic guilt item was quite high ($r = .82$), suggesting that the initial response was unbiased. Note that we used a guilt measure specific to the food domain because guilt can vary across domains (Ausubel 1955; Burney and Irwin 2000).

Analysis

The two autonomous choice conditions (free choice of vice vs. free choice of virtue) were pooled together into a single autonomous-choice condition (high autonomy), which was then compared with the two low-autonomy conditions: assigned-vice and assigned-virtue. Experiment 4 thus used the same three-way ANOVA as experiment 3. The focal comparison, as in experiment 3, was that between assigned-vice and pooled autonomous-choice. Our theorizing argues that for those chronically low in guilt, these two conditions will not differ in terms of vitality, creativity, and self-control. However, our earlier findings should replicate for those high in guilt: creativity, vitality, and self-control should be higher in the assigned-vice case than in the autonomous-choice condition.

Since our design featured a measured variable (chronic guilt) and a categorical factor (choice type), analyses followed the regression procedures recommended by Aiken and West (1991). The three-level choice factor was represented via two dummy variables. Thus, dummy1 described the effect of autonomous choice and dummy2 described the effect of assigned-virtue, both in relation to the focal assigned-vice condition, which functioned as the reference category (see Mehta, Hoegg, and Chakravarti 2011). Each of the dependent variables was regressed on the continuous measure of chronic guilt, choice dummy1, choice dummy2, and the two-way interaction terms involving chronic guilt and the two dummy variables. Note that our key predictions regarding the moderating role of guilt on the vitality benefits of low-autonomy vice consumption versus autonomous choice should manifest in an interaction effect of chronic guilt and dummy1 (since this dummy describes the difference in outcome for assigned-vice vs. autonomous-choice conditions, with dummy2 being held at 0).

Results

Task Enjoyment and Autonomy. The regression on task enjoyment revealed a significant main effect of dummy2 (assigned-virtue–assigned-vice dummy), which was driven by the anticipated effect of snack type ($M_{\text{assigned-virtue}} = 3.96$, $M_{\text{assigned-vice}} = 5.55$; $\beta = -1.89$, $t = -4.21$, $p < .001$). Of note, the effect of choice dummy1 (autonomous-choice–assigned-vice dummy) was not significant ($M_{\text{autonomous-choice}} = 5.48$, $M_{\text{assigned-vice}} = 5.55$; $\beta = .18$, $t = .41$, $p > .10$), showing that perceived autonomy did not affect task enjoyment. In contrast, the regression on perceptions of autonomy yielded only a significant main effect of choice dummy1 ($M_{\text{autonomous-choice}} = 5.24$, $M_{\text{assigned-vice}} = 3.18$; $\beta = 2.14$, $t = 5.32$, $p < .001$) but not choice dummy2 ($M_{\text{assigned-virtue}} = 2.72$, $M_{\text{assigned-vice}} = 3.18$; $\beta = -.45$, $t = -1.06$, $p > .10$). That is, perceived autonomy was influenced only by autonomy instruction, not by snack type (see table 4). No interaction was significant for either of these two analyses.

Guilt. The regression on participants' feelings of guilt yielded a marginally significant main effect of chronic guilt

TABLE 4

EXPERIMENT 4: EFFECTS OF CHRONIC GUILT AND CHOICE TYPE ON TASK ENJOYMENT, PERCEIVED AUTONOMY, GUILT, VITALITY, SLOGAN CREATIVITY, AND WILLINGNESS TO PAY (WTP)

	Autonomous choice	Assigned vice	Assigned virtue
Task enjoyment:			
High chronic guilt	5.41	5.60	4.14
Low chronic guilt	5.54	5.50	3.78
Perceived autonomy:			
High chronic guilt	5.13	3.11	2.64
Low chronic guilt	5.34	3.24	2.79
Guilt:			
High chronic guilt	2.46	1.76	1.40
Low chronic guilt	1.34	1.38	1.51
Subjective vitality:			
High chronic guilt	3.97	4.34	3.42
Low chronic guilt	4.54	4.40	2.84
Slogan creativity:			
High chronic guilt	5.85	6.37	5.27
Low chronic guilt	6.62	6.55	5.23
WTP (standardized score; lower score = higher self-control):			
High chronic guilt	.12	-.34	.12
Low chronic guilt	-.01	.08	.05

($M_{\text{high-guilt consumers}} = 1.87$, $M_{\text{low-guilt consumers}} = 1.41$; $\beta = .17$, $t = 1.68$, $p = .09$). More importantly, this was qualified by an interaction between chronic guilt and choice dummy1 (autonomous choice-assigned vice dummy; $\beta = .32$, $t = 2.34$, $p < .05$); no other effects were significant. To explore the interaction in more detail, we performed a spotlight analysis at ± 1 SD from the mean of chronic guilt. The planned contrast for those with a high level of chronic guilt ($+1$ SD from mean) revealed a significant main effect of dummy1, showing that high-guilt consumers experienced greater guilt when they freely chose to consume a snack than when they were assigned to consume a vice ($M = 2.46$ vs. 1.76 , respectively; $\beta = .70$, $t = 2.09$, $p < .05$). Note that the vast majority of respondents in the autonomous-choice condition chose the vice, driving this effect.

