Creative Ideation Activates Disinhibited Reward-Seeking and Indulgent Choices

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Abstract

Given that creative ideation has been widely characterized as involving disinhibition, we tested whether a brief creative ideation effort increased subsequent indulgence through the choice of real or imagined rewards. Across ten experiments (and an additional four in the supplemental material) and 3412 participants (including the ones in the supplemental material), we show that a short creative ideation (vs. control) task led to more indulgent eating, drinking, and exercise choices and behaviors. Participants who generated creative ideas subsequently assembled burgers with higher calorie content (Studies 1a, 3a, 3b, 4), proposed cocktails with higher alcohol content (Study 1b), planned workouts that burned fewer calories (Study 1c), chose candy more often (Study 1d) and ate more candy (Study 2) than participants who engaged in control tasks. In line with the perspective that creativity involves disinhibition, these effects were mediated by the behavioral activation system (BAS), which is thought to underlie the uninhibited pursuit of desires and rewards (Studies 2, 3a, 4). Furthermore, an experiment in which we manipulated BAS activation showed a causal effect on indulgent eating choices (Study 5). We discuss the implications for future research on the consequences of creativity as well as the possibility that creative work might lead to indulgent, potentially unhealthy choices and behaviors.

Keywords: consequences of creativity, decision-making, indulgence, unhealthy choices, disinhibition, Behavioral Activation System, self-control, reward-seeking

Statement of Limitations

Given that we manipulated our independent variable (and mediator in Study 5) and randomly assigned participants to conditions, we have strong internal validity. Our external validity is weaker given that we conducted our experiments on online participants in the USA and on students at a US university, which limits the generalizability of our findings to other cultures (Henrich et al., 2010). Our results may not generalize to collectivistic cultures who tend to emphasize continuity with existing solutions rather than the free exploration of novel ideas (Loewenstein & Mueller, 2016). The construct validity of our outcome variable seems strong because burgers, cocktails, and candy are widely viewed (by the public and operationalized by scholars) as indulgences. The construct validity of our mediator variable is weaker given that disinhibition can be measured in myriad ways. We tested as many of the existing operationalizations of disinhibition as was feasible and the only robust mediator was the behavioral activation system (BAS). Last, given that 13 of our 14 experiments showed the same statistically significant effect, that we had sufficient power to detect an effect (see Table 2 for sensitivity analyses), and that we used the correct statistical analyses (t-tests, one-way ANOVAs, mediation) for the data, we believe that our statistical validity is strong.

Creativity and Indulgent Choices

Research often focuses on the antecedents of creativity because creative ideas can offer new and appropriate solutions (Amabile, 1982; Hua et al., 2022, Perry-Smith & Mannucci, 2017) to the world's most pressing challenges. Creativity occurs in many disparate domains, including the arts, science, and business. Indeed, according to a survey of over 1,500 corporate and public sector leaders across 60 nations and 33 industries, the most important quality for leaders is creativity (IBM, 2010). Moreover, encouraging employee creativity in organizations is vital as 77% of CEOs search for employees with creative-thinking skills (PwC 20th CEO Survey, 2017). Beyond organizational experiences, people use creative ideation, defined as the generation of creative (novel and useful) ideas (Amabile, 1982), to solve problems in their personal lives and engage in creative behaviors for hobbies. Creativity and creative ideation are not activities in which a few people engage but, rather, a fundamental aspect of daily life (Kaufman & Beghetto, 2009; Richards, 2007). Thus, there are growing calls to broaden research on the downstream psychological consequences of creative ideation for the individual (Foulk et al., 2022; Goncalo et al., 2015; Goncalo & Katz, 2020; Haselhuhn et al., 2022; Khessina et al., 2018; Kim et al., 2023; Sassenberg & Moskowitz, 2005). Understanding how engaging in creative ideation affects cognition and motivation, regardless of the objective success of the creative effort, is important to understand given that the act of being creative is an integral part of the human experience.

One characterization of creative ideation is that it involves the loosening of constraints (Eysenck, 1995; Kounios & Beeman, 2014). While problem solvers are trying to generate creative ideas, they are encouraged to freely explore solutions from a wide range of different categories, including "wild ideas" that break rules, norms, and conventions (Kim et al., 2013; Krause et al., 2021; Mueller et al., 2012; Nemeth, 1986; Nijstad et al., 2010; Staw, 1995). Khessina et al. (2018) thus argued that creative ideation, by generating ideas without

censoring them, might involve general disinhibition, which is broadly defined as the loss of control over one's emotions, thoughts, or behavior (e.g., see Baumeister et al., 1994; Clark & Watson, 2008; Joyner et al., 2021; Watson & Clark, 1993). Aligned with this view, making people disinhibited by, for example, drinking alcohol, seems to increase their creativity (Norlander, 1999).

But if creative ideation involves disinhibition, what happens after the creative act is complete? Might that disinhibition shape and influence subsequent decision-making and behavior such as reward-driven choices? Indeed, disinhibition seems to play a pivotal role in self-control decisions wherein people try to manage sticking to their long-term goals in the face of short-term pleasures and temptations (see e.g., Krueger et al., 2002; Patrick et al., 2009). As is implied by the word itself, disinhibition as it relates to self-control means a reduced ability to inhibit desires and impulses in line with those short-term, often hedonic, goals. For example, decisions concerning eating, drinking, and exercise, are often studied in the self-control literature because people commonly experience this type of tension between indulging in temptations and abstaining for the good of their health and longevity goals (e.g., Dohle et al., 2018; Fishbach, 2022; Fujita, 2011; Milkman, 2021; Stautz et al., 2018). The role of disinhibition has been repeatedly invoked across domains of self-control outcomes such as these and more, including around emotions, decision-making, cognitive neuroscience, and psychopathology (e.g., Brennan & Baskin-Sommers, 2018; Iacono et al., 1999; Iacono et al., 2008; Nelson, & Foell, 2018; Venables et al., 2018).

In their review on the possible consequences of creativity, Khessina et al. (2018) speculated that if creative acts involve disinhibition in the sense of a general loosening of constraints, one of the potential consequences might be more indulgent decisions in these classic self-control domains. We theorize and test for the first time the possibility that the disinhibition experienced after creative ideation may heighten individuals' focus on short-

term gratification of rewards and their pursuit of those rewards. Specifically, those who engage in creative ideation might subsequently make more indulgent choices, defined "as allowing oneself to select and enjoy the pleasure from an option that is considered a treat compared with the alternative option(s)" (Cavanaugh, 2014; p. 220), in the domains of eating, drinking, and exercise, via choosing more calories, alcohol, and inactivity, respectively.

If such an effect emerges, it would contribute to both the creativity and self-control literatures. First, it would identify a novel downstream effect of creative ideation that is consequential for decision-making and behavior and might possibly be characterized as unhealthy. Although creativity is often viewed in a positive manner, growing evidence suggests that creativity can at times lead to relatively undesirable consequences (Cropley et al., 2008; Eisenman, 2010; Harris et al., 2013; Harris et al., 2014; Harrison & Wagner, 2016; Vincent & Kouchaki, 2016). If creative ideation leads to more indulgent choices in these classic self-control domains, it will indicate that creative ideation may entice people to favor their short-term hedonic goals over their long-term health goals. Although there are certainly healthy ways to pursue hedonic goals and maladaptive ways to strictly adhere to only long-term goals (Ferraro et al., 2015), most people typically report wishing that they could stick more to their long-term goals over their short-term indulgences (Baumeister, 2002; Hoch & Loewenstein, 1991; Read et al., 1999) and a multi-billion dollar industry exists to help people do just that (Petersen et al., 2023).

Second, such an effect between creative ideation and indulgence would identify a novel antecedent of self-control failures. An enormous literature – spanning multiple areas in psychology – has focused on identifying the psychological precursors to decision-making that prioritize short-term over long-term thinking and doing (for recent reviews see: Fishbach, 2022; Laran, 2020; Milkman, 2021). In fact, some work has called for greater research specifically on the factors that increase a propensity to prioritize hedonic short-term goals

over longer term goals (Duckworth & Steinberg, 2015). Identifying a link between creative ideation and indulgence would encourage new research aimed at understanding what kinds of creative people and which kinds of creative pursuits might lead to greater subsequent succumbing to temptations such as indulgent rewards. From a different perspective, it could also promote continued research into understanding when and why indulgence can be a healthy and enjoyable activity (e.g., a celebration) versus a pursuit of short-term rewards and desires that people later regret.

What are the possible mechanisms related to disinhibition that could explain an effect of creative ideation on indulgence? Multiple theoretically derived processes broadly related to disinhibition might underlie a causal effect of creative ideation on indulgence. Disinhibition is a complex construct that has been measured and operationalized differently across literatures including clinical, cognitive, neuroscience, and social psychology (see, e.g., Amodio et al., 2008; Carver, 2005; Heatherton & Wagner, 2011; Joyner et al. 2021, Iacono et al., 2008; Nigg, 2000; Patterson & Newman, 1993; Tarter et al., 2003). For example, the effect of creative ideation on indulgence might work through increasing impulsivity, which has been repeatedly shown to lead to more indulgent choices (Baumeister, 2002; Bickel & Marsch, 2001; Ramanathan & Menon, 2006; cf. Joyner et al., 2021). Or it might work through liberation given that Goncalo and colleagues (2015) demonstrated that creative compared to practical ideation made people feel liberated from the burden of keeping a big secret. Thus, it might be that people also feel liberated from burdens such as adhering to the common dietary rule of eating healthily, which in turn, might allow people to indulge.

Another theoretically relevant construct that has been repeatedly associated with reward-seeking and self-control failure is the behavioral activation system (BAS) developed by Gray and colleagues along with the behavioral inhibition system (BIS; Carver & White, 1994; Elliot & Thrash, 2002; Gray, 1987, 1990, 1994; Patterson & Newman, 1993; Sutton &

Davidson, 1997). The BAS is a motivational orientation emphasizing the pursuit of rewards and desires, whereas the BIS is oriented toward aversive stimuli. The BAS activates a reward-focus that leads to appetitive, incentive-motivated behavior and is responsive to positive outcomes. Importantly, the BAS is associated with self-control failures (Mowlaie et al., 2016), including addiction (Franken, 2002; Franken et al., 2006; Johnson et al., 2003; Kim et al., 2016; Yen et al., 2009).

We argue that creative ideation activates the BAS. Previous research has shown an association between creativity, mania, and the BAS system (Johnson et al., 2012; Kim & Kwon, 2017) such that a heightened BAS sensitivity increased creativity. We argue that creative ideation allows individuals to expand their thinking of which behaviors and rewards are possible or permitted and thus activates their desire to pursue those rewards. Creative ideation requires divergent thinking, which encourages individuals to consider a broad range of options and possibilities that they typically would not have considered (Eysenck, 1995; Kounios & Beeman, 2014) even ones that contradict typical choices and behaviors (Kim et al., 2013; Mueller et al., 2012; Nemeth, 1986; Nijstad et al., 2010; Staw, 1995). The disinhibition stemming from creative ideation (Khessina et al, 2018) might cause individuals to pursue indulgent rewards that they typically would not have pursued. In fact, previous research supports the notion that creativity can activate reward-seeking behaviors. For example, individuals induced to feel like they are creative later lie, cheat, and steal in order to get what they want disregarding the consequences of their dishonest actions (Vincent & Kouchaki, 2016). Therefore, prior research also points to the possibility that engaging in creative tasks might increase an individual's awareness of and willingness to pursue potential rewards, which would activate the BAS. Once the BAS is activated, the dominant response to a desirable reward, such as candy, is to obtain it with a disregard for any potentially negative consequences (Avila, 2001; Patterson & Newman, 1993). Thus, we predict that an activated

BAS leads to self-control failures in the domain of indulgences. In other words, people whose BAS is activated may reward themselves with an indulgent choice. Indulgences such as sweet (e.g. candy), salty (e.g. chips), or fatty (e.g. burgers) foods and alcohol (e.g. cocktails) are often used as rewards (Mukhopadhyay & Johar, 2009; Wiggin et al., 2019) because they are easy to come by as they are amply available for purchase in most people's vicinity (supermarkets, fast food joints, restaurants). Thus, we predict that creative ideation increases indulgence via BAS activation.

Nonetheless, given the broad and diverse ways in which disinhibition has been operationalized and measured across different bodies of research, we carefully cast a wide net to investigate possible mechanisms. Throughout our ten experiments, we systematically test candidate mechanisms related to disinhibition that might explain the effect of creative ideation on indulgence, focusing on those that conceptually overlap with disinhibition and that have been linked with indulgence and the prioritization of short-term rewards. Through this process, we identify the BAS as the most consistent and reliable mediator of the effect of creative ideation on indulgent behaviors. This suggests that creative ideation causes a heightened focus on reward achievement, which then presumably disinhibits individuals from concerns of potential consequences and causes them to focus on short-term gratification.

Throughout our studies we also tested potential alternate explanations that might operate independently of disinhibition. For example, engaging in a creative task might cause fatigue, which has been linked to indulgence (Wilkowski et al., 2018). We also tested and ruled out alternate explanations of the effect on indulgence, such as the possibility that creative choices (of food and drinks) are also more indulgent.

Overview of Experiments

In a series of ten experiments, we test our hypothesis that engaging in creative ideation compared with engaging in practical ideation or a neutral control task leads people to a) self-

report feeling more indulgent (Studies 1a-d, 2, 3c, 4) and b) make more indulgent choices such as building more calorie-rich burgers (Studies 1a, 3a, 3b, 4), more alcoholic cocktails (Study 1b), workout regimens that burn fewer calories (Study 1c), choosing candy vs. healthier options (Study 1d), and eating more candy (Study 2). We chose these dependent measures because one of the most common behavioral measures of indulgence is the choice or consumption of unhealthy foods (Cornil & Chandon, 2013; Effron et al., 2013; Fishbach & Zhang, 2008; Flores et al., 2019; Inzlicht & Kang, 2010; Kim et al., 2019; May & Irmak, 2018; Ward & Mann, 2000). In this way, the amount of unhealthy food created for consumption (calories in a burger, alcohol in a cocktail) or actually consumed (e.g., the weight of candy) is the behavioral manifestation of indulgence.

Throughout these empirical demonstrations, we systematically test potential underlying psychological mechanisms of the effect (See Table 1 for an overview of our studies and results). We examined each of the following candidate mechanisms: liberation (Studies 1a, 1b, 1d, 2, and 3b), which is defined as the relief of a burden (Goncalo et al., 2015), entitlement (Study 1d), which is defined as the belief that one is deserving of rewards, regardless of one's effort (Jehn & Bezrukova, 2010), fatigue (Study 1d), which is measured with face-valid items such as degree of tiredness and fatigue, trait self-control (Studies 1c, 2), which is defined as the "capacity to change and adapt the self so as to produce a better, more optimal fit between self and world" (p. 275, Tangney et al., 2004), rule-breaking (Study 3a), which is defined as violating a rule (Lu et al., 2017), Behavioral Inhibition System (BIS, Studies 3a, 4), which is defined as a motivational force that constrains actions that could cause undesirable outcomes (Carver & White, 1994; Morean et al., 2014), autonomy (Study 3b), which is defined as the "enjoyment derived from the freedom to choose" (p. 359, Dahl & Moreau, 2007), hedonic capacity (Study 3b), which is defined as the capacity to create "cognitive representations of desired affective states that are associated with immediate

pleasure or relief from displeasure that motivate specific behaviors toward their attainment" (p. 627, Bernecker & Becker, 2021), affect (Study 3c), defined as one's emotional state (Mayer & Gaschke, 1988), impulsiveness (Study 3c), defined "as a predisposition toward rapid, unplanned reactions to internal or external stimuli without regard to the negative consequences of these reactions to the impulsive individuals or to others" (p. 1784, Moeller et al., 2001), and authentic and hubristic pride (Study 4) with pride defined as "the emotional response to internally attributed success in a valued domain" (p. 130, Mercadante et al., 2021) with authentic pride stemming from specific accomplishments and genuine feelings of self-worth and hubristic pride stemming from distorted and self-aggrandizing self-views (Tracy & Robins, 2007)

The only consistent and robust mediator across multiple studies was the BAS (Studies 2, 3a, 4), which we manipulated in Study 5 to demonstrate a causal effect of the BAS on calories in the burger and candy consumption. We discuss the theoretical rationale and implications of these findings in the individual studies and the general discussion.

We also attempted to rule out the possibility that engaging in creative ideation is merely more effortful and thus tiring (fatigue scale) or more enjoyable and fun (affect scale) than the control conditions. These findings comport with recent data showing that creative ideation is not perceived to require more effort, to be more enjoyable, or to be more meaningful compared to generating generic or practical ideas (see Kim et al., 2023; supplementary material).

In all studies, we asked participants various additional questions such as how hungry or thirsty they currently are and whether they are on a calorie reducing diet or not among others. Social prescriptive norms around healthy eating, drinking, and moving are widespread (Steingoltz et al., 2018), such that most people in these samples want to choose healthy options and avoid temptations (we provide empirical support for this assumption in a pilot

study reported in the supplemental material). Therefore, we expected the effect of creative ideation on indulgence to emerge across participants. We list all additional questions for each study and reveal whether the answers affected the results. However, for brevity's sake, we included the full results for these additional variables in the supplemental material.

Table 1

Overview of Studies: Manipulations, Measures, and Results

	Manipulations		**Measures**	**Results**		
Study	Independent Variable	Mediators	Dependent Variables	Main effect hypothesis	BAS mediation	Alternative mediators
1a	Creative/practical ideation	Liberation, variety seeking	Burger Calories, Indulgence	✓	-	✗
1b	Creative/practical ideation and control	Liberation, variety seeking	Alcohol in Cocktail (ABV), Cocktail Calories, Indulgence	✓	-	✗
1c	Creative/practical ideation	Self-control	Calories Burned in Workout, Indulgence	✓	-	✗
1d	Creative/practical ideation	Liberation, entitlement, fatigue	Candy chosen: yes/no, Indulgence	✓	-	✗
2	Creative/practical ideation and control	**BAS**, variety seeking, self-control, liberation	Candy Consumed, Indulgence	✓	✓	✗ variety seeking and self-control ✓ liberation
3a	Creative/practical ideation and control	rule-breaking, BIS, **BAS**	Burger Calories, Indulgence	✓	✓	✗
3b	Creative/practical ideation and control	autonomy, liberation, hedonic capacity	Burger Calories	✓	-	✗
3c	Creative/practical ideation and control	emotion, mood, impulsiveness	Burger Calories	✗ calories ✓ indulgence	-	✗
4	Creative/practical ideation and control	**BAS**, BIS, authentic pride, hubristic pride,	Burger Calories	✓	✓	✗ BIS, hubristic pride ✓ authentic pride
5	BAS and control	-	Burger Calories, Candy Consumed	✓		

Transparency and Openness

For all studies, experimental designs, data and code for analyses can be found at https://osf.io/yh549/?view_only=5d7c450333634c6dacbf27f38e2c0a5d. We report all studies that we conducted, how we determined our sample size, all data exclusions, all manipulations, all measures in the studies, and all analyses that we conducted. For each study conducted, we excluded all previous participants from participating again. We also obtained IRB approval for all studies. In all studies, we attempted to maximize power in two ways. First, we recruited at least 50 (but often 100) participants per condition as recommended by Simmons et al. (2013). We also conducted sensitivity power analyses for all studies (including those in the supplementary material) using G*Power (Faul et al., 2007), indicating the minimum effect size detectable with statistical power of .80 given the final sample sizes achieved. Overall, across the studies, the observed effect sizes were larger or slightly smaller than the minimum effect size detectable at .80. However, studies 1d and 3c had lower observed effect sizes compared to the minimum effect size detectable at .80. See Table 2 for a summary of the results for the sensitivity power analyses. See Table 3 for a Forest Plot of the effect sizes across all studies conducted. Last, we included violin plots for all studies showing the distribution of our data on the final pages of the supplemental material.

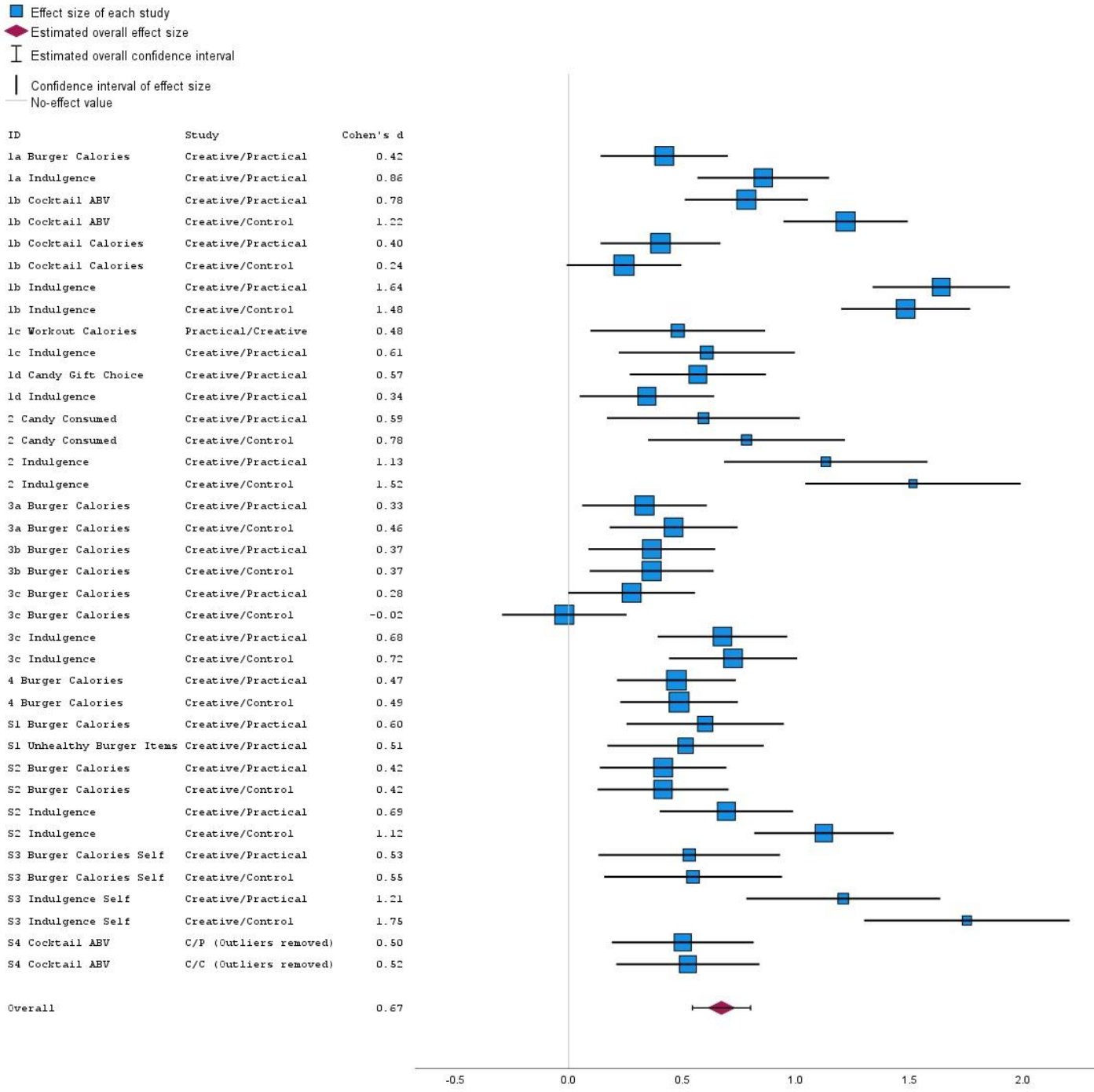
Second, we included two types of attention checks to improve the quality of the data. Only data from participants who successfully completed the attention checks were included in the analyses. To ensure that our manipulations functioned as we intended, we used two types of manipulation checks. One manipulation check was self-reported (how creative were the ideas you generated?), and, for the second, two independent raters who were unaware of condition rated the creativity of the ideas generated across all studies. The designs, hypotheses, and analysis plans of Pilot Study 1 (in the supplemental) and Studies 3a-c were pre-registered at AsPredicted.

Table 2
Summary of Sensitivity Analyses

Study	Design	N	Observed effect size for primary dependent variable	Minimum detectable effect size at 80% power (as calculated in G*Power)	G*Power output converted (if needed)
1a	Two-cell	200	d = .42	d = 0.4	
1b	Three-cell	359	η^2 = .3	f = .16	η^2 = .03
1c	Two-cell	107	d = .48	d = .55	
1d	Two-cell	176	OR = .32	d = .42	OR = 2.14
2	Three-cell	132	η^2 = .12	f = .27	η^2 = .07
3a	Three-cell	306	η^2 = .042	f = .18	η^2 = .03
3b	Three-cell	305	η^2 = .034	f = .18	η^2 = .03
3c	Three-cell	308	η^2 = .014	f = .18	η^2 = .03
4	Three-cell	351	η^2 = .052	f = .25	η^2 = .028
5	Two-cell	131	d = .76 (candy consumed) d = .87 (burger calories)	d = .31 d = .31	
S1	Two-cell	134	d = .46	d = .49	
S2	Three-cell	297	η2 = .045	f = .17	η2 = .028
S3	3 X 2 interaction	300	η2 = .041 (main effect of condition) η2 = .006 (main effect of self vs. other) η2 = .023 (interaction)	f = .18	η2 = .03
S4 (without outliers)	Three-cell	251	η2 = .061	f = .20	η2 = .039
S4 (with outliers)	Three-cell	304	η2 = .009	f = .18	η2 = .03
Pilot (unusualness)	Correlational	53	r = .07	r = .43	
Pilot (Tastiness)	One-sample	181	d= 2.75 (tastiness) d= .50 (unhealthy) d= .80	d= .20 d= .20 d= .20	

Table 3

Forest Plot of Effect Sizes Across All Studies



Note. The treatment and control conditions for the workout study (1c) were reversed given that we predicted a reversed effect. The results of the gift choice study (1d) are portrayed as continuous results to fit with the other continuous variables. Wherever it says Indulgence, we mean self-reported indulgence.

Studies 1a-d: Establishing the Main Effect

Given the novelty of our prediction, we first conducted a series of replications to establish the reliability of the main effect. This enabled us to also follow a cyclical and recursive process of testing and confirming several theoretically plausible mechanisms that explained our theory that engaging in creative ideation would lead to indulgent choices. These studies were designed to test our main effect using four different but related dependent measures and explore some of those potential mechanisms. We tested whether participants who engage in creative ideation a) indicate feeling more indulgent on a self-reported measure (Studies 1a-d) and b) create more calorie-rich burgers (Study 1a), more alcoholic cocktails (Study 1b), exercise regimens that burn fewer calories (Study 1c) and choose candy more often than apples or pens (Study 1d) than participants who engage in control tasks.

In studies 1a and 1b, we first tested whether liberation would mediate the effect because creative idea generators feel liberated (Goncalo et al., 2015), which might induce a liberation from healthy eating rules, which might lead to indulgence. In study 1c, we tested whether trait self-control would moderate or mediate the effect. It might be the case that only people with lower trait self-control show the effect because they may be more likely to experience tension between long-term goals and short-term temptations (e.g., see Fujita, 2011). Although this scale is designed as an individual difference scale, it might also mediate the effect.

In study 1d, we tested whether entitlement, fatigue, or liberation would mediate the effect. First, given that creativity is thought of as a rare trait, people who believe they are creative may develop a high sense of state psychological entitlement (Vincent & Kouchaki, 2016) which might motivate indulgence. Second, engaging in creative ideation could feel cognitively taxing and thus might lead to fatigue and depletion. In fact, there is some evidence in the cognitive neuroscience literature showing that coming up with novel (but not with common ideas) is associated with higher internal processing demands (e.g., Fink &

Benedek, 2014; Jauk et al., 2012), which might feel tiring. Furthermore, self-regulatory resource depletion (Heatherton & Tice, 1994) might also lead people to choose unhealthy, tempting foods over healthy foods in food-tasting tests (Hofmann et al., 2009; Kahan et al., 2003; Vohs & Heatherton, 2000; Zyphur et al., 2007), and it may increase temptation to consume alcohol and may lead to higher alcohol consumption (Friese et al., 2008; Muraven et al., 2004; Muraven et al., 2005a; Muraven et al., 2005b). Thus, some findings suggest that engaging in creative ideation might simply be depleting, which could, in turn, promote indulgent choices. However, the literature does not strongly support this argument. Research to date shows that depletion after creative ideation only happens to avoidance-motivated individuals (Roskes et al., 2012), a trait that would likely characterize only a subset of our sample. Instead, there is more evidence that engaging in creative tasks feels good (Amabile et al., 2005), energizing (Csikszentmihalyi, 1996) and liberating (Goncalo et al, 2015). Additionally, recent work has failed to replicate ego depletion effects more generally (Vohs et al., 2021). However, we do measure fatigue to test for the possibility that it might be a possible confound.

We also included variety seeking (Van Trijp et al., 1996) in Studies 1a and 1b because it might also be a methodological confound. Participants in the creative ideation condition might have sought greater variety in their ideas to be more creative. This greater variety-seeking might cause participants to include more burger/cocktail components which would lead to more caloric burgers and alcoholic cocktails.

Study 1a

Method

Participants and design

In study 1a, participants were from a large U.S. university and were paid $5 in exchange for their participation. We set the sample size to 100 participants per condition and 200 students participated (55.5% male; *M*age = 21.4 years). We did not have to exclude any

participant from analysis because everyone completed the study and passed the attention checks. Participants were randomly assigned to one of two conditions (Ideation: creative versus practical).

Procedure

Participants entered the laboratory and were led to individual cubicles by a research assistant who was blind to the conditions and hypotheses of the study. Participants first completed an ideation task based on the task used by Goncalo and Staw (2006). Participants were randomly assigned to receive instructions to generate solutions to a problem that were either creative or practical by substituting the appropriate words in the following communication to participants: "A store has recently gone bankrupt, and there is now an empty space where the store used to be. Please generate as many ***creative, original and novel/practical, logical and useful*** ideas for uses of that space as you can. You have 7 minutes to do so. The survey will automatically move you forward after 7 minutes."

After generating ideas, participants engaged in a task in which they were asked to build their perfect burger. This task was designed to measure indulgent choices. Participants were provided with pictures of 14 different types of buns (including sesame seed bun, lettuce wrap, and naan bread), nine different types of patties (including beef patties, grilled chicken, and veggie patties), 13 different types of cheese (including American cheese, blue cheese, and brie as well as an additional no cheese option), and 72 choices of burger toppings (including ketchup, bacon, and peanut butter). Participants were instructed as follows: "For the next study, we will ask you to build a burger that you would love to eat. You can select any and all ingredients to make your perfect burger. At the end, you can name your burger." The potential mediator and indulgence scales were positioned after the burger task.

Dependent variables

The main dependent measure was the number of calories in the burger (calculated using data from myfooddiary.com), with higher calorie content indicating more indulgent choices. In order to verify that burgers are perceived as tasty but unhealthy and thus are indulgent choices, we ran a pre-registered pilot study testing just that (https://aspredicted.org/dh8nv.pdf). The results show that, on average, participants think of burgers as tasty but unhealthy and that consumption of them should be limited. The details of this study (Pilot 1) can be found in the supplemental material.

In the real world, restaurants have begun to make calorie counts available to help people make healthier choices which, in fact, seems to work (Lim et al., 2018). Thus, to enhance the realism and generalizability of the task and to test whether individuals deliberately make indulgent choices even when calorie counts are known, we listed the number of calories for each burger component easily visible next to each component.

We also included a self-reported indulgence measure to test whether participants admit to feeling indulgent. Specifically, following the indulgent choices measure, participants completed a survey which included a slightly modified version of the six-item measure of hyperopia, which measures an aversion to indulgence, by Haws & Poynor (2008). We adapted the scale to focus on indulgence. The items were on a seven-point scale ranging from 1 (Strongly disagree) to 7 (Strongly Agree). Two sample items are: “I love to pamper myself” and “It's hard for me to make myself indulge” with the latter item being reverse scored. The scale’s reliability (Cronbach’s $\alpha = .86$) was acceptable.

Potential Mechanisms

Next, participants completed a survey which included two potential mechanisms: 1) a liberation measure (Goncalo et al., 2015), and 2) a variety seeking scale (Van Trijp et al., 1996) given that this might be a methodological confound. Each of these scales were from 1 (Strongly disagree to 7 (Strongly agree). The liberation scale is made up of the following

three items: When I was making my burger, I felt 1) constrained 2) liberated 3) uninhibited. The scale's reliability (Cronbach's $\alpha = .80$) was acceptable. The variety seeking scale consists of five items. Two example items are: "I enjoy trying new things" and "I like to try new flavors of different products." The scale's reliability (Cronbach's $\alpha = .87$) was acceptable.

Additional Measures

At the end of the study, we collected information on ethnicity, gender, age, whether participants are currently on a calorie restricting diet (yes/no), and how hungry participants currently are (on a scale from 1 (not at all hungry) to 10 (extremely hungry)). Participants were also asked how hungry they were before engaging in the burger task.

Unusualness of Burger Components

Skeptical readers might wonder whether participants who engage in creative ideation might continue to be creative (Shalley, 1991) by creating burgers that contain components that are not typically found on burgers in restaurants. This would be a problematic confound if uncommon components, such as peanut butter, also contained unusually high calories. We thus asked 53 participants on Amazon Mechanical Turk to rate how typical all the burger buns, cheeses, patties, and other toppings were on a scale from 1 (very common) to 7 (very uncommon). We then averaged their scores to create an unusualness score for each burger component. The correlation between the number of calories and the unusualness of the burger components was not significant, $r = 0.07$, $p = 0.477$. Nonetheless, to show that the unusualness of the burger components did not influence the effect of creative ideation on indulgent choices, we controlled for it to rule out this alternative explanation of our results. In another study (S2, in the supplemental material) we excluded all unusual burger components (e.g., peanut butter) to ensure that our effect persisted, and it did.

Manipulation checks

As a manipulation check, participants responded to the question "how creative were the ideas that you generated during the ideation task" on a five-item scale from 1 (not at all) to 5 (a great deal). Additionally, two independent raters who were blind to condition rated the creativity of the ideas generated on a 5-point scale from 1 (not at all creative) to 5 (very creative). The interrater reliability (LeBreton & Senter, 2008) between the two raters was ICC(2) = 0.84, which was acceptable. Thus, we averaged the two raters' creativity ratings.

Results

Manipulation Check Results

An independent samples t-test demonstrated that the participants in the creative ideation condition (M = 3.98; SD = 0.87) indicated that the ideas they generated were significantly more creative than those in the practical condition (M = 2.93; SD = 0.11), $t(198) = -7.55$, $p < 0.001$, $d = 1.69$. Furthermore, an independent samples t-test demonstrated that participants in the creative ideation condition (M = 2.39; SD = 0.60) generated significantly more creative ideas than those in the practical ideation condition (M = 1.99; SD = 0.42), $t(169.95) = -5.30$, $p < .001$, $d = .77$. Equal variance was not assumed because the Levene's tests were significant, $p = .002$. Together, these results indicate that the manipulations were successful in that participants who were instructed to be creative not only believed they were creative but independent coding of their ideas also indicated that they followed the instructions and thus were more creative.

Calorie and Self-reported Indulgence Results

As predicted, the results of an ANCOVA revealed a significant effect of type of ideation task (creative vs. practical) on the number of calories in the burger when controlling for the unusualness of the burger components, with the participants in the creative ideation condition (M_{kcal} = 1727.34; SD_{kcal} = 1481.00) creating significantly more calorie-rich burgers than the participants in the practical ideation condition (M_{kcal} = 1258.75; SD_{kcal} = 584.94), $F(1, 197)$ =

5.79, $p = .017$, $d = .42$. When not controlling for the unusualness of the burger components, the results remain significant. See supplemental material for the analysis and results.

As predicted, an independent samples t-test revealed that participants in the creative ideation condition ($M = 4.91$; $SD = 1.05$) indicated feeling significantly more indulgent than participants in the practical ideation condition ($M = 3.97$; $SD = 1.14$), $t(198) = -6.07$, $p < .001$, $d = .86$.

Potential Mechanisms

We tested for mediation by liberation and variety seeking by running separate mediation procedures (Model 4) on PROCESS in SPSS as recommended by Hayes (2017). For both, we used calories in the burger as our dependent variable. The indirect effects through liberation and variety seeking were not significant as the 95% CIs contained zero (liberation: [-12.73, 45.49], variety seeking: [-28.24, 6.23]). We thus did not find support that these potential mechanisms explained the relationship between creative ideation and indulgent choices.

Additional Results

When excluding the outliers, the pattern of main effects and mediation results remain the same. When controlling for being on a calorie restricting diet and/or when controlling for hunger, the pattern of effects remains the same. See the supplemental materials for the detailed analyses.

Study 1b: Build a Cocktail

Method

Participants and Design

Four hundred and four participants from Mturk (63% male; $M_{age} = 36.36$ years) participated for $2. Our sample size was set a priori to 100 per condition. Given the typical attrition rate on Mturk, we aimed to collect an additional 100 participants. Forty-five participants were removed for failing to write anything on the writing prompt (ideation or

their day yesterday) or not following the writing prompt's directions (e.g., writing about something irrelevant). That left us with 359 participants. Participants were randomly assigned to one of three conditions: Ideation (creative vs. practical) or the neutral control condition (their day yesterday).

Procedure

Here, we wanted to provide a more rigorous test of our hypothesis by including an additional control condition in which participants did not engage in any form of ideation to ensure that people who engage in a creative ideation task indeed create more calorie-rich burgers rather than that people who engage in a practical ideation task create less calorie-rich burgers than people would usually do. We thus included an additional control condition, which asked participants to complete a standard reflection task—to write about their day yesterday. Thus, participants were first randomly assigned to complete this control task or one of the same ideation tasks (creative or practical) as in the previous study. They were given 5 minutes to complete the task.

Next, participants were told: “For the next section, we will ask you to create a cocktail that you would love to drink. You will find different categories of ingredients such as bitters, fruits, juices, and sodas. You can select any and all ingredients to make your perfect cocktail. You can use ingredients from any of the categories to create your drink, but you do not have to use every category. At the end, you can name your cocktail.” For each category of cocktail component, participants were given some information. For the alcohol component the information was as follows: “First, pick your liquor. For this study, a serving of liquor is 1.5 ounces. Your cocktail can include up to 12 ounces of liquor. You can pick as many of the options as you like, but you will be limited to a total of 12 ounces of liquor. You can also choose to not use alcoholic drinks in your cocktail. You will see the alcohol by volume (ABV) when applicable and the calories per serving.” Participants were presented with 29

types of alcohol, 22 types of bitters, 36 types of juices, 29 types of syrups, 31 types of fruit, 28 types of mixers or sodas, and 78 other types of ingredients such as mint leaves, ice cream, and hot sauce. Each one of these potential cocktail ingredients were labelled with the calories associated with them. We chose 1.5 ounces of liquor as one serving as this is the standard in most bars. In the United States, a standard drink is considered to be 14 grams of alcohol, which corresponds to a 12-US-fluid-ounce (350 mL) glass of 4.1% beer (Office of Alcohol Policy and Education, n.d.). Thus, to increase the realism of the measure, we restricted the amount of alcohol to 12 ounces per drink.

Dependent variables

To create our dependent variable for this study, we summed the Alcohol by Volume (ABV's) of each alcoholic component to get at the total ABV. For example, if someone added two shots of Cointreau (40% ABV) and one shot of tequila (45% ABV), their summation of ABV would be 40+40+45=125. This is a measure of how much alcohol is in the drink, with more alcohol indicating higher indulgence. Following the alcohol measure, participants completed a survey which included the same modified measure of indulgence as before (Haws & Poynor, 2008). The indulgence scale's reliability (Cronbach's $\alpha = .78$) was acceptable. Additionally, the total number of calories in each cocktail was calculated.

Potential Mechanisms

At the end of the study, we included a survey that entailed the same liberation and variety seeking measures as in Study 1a. The liberation (Cronbach's $\alpha = .40$) and variety seeking (Cronbach's $\alpha = .63$) scales were not particularly reliable in this study.

Manipulation Checks

We asked the same manipulation check question as in the previous study. Additionally, just as before, we had two independent raters who were unaware of condition rate the

creativity of the ideas. The interrater reliability (LeBreton & Senter, 2008) between the two raters was acceptable, ICC(2) = 0.70. We thus averaged the two raters' creativity ratings.

Additional Variables

At the end of the study, we included a survey that asked participants how hungry and thirsty they were before engaging in the cocktail task. Furthermore, we asked for ethnicity, age, gender, whether they are currently on a calorie restricting diet or not, and how many alcoholic drinks they usually consume within a week.

Results

Manipulation Check Results

An independent samples t-test demonstrated that the participants in the creative ideation condition (M = 3.77; SD = 1.05) indicated that the ideas they generated were significantly more creative than those in the practical ideation condition (M = 2.68; SD = 1.32), $t(223) = -6.9$, $p < .001$, $d = .91$. Furthermore, an independent samples t-test demonstrated that participants in the creative ideation condition (M = 2.59; SD = 0.51) generated significantly more creative ideas than those in the practical ideation condition (M = 2.19; SD = 0.53), $t(223) = -5.87$, $p < .001$, $d = .77$. Together, these results indicate that the manipulation was successful.

ABV, Calorie, and Self-reported Indulgence Results

As predicted, the results of a one-way ANOVA revealed a significant effect of condition on the amount of alcohol (ABV) in the cocktail, $F(2, 356) = 35.13$, $p < .001$, $\eta^2 = 0.17$. As predicted and as can be seen in Figure 1, the participants in the creative ideation condition (M_{ABV} = 150.01; SD_{ABV} = 94.09), created cocktails that contained significantly more alcohol than the participants in the practical ideation condition (M_{ABV} = 90.73; SD_{ABV} = 73.75), $p < .001$, $d = .70$, and the participants in the control condition (M_{ABV} = 76.45; SD_{ABV} = 40.62), $p < .001$, $d = 1.1$. The cocktails' alcohol content of the participants in the practical and control

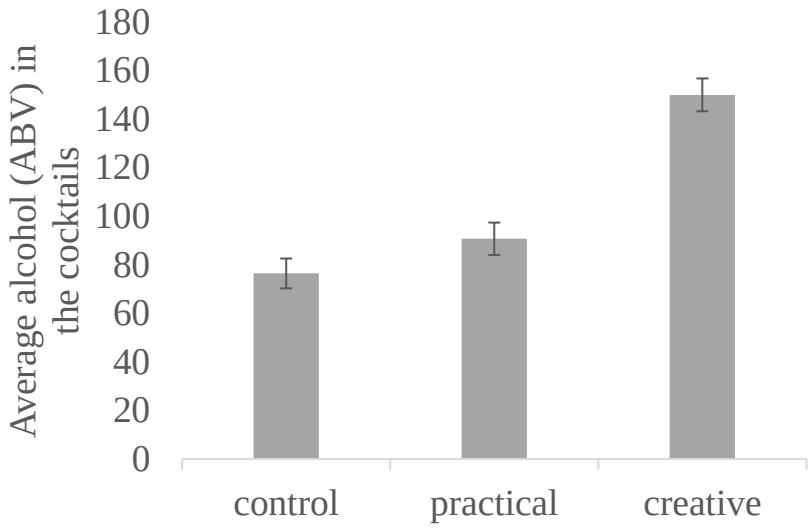
conditions did not differ from each other, $p = .12$. Outlier analysis showed that 11 participants created cocktails that contained an extreme amount of alcohol (between 295 and 440 ABV). All results remain significant when excluding these outliers. See supplemental materials for the details of these analyses.

In order to attempt to replicate the results of Study 1a, we also ran a one-way ANOVA using the calories in the cocktails as our dependent variable. We found a significant effect of condition on the number of calories in the cocktails, $F(2, 356) = 7.09$, $p < .001$, $\eta^2 = 0.04$. Pairwise comparisons showed that participants in the creative ideation condition (M = 2357.62; SD = 5844.54) added significantly more calories than participants in the practical ideation condition (M = 673.79; SD = 977.95), $p < .001$, $d = .40$, as well as the control condition (M = 1377.49; SD = 1140.79), $p = .02$, $d = .24$. The practical ideation condition and the control condition did not differ from one another, $p = .10$.

Similarly, and as predicted, the results of a one-way ANOVA revealed a significant effect of condition on self-reported indulgence, $F(2, 356) = 88.72$, $p < .001$, $\eta^2 = 0.3$. Pairwise comparisons showed that participants in the creative ideation condition (M = 5.37; SD = 0.84) indicated feeling significantly more indulgent than participants in the practical ideation condition (M = 3.95; SD = 0.89), $p < .001$, $d = 1.64$, as well as the control condition (M = 3.98; SD = 1.01), $p < .001$, $d = 1.50$. The practical ideation condition and the control condition did not differ from one another, $p = .82$.

Figure 1

Effect of Condition (Creative/Practical Ideation or Control) on Alcohol by Volume of the Cocktails in Study 1b.



Note. Error bars represent +/- 1 standard error.

Additional Variables

When excluding the outliers, the pattern of results remains the same. Controlling for being on a calorie restricting diet, hunger, thirst, the amount of alcoholic drinks usually consumed within a week, and/or calories of the cocktails did not change the pattern of the results. See the supplemental material for the details of these analyses.

Potential Mechanisms

We again tested for mediation by liberation and variety seeking by running separate mediation procedures (Model 4) on PROCESS in SPSS as recommended by Hayes (2017). The indirect effects through liberation and variety seeking were not significant as the 95% CIs contained zero [-0.99, 2.17], [-1.66, 1.42] respectively. Again, we found no evidence to support these potential mechanisms as explanations of the relationship between creative ideation and indulgent choices.

Study 1c: Create a Workout

Method

Participants and Design

One hundred and seven participants from a large U.S. university (48.6% male; M_{age} = 21.4 years) participated for $5. Our sample size was set a priori to include all participants who chose to complete the study within the week that the study was conducted. All participants completed the study and passed all attention checks. Participants were randomly assigned to one of two conditions (Ideation: creative vs. practical).

Procedure

Participants entered the laboratory and were led into individual cubicles by research assistants blind to the hypotheses and conditions of the study. Participants were first randomly assigned to complete one of the same ideation tasks described in the previous studies.

Next, participants were instructed as follows: "For the next study, we will ask you to build an exercise regimen that you would love to engage in. You can select any and all exercises to make your perfect regimen. At the end, you can name your workout." Participants were presented with 39 different types of exercise, including running, cycling, swimming, yoga, weightlifting, basketball, etc. For each exercise participants were supposed to indicate how many 10min sessions they would like to incorporate into their exercise regimen. Each exercise indicated how many calories an average person burns performing 10min of this exercise. This information was taken from The British Heart Foundation's exercise calorie calculator (British Heart Foundation, n.d.). An example of a low-calorie burning workout would be 30 min of Pilates, which burns approximately 180 kcal. An example of a high-calorie burning workout would be 30 min of jogging at 7.5 mph, which burns approximately 412 kcal. Last, participants filled out a survey which included the self-reported indulgence measure, the self-control measure (see below), as well as additional questions and demographics.

Dependent Variables

Here, we wanted to show that those who engage in a creative task also avoid non-indulgent options by putting together workout regimen that burn fewer calories than participants in the practical condition. The number of calories burned in the entire exercise regimen was our measure of indulgent choice with fewer calories burned representing a less rigorous and therefore more indulgent workout. We also included the same modified six-item measure of indulgence as in previous studies (Haws & Poynor, 2008) as part of the survey at the end of the study. The scale's reliability (Cronbach's $\alpha = .79$) was acceptable.

Potential Individual Difference or Mechanism

Following the indulgent choices measure, participants completed a survey which included the trait self-control measure by Tangney et al. (2004) on a scale from 1 (strongly disagree) to 7 (strongly agree). Example items of this 13-item scale are: "I am good at resisting temptation" and "I do certain things that are bad for me, if they are fun," with the latter being reverse scored. The scale's reliability (Cronbach's $\alpha = .79$) was acceptable.

Additional Variables

At the end of the survey, participants were also asked how many hours a week they usually exercise, how much they weigh, and whether they are on a calorie reducing diet or not. Furthermore, we asked for ethnicity, age, and gender.

Manipulation Checks

We asked the same manipulation check question as before. Additionally, as before, we had two independent raters who were blind to condition rate the creativity of the ideas. The interrater reliability (LeBreton & Senter, 2008) between the two raters was acceptable, $ICC(2) = 0.79$. We thus averaged the two raters' creativity ratings.

Results

Manipulation Check Results

An independent samples t-test verified that the participants in the creative ideation condition (M = 3.22; SD = 0.98) indicated that the ideas they generated were significantly more creative than those in the practical ideation condition (M = 2.87; SD = 0.79), $t(105) = -2.05$, $p = .043$, $d = .73$. Furthermore, an independent samples t-test demonstrated that participants in the creative ideation condition (M = 2.30; SD = 0.39) generated significantly more creative ideas than those in the practical ideation condition (M = 2.07; SD = 0.21), $t(105) = -3.86$, $p < .001$, $d = .39$. Together, these results indicate that the manipulation was successful.

Calories Burned and Self-reported Indulgence Results

As predicted, the results of an independent samples t-test revealed a significant effect of type of ideation task (creative vs. practical) on the number of calories burned in the exercise regimen, with the participants in the creative ideation condition (M_{kcal} = 1882.8; SD_{kcal} = 1161.31), burning significantly fewer calories in their exercise regimen than the participants in the practical ideation condition (M_{kcal} = 2399.18; SD_{kcal} = 974.44), $t(105) = 2.48$, $p = .015$, $d = .48$, supporting our hypothesis.

Furthermore, as predicted, an independent samples t-test revealed that participants in the creative ideation condition (M = 4.77; SD = 1.01) indicated feeling significantly more indulgent than participants in the practical ideation condition (M = 4.19; SD = 0.89), $t(105) = -3.12$, $p = .002$, $d = .61$.

Potential Individual Difference or Mechanism

We ran a condition (creative/practical) x trait self-control moderation analysis (Model 1) in PROCESS in SPSS. The interaction was not significant, $F(1, 103) = .44$, $p = .51$, 95% CI (-436.75, 872.52), suggesting that the effect is emerging for both those with more versus less trait self-control.

We also tested for mediation by self-control by running a mediation procedure (Model 4) on PROCESS in SPSS as recommended by Hayes (2017). The indirect effect through self-control was not significant as the 95% CI contained zero [-70.18, 38.13]. There was also no significant effect of condition on self-control, t(105) = .66, p = .51. We thus did not find support that trait self-control explains the relationship between creative ideation and calories burned.

Additional Variables

When controlling for currently being on a calorie restricting diet or not, usual number of hours exercised in a week, and/or weight, the pattern of results of this study remained the same. See the supplemental material for detailed analyses.

Study 1d: Gift Choice

Method

Participants and Design

One hundred and seventy-eight participants from a large U.S. university participated for $5 and course credit. Our sample size was set a priori to include all participants who chose to complete the study within the week that the study was conducted. Two participants failed to provide any ideas on the ideation task and were thus excluded from analyses. One hundred and seventy-six participants remained (55.3% male; M_{age} = 20.68 years). Participants were randomly assigned to one of two conditions: Ideation (creative versus practical).

Procedure

After agreeing to participate in the study, participants were randomly assigned to generate as many ways to improve the student experience at the university that were either creative or practical, depending on the condition to which they were assigned, as they could in seven minutes. Then, participants filled out a survey with the indulgence scale as well as the potential mediators, some questions, and demographics.

Here, we measured behavioral rather than hypothetical choices. Participants were given the opportunity to select a pen (a non-indulgence related choice), an apple (a non-indulgent choice), and fun-size packets of M&Ms or Skittles (an indulgent choice) as an extra gift for completing the survey. Participants were invited to select any or all of the items that they would like. Their choices were recorded by a research assistant who was unaware of the hypotheses and conditions of the study.

Potential Mechanisms

At the end of the study, but before being offered any gifts, participants filled out a survey, which included the same liberation scale as before and an entitlement and a fatigue scale. We used the entitlement scale by Jehn & Bezrukova (2010). Example items of this four-item scale are: "I feel I am entitled to certain things even if I put in little effort;" and "I feel I deserve a piece of the world because I am an extraordinary person." We also included a fatigue scale, which we created, that asked participants to indicate whether they felt tired, exhausted, fatigued, and had a lot of energy (reverse scored). Each of these three scales were from 1 (strongly disagree) to 7 (strongly agree). The liberation scale's reliability was not particularly good (Cronbach's $\alpha = .43$). The entitlement (Cronbach's $\alpha = .86$) and fatigue (Cronbach's $\alpha = .83$) scales' reliabilities were acceptable.

Dependent Variables

Our dependent variable was the choice of candy (fun-size packets of M&Ms or Skittles), apple, and/or pen. Furthermore, participants completed a survey measuring the same modified indulgence measure as in previous studies (Haws & Poynor, 2008). The scale's reliability (Cronbach's $\alpha = .71$) was acceptable.

Manipulation Checks

As part of the survey, we asked the same manipulation check question as in previous studies. Additionally, as before, we had two independent raters who were blind to condition

rate the creativity of the ideas. The interrater reliability (LeBreton & Senter, 2008) between the two raters was acceptable, ICC(2) = 0.69. We thus averaged the two raters' creativity ratings.

Additional Variables

Given that participants could choose more than one gift, the research assistant also recorded the number of items taken. Additionally, participants answered questions with regards to ethnicity, age, gender, whether they are on a calorie restricting diet (yes/no) and how hungry they currently were.

Results

Manipulation Check Results

An independent samples t-test demonstrated that participants in the creative ideation condition (M = 3.17; SD = 1.12) indicated that the ideas they generated were significantly more creative than those in the practical ideation condition (M = 2.72; SD = 0.87), $t(174) = -2.93$, $p = .004$, $d = .45$. Furthermore, an independent samples t-test demonstrated that participants in the creative ideation condition (M = 2.32; SD = 0.43) generated significantly more creative ideas than those in the practical ideation condition (M = 2.16; SD = 0.37), $t(174) = -2.50$, $p = .01$, $d = .40$. Together, these results indicate that the manipulation was successful.

Gift Choice and Self-reported Indulgence Results

As predicted, the results of a logistic regression revealed a significant effect of condition on the likelihood of taking candy $\chi^2(1) = 11.54$, $p = .001$, OR = .32. The participants in the creative ideation condition chose candy 78.7% of the time, while participants in the practical ideation condition chose candy only 54.0% of the time. Participants in both conditions were equally likely to choose the apple, $\chi^2(1) = 0.57$, $p = .45$, OR = 1.28, as well as the pen, $\chi^2(1) = 0.36$, $p = .55$, OR = 1.20. Furthermore, even though participants could choose as many items as

they wanted, there was no difference between conditions on the number of items chosen. Participants in the creative ideation condition (M = 1.54; SD = 0.71) did not choose significantly more items compared to those in the practical ideation condition (M = 1.38, SD = 0.65), $t(176)$ = -1.55, p = .12. Additionally, and as predicted, an independent samples t-test demonstrated that those in the creative ideation condition (M = 5.10; SD = 0.92) felt significantly more indulgent than those in the practical ideation condition (M = 4.79; SD = 0.88), $t(176)$ = -2.27, p = .024, d = .34. We thus find support for our main effect hypothesis.

Potential Mechanisms

We tested for mediation by liberation, entitlement, and fatigue by running separate mediation procedures (Model 4) on PROCESS in SPSS as recommended by Hayes (2017). The indirect effect through liberation, entitlement, and fatigue were not significant as the 95% CIs contained zero [-0.08, 0.07], [-0.005, 0.36], and [-0.05, 0.10] respectively. We thus again confirmed with a behavioral outcome that liberation and these additional constructs do not seem to explain the relationship between creative ideation and indulgent choices.

Fatigue as Confound

An independent samples t-test demonstrated that the participants in the creative ideation condition (M = 3.74; SD = 1.37) indicated feeling no more fatigued than those in the practical ideation condition (M = 3.62; SD = 1.28), t(176) = -.58, p = .56. Had the creative ideation condition been more demanding and effortful, we would expect participants to feel more fatigued, but they did not.

Additional Variables

Given that the pattern of results of our analyses up to now remain unchanged by controlling for the additional variables collected, we did not analyze the effect of the additional variables for this study.

Discussion – Studies 1a-d

The results of these initial studies demonstrate that people who engage in creative ideation make more indulgent choices by creating more calorie-rich burgers and more alcoholic cocktails they would love to consume, exercise regimens that burn fewer calories, and by choosing candy more often than people who engage in control tasks. Furthermore, those generating creative ideas self-report indulging more than those in the control conditions. Study 1a showed that the main effect on indulgent choices occurred despite controlling for the unusualness of the burger components. These results are particularly important as they seem to suggest that people create indulgent burgers, and not simply more creative and unusual burgers that also happen to be indulgent. The results showing that variety seeking does not mediate the effect corroborates that conclusion. Additionally, we did not find support that liberation, entitlement, fatigue or variety seeking mediated the results.

In Study 1c, creative ideation did not interact with trait self-control, and did not affect responses on that measure. The fact that the effect of creativity on indulgence emerges even among those with high self-control suggests that those who struggle with successfully adhering to their long-term goals and those who struggle relatively less show this effect. In order to more directly target a state-based loss of self-control, in subsequent studies we added scales designed to directly capture the motivation to seek hedonic rewards (the BAS), which has been linked with self-control failures (Franken, 2002; Johnson et al., 2003; Yen et al., 2009).

Study 2: Candy Consumption and BAS Mediation

Next, we wanted to measure the actual consumption of an indulgent food. We thus gave participants a choice of either Skittles or M&Ms to eat and measured the amount of candy consumed. Furthermore, we included a BAS measure to test its mediating effect. We included all three BAS subscales and treated the BAS as one large scale in our analysis (Carver & White, 1994).

We also again included variety seeking, trait self-control, and liberation measures to confirm that these potentially relevant constructs (liberation and variety seeking) are not mediating the effect, and we also test whether the BAS scale is distinctive from a trait self-control scale.

Method

Participants and Design

One hundred and thirty-two students from a university in the U.S. (37.1% male; M_{age} = 20.08 years) participated for $5 and extra credit. Our sample size was set a priori to 50 per condition. However, after 132 students participated, we needed to stop data collection due to campus closure due to COVID-19. Due to the nature of the task (actual eating behavior), we could not collect data online. All participants finished the study and passed all attention checks. Participants were randomly assigned to one of three conditions: creative/practical ideation or control.

Procedure

Participants were randomly assigned to the control condition in which they were asked to write about their day yesterday or to one of the following two ideation tasks drawn from Goncalo and Katz (2020): “Instructions: A candle company is trying to come up with ideas for candle scents. Please generate as many creative (new, original, and novel)/practical (logical, suitable, and useful) ideas for candle scents as you can. You have 7 minutes to do so. The survey will automatically move you forward after 7 minutes.” At this point, participants were given the serving of their chosen candy, which they were told they could eat as much of as they wanted while completing the remaining survey. Participants could also refuse the candy, and some did.

Dependent Variables

To create our dependent variable for this study, we measured the amount of candy eaten by subtracting the weight of the candy cup after the study from the weight of the candy cup before the study for each participant, which provided a measure of how much candy participants consumed while completing the ideation task. The research assistants were told to give each participant two fun-size packs of their chosen candy, emptied into a cup. Due to an error, one research assistant gave participants only one instead of the two fun-size packs of candy. Whether a participant received one or two packs of candy did not differ by condition, $F(2, 129) = 0.24$, $p = .79$. Nevertheless, we controlled for the starting weight of the candy cup in all analyses below because the starting weight did have a significant positive effect on the amount of candy eaten, $\beta = 0.52$, $p < .001$. Consistent with our previous studies, we included the modified measure of indulgence (Haws & Poynor, 2008). The scale's reliability (Cronbach's $\alpha = .77$) was acceptable.

Potential Mechanisms

We included the three BAS subscales (Carver & White, 1994), which were each measured on a seven-point scale ranging from 1 (strongly disagree) to 7 (strongly agree). The final BAS measure consisted of a composite score of all three subscales. An example item of the BAS Reward Responsiveness subscale is: "It would excite me to win a contest." An example item of the BAS Drive subscale is: If I see a chance to get something I want, I move on it right away." An example item of the BAS Fun Seeking subscale is: I crave excitement and new sensations." The entire BAS scale's reliability (Cronbach's $\alpha = .94$) was acceptable. We also included the same variety seeking (Cronbach's $\alpha = .68$), trait self-control (Cronbach's $\alpha = .65$), and liberation (Cronbach's $\alpha = .78$) measures as in previous studies. Their reliabilities were acceptable.

Manipulation Checks

We asked the same manipulation check question as in previous studies. Additionally, we had two independent raters who were blind to condition rate the creativity of the ideas. The interrater reliability (LeBreton & Senter, 2008) between the two raters was acceptable, ICC(2) = 0.71. We thus averaged the two raters' creativity ratings.

Additional Variables

We asked participants how hungry they were before being given the candy, how much they generally enjoy eating the candy they chose, and whether they are currently on a calorie restricting diet or not. Furthermore, we asked for ethnicity, age, and gender.

Results

Manipulation Check Results

Participants in the creative ideation condition (M = 3.53; SD = 1.70) indicated that the ideas they generated were significantly more creative than those in the practical ideation condition (M = 2.77; SD = 0.68), $t(57.88) = -2.78$, $p = .007$, $d = .59$. These results do not assume equal variance because the Levene's test was significant, $p < .001$. Furthermore, an independent samples t-test demonstrated that participants in the creative ideation condition (M = 2.44; SD = 0.43) generated significantly more creative ideas than those in the practical ideation condition (M = 1.95; SD = 0.41), $t(87) = -5.48$, $p < .001$, $d = 1.17$. Together, these results indicate that the manipulation was successful.

Candy Consumption and Self-reported Indulgence Results

As predicted, the results of an ANCOVA controlling for starting weight revealed a significant effect of condition on the amount of candy eaten, $F(2, 128) = 8.89$, $p < .001$, $\eta^2 = 0.12$. As predicted, the participants in the creative ideation condition (M_{oz} = 0.58; SD = 0.39), ate significantly more candy than the participants in the practical ideation condition (M_{oz} = 0.36; SD = 0.35), $p = .002$, $d = .59$, and the participants in the control condition (M_{oz} = 0.30;

SD = 0.32), $p < .001$ $d = .79$. The amount of candy eaten by participants in the practical and control conditions did not differ from each other, $p = .42$.

As predicted, results of a one-way ANOVA, revealed a significant effect of condition on self-reported indulgence, $F(2, 129) = 26.33$, $p < .001$, $\eta^2 = 0.29$. The participants in the creative ideation condition ($M_{oz} = 5.69$; $SD = 0.89$), indicated feeling significantly more indulgent than the participants in the practical ideation condition ($M_{oz} = 4.66$; $SD = 0.93$), $p < .001$, $d = 1.13$, and the participants in the control condition ($M_{oz} = 4.44$; $SD = 0.75$), $p < .001$ $d = 1.52$. The indulgence reported by participants in the practical and control conditions did not differ from each other, $p = .25$.

Mechanisms

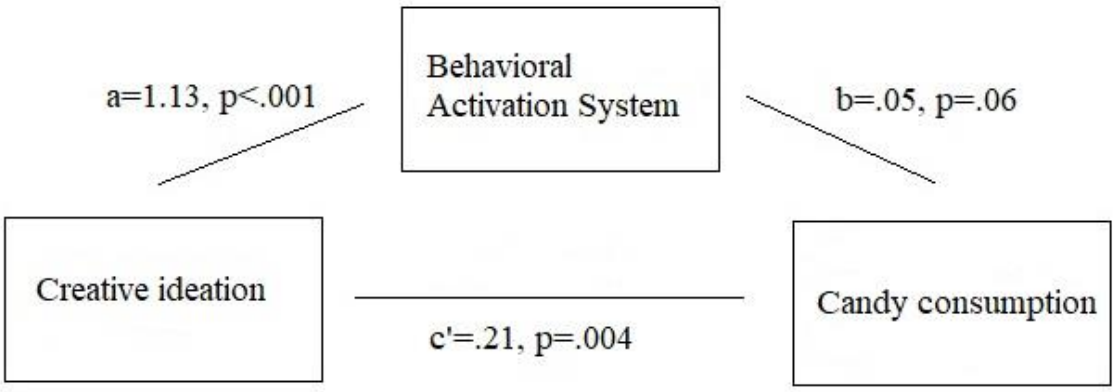
A one-way ANOVA revealed a significant effect of condition on scores on the BAS, $F(2, 129) = 11.95$, $p < .001$, $\eta^2 = 0.16$. In particular, participants in the creative ideation condition ($M = 4.89$; $SD = 1.19$) reported higher scores on the BAS than participants in the practical ideation condition ($M = 3.95$; $SD = 1.14$), $p < .001$, $d = .81$, and participants in the control condition ($M = 3.81$; $SD = 1.10$), $p < .001$, $d = .96$. The practical and control conditions did not differ from each other, $p = .56$.

We tested whether the effect of engaging in a creative ideation task on indulgent choices would be mediated by the BAS, which reflects the motivation to seek rewards. We tested for mediation by running mediation procedure (Model 4) on PROCESS in SPSS as recommended by Hayes (2017). Given that our independent variable was multi-categorical and given that there was no difference between the practical ideation condition and the control condition, we used the following indicator coding: creative ideation condition = 1, practical ideation condition = 0 and control condition = 0. We also controlled for starting weight in these analyses. Based on bootstrapping 5,000 resamples, the indirect effect through the BAS was significant at $p < 0.05$ (indirect effect = 0.05; *SE* = 0.03) as the 95% CI did not

include zero [<0.01, 0.12]. Specifically, relative to participants in the practical and control conditions, participants who engaged in creative ideation reported significantly higher BAS scores (effect = 1.13, *SE* = 0.23, $p < .001$, 95% CI (0.67, 1.59)), which translated into marginally increased consumption of candy (effect = 0.05, *SE* = 0.02, $p = .06$, 95% CI (-0.01, 0.09)). We thus find initial, partial support for mediation via the BAS, see figure 2.

Figure 2

The Effect of Creative Ideation on Candy Consumption Mediated by the Behavioral Activation System (BAS)



The results become stronger when not controlling for starting weight. The pattern of results remains very similar when using each of the three BAS subscales individually. The details of these analyses can be found in the supplemental material.

Further, we tested whether the effect of engaging in a creative ideation task on self-reported indulgence would be mediated by the BAS. We tested for mediation by running mediation procedure (Model 4) on PROCESS in SPSS as recommended by Hayes (2017) using the same coding of the multicategorical independent variable as described above. Based on bootstrapping 5,000 resamples, the indirect effect through the BAS was significant at $p < 0.05$ (indirect effect = 0.34; *SE* = 0.11) as the 95% CI did not include zero [0.15, 0.60].

Specifically, relative to participants in the practical and control conditions, participants who engaged in creative ideation scored significantly higher on the BAS (effect = 1.08, *SE* = 0.24, $p < .001$, 95% CI (0.60, 1.56)), which translated into significantly higher indulgence (effect = 0.31, *SE* = 0.06, $p < .001$, 95% CI (0.19, 0.43)). We thus find support for this mediation.

We ran a condition (creative/practical/control) x trait self-control moderation analysis (Model 1) in PROCESS in SPSS. The interaction was not significant, $F(2, 125) = .21$, $p = .81$, 95% CI (-.28, .32), suggesting that the effect is emerging for both those with more versus less trait self-control.

We also again tested for mediation by variety seeking, liberation, and trait self-control by running separate mediation procedures (Model 4) on PROCESS in SPSS as recommended by Hayes (2017). Given that our independent variable was multi-categorical we used the same indicator coding as described above. Candy consumption was our dependent measure and thus we also controlled for starting weight. The indirect effect through variety seeking and trait self-control were not significant as the 95% CIs contained zero [-0.01, 0.04] and [-0.01, 0.03] respectively. We thus did not find support that these constructs explain the relationship between creative ideation and candy consumption. However, the indirect effect through liberation was significant as the 95% CI did not contain zero [0.20, 0.46]. However, given that we measured liberation in eight studies and that liberation mediates the effect in only one of the eight, it is likely that this result is a false positive.

Discussion

We again demonstrated that engaging in creative ideation leads people to feel indulgent and it leads them to eat more candy than participants in the control conditions. The latter result shows that there is a behavioral effect of creative ideation leading to increased consumption of an indulgent treat. Additionally, we find the first support for a mediator of

this effect: creative ideation led to higher BAS scores (more motivation for reward seeking), which led to feeling indulgent and increased consumption of candy.

One limitation of our studies so far is that we measured some of our potential mediators as well as the self-reported indulgence scale using trait scales. In all remaining studies, we created state versions of these scales to better capture their presumed temporary activation.

Studies 3a, 3b, 3c: Replication and Potential Mechanisms

Next, we ran three studies simultaneously with the goal of replicating our BAS mediation findings, while continuing to test alternative mechanisms. These studies' hypotheses, material, and analyses were preregistered at AsPredicted (https://aspredicted.org/zt6s8.pdf). The studies were identical except that different alternative mechanisms were included in each of them.

In study 3a, we use the brief version of the BIS/BAS scale (Morean et al., 2014), which we changed from a trait to a state scale. We also included the BIS as a potential mechanism given that it is closely related to the BAS. Furthermore, we also included a rule-breaking scale as an additional potential mechanism (Lu et al., 2017). Individuals who feel less constrained by the rules or more likely to break rules may be less influenced by common guidelines (e.g., daily caloric intake guidelines) and more willing to engage in behaviors that defy those guidelines.

In study 3b, we included scales to measure autonomy and hedonic capacity as potential mechanisms. Engaging in creative ideation causes people to feel autonomous (Kim et al., 2023), which might make people feel like they have complete control over their choices and can do what they desire in the moment. Creative ideation might also activate people's hedonic capacity, which relates to the ability to feel pleasure and change one's behavior to achieve pleasurable outcomes (Pizzagalli et al., 2008). We also again included a measure of liberation given that it did mediate the effect in Study 2.

In study 3c, we included scales to measure mood and impulsiveness as potential mechanisms. A daily diary study has demonstrated that engaging in creative tasks at work feels good, and it lifts one's mood (Amabile et al., 2005). It should be noted that participants in that study engaged in a range of creative behaviors required for their work. Thus, their efficacy and level of comfort with those creative activities may be greater than the participants for the current study experienced during the idea generation task. Moreover, engaging in creative tasks may not always generate positive affect given that creative tasks can also cause a fear of judgement (Kim et al., 2023). However, we wanted to explore the possibility that creativity can cause a positive mood. Given that indulging feels good, too (Xu & Schwarz, 2009), people might indulge after having engaged in a creative task to continue feeling good (Tugade & Fredrickson, 2007). Furthermore, impulsively seeking rewards is a specific instance of the broader concept of impulsivity. It is conceivable that general impulsivity is activated by creative ideation and not just impulsive reward-seeking. General impulsivity, in turn, is a well-known predictor of indulgent choices (Donohew et al, 1999; Donohew et al., 2000).

Method

Participants and Design

In the three studies, participants were recruited using a representative United States sample from Prolific and were paid $3.00 for a fifteen-minute study. To be eligible, participants had to be located in the United States and have a 95% approval rate. We set the sample size to 100 participants per condition for each of the studies. Across the three studies, 1,013 participants started the survey, 919 participants completed the survey and passed both attention checks (90.7% survey completion rate); data from those 919 participants were included for the analysis. Study 3a had 306 participants (48.4% male; *M*age = 44.6 years). Study 3b had 305 participants (49.8% male; *M*age = 44.4 years). Study 3c had 308

participants (46.8% male; *M*age = 44.93 years). Participants were randomly assigned to one of three conditions (Ideation: creative versus practical, control condition).

Procedure

The manipulations procedure was identical to the one in Study 1b. After the manipulations, participants in Study 3a filled out the brief BIS/BAS and the rule-breaking scales, participants in Study 3b filled out autonomy, liberation, and hedonic capacity scales, participants in Study 3c filled out emotion, mood, and impulsiveness scales. All participants then answered how hungry they are in the moment. They then moved on to the "build your perfect burger" task described in Study 1a.

Potential Mediator Variables

In Study 3a, we used a different measure for the BAS as in Study 2. We included a modified, state version of the brief BIS/BAS scale (Morean et al., 2014), which was measured on a seven-point scale ranging from 1 (not true at all for me) to 7 (very true for me) in accordance with the brief version designed by Morean et al. (2014) to measure the BIS as well as the BAS. Sample items for the BAS scale are: "Right now, it would excite me to win a contest" and "If I wanted something right now, I would go all out to get it." Sample items for the BIS scale are: "Right now, I worry about making mistakes" and "If I thought something unpleasant was going to happen, I would get pretty worked up." The BAS (Cronbach's $\alpha = .80$) and BIS (Cronbach's $\alpha = .77$) scales' reliabilities were acceptable. Additionally, we included a rule-breaking measure (Lu et al., 2017). Participants were presented with three pictures in which people were about to break a rule, which the picture explicitly stated not to do. For example, several people stood in their bathing suits in front of a sign placed on a pier leading out into the ocean that read "swimming prohibited." Participants had to indicate on a scale from 1 (not at all) to 7 (very much): "If you were in the

situation depicted in the pictures, to what extent would you care about following the rules?" The scale's reliability (Cronbach's α = .80) was acceptable.

In study 3b, we included an autonomy scale adopted from Dahl & Moreau (2007), the same liberation scale (Goncalo et al., 2015) as in the previous studies, and we modified the trait hedonic capacity scale (Bernecker & Becker, 2021) into a state version and administered it on a scale from 1 (not at all like me) to 5 (very much like me). Sample items of the autonomy scale are: "I have been able to express my own autonomy in completing the idea generation task" and "I did not feel controlled when completing the idea generation task." Sample items of the state hedonic capacity scale are: "Right now, I want to follow my desires in the here and now" and "Right now, I am thinking about my duties even though I am trying to enjoy a good moment." The autonomy scale's reliability (Cronbach's α = .83) as well as the liberation scale's reliability (Cronbach's α = .69) were acceptable. The hedonic capacity scale's reliability (Cronbach's α= .53) was not particularly good.

In study 3c, we included the Brief Mood Introspection Scale (BMIS; Mayer & Gaschke, 1988) which includes 16 emotions (such as happy, lively, tired, and active) on a scale from 1 (definitely do not feel) to 4 (definitely feel). We reverse scored the negative emotions to create an average positive emotion score. The scale's reliability (Cronbach's α = .90) was acceptable. Furthermore, the BMIS contains one question about one's general mood on a scale from -10 (very unpleasant) to 10 (very pleasant) which we used as a general mood measure. Additionally, we included the brief version of the Barratt Impulsiveness Scale (Barrat, 1959; Morean et al., 2014) which we also changed from a trait into a state scale. This measure was on a scale from 1 (absolutely not) to 4 (definitely). Sample items of this scale are: I'm currently in a state in which … "I plan tasks carefully" and "I am likely to say things without thinking," with the latter reverse scored. The scale's reliability (Cronbach's α = .63) was acceptable.

Dependent Variables

Just as in Study 1a, the dependent measure was the number of calories in the burger, with higher calorie content indicating more indulgent choices. In Study 3c, we also included the modified version of the indulgence scale (Haws & Poynor, 2008). We changed the scale from a trait to a state scale. Sample items for the state scale are: "Right now, I want to take opportunities to enjoy rich experiences" and "Right now, I want to pamper myself." The scale's reliability (Cronbach's $\alpha = .82$) was acceptable. We unfortunately neglected to add this measure to our preregistration; however, our expectations and analyses for this measure are in line with other indulgence measures used across the studies.

Manipulation Checks

We asked the same manipulation check question as in previous studies. Additionally, we had two independent raters who were blind to condition rate the creativity of the ideas. The interrater reliability (LeBreton & Senter, 2008) between the two raters was acceptable for all studies, 7a: ICC(2) = .72, 7b: ICC(2) = .72, 7c: ICC(2) = .69. We thus averaged the two raters' creativity ratings in each study.

Additional Variables

Participants answered questions with regards to ethnicity, age, gender, whether they are on a calorie restricting diet (yes/no) and how hungry they currently were.

Results

Manipulation Check Results

In study 3a, an independent samples t-test showed that participants in the creative ideation condition ($M = 3.51$; $SD = .78$) indicated that the ideas they generated were significantly more creative than those in the practical ideation condition ($M = 3.00$; $SD = .93$), $t(200) = 4.14$, $p < .001$, $d = .59$. Furthermore, an independent samples t-test demonstrated that participants in the creative ideation condition ($M = 2.19$; $SD = .42$) generated significantly

more creative ideas than those in the practical ideation condition (M = 1.94; SD = .33), t(204) = 4.77, p < .001, d = .67. Together, these results indicate that the manipulation was successful.

In study 3b, an independent samples t-test showed that participants in the creative ideation condition (M = 3.53; SD = 1.05) indicated that the ideas they generated were significantly more creative than those in the practical ideation condition (M = 2.87; SD = .85), t(199) = 4.81, p < .001, d = .67. Furthermore, an independent samples t-test demonstrated that participants in the creative ideation condition (M = 2.25; SD = .41) generated significantly more creative ideas than those in the practical ideation condition (M = 1.87; SD = .30), t(199) = 7.27, p < .001, d = 1.03. Together, these results indicate that the manipulation was successful.

In study 3c, an independent samples t-test showed that participants in the creative ideation condition (M = 3.65; SD = .94) indicated that the ideas they generated were significantly more creative than those in the practical ideation condition (M = 2.87; SD = 1.02), t(198) = 5.61, p < .001, d = .80. Furthermore, an independent samples t-test demonstrated that participants in the creative ideation condition (M = 2.13; SD = .37) generated significantly more creative ideas than those in the practical ideation condition (M = 1.88; SD = .31), t(197) = 5.26, p < .001, d = .75. Together, these results indicate that the manipulation was successful.

Calorie Results

As predicted, in Study 3a, a one-way ANOVA revealed a significant effect of condition on the number of calories in the burger, F(2, 303) = 6.60, p = .002, η^2 = .042. Planned contrasts revealed that participants in the creative ideation condition (M_{kcal} = 1646.40; SD_{kcal} = 1140.06) built burgers that contained significantly more calories than participants in the practical ideation condition (M_{kcal} = 1327.94; SD_{kcal} = 737.81), p = .007, d

= .33. and participants in the control condition (M_{kcal} = 1233.69; SD_{kcal} = 538.69), p = .001, d = .46. The calories in the burger of participants in the practical and control conditions did not differ from each other, p = .42.

As predicted, in Study 3b, a one-way ANOVA revealed a significant effect of condition on the number of calories in the burger, $F(2, 302) = 5.26$, p = .006, η^2 = .034. Planned contrasts revealed that participants in the creative ideation condition (M_{kcal} = 1512.62; SD_{kcal} = 875.81) built burgers that contained significantly more calories than participants in the practical ideation condition (M_{kcal} = 1233.71; SD_{kcal} = 608.11), p = .006, d = .37 and participants in the control condition (M_{kcal} =1238.68; SD_{kcal} = 593.68), p = .005, d = .37. The calories in the burger of participants in the practical and control conditions did not differ from each other, p = .96.

In Study 3c, a one-way ANOVA revealed a non-significant effect of condition on the number of calories in the burger, $F(2, 304) = 2.19$, p = .11, η^2 = .014. Planned contrasts revealed that participants in the creative ideation condition (M_{kcal} = 1515.30; SD_{kcal} = 959.30) built burgers that contained marginally more calories than participants in the practical ideation condition (M_{kcal} = 1287.87; SD_{kcal} = 660.57), p = .09, d =.28 and slightly fewer calories than participants in the control condition (M_{kcal} =1535.36; SD_{kcal} = 1132.05), p = .88, d = .02. Participants in the practical ideation condition built burgers that contained marginally fewer calories than participants in the control condition, p = .06.

Self-reported Indulgence Results for Study 3c

As predicted, in Study 3c, a one-way ANOVA revealed a significant effect of condition on the modified state version of the indulgence measure, $F(2, 305) = 15.67$, $p < .001$, η^2 = .09. Planned contrasts revealed that participants in the creative ideation condition (M = 5.30; SD = .96) felt significantly more indulgent than participants in the practical ideation condition (M = 4.60; SD = 1.10), $p < .001$, d = .68 and than participants in the control condition (M

=4.57; *SD* = 1.05), $p = .001$, $d = .73$. How indulgent participants in the practical and control conditions felt did not differ, $p = .84$.

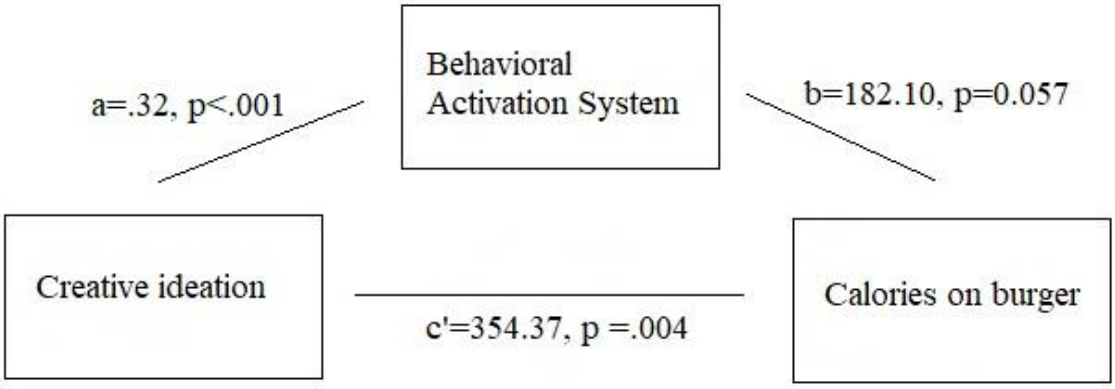
Mediation Results for Study 3a

As predicted, a one-way ANOVA revealed a significant effect of condition on scores on the BAS, $F(2, 303) = 18.90$, $p < .001$. In particular, participants in the creative ideation condition ($M = 3.06$; $SD = 0.49$) reported higher scores on the BAS than participants in the practical ideation condition ($M = 2.64$; $SD = 0.49$), $p < .001$, $d = .86$ and participants in the control condition ($M = 2.74$; $SD = 0.54$), $p < .001$, $d = .62$. The practical and control conditions did not differ from each other, $p = .18$.

We tested for mediation by running the mediation procedure (Model 4) on PROCESS in SPSS as recommended by Hayes (2017). We used the same multicategorical coding as described in previous studies. As predicted, based on bootstrapping 5,000 resamples, the indirect effect through the BAS was significant at $p < 0.05$ (indirect effect = 58.34; *SE* = 26.27) as the 95% CI did not include zero [11.44, 113.87]. Specifically, relative to participants in the practical and control conditions, participants who engaged in creative ideation scored significantly higher on the BAS (effect = 0.32, *SE* = 0.07, $p < .001$, 95% CI (0.18, 0.46)), which translated into marginally higher calories in the burger (effect = 182.09, *SE* = 95.12, $p = .057$, 95% CI (-5.10, 369.28)). We thus find partial support for our mediation hypothesis as can be seen in Figure 3.

Figure 3

The Effect of Creative Ideation on Calories in the Burger Mediated by the Behavioral Activation System (BAS)


Behavioral
Activation System
a=.32, p<.001
b=182.10, p=0.057
Creative ideation
c'=354.37, p =.004
Calories on burger

Other Mechanisms

We tested for mediation by BIS and rule-breaking in Study 3a, and by autonomy, liberation, and hedonic capacity in Study 3b by running separate mediation procedures (Model 4) on PROCESS in SPSS as recommended by Hayes (2017). The dependent variable for these analyses was the calories in the burger. In study 3a, the indirect effects through BIS and rule-breaking were not significant as the 95% CIs contained zero [-16.88, 15.97] and [-36.79, 150.26] respectively. In study 3b, the indirect effects through autonomy, liberation, and hedonic capacity were not significant as the 95% CIs contained zero (autonomy: [-13.35, 73.67], liberation: [-39.15, 27.23]; hedonic capacity: [-18.69, 34.69]). We thus did not find support that these potential alternative mechanisms explained the relationship between creative ideation and indulgent choices.

Even though we had collected mood and impulsiveness in Study 3c, given that the main effect on calories was not significant we did not test for mediation here. Instead, we used the modified state version of the indulgence measure given that the main effect was significant. We tested for mediation by positive affect, mood, and impulsivity by running separate mediation procedures (Model 4) on PROCESS in SPSS as recommended by Hayes (2017). The indirect effects through positive affect, mood, and impulsivity were not significant as the 95% Cis contained zero [-.08, .05], [-.04, .04] and [-.02, .05] respectively. We thus did not find support that these potential alternative mechanisms explained the relationship between creative ideation and indulgence.

Positive Affect as Confound

A one-way ANOVA demonstrated that participants' positive affect in the creative ideation condition (M = 5.10; SD = 4.04) was no different from those in the practical ideation (M = 4.61; SD = 4.51), p = 0.42, and the neutral control (M = 4.99; SD = 4.35) conditions, p = .85. Had the creative ideation condition been more enjoyable and interesting, we would

have expected participants to experience higher positive mood than participants in the other conditions, but they did not.

Discussion

The results of studies 3a and 3b again demonstrate that people who engage in creative ideation make more indulgent choices by creating more calorie-rich burgers. Inexplicably, the calorie results of study 3c fail to replicate these results. Given that only one out of our ten studies failed to show our predicted main effect (see the Forest Plot in Table 3), we believe it to be an anomaly especially because the results of the modified, state indulgence measure in Study 3c do replicate the previous findings. Additionally, we find, in Study 3a, that creative ideation activated the BAS, which, predicted calories in the burger. Importantly, we also show that the BIS does not have the same effect. It thus seems that behavioral activation rather than behavioral inhibition explains why creative idea generators indulge. We included numerous other potential mechanisms, none of which demonstrate a statistically significant effect, adding evidence for the unique role of BAS as a mechanism for the effect.

Study 4: Replication and Potential Alternative Mechanisms

Our next study replicates our BAS mediation findings and tests two other alternative mechanisms and a moderator (healthy eating goals). The goal to eat in moderation is normative (in these samples). Thus, people should feel the need to abide by their long-term goals and not succumb to the short-term hedonic reward of high caloric consumption. It might be such a common constraint that most people show the effect rather than only those who report having a stronger goal to do so. We thus predicted that the effect of creativity on indulgence would emerge robustly even among those who report less of a goal to eat in moderation. This study was identical to Studies 3a-c except that different potential mechanisms and a moderator were included. Besides the state BIS/BAS scale, we also included authentic and hubristic pride scales (Tracy & Robins, 2007) because previous

research has demonstrated a positive correlation between pride and creative achievement (Damian & Robins, 2013). The relationship between pride, self-control, and indulgence, however, has yielded mixed findings. On the one hand, research shows that pride may signal sufficient achievement towards long-term goals, which might cause individuals to feel justified in indulging (Kivetz & Zheng, 2006; Wilcox et al, 2011; Shimoni et al, 2016). On the other hand, research shows that pride enhances perseverance on tasks that serve long-term goals (Williams & DeSteno, 2018). Most likely only a subset of our participants has a long-term goal of being creative though. Instead, in our studies, we temporarily activate a goal to be creative (or practical). Thus, it is more likely that if participants in the creative ideation condition feel proud after ideation it is because they believe to have successfully fulfilled their short-term goal of being creative, which they use to justify indulging.

Method

Participants and Design

In this study, participants were recruited using a representative sample of the United States on Prolific and were paid $2.50. To be eligible, participants had to be located in the United States and have a 95% approval rate. We set the sample size to 100 participants per condition for each of the studies. Four hundred and seventy-five participants started the survey. Three hundred and fifty-one people (45.3% male; *M*age = 27.6 years) completed all survey questions and passed both attention checks (74% completion rate). Participants were randomly assigned to one of three conditions (Ideation: creative vs. practical, control condition).

Procedure

The manipulations procedure was identical to the one in Study 1b. After the manipulations, participants filled out the brief BIS/BAS and the other potential mechanism

scales. All participants then answered how hungry they are in the moment. They then moved on to the "build your perfect burger" task described in Study 1a.

Mediator Variable

We included the same modified, state version of the brief BIS/BAS scale (Morean et al., 2014) as in Study 3a. The reliability of the BAS (Cronbach's α = .68) but of the BIS scale less so (Cronbach's α = .49) were acceptable. Additionally, we included authentic and hubristic pride scales (Tracy & Robins, 2007) which were administered on a 5-point scale from 1 (not at all) to 5 (extremely). Sample items of the authentic pride scale are: "I feel accomplished" and "I feel successful." Sample items of the hubristic pride scale are: "I feel egotistical" and "I feel snobbish." The reliability of the authentic (Cronbach's α = .91) and of the hubristic pride scales (Cronbach's α = .88) were acceptable. These were additional potential mechanisms.

Potential Moderator

We also included a scale measuring people's healthy eating goals (Steptoe et al., 1995) on a scale from 1 (strongly disagree) to 7 (strongly agree) as a potential moderator. Sample items of this scale are: It is important to me that the food I eat on a typical day … "keeps me healthy" and "is nutritious." The scale's reliability (Cronbach's α = .91) was acceptable.

Dependent Variable

Just as in Studies 1a and 3a-c, the dependent measure was the number of calories in the burger.

Manipulation Checks

We asked the same manipulation check question as in previous studies. Additionally, we had two independent raters who were blind to condition rate the creativity of the ideas. The interrater reliability (LeBreton & Senter, 2008) between the two raters was acceptable, ICC(2) = .64. We thus averaged the two raters' creativity ratings.

Additional variables

Participants answered questions with regards to ethnicity, age, gender, whether they are on a calorie restricting diet (yes/no) and how hungry they currently are.

Results

Manipulation Check Results

An independent samples t-test showed that participants in the creative ideation condition (M = 3.30; SD = .95) indicated that the ideas they generated were significantly more creative than those in the practical ideation condition (M = 2.67; SD = 1.00), $t(229) = 4.93$, $p < .001$, d =.65. Furthermore, an independent samples t-test demonstrated that participants in the creative ideation condition (M = 2.02; SD = .38) generated significantly more creative ideas than those in the practical ideation condition (M = 1.75; SD = .28), $t(229) = 5.95$, p <.001, d = .79. Together, these results indicate that the manipulation was successful.

Calorie Results

As predicted, a one-way ANOVA revealed a significant effect of condition on the number of calories in the burger, $F(2, 348) = 9.58$, $p < .001$, $\eta^2 = .052$. Planned contrasts revealed that participants in the creative ideation condition (M_{kcal} = 2111.08; SD_{kcal} = 910.79) built burgers that contained significantly more calories than participants in the practical ideation condition (M_{kcal} = 1722.66; SD_{kcal} = 713.57), $p < .001$, d =.47 and participants in the control condition (M_{kcal} = 1695.75; SD_{kcal} = 796.39), $p < .001$, d =.49. The calories in the burger of participants in the practical ideation and control conditions did not differ from each other, p = .80.

Mediation Results

As predicted, a one-way ANOVA revealed a significant effect of condition on the BAS, $F(2, 348) = 8.20$, $p < .001$. In particular, participants in the creative ideation condition (M = 3.05; SD = 0.49) scored significantly higher on the BAS than participants in the practical ideation condition (M = 2.78; SD = 0.49), $p < .001$, d =.55 and participants in the control

condition (M = 2.89; SD = 0.55), p = .02, d = .31. The practical and control conditions did not differ from each other, p = .09.

We tested for mediation by running the mediation procedure (Model 4) on PROCESS in SPSS as recommended by Hayes (2017). We used the same multicategorical coding as in previous studies. As predicted, based on bootstrapping 5,000 resamples, the indirect effect through the BAS was significant at $p < 0.05$ (indirect effect = 61.86; SE = 31.32) as the 95% CI did not include zero [10.08, 131.77]. Specifically, relative to participants in the practical and control conditions, participants who engaged in creative ideation scored significantly higher on the BAS (effect = .16, SE = 0.07, p = .02, 95% CI (0.03, 0.29), which translated into significantly higher calories in the burger (effect = 393.73, SE = 82.51, $p < .001$, 95% CI (231.44, 556.02)). We thus again find support for our mediation hypothesis, confirming this same finding in two other studies.

Other Mechanisms

We tested for mediation by BIS, hubristic, and authentic pride by running separate mediation procedures (Model 4) on PROCESS in SPSS as recommended by Hayes (2017). The indirect effects through BIS and hubristic pride were not significant as the 95% CIs contained zero [-20.50, 17.60] and [-23.01, 14.83], respectively. The indirect effect through authentic pride was significant at $p < 0.05$ (indirect effect = 83.74; SE = 31.91) as the 95% CIs did not contain zero [27.32, 152.13]. Specifically, relative to participants in the practical and control conditions, participants who engaged in creative ideation experienced significantly more authentic pride (effect = .33, SE = 0.11, p = .004, 95% CI (0.10, 0.55)), and this greater authentic pride translated into significantly higher calories in the burger (effect = 254.95, SE = 47.76, $p < .001$, 95% CI (161.02, 348.88)).

Moderation

Last, we tested whether healthy eating goals would moderate the effect of condition on calories in the burger by running the moderation procedure (Model 1) on PROCESS in SPSS as recommended by Hayes (2017). We used the same multicategorical coding as before. The results show that there is no significant interaction between condition and healthy eating goals on calories in the burger (b = 22.52, 95% CI [-157.60, 202.63], t = .25, p = .81).

Discussion

The results again demonstrate that people who engage in creative ideation make more indulgent choices by creating more calorie-rich burgers than people who engage in control tasks. Importantly, we again find that creative ideation activated the BAS, which predicted calories in the burger. Furthermore, having healthy eating goals did not moderate the effect of creative ideation on indulgent choices Last, while hubristic pride did not mediate, authentic pride did mediate the effect of condition on calories in the burger. These latter results show, for the first time, that there is a causal relationship between engaging in creative ideation and pride. In particular, participants in the creative ideation condition experienced authentic pride, which led them to indulge by creating more caloric burgers. While the results of the current paper robustly demonstrate the BAS to mediate the effect between creative ideation and indulgence, future research might look more deeply at the role pride plays among these variables. For example, authentic pride might be a micro-mediator connecting creative ideation with the BAS or pride and the BAS might be parallel mediators.

Study 5: BAS manipulation

Given the correlational nature of mediation analyses, in one final study we tested whether there is a causal effect of the BAS on two of our dependent variables: calories in the burger and candy consumption. We thus manipulated the BAS in this final study.

Method

Participants and Design

In this study, 138 students from a large U.S. university participated for $5 and extra credit. We set the sample size to at least 50 participants per condition but allowed the study to continue until every student who wanted to participate had a chance to do so. One hundred and thirty-one participants (33.6% male; M_{age} = 20.84 years) completed all survey questions and passed both attention checks (95% completion rate). Participants were randomly assigned to one of two conditions (BAS or control).

Procedure

Participants entered the laboratory and were led to individual cubicles by a research assistant who was unaware of the conditions and hypotheses of the study. After signing the consent form, participants were offered to choose between two fun size packs of M&Ms or Skittles, which they were told they could eat as much of as they wanted while completing the remaining survey. Participants could also refuse the candy, and some did. Next, we randomly assigned participants to either a control condition, in which they were asked to write about their day yesterday for five minutes or to the BAS condition, which we designed as follows. We took three statements from the BAS scale and made them into the following prompts: 1. Recall a time when you saw a chance to get something you wanted, and you moved on it right away. 2. Recall a time when you were very excited about winning a contest. 3. Recall a time when you craved excitement and new sensation. We gave participants five minutes to write about these situations. After the manipulations, participants filled out the state version of the brief BIS/BAS as a manipulation check. All participants then answered how hungry they are in the moment. They then moved on to the "build your perfect burger" task described in Study 1a. Next, participants filled out the healthy eating goals scale (Steptoe et al., 1995) and last the demographics.

Dependent Variables

Just as in Studies 1a, 2, and 3a-c, one dependent measure was the number of calories in the burger. Just as in Study 2, the other dependent measure was the amount of candy consumed.

Manipulation Check

We asked participants to fill out the state version of the Brief BIS/BAS scale (Morean et al., 2014) that we used in previous studies. The reliability of the BAS (Cronbach's $\alpha = .71$) but of the BIS scale less so (Cronbach's $\alpha = .52$) were acceptable.

Additional Variables

We included the same healthy eating goals scale (Steptoe et al., 1995) as in Study 4. The scale's reliability (Cronbach's $\alpha = .89$) was acceptable. We also collected data on ethnicity, gender, age, dieting status, and how hungry people were.

Results

Manipulation Check

Given that the Levene's Test was significant, $p = .03$, equal variances were not assumed here. An independent samples t-test revealed that those in the BAS condition ($M = 3.31$, $SD = 0.39$) scored significantly higher on the BAS than those in the control condition ($M = 2.81$, $SD = .56$), $t(117.86) = -5.83$, $p < 0.001$, $d = 1.01$. Thus, the manipulation was successful.

Candy Consumed and Burger Calorie

An independent samples t-test revealed that those in the BAS condition ($M_{oz} = .85$, $SD = 0.52$) ate significantly more candy than those in the control condition ($M_{oz} = .47$, $SD = .47$), $t(129) = -4.37$, $p < .001$, $d = .76$.

An independent samples t-test revealed that those in the BAS condition ($M_{kcal} = 1865.37$, $SD = 955.71$) created burgers with significantly more calories than those in the control condition ($M_{kcal} = 1193.37$, $SD = 522.32$), $t(96.57) = -4.96$, $p < .001$, $d = .87$. Given that the Levene's Test was significant, $p < .001$, equal variances were not assumed here.

Discussion

In this study, we demonstrated that participants who were primed to be in a state of behavioral activation (BAS) created more calorie-rich burgers and ate more candy than participants in the control condition. Importantly, this study shows that the BAS causally affects indulgent choices.

General Discussion

Across ten studies (and an additional four in the supplemental material), we found strong and consistent evidence using a variety of different indulgent choice dilemmas that people who generated creative ideas subsequently made more indulgent choices compared with control participants and that they did so because they experienced a sense of behavioral disinhibition. Participants in the creative ideation condition created more caloric burgers, more alcoholic cocktails, workouts that burned fewer calories, picked candy rather than apples or pens, and consumed more candy than control participants. The workout and candy/apple/pen studies showed that creative ideation does not simply promote a desire to indiscriminately hoard more of everything because creative ideators chose workout regimens that burned fewer rather than more calories. Additionally, they did not take more candy, apples, and pens overall than control participants, but instead, they chose to take candy more often than control participants. Despite research showing that visible calorie content on restaurant menus discourages people from ordering high-calorie menu items (Lim et al., 2018), the visible calorie content in our studies did not restrain participants in the creative ideation condition from making high-calorie burgers. Furthermore, we consistently demonstrated that our hypothesized effect stemmed from participants in the creative ideation condition choosing more indulgent options rather than from participants in the practical ideation condition choosing less indulgent options since the neutral control condition generally yielded similar choices as the practical condition.

Last, we tested multiple plausible mechanisms and found that the relationship between creative ideation and indulgent behaviors consistently occurred through a heightened BAS. We believe that the process of creative ideation activates the BAS by increasing a feeling of disinhibition and a focus on immediate rewards. In combination, our studies uncover a robust phenomenon. We show, for the first time, that engaging in short creative ideation tasks can have detrimental consequences for one's choices. We now turn to the theoretical implications of our findings for the literatures on creativity and self-control.

The Consequences of Creativity

Much research on creativity has assumed its inherent positivity (Khessina et al., 2018). Yet, there is growing interest in the possible negative side of creativity (Cropley et al., 2008). We contribute to this perspective by providing evidence for a potentially harmful side effect of creative ideation—disinhibited indulgence. Thus, we contribute to the creativity and general psychology literatures in the following important ways.

First, creativity has been associated with dishonesty (Vincent & Kouchaki, 2016), work-life imbalance (Harrison & Wagner, 2016), ostracism (Breidenthal et al., 2020), malevolence (Cropley et al., 2008; Harris et al., 2013), and destructiveness (Eisenman, 2010; Harris et al., 2014). All of these consequences directly harm others. We find that engaging in creative ideation can also harm the self by inducing disinhibition and consequently indulgent choices. We further propose that a common, yet currently unidentified, thread among these negative consequences of creativity is that engaging in creative tasks might disinhibit individuals to cast off normative concerns with adhering to what is typically expected (e.g., be honest, be kind, spend time with family) and instead to approach the immediate attainment of rewards and the fulfillment of personal desires. We thus propose that disinhibition might connect our findings with the existing findings on the negative side of creativity.

Second, we add to the relatively small, but growing stream of research on the psychological consequences of creativity. We show that engaging in creative ideation triggers people's behavioral activation system (BAS), which is characterized by one's desire to reward the self, and thus activates the desire to indulge (Wiggin et al., 2019). Connecting creativity to the activation of the BAS might have a wide range of implications, given that the BAS is central to positive affect (Carver & White, 1994; Gable et al., 2000) and has been linked to mania (Johnson et al., 2012), riskier decision-making in gambling scenarios (Balconi et al., 2014), and drug addiction (Franken et al., 2006).

Implications of Creative Ideation for Self-control and Cognitive Neuroscience

In addition to demonstrating new (potentially undesirable) consequences of creative acts, we also connect the creativity literature with work on the decision-making, self-control, and cognitive neuroscience literatures. The first two have already found that disinhibition, when defined as self-regulatory resource depletion (Heatherton & Tice, 1994), leads people to choose unhealthy, tempting foods (Hofmann et al., 2009; Kahan et al., 2003; Vohs & Heatherton, 2000; Zyphur et al., 2007) and that it leads to higher alcohol consumption (Friese et al., 2008; Muraven et al., 2004; Muraven et al., 2005a; Muraven et al., 2005b). Importantly, frequent consumption of such indulgences harms physical health (Cummings & Tomiyama, 2019) and is thus widely deemed unhealthy. However, we argue that BAS activation differs from self-regulatory resource depletion because the latter requires a loss of self-control due to depletion (Heatherton & Tice, 1994) while the former does not. BAS activation might lead to disinhibited indulgences (Wiggin et al., 2018) whether someone has long term health goals over which it is possible to lose control or not. In fact, we do not find evidence that creative ideation interacts with health goals in Study 4. Furthermore, the self-regulatory resource depletion account of disinhibition would predict that creativity feels depleting, which is neither supported theoretically nor do we find evidence for it in our

studies. The results of our studies, as well as the finding that neither fatigue nor trait self-control mediated our findings, shows evidence for disinhibition in the form of the BAS mediating our effect and does not provide support for a self-regulatory resource account of disinhibition.

In addition to showing that disinhibition did not seem to cause indulgence through fatigue, our findings also suggest that it did not work exclusively through increased activity or approach behaviors. Some prior research has shown an association between creativity, mania, and the BAS system (Johnson et al., 2012; Kim & Kwon, 2017), suggesting that creativity might increase the BAS system which in turn increases activity toward temptations, desires, and short-term indulgences (see also Albarracin et al., 2008). However, as mentioned, the findings from the chosen exercise regimens demonstrate that the pursuit of indulgence sometimes involves lowered activity. Indeed, overall, these findings highlight the importance of considering behaviors that lead to desires, regardless of whether those behaviors require more or less effort. Future work might test whether people who engage in creative ideation (versus not) might even put in greater effort to acquire tempting goods, and when the downside of such effort investment overrides the hedonics of the temptation.

Last, there is evidence in the cognitive neuroscience literature showing that individual differences in inhibition as well as other measures of cognitive control are positively related to divergent and original thinking (e.g., Benedek & Fink, 2019; Benedek et al., 2014; Zabelina & Ganis, 2018). First, Zabelina and Ganis (2018) found that divergent thinkers used stronger cognitive control processes during attentional switches between global to local attentional levels. Second, Radel and colleagues (2015) found that fluency and originality scores on a divergent idea generation task (but not creative achievement) were positively associated with reduced inhibition, which was defined as the ability to suppress the processing or expression of information that would disrupt the efficient completion of the

goal at hand. Third, Benedek and colleagues (2014) note that "the concept of inhibition is particularly diverse, and may, in different contexts, also denote other conceptualizations such as the control of distractor interference." They examine inhibition as the suppression of dominant but irrelevant response tendencies. In contrast to these three research findings, we focus on disinhibition as the loss of control over one's behaviors, thoughts, or emotions (Baumeister et al., 1994). Importantly, we focus on a state of disinhibition as a result of rather than an antecedent to creative ideation. Clearly then, the direction of causality as well as the type of inhibition/disinhibition studied matter for the outcome and cannot be directly compared.

Limitations and Future Research

We noted above the definition of creativity as novel and useful and want to acknowledge that our studies aligned with other research that focused on the novelty component. Nonetheless, there is an active debate over the relative importance of novelty versus usefulness in defining creativity and whether or how to combine them (e.g. Diedrich et al., 2015; Harvey & Berry, 2023; Harvey & Mueller, 2021). We followed prior research emphasizing that novelty is the distinguishing characteristic of a creative idea over and above an idea that is strictly practical (Amabile, et al., 2005; George, 2007). As such, novelty is typically viewed as the critical factor that distinguishes creative from non-creative ideas (Campbell, 1960; Litchfield et al., 2015). Moreover, we are focused on the initial idea generation stage of the creative process—a stage during which the emphasis is directed at novelty or variation with usefulness coming into focus in later stages during which ideas are selected for implementation (Staw, 1990). For instance, the idea generation stage tends to focus on novelty while the later stages such as idea selection and elaboration tend to focus on usefulness (Campbell, 1960; Staw, 1990; Simonton, 1999). Given the emphasis on novelty in prior research and the stage of the creative process (e.g. idea ideation/generation) that was the

focus of our research, we chose to focus on the originality component of creativity when manipulating creativity.

As detailed in Table 4, we collected data on US Americans, who live in an individualistic culture and define creativity as truly novel ideas. Our results may thus not be generalizable to collectivistic cultures, which tend to view creativity as incremental, building on existing ideas (Loewenstein & Mueller, 2016). Furthermore, three unanswered questions remain, opening doors for future research. First, would other types of indulgences, such as retail shopping, Spa treatments and expensive vacations, be equally affected? Second, under what circumstances and why do people on a calorie restricting diet sometimes indulge more than those not on such a diet? Third, what happens to individuals who engage in creative tasks on a daily basis? Will they indulge regularly or find ways to channel their disinhibition in healthier directions? While this is a question that future research could address, it still is worthwhile to examine the immediate psychological and behavioral effects of engaging in creative tasks (e.g. Kim et al., 2023; Nijstad et al., 2010; Vincent & Kouchaki, 2016).

Moreover, understanding the short-term health effects could help reduce potential long-term effects. Stillman and Wooley (2023) found that highlighting short-term consequences and costs of health choices rather than long-term consequences can reduce the engagement in unhealthy behaviors. Thus, it is possible that by recognizing and increasing awareness of the short-term health consequences of engaging in creative tasks, negative long-term health effects could be avoided. However, as this paper examines the immediate behavioral choices of engaging in a single creative ideation task, we cannot predict any long-term effects of engaging in creative tasks. However, it is noteworthy that the effects of engaging in a creative ideation task can override other goals such as health goals at least temporarily due to an activation of the BAS.

Future research might also investigate the possible role of goal strength (e.g. Higgins, Shah, & Friedman, 1997). Goal strength indicates how accessible and easily goals are for a person within their promotion or prevention foci (Higgins, 1997). Regulatory focus would affect the type of goals that are accessible for a person, and the goal strength within either the promotion or prevention focus could affect their behaviors and choices. Prevention focus, for instance, might cause people to be more focused on who they believe they ought to be. Thus, it is possible that individuals with stronger prevention focus who also have salient health and eating goals would not be as affected by reward-focus created by creative ideation.

Table 4

Limitations

Type of limitation	Details
External validity	Our participants were recruited from a college student population or from online populations from Mturk and Prolific. Although college student samples are rather homogeneous, samples drawn from Mturk and Prolific are more, but not perfectly, representative of the wider U.S. population (Paolacci, & Chandler, 2014).
External validity	Our entire sample consists of participants living in the United States, which may limit the generalizability of our findings to other cultures (Henrich, Heine, & Norenzayan, 2010). As an individualistic culture, US Americans have different implicit views of creativity than people from collectivistic cultures. Thus, our results may not generalize to collectivistic cultures whose definition of creativity emphasizes continuity with existing solutions rather than the free exploration of novel ideas (Loewenstein & Mueller, 2016).
External validity	The particular types of activities that people find to be rewarding may be culture-specific, which raises interesting future potential research questions about how creative ideation might affect downstream behavior, and whether it can lead to similar (but culture-specific) types of indulgences.
Statistical validity	The internal consistency of some of our potential mediator measures was poor to mediocre at times (alpha < .60), which made it more difficult to find statistically significant effects. In particular, we measured liberation in five studies and in two of these, the internal consistency was poor. We measured BIS in two studies and the internal consistency was mediocre. Last, the hedonic capacity scale's reliability which we measured once was also mediocre.
Unanswered questions	There are many other forms of indulgences, such as retail shopping, Spa treatments, expensive vacations, etc, and people who engage in creative ideation may be more likely to indulge in them. Future research could test this prediction.
Unanswered questions	We measured dieting status across 13 studies. As detailed in the supplemental material, in four of those studies, dieting (yes/no) interacted with condition to affect calories. Importantly, those who are on a calorie restricting diet are the ones who indulge significantly more after engaging in creative ideation. These results might be a confound of the hypothetical cocktail and burger creating tasks. Future research could delve deeper into this phenomenon.
Unanswered questions	Here, a short creative ideation task promotes people's desire for and choices of unhealthy behaviors. Many professions require their employees to be creative daily. Although we cannot directly speak to long-term effects, people who engaging in creative tasks regularly may indulge regularly, which

	can have dire personal and societal consequences in the long run. For instance, eating foods high in fat, salt, and sugar, a lack of exercise, and alcohol consumption in excess can cause obesity and alcoholism, which are psychologically (Falkner et al., 2001; Puhl & Heuer, 2010) and physically debilitating. (Center for Disease Control and Prevention [CDC], 2020a). Alternatively, they may find alternative outlets for their disinhibited behaviors.

Conclusion

Our ten experiments show that engaging in a creative ideation task has downstream psychological consequences that result in indulgent choices across several distinct domains of health choices. The results are consistent with our theoretical perspective that creative ideation is disinhibiting—a psychological state that may have numerous consequences given that effective inhibition is fundamental to human survival. Taken together, these studies raise a potentially costly tradeoff that is worthy of contemplation. Engaging in creative tasks may have significant benefits; however, there may be unexpected consequences that reach beyond the creative task itself to affect our health choices.

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