Is There In Choice No Beauty?

Motivation for Choosing Moderates Choice Overload

by

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Abstract

Some research suggests that increasing the number of options may be harmful for consumers by increasing their difficulty with choosing, which increases their likelihood of experiencing regret. However, other research suggests that increasing the number of options may also be beneficial by satisfying consumers’ diverse tastes and variety-seeking needs. Thus, it isn’t clear whether – or when – more choice would be harmful or beneficial for consumers. I propose that the motivation for choosing as either extrinsic or intrinsic impacts consumers’ satisfaction with the chosen option differently. For extrinsic choices where consumers are choosing an option to achieve some separable consequence, more choice increases the difficulty with choosing, which decreases satisfaction. For intrinsic choices where consumers are choosing an option for its inherent rewards, more choice increases the autonomy from choosing, which increases satisfaction. Crucially, this difficulty or autonomy occurs because consumers perceive variety with more choice, even though more choice does not necessarily mean a greater objective amount of variety. I conclude by discussing how understanding the motivation for choosing has implications for researchers and marketers who study or provide choice to consumers.
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Introduction

Today’s society places a high value on choice. We choose what to eat, who to marry, and where to travel. We feel threatened when our freedom of choice is restricted. Choice is so important that it may even be a fundamental human need (Inesi et al. 2011; Markus and Schwartz 2010; Ryan and Deci 2006). However, while choice may be important or fundamental, some research suggests that more choice – that is, increasing the number of options – may be harmful for consumers. For example, when there are many options from which to choose and there are many differences between the options, it is hard for consumers to justify choosing any one option (Fasolo, McClelland, and Todd 2007; Sela, Berger, and Liu 2009). And consumers often do not have prior preferences (Bettman, Luce, and Payne 1998), so having to choose from many options induces fear of not choosing optimally or feeling of regret with choosing the wrong one (Fasolo et al. 2007; Schwartz 2004). These findings that more choice is harmful for consumers are commonly referred to as “choice overload” (Iyengar and Lepper 2000), “overchoice” (Gourville and Soman 2005), the “too-much-choice effect” (Fasolo et al. 2007), and the “paradox of choice” (Schwartz 2004).

However, there are reasons why more choice may also be beneficial for consumers. From an economic standpoint, an increase in the number of options is a Pareto-efficient outcome because it never makes a consumer worse-off. Consumers’ preferences are different, and so more choice can better satisfy each of these diverse tastes and cater to individuality (Anderson 2006; Hoch, Bradlow, and Wansink 1999; Hotelling 1929; Kuksov and Villas-Boas 2009; Reibstein, Youngblood, and Fromkin 1975). More choice can also meet variety-seeking needs by providing consumers insurance against uncertain preferences (Ariely and Levav 2000; Kahn 1995;
Simonson 1990). And if more choice is harmful, then marketers should offer fewer products for consumers to choose. Yet, sales do not always increase when they do so (Boatwright and Nunes 2001; Drèze, Hoch, and Purk 1994; Sloot, Fok, and Verhoef 2006). Indeed, marketers that offer choice to consumers often enjoy competitive advantages over those that do not (Arnold, Oum, and Tigert 1983; Koelemeijer and Oppewal 1999; Oppewal and Koelemeijer 2005). For example, consumers perceive greater quality in product offerings by marketers that offer choice than those that do not (Berger, Draganska, and Simonson 2007). Thus, there are reasons why more choice may be harmful for consumers, but there are reasons why more choice may also be beneficial. Thus, the question is not whether – but when – is more choice bad or good? I propose a moderator that explains when more choice is harmful or beneficial for consumers.