Importantly, and also as predicted, the equivalent contrast for those with low chronic guilt (-1 SD from mean) was not significant, showing that low-guilt consumers did not experience any difference in guilt for autonomous-choice versus assigned-vice conditions ($M = 1.34$ vs. 1.38 , respectively; $\beta = -.04$, $t = -.19$, $p > .10$). This is why the effect of autonomy on vice-induced vitality should be attenuated for such participants, as described below.

Vitality. We expected to replicate our earlier results on this key outcome for those habitually prone to guilt about food indulgences: vitality should be higher for externally assigned (i.e., low-autonomy) vice consumption versus autonomously chosen consumption (i.e., the high-autonomy condition). Importantly however, this difference in vitality for the assigned-vice versus the autonomous-choice condition should be attenuated for those less prone to guilt because experienced guilt for such participants is low across conditions.

Consistent with the predicted moderating impact of guilt, the regression analysis on vitality revealed a marginally significant interaction between chronic guilt and dummy1 (autonomous choice-assigned vice dummy; $\beta = -.23$, $t = -1.90$, $p = .06$). Spotlight analyses at ± 1 SD then showed that, replicating our previous findings, high-guilt consumers experienced greater vitality when they were assigned to consume a vice than when they chose a snack freely ($M = 4.34$ vs. 3.97 ; respectively; $\beta = -.37$, $t = -2.16$, $p < .05$). In contrast, but also as predicted, low-guilt consumers demonstrated no difference in vitality for autonomous-choice versus assigned-vice conditions ($M = 4.54$ vs. 4.40 , respectively; $\beta = .15$, $t = .69$, $p > .10$).

A significant main effect of dummy2 (assigned virtue-assigned vice dummy) was also obtained, showing that participants who were assigned to eat a baby carrot experienced less vitality than those who were assigned to eat a chocolate brownie, that is, there was an expected effect of snack type ($M = 3.13$ vs. 4.37 , $\beta = -1.97$, $t = -5.41$, $p < .001$). Finally, although not central to our theorizing, this main effect was accompanied by an interaction with chronic guilt ($\beta = .28$, $t = 2.23$, $p < .05$). Exploring this interaction, slope analyses showed that for the assigned vice, no difference in vitality was observed for high-guilt versus low-guilt consumers ($M = 4.34$ vs. 4.40 , respectively; $\beta = -.03$, $t = -.31$, $p > .10$). For the assigned virtue, vitality was higher for high-guilt versus low-guilt consumers ($M = 3.42$ vs. 2.84 , respectively; $\beta = .25$, $t = 2.16$, $p < .05$). We had no a priori predictions for the effect of guilt on assigned-virtues, so this is a somewhat unexpected finding. However, it does not detract from our major result regarding the moderating impact of guilt on the vitality difference

between the assigned-vice and autonomous-choice conditions.

Creativity. Choice dummy2 (assigned virtue-assigned vice dummy) had a significant main effect on creativity, as measured via slogan-generation ($M_{\text{assigned-virtue}} = 5.25$, $M_{\text{assigned-vice}} = 6.46$; $\beta = -1.47$, $t = -3.67$, $p < .001$); this did not interact with chronic guilt ($\beta = .10$, $t = .70$, $p > .10$). More importantly, the interaction between chronic guilt and dummy1 (autonomous choice-assigned vice dummy) reached significance ($\beta = -.26$, $t = -1.98$, $p < .05$). Spotlight analysis revealed that, as predicted for high-guilt consumers, being assigned to consume a vice produced more creativity than did freely choosing a snack to consume ($M = 6.37$ vs. 5.85 , respectively; $\beta = -.52$, $t = -2.32$, $p < .05$). For low-guilt consumers, in contrast, there was no difference in creativity for assigned-vice versus autonomous-choice ($M = 6.55$ vs. 6.62 , respectively; $\beta = .07$, $t = .32$, $p > .10$).

Next, a mediation analysis tested whether the crucial interaction effect of choice dummy1 and chronic guilt on task creativity was driven by vitality. A significant effect of the interaction term was obtained on the vitality mediator ($\beta = -.23$, $t = -1.97$, $p = .05$). Further, vitality had a positive effect on the outcome of creativity, such that participants with greater vitality performed more creatively in the slogan generation task ($\beta = .28$, $t = 3.63$, $p < .001$). Bootstrapping analyses then showed that the direct effect of the interaction term on creativity performance was not significant ($\beta = -.20$, $t = -1.48$, $p > .10$). Importantly, the indirect effect through vitality was negative and significant ($\beta = -.06$), with the 95% confidence interval excluding zero ($-.1518$, $-.0057$), supporting mediation.

Willingness to Pay for a Car (WTP). Willingness to pay for a car was used to assess self-control. Two participants did not respond to this measure. Also, because WTP was assessed in an open-ended manner (participants wrote down the actual price they were willing to pay), we followed past research that has removed extreme values for such measures (Omtzigt and Hendriks 2004; Simonson and Drolet 2004). The Median Absolute Deviation (MAD) technique was used for outlier detection (Barnett and Lewis 1978; Leys et al. 2013; Omtzigt and Hendriks 2004). This technique led to the removal of 12 extreme values: 550,000, 600,000 (two respondents); 700,000, 800,000 (two respondents); 900,000, 1,000,000 (two respondents); 3,000,000, 4,000,000, and 10,000,000 (three respondents). Analyses were then conducted on the remaining 279 responses (which ranged from 0 to 500,000HKD) after standardization; please see online app. D for further details of the MAD technique.

A regression analysis on WTP revealed that the predicted interaction between chronic guilt and dummy1 (autonomous choice-assigned vice dummy) attained significance ($\beta = .25$, $t = 1.97$, $p = .05$). Spotlight analyses showed that for high-guilt consumers, vice consumption under lower autonomy increased self-control, as indicated by lower WTP for assigned-vice versus autonomous-choice conditions ($M =$

-0.34 vs. 0.12 , respectively; $\beta = .46$, $t = 1.92$, $p = .06$). In contrast, for low-guilt consumers, there was no significant difference in self-control for autonomous-choice versus assigned-vice conditions ($M = -0.01$ vs. 0.08 , respectively; $\beta = -.10$, $t = -.43$, $p > .10$).

We conducted a mediation analysis to test whether the interaction effect of choice dummy1 and chronic guilt on self-control was mediated by vitality. A significant effect of the interaction term was obtained on the vitality mediator ($\beta = -.27$, $t = -2.21$, $p < .05$). Further, vitality had a marginally significant negative effect on WTP (i.e., a positive effect on self-control, $\beta = -.13$, $t = -1.83$, $p = .07$). Bootstrapping analysis then revealed that the direct effect of the interaction term on WTP was marginally significant ($\beta = .21$, $t = 1.69$, $p = .09$). Importantly, this was accompanied by a positive and significant indirect effect through vitality ($\beta = .04$), with the 95% confidence interval excluding zero (.0000, .1122), showing that the self-control pattern was at least partially mediated by vitality.

Assigned-Vice versus Free-Vice: A Specific Comparison. Experiment 4 examined the beneficial effects of low-autonomy vices (on vitality, creativity, and self-control) by comparing it with the autonomous-choice condition as a whole, as was done in experiment 3. However, as in that study, we sought to provide a specific comparison with the autonomous-vice condition, so as to control for product type while documenting the beneficial impact of low-autonomy vice consumption. In order to do this, the very few (nine out of 99) respondents who autonomously chose the virtue were dropped from our analysis, which was then conducted in the context of a three-level categorical factor (choice type: autonomous-vice/assigned-vice/assigned-virtue), interacting with chronic guilt. Note that unlike in experiment 3, there were too few participants in the autonomous-virtue condition to conduct a meaningful analysis with a four-level factor for choice type.

Results from this analysis again supported expectations. As predicted, for those chronically high in guilt, being assigned to the vice led to lower guilt and higher levels of vitality, creativity, and self-control (low-autonomy-vice: $M_{\text{guilt}} = 1.72$, $M_{\text{vitality}} = 4.37$, $M_{\text{creativity}} = 6.42$, $M_{\text{wtp}} = -0.37$; lower WTP = higher self-control) versus those who autonomously chose the vice (high-autonomy-vice: $M_{\text{guilt}} = 2.35$, $M_{\text{vitality}} = 3.95$, $M_{\text{creativity}} = 5.81$, $M_{\text{wtp}} = 0.24$; all $p < .05$). Also as predicted, this difference was not observed for those low in guilt (low-autonomy-vice: $M_{\text{guilt}} = 1.38$, $M_{\text{vitality}} = 4.39$, $M_{\text{creativity}} = 6.55$, $M_{\text{wtp}} = 0.10$; high-autonomy-vice: $M_{\text{guilt}} = 1.41$, $M_{\text{vitality}} = 4.50$, $M_{\text{creativity}} = 6.50$, $M_{\text{wtp}} = -0.12$; all $p > .10$).

Discussion

Experiment 4 replicated our core findings while also providing convergent evidence regarding the mechanism driving these effects. As before, low-autonomy vice consumption (vs. letting people freely choose between the vice and the virtue) led to increased vitality, creativity, and self-control. However,

this effect only manifested for those chronically high in guilt. Our theorizing argues that the beneficial impact of lowering vice autonomy arises from the guilt reduction that is caused by low autonomy (vs. free choice). Accordingly, it should not manifest for those who are unlikely to experience guilt in the first place. In support, the usual advantage of low-autonomy vice consumption versus free choice was no longer observed for those chronically low in guilt.

GENERAL DISCUSSION

Our theorizing and results extend knowledge on the antecedents and consequences of subjective vitality, while also contributing to an understanding of vice behaviors. In particular, we investigate when and why engaging in vices can positively influence consumers' psychological well-being, as manifested by increased vitality. Based on a conceptualization of vices as guilt-ridden pleasures, we propose that the vitality resulting from vices is enhanced when the behavior is associated with lower autonomy, thereby reducing the guilt induced by the vice. This prediction offers a counterpoint to extant research on self-determination theory, which finds that increased decision autonomy typically heightens vitality. We further argue that the increased vitality resulting from low-autonomy vice behaviors exerts important downstream effects—it improves subsequent creativity as well as self-regulation performance.

A set of four experiments provides good support for these arguments with regard to both the predicted outcomes and the posited mechanism. Reassuringly, our findings obtain for vice consumption as well as choice, with different manipulations of autonomy, and with different operationalizations of vitality consequences (e.g., varying measures of self-regulation). This convergence attests to the wide applicability of the underlying conceptualization.

Contributions and Implications

This investigation advances knowledge in three main directions, namely, research on vice behaviors, self-determination theory, and extant work on the consequences of vitality.

Vice Behaviors. It has long been believed that yielding to vices, that is, giving in to one's hedonic impulses while neglecting long-term costs, is normatively bad (Rook 1987; Rook and Fisher 1995). Accordingly, people should exercise self-control and resist vices (e.g., Hoch and Lowenstein 1991; Vohs and Faber 2007). While not disagreeing with this picture, the current research simply presents the observation that a negative view of vices does not quite tell the full story (see Kivetz and Simonson 2001). We argue that vice consumption and purchase can increase subjective vitality because of the intrinsic pleasure afforded by the vice. In turn, enhanced vitality can produce other favorable consequences, such as improved self-control and creativity. Our conceptualization also enables us to identify when and why vices will exert these benefits, namely, when the guilt as-

sociated with vice behaviors can be reduced by justifying the behavior on the grounds of low autonomy.

Self-Determination Theory and Vitality. In studying the vitalizing effect of vices, the present work not only draws on SDT but also informs this theory by documenting the positive impact of low autonomy. Research in the self-determination area has argued and repeatedly found that perceptions of higher autonomy lead to improved vitality because the more autonomous the behavior, the more it is perceived to be an expression of the self rather than being a drain on it (Kasser and Ryan 1999; Muraven et al. 2008). However, this beneficial effect of higher autonomy has been documented for behaviors that are not intrinsically enjoyable; rather, performing them requires the active recruitment of self-control (e.g., resisting tempting food: Muraven et al. 2008; engaging in difficult choice tasks: Laran and Janiszewski 2011). In such contexts, vitality is replenished by fostering the belief that the behavior has been freely chosen (rather than being mandated). In contrast, the current research studies vice behaviors that are themselves intrinsically enjoyable and do not require an autonomy-supportive environment to be seen as being self-determined. With these behaviors, vitality is lowered because of the guilt implicit in vices. Accordingly, vitality can be increased if guilt is lowered, and one way of achieving this is to allow individuals to attribute their behavior to external reasons, that is, by lowering perceptions of autonomy. By supporting this thesis, our research contributes to SDT by showing that the higher-autonomy→greater-vitality relationship may not apply for the specific case of vices.

Interestingly, although the idea that lower autonomy can have its benefits is new from a vitality standpoint, it fits well with some existing findings in the literature relating to tragic choices (Botti and Iyengar 2004; Botti, Orfali, and Iyengar 2009). Thus, Botti et al. (2009) have demonstrated that for tragic decisions such as terminating the life support of one's baby, people prefer to have the decision made for them rather than making it themselves (see also Botti and Iyengar 2004). In such negatively-valenced contexts, the enhanced sense of responsibility and agency caused by increased autonomy leads to self-blame and guilt regarding the outcome, thereby lowering decision satisfaction (Botti et al. 2009).

While the research conducted by Botti and her coauthors does not examine vitality, the insight it offers into the relationship between autonomy and guilt is congenial to our position. Unlike the unattractive choice options investigated in that research (Botti and Iyengar 2004; Botti et al. 2009), vice consumption is intrinsically enjoyable, but the key similarity is that it is also associated with guilt. Accordingly, as in that research, lowering autonomy and personal agency reduces one's sense of guilt. In turn, this produces an enhancement in vice-induced vitality (and in its downstream consequences).

Consequences of Vitality: Self-Regulation and Creativity. Our findings regarding the downstream effects of vi-

tality on self-regulation and creativity also add to extant knowledge in the area. Regarding the former, while past research has already documented the positive influence of vitality on regulatory performance (e.g., Muraven et al. 2008), the current work provides fresh insights into that result. In particular, a valuable theme emerging from earlier research is that while initial acts of self-control typically deplete regulatory resources, these resources can be replenished (because of heightened vitality) if the initial task is made more intrinsically enjoyable (Laran and Janiszewski 2011; Muraven et al. 2008; Nix et al. 1999). Thus, framing an initial regulatory task as “fun” rather than “work” helps to restore regulatory resources and benefits subsequent performance (Laran and Janiszewski 2011). The current findings complement this perspective. We show that framing an intrinsically enjoyable task (a “fun” activity) as “work,” that is, complying with instructions, can also increase vitality by reducing the guilt associated with the fun activity. Thus, the vitality ensuing from guilt-ridden pleasures can be increased by framing the pleasure as a duty.

The second downstream consequence examined in this research is relatively new to the vitality literature, namely, creativity. Drawing on arguments regarding the positive impact of vitality on relevant aspects such as cognitive flexibility and task persistence, we proposed that vitality should positively influence creativity as well. This prediction, which was tested via a slogan-generation measure of creativity, received good support, thus adding to the other benefits of vitality that have been documented in the literature (Muraven et al. 2008; Ryan et al. 1991; Ryan and Deci 2008).

An overall observation about these downstream consequences is worth noting. Mediation analyses showed that in some cases, in addition to the predicted path via vitality, low-autonomy vice purchase also exerted a direct effect on creativity (experiment 3) and self-regulation (experiment 4). While this does not contradict our theorizing (which argues simply that vitality is one factor underlying these effects, and it does not rule out other simultaneous paths), future research should investigate the other ways in which low autonomy may affect these consequences in the context of vices. For instance, in the case of the creativity consequence, the direct impact of autonomy might be due to the novelty construct getting primed. Being “forced” to choose a celebrity album (and one, moreover, that carried a reasonably high value of 100 HKD; experiment 3) is an experience that is likely quite novel for the participants. This activation of the “novelty” knowledge structure can make accessible new ways of thought, manifesting in greater creativity (see Fitzsimons, Chartrand, and Fitzsimons 2008). This is merely a speculation, of course, whose assessment awaits further empirical work.

Future Research

Other interesting opportunities also exist for further investigation. At a theoretical level, future research could attempt to further refine aspects of the current conceptualization of vice-induced vitality. Consider, in particular, the

enjoyment offered by a vice, which is held to exert a positive influence on vitality. Whether it is based on actual consumption experience (e.g., eating a tasty snack in experiments 1, 2, and 4) or anticipated pleasure (e.g., looking forward to browsing through a celebrity photo album that one has obtained in experiment 3), we argue that the enjoyment associated with the vice derives from its intrinsic attributes. It is for that reason that perceived autonomy is predicted to not affect task enjoyment—a premise that receives support in our studies. Vices might also offer another source of pleasure, however, namely, there might be a “taboo pleasure” in the sheer act of succumbing to a temptation that one knows to be normatively bad. That is, quite apart from the actual (or anticipated) intrinsic pleasure of the experience itself, there may well be a pleasure in deliberately doing something wrong.

However, note that by its very nature, such enjoyment should be positively influenced by perceived autonomy (i.e., the sense that one has volitionally opted to engage in the frowned-upon behavior). The absence of an autonomy effect on task enjoyment in all our studies suggests that this taboo pleasure was not present in the current investigation. We speculate that such a pleasure might play a role when the “forbidden” aspect of the vice becomes particularly salient, as is likely to happen for serious vices such as indulging in addictive drugs, engaging in illicit sexual relationships, and so forth.

It would be very interesting to explore how autonomy affects vice-induced vitality in such contexts. Increased autonomy will not affect the intrinsic pleasure of the experience, but it should increase guilt (reducing vitality) while enhancing the taboo-pleasure component (benefiting vitality). A systematic examination of the ensuing trade-off could benefit our understanding of vice behaviors. At a broader level, such investigations can also further illuminate the construct of subjective vitality, which has been largely neglected in consumer research despite its relevance to our field. The current work represents an attempt to address that gap, but much remains to be done.

DATA COLLECTION INFORMATION

The data reported in our studies were collected over the past 3 years (starting from 2011) in the dedicated behavioral research lab at Hong Kong University of Science and Technology (HKUST), Hong Kong. Specific time frames for the four studies include the following: experiment 1: winter 2012; experiment 2: fall 2011; experiment 3: winter 2014; experiment 4: spring 2013. These studies were run by the first author (Fangyuan Chen), with the assistance of our lab manager, Esther Nip. Fangyuan Chen conducted all the data analyses.

APPENDIX A

SCALES

Subjective Vitality Scale (Ryan and Frederick 1997)

1. At this moment, I feel alive and vital.
2. I don't feel very energetic right now. (R: reverse-coded)
3. Currently I feel so alive that I just want to burst.
4. At this time, I have energy and spirit.
5. I am looking forward to each new day.
6. At this moment, I feel alert and awake.
7. I feel energized right now.

Task Enjoyment and Autonomy Checks for Snack Consumption Task: Experiment 1

A. Task Enjoyment Measure (Subscale of Intrinsic Motivation Inventory; Ryan et al. 1991)

1. I enjoyed doing the food-sampling task very much.
2. The food-sampling task was fun to do.
3. I thought the food-sampling task was a boring activity. (R)
4. The food-sampling task did not hold my attention at all. (R)
5. I would describe this food-sampling task as very interesting.
6. I thought the food-sampling task was quite enjoyable.
7. While I was doing the food-sampling task, I was thinking about how much I enjoyed it.

B. Perceived Autonomy Measure (Ryan et al. 1991)

1. I believe that I had a choice over whether to sample the food or to refuse.
2. I felt like it was my own choice as to sample the food or not.
3. I felt that I had no control to decide what to do. (R)
4. I did the food-sampling task because that was what the experimenter wanted me to do. (R)

Task Enjoyment and Autonomy Checks for Shopping Task: Experiment 3

A. Task Enjoyment Measure (shortened; Ryan et al. 1991)

1. I enjoyed doing the shopping task very much.
2. The shopping task was fun to do.
3. I thought the shopping task was a boring activity. (R)
4. While I was doing the shopping task, I was thinking about how much I enjoyed it.

B. Perceived Autonomy Measure (Ryan et al. 1991)

1. I believe that I had a choice over which book to purchase.
2. I felt like it was my own choice as to which book to choose.

3. I felt that I had no control to decide what to choose. (R)
4. I bought the book because that was what the experimenter wanted me to choose. (R)

REFERENCES

- Aiken, Leona, and Stephen G. West (1991), *Multiple Regression: Testing and Interpreting Interactions*, Newbury Park, CA: Sage.
- Alba, Joseph W., and Elanor F. Williams (2013), "Pleasure Principles: A Review of Research on Hedonic Consumption," *Journal of Consumer Psychology*, 23 (1), 2–18.
- Amabile, Teresa M. (1983), "The Social Psychology of Creativity: A Componential Conceptualization," *Journal of Personality and Social Psychology*, 45 (2), 357–76.
- (1996), *Creativity in Context*. Boulder, CO: Westview.
- Ausubel, David P. (1955), "Relationships between Shame and Guilt in the Socializing Process," *Psychological Review*, 62 (5), 378–90.
- Barkley, Russell A. (1997), "Behavioral Inhibition, Sustained Attention, and Executive Functions: Constructing a Unifying Theory of ADHD," *Psychological Bulletin*, 121 (1), 65–94.
- Barnett, Vic, and Toby Lewis (1978), *Outliers in Statistical Data*, New York: Wiley.
- Botti, Simona, and Sheena S. Iyengar (2004), "The Psychological Pleasure and Pain of Choosing: When People Prefer Choosing at the Cost of Subsequent Satisfaction," *Journal of Personality and Social Psychology*, 87 (3), 312–26.
- Botti, Simona, Kristina Orfali, and Sheena S. Iyengar (2009), "Tragic Choices: Autonomy and Emotional Responses to Medical Decisions," *Journal of Consumer Research*, 36 (3), 337–52.
- Burney, John, and Harvey J. Irwin (2000), "Shame and Guilt in Women with Eating-Disorder Symptomatology," *Journal of Clinical Psychology*, 56 (1), 51–61.
- Burroughs, James E., Darren W. Dahl, Page C. Moreau, Amitava Chattopadhyay, and Gerald J. Gorn (2011), "The Interaction of Creativity Training and Extrinsic Rewards on New Product Development," *Journal of Marketing*, 75 (4), 53–67.
- Dahl, Darren W., and C. Page Moreau (2002), "The Influence and Value of Analogical Thinking during New Product Ideation," *Journal of Marketing Research*, 39 (1), 47–60.
- (2007), "Thinking inside the Box: Why Consumers Enjoy Constrained Creative Experiences," *Journal of Marketing Research*, 44 (3), 357–69.
- Deci, Edward L., and Richard M. Ryan (1985), *Intrinsic Motivation and Self-Determination in Human Behavior*, New York: Plenum.
- (2000), "The 'What' and 'Why' of Goal Pursuits: Human Needs and the Self-Determination of Behavior," *Psychological Inquiry*, 11 (4), 227–68.
- Fishbach, Ayelet, and Ravi Dhar (2005), "Goals as Excuses or Guides: The Liberating Effect of Perceived Goal Progress on Choice," *Journal of Consumer Research*, 32 (December), 370–77.
- Fitzsimons, Gráinne M., Tanya L. Chartrand, and Gavan J. Fitzsimons (2008), "Automatic Effects of Brand Exposure on Motivated Behavior: How Apple Makes You 'Think Different,'" *Journal of Consumer Research*, 35 (June), 21–35.
- Freud, Sigmund (1923/1962), *The Ego and the Id*. New York: Norton.

- Hartmann, Heinz (1939/1958), *Ego Psychology and the Problem of Adaptation*, New York: International Universities Press.
- Haws, Kelly L., William O. Bearden, and Gergana Y. Nenkov (2012), "Consumer Spending Self-Control Effectiveness and Outcome Elaboration Prompts," *Journal of the Academy of Marketing Science*, 40 (5), 695–710.
- Hirschman, Elizabeth C. (1980), "Consumer Modernity, Cognitive Complexity, Creativity and Innovativeness," in *Marketing in the 80s: 1980 Educator's Conference Proceedings*, ed. Richard P. Bagozzi, Kenneth L. Bernhardt, Paul S. Busch, David W. Cravens, Joseph F. Hair Jr., and Carol Scott, Chicago: American Marketing Association, 135–39.
- Hirschman, Elizabeth C., and Morris B. Holbrook (1982), "Hedonic Consumption: Emerging Concepts, Methods and Propositions," *Journal of Marketing*, 46 (3), 92–101.
- Hoch, Stephen J., and George F. Loewenstein (1991), "Time-Inconsistent Preferences and Consumer Self-Control," *Journal of Consumer Research*, 17 (4), 492–507.
- Jonas, Klaus, Michael Diehl, and Philip Brömer (1997), "Effects of Attitudinal Ambivalence on Information Processing and Attitude-Intention Consistency," *Journal of Experimental Social Psychology*, 33 (2), 190–210.
- Kasser, Virginia G., and Richard M. Ryan (1999), "The Relation of Psychological Needs for Autonomy and Relatedness to Vitality, Well-Being, and Mortality in a Nursing Home," *Journal of Applied Social Psychology*, 29 (5), 935–54.
- Khan, Uzma, and Ravi Dhar (2006), "Licensing Effect in Consumer Choice," *Journal of Marketing Research*, 43 (2), 259–66.
- Kivetz, Ran, and Itamar Simonson (2001), "Self-Control for the Righteous: Towards a Theory of Pre-commitment to Indulgence," *Journal of Consumer Research*, 29 (2), 199–217.
- (2002), "Earning the Right to Indulge: Effort as a Determinant of Customer Preferences toward Frequency Program Rewards," *Journal of Marketing Research*, 39 (2), 155–70.
- Kivetz, Ran, and Yuhuang Zheng (2006), "Determinants of Justification and Self-Control," *Journal of Experimental Psychology: General*, 135 (4), 572–87.
- Laran, Juliano, and Chris Janiszewski (2011), "Work or Fun? How Task Construal and Completion Influence Regulatory Behavior," *Journal of Consumer Research*, 37 (April), 967–83.
- Leys, Christophe, Olivier Klein, Philippe Bernard, and Laurent Licata (2013), "Detecting Outliers: Do Not Use Standard Deviation around the Mean, Use Absolute Deviation around the Median," *Journal of Experimental Social Psychology*, 49 (July), 764–66.
- Mehta, Ravi, Joandrea Hoegg, and Amitav Chakravarti (2011), "Knowing Too Much: Expertise-Induced False Recall Effects in Product Comparison," *Journal of Consumer Research*, 38 (3), 535–54.
- Mehta, Ravi, and Rui (Juliet) Zhu (2009), "Blue or Red? Exploring the Effect of Color on Cognitive Task Performances," *Science*, 323 (5918), 1226–29.
- Mehta, Ravi, Rui (Juliet) Zhu, and Amar Cheema (2012), "Is Noise Always Bad? Exploring the Effects of Ambient Noise on Creative Cognition," *Journal of Consumer Research*, 39 (4), 784–99.
- Moller, Arlen C., Edward L. Deci, and Richard M. Ryan (2006), "Choice and Ego-Depletion: The Moderating Role of Autonomy," *Personality and Social Psychology Bulletin*, 32 (8), 1024–36.
- Moreau, C. Page, and Darren W. Dahl (2005), "Designing the Solution: The Impact of Constraints on Consumers' Creativity," *Journal of Consumer Research*, 32 (1), 13–22.
- Mukhopadhyay, Anirban, and Gita V. Johar (2009), "Indulgence as Self-Reward for Prior Shopping Restraint: A Justification-Based Mechanism," *Journal of Consumer Psychology*, 19 (3), 334–45.
- Mukhopadhyay, Anirban, Jaideep Sengupta, and Suresh Ramanathan (2008), "Recalling Past Temptations: An Information-Processing Perspective on the Dynamics of Self-Control," *Journal of Consumer Research*, 35 (December), 586–99.
- Muraven, Mark, Marylène Gagné, and Heather Rosman (2008), "Helpful Self-Control: Autonomy Support, Vitality, and Depletion," *Journal of Experimental Social Psychology*, 44 (May), 573–85.
- Muraven, Mark, Heather Rosman, and Marylène Gagné (2007), "Lack of Autonomy and Self-Control: Performance Contingent Rewards Lead to Greater Depletion," *Motivation and Emotion*, 31 (4), 322–30.
- Nix, Glen A., Richard M. Ryan, John B. Manly, and Edward L. Deci (1999), "Revitalization through Self-Regulation: The Effects of Autonomous and Controlled Motivation on Happiness and Vitality," *Journal of Experimental Social Psychology*, 35 (3), 266–84.
- Omtzigt, David, and Angélique W. Hendriks (2004), "Magnocellular Involvement in Flanked-Letter Identification Relates to the Allocation of Attention," *Vision Research*, 44 (16), 1927–40.
- Purcell, Allan T. (1982), "The Structure of Activation and Emotion," *Multivariate Behavioral Research*, 17 (2), 221–51.
- Quay, Herbert C. (1997), "Inhibition and Attention Deficit Hyperactivity Disorder," *Journal of Abnormal Child Psychology*, 25 (1), 7–13.
- Quiles, Zandra N., and Jane Bybee (1997), "Chronic and Dispositional Guilt: Relations to Mental Health, Prosocial Behavior, and Religiosity," *Journal of Personality Assessment*, 69 (1), 104–26.
- Ramanathan, Suresh, and Patti Williams (2007), "Immediate and Delayed Emotional Consequences of Indulgence: The Moderating Influence of Personality Type on Mixed Emotions," *Journal of Consumer Research*, 34 (2), 212–23.
- Read, Daniel, George F. Loewenstein, and Shobana Kalyanaraman (1999), "Mixing Virtue and Vice: Combining the Immediacy Effect and the Diversification Heuristic," *Journal of Behavioral Decision Making*, 12 (December), 257–73.
- Rook, Dennis W. (1987), "The Buying Impulse," *Journal of Consumer Research*, 14 (September), 189–99.
- Rook, Dennis W., and Robert J. Fisher (1995), "Normative Influences on Impulsive Buying Behavior," *Journal of Consumer Research*, 22 (3), 305–13.
- Ryan, Richard M., and Edward L. Deci (2000), "Self-Determination Theory and the Facilitation of Intrinsic Motivation, Social Development, and Well-Being," *American Psychologist*, 55 (1), 68–78.
- (2008), "From Ego Depletion to Vitality: Theory and Findings Concerning the Facilitation of Energy Available to the Self," *Social and Personality Psychology Compass*, 2 (2), 702–17.
- Ryan, Richard M., and Christina M. Frederick (1997), "On Energy, Personality, and Health: Subjective Vitality as a Dynamic Reflection of Well-Being," *Journal of Personality*, 65 (3), 529–65.
- Ryan, Richard M., Richard Koestner, and Edward L. Deci (1991), "Ego-Involved Persistence: When Free-Choice Behavior Is Not Intrinsically Motivated," *Motivation and Emotion*, 15 (3), 185–205.

- Sengupta, Jaideep, and Rongrong Zhou (2006), "Understanding 'Impulsive' Choice Behaviors: The Motivational Influences of Regulatory Focus," *Journal of Marketing Research*, 24 (May), 297–308.
- Shaver, Phillip, Judith Schwartz, Donald Kirson, and Cary O'Connor (1987), "Emotion Knowledge: Further Exploration of a Prototype Approach," *Journal of Personality and Social Psychology*, 52 (6), 1061–86.
- Sheldon, Kennon M. (1995), "Creativity and Self-Determination in Personality," *Creativity Research Journal*, 8 (1), 61–72.
- Shiv, Baba, and Alexander Fedorikhin (1999), "Heart and Mind in Conflict: Interplay of Affect and Cognition in Consumer Decision Making," *Journal of Consumer Research*, 26 (December), 278–82.
- Simonson, Itamar, and Aimee Drolet (2004), "Anchoring Effects on Consumers' Willingness-to-Pay and Willingness-to-Accept," *Journal of Consumer Research*, 31 (3), 681–90.
- Strahilevitz, Michal, and John G. Myers (1998), "Donations to Charity as Purchase Incentives: How Well They Work May Depend on What You Are Trying to Sell," *Journal of Consumer Research*, 24 (March), 434–46.
- Thayer, Robert E. (1987), "Energy, Tiredness, and Tension Effects as a Function of a Sugar Snack versus Moderate Exercise," *Journal of Personality and Social Psychology*, 52 (1), 119–25.
- Vohs, Kathleen D., and Ronald J. Faber (2007), "Spent Resources: Self-Regulatory Resource Availability Affects Impulse Buying," *Journal of Consumer Research*, 33 (March), 537–47.
- Wertenbroch, Klaus (1998), "Consumption Self-Control by Rationing Purchase Quantities of Virtue and Vice," *Marketing Science*, 17 (4), 317–37.
- Xu, Jing, and Norbert Schwarz (2009), "Do We Really Need a Reason to Indulge?" *Journal of Marketing Research*, 46 (1), 25–36.