To be sure, this dissertation is not the first research to propose a moderator for choice overload. For example, one stream of research suggests that when the options are presented with few attributes, choosing among many options is not as difficult as when the options are presented with many because there is not as much information for consumers to process (Greifeneder, Scheibehenne, and Kleber 2010; Reutskaja and Hogarth 2009). Another proposed moderator for choice overload suggests that more choice is harmful only for consumers without prior preferences, while more choice tends is not harmful for those who do have such preferences (Chernev 2003; Mogilner, Rudnick, and Iyengar 2008). For consumers who already know which option that they would prefer – perhaps they have made a similar choice previously – they simply need to locate the option that they have previously evaluated as favourable (Lingle and Ostrom 1979; Lynch, Marmorstein, and Weigold 1988; Russo and Leclerc 1994; Wright 1975) or identify the option that best matches their previously chosen option (Coupey, Irwin, and Payne 1998; Hauser and Wernerfelt 1990). Thus, when consumers have prior preferences, choosing
among many options is not as difficult as when they do not.

Regrettably, these moderators only indicate when more choice is not harmful for consumers, not when it is beneficial. For example, Chernev (2003) found that consumers who are given many sofas from which to choose, compared to those who are given just a few, are more likely to switch to a different sofa when they are subsequently asked whether they would like to switch their choice to a newly-presented, sales associate-recommended sofa (which the author suggests is an indicator of a weak preference for or low satisfaction with the initial chosen sofa) when they do not have prior preferences. However, when they do have such preferences, they are not less likely to switch to a different sofa with more choice (which would suggest a strong preference for or high satisfaction with the chosen sofa). Rather, there are no differences in switching likelihood whether consumers choose from many or few options. Furthermore, these findings contrast with others that more choice can be harmful even for consumers who do have prior preferences. For example, Diehl and Poynor (2010) found that consumers’ expectations with finding their preferred option among many options are often so high that they are unable to fulfil them, which decreases satisfaction. Finally, even if more choice increases satisfaction for consumers who have prior preferences, it still does not explain why more choice meets the variety-seeking needs for consumers who do not have prior preferences or whose preferences are uncertain (Ariely and Levav 2000; Kahn 1995; Simonson 1990).

This difficulty in finding a moderator that explains when more choice is also beneficial for consumers is echoed in a meta-analysis on choice overload (Scheibehenne, Greifeneder, and Todd 2010). This meta-analysis reviewed 50 experiments both published and unpublished conducted in the United States, Europe, Asia, and Australia. The authors coded each experiment on various variables including the year and country in which it was conducted, the number of
options, whether the choices used were real or hypothetical, whether it was published or unpublished, and whether participants had prior preferences. The meta-analysis found support for the aforementioned notion that more choice is beneficial for consumers who do not have prior preferences, but it was not able to posit useful moderators for more choice would be harmful or beneficial. It revealed that unpublished experiments are more likely to find that more choice is beneficial for consumers compared to published experiments, which indicates a publication bias for findings of choice overload. It also revealed that recent experiments are more likely to find that more choice is beneficial compared to earlier experiments, which likely is evidence of the Prometheus effect, according to which provocative findings have an advantage for getting published initially, compared to subsequent experiments that find contradictory or weaker results (Trikalinos and Ioannidis 2005). These findings led the authors to conclude that the overall mean effect size of choice overload is “virtually zero” (p. 409). Furthermore, a re-analysis of this meta-analysis using the p-curve and new statistical tools suggested that the overall effect of more choice is positive – but it still was unable to offer moderators for when more choice would be beneficial (Nelson, Simonsohn, and Simmons 2014).

I propose a moderator that not only explains when more choice is harmful for consumers but when more choice is also beneficial. Specifically, I draw on motivation theory (Deci and Ryan 1985; Kasser and Ryan 1996; Moller, Deci, and Ryan 2006) to propose that more choice impacts consumers’ satisfaction with the chosen option differently depending on the motivation for choosing. For extrinsic choices where consumers are choosing an option to achieve some separable consequence, more choice increases the difficulty with choosing, which decreases satisfaction. For intrinsic choices where consumers are choosing an option for its inherent rewards, more choice increases the autonomy from choosing, which increases satisfaction.
Approaching choice overload from a motivational perspective explains when and why more choice is harmful for consumers by increasing the difficulty with choosing, as well as when and why it is beneficial by increasing the autonomy from choosing. Thus, more choice is not necessarily a “recipe for unhappiness” as Schwartz (2004) claimed, but there can be a beauty to it depending on why consumers are choosing at all.
Theoretical Framework

Based on seminal theories in motivation (Alderson 1957; Batra and Ahtola 1990), I distinguish between two primary motivations for choosing – extrinsic and intrinsic. When consumers are making an *extrinsic choice*, they are choosing an option that is instrumental to achieving some separable consequence (Dhar and Wertenbroch 2000; Lepper, Greene, and Nisbett 1973; Mano and Oliver 1993; Ryan, Koestner, and Deci 1991). In other words, the chosen option is a means to an end. For example, a consumer is making an extrinsic choice when she is choosing which orchestral concert to attend in order to expand her knowledge of classical music. When consumers are making an *intrinsic choice*, they are choosing an option for its inherent rewards (Deci and Ryan 1985; Holbrook and Hirschman 1982; Kasser and Ryan 1996; Moller et al. 2006; Pham 1998; Ryan et al. 1991). In other words, the chosen option is an end in itself. For example, a consumer is making an intrinsic choice when she is choosing a concert for the sheer pleasure of listening to the music. Put differently, extrinsic choices are intermediate steps to achieve some separable consequence, while intrinsic choices are sought for themselves as a terminal goal (Botti and McGill 2011; Huffman, Ratneshwar, and Mick 2000; Pham 1998). In this sense, choosing a concert that expands one’s knowledge of classical music can itself be a pleasurable experience, which may suggest that it is an intrinsic choice, but because the concert is primarily a means to expanding knowledge, it is by definition an extrinsic choice (Kasser and Ryan 1996).

According to motivation theory, intrinsic choices are more autonomous than extrinsic choices. *Autonomy* refers to the perceived ability to determine one’s own outcome without being pressured or coerced to choose any particular course of action (Kasser and Ryan 1996; Moller et
al. 2006). For example, a consumer has greater autonomy when she is free to choose an option than when she is pressured to choose a certain one (Baumeister et al. 1998; Moller et al. 2006). At the extreme, a consumer has autonomy when she is able to choose for herself, but she does not have autonomy when someone else chooses for her (Botti and McGill 2011). Thus, consumers have greater autonomy from intrinsic than extrinsic choices because the latter are determined less by consumers but more by the separable consequence that the chosen option is to achieve. Consistent with this notion, Ryan et al. (1991) found that students who choose three out of six puzzles to work on that a teacher describes as “tests of social intelligence”, which is akin to extrinsic motivation, perceive themselves as having less freedom to choose their own puzzles, compared to when the teacher described the puzzles as “games that you might find interesting”, which is akin to intrinsic motivation. Rather, because extrinsic choices achieve some separable consequence, consumers must make trade-offs between the options in order to find the one that best achieves that goal – and prior research has found that it is difficult to do so (Baumeister et al. 1998; Luce, Bettman, and Payne 1997; Wang et al. 2010). Building on these notions that extrinsic choices are difficult while intrinsic ones are autonomous, I propose that for extrinsic choices, more choice increases the difficulty with choosing, which decreases satisfaction with the chosen option. For intrinsic choices, more choice increases the autonomy from choosing, which increases satisfaction.

For extrinsic choices, consumers are choosing an option to achieve some separable consequence. Consumers are often restricted to choosing only one option, and so they must make trade-offs between the options by weighing each option’s advantages against its disadvantages and comparing the evaluation of one option to another in order to find the one that best achieves that goal. I propose that more choice makes this process of making trade-offs more difficult,
which decreases satisfaction. Prior research has found that consumers perceive greater variety with more choice, in that they see options as more distinct from each other, even though more choice does not necessarily mean a greater objective amount of variety (Broniarczyk, Hoyer, and McAlister 1998; Hoch et al. 1999; Kahn and Wansink 2004; Reibstein et al. 1975; van Herpen and Pieters 2002). This perceived variety should increase the amount of trade-offs that consumers must make because they perceive that each option has more advantages as well as disadvantages – and difficulty increases when the difference in attribute values between the options increases (Chatterjee and Heath 1996; Tversky and Shafir 1992). However, consumers often do not have prior preferences (Bettman et al. 1998), and so this perceived variety should increase feelings of conflict and uncertainty regarding which option best achieves the separable consequence (Dhar 1997; Fasolo et al. 2007; Sela et al. 2009) as well as post-choice feelings of dissatisfaction and regret with the chosen option (Greenleaf and Lehmann 1995; Zeelenberg et al. 2000). Thus, for extrinsic choices, the perceived variety with more choice should decrease satisfaction with the chosen option.

Indeed, the process of making trade-offs is taxing both emotionally and psychologically (Luce et al. 1997; Wang et al. 2010). Confusion arises especially when the options are distinct from each other and consumers who have no prior preferences are uncertain as to which option is superior (Dhar 1997). As mentioned earlier, confusion increases when the differences between the options increase (Chatterjee and Heath 1996; Tversky and Shafir 1992), and so the size of trade-offs that consumers must make also increases (Wang et al. 2010). Thus, the perceived variety with more choice should increase the difficulty with searching for the option that best achieves the separable consequence. In turn, this difficulty with extrinsic choices should decrease consumers’ satisfaction with the chosen option.
For intrinsic choices, consumers are choosing an option for its inherent rewards. As mentioned earlier, intrinsic choices are autonomous (deCharms 1968; Deci and Ryan 1985; Moller et al. 2006; Ryan et al. 1991). However, there are situations that can increase or decrease autonomy, which in turn facilitates or undermines intrinsic motivation. For example, Zuckerman et al. (1978) found that students who freely choose a puzzle are more motivated and more satisfied with it than those who have a puzzle “chosen” for them by a teacher. Botti and McGill (2011) further found that consumers who choose their own outcome, compared to those who have it determined for them by someone else, are more satisfied. Similarly, Ryan et al. (1991) found that even using subtle language that conveys autonomy such as “can” or “may” instead of “should” or “must” increases intrinsic motivation. In contrast, reducing autonomy undermines intrinsic motivation. For example, Ryan et al. also found that as an intrinsically-motivated behaviour becomes increasingly controlled by an external reward, people are more likely to see that behaviour as driven by the reward and less out of their own willingness, which diminishes their enjoyment with a task even though they may have “chosen” it.

As mentioned earlier, consumers perceive variety with more choice. However, for extrinsic choices, whereas this perceived variety increases difficulty, I propose that for intrinsic choices, this perceived variety is one situation that increases consumers’ autonomy, which increases satisfaction. Prior research has found that when consumers perceive options to be similar, they feel that what they choose is inconsequential because the quality of the final outcome is, in a sense, already pre-determined by the choice set (Botti and McGill 2006). Here, autonomy diminishes. The inverse implication is that when consumers perceive the options to be different from each other – that is, when they perceive variety, such as with more choice – they should feel that the outcome is not pre-determined, but rather, they are able to determine it
themselves and that what they choose matters. Here, autonomy should increase. Indeed, people at their very core strive to see themselves as causal agents (deCharms 1968). When people attribute the cause of an outcome to themselves, they stand by and willingly endorse it. Thus, for intrinsic choices, the perceived variety with more choice should increase autonomy, which increases consumers’ satisfaction with the chosen option.

It is important to emphasize that autonomy is independent of the number of options from which to choose. Having zero options from which to choose is clearly a situation where consumers do not have autonomy. However, having a single option from which to choose, which may seem like a situation where consumers also have no or at least little autonomy, can be fully autonomous if consumers willingly choose it (Ryan and Deci 2006). Alternatively, having more than one option does not by itself mean that consumers have autonomy. For example, Baumeister et al. (1998) found that people who are pressured to choose one of two sides of an issue to debate do not persist on a subsequent unrelated task, which indicates that they experience little autonomy. One situation where consumers do have autonomy is when they have an intrinsic motivation, compared to an extrinsic motivation (deCharms 1968; Deci and Ryan 1985; Moller et al. 2006; Ryan et al. 1991). Crucially, even within intrinsic motivation, there are situations that influence consumers’ autonomy, which in turn either facilitates or undermines intrinsic motivation as well as satisfaction with a choice, behaviour, or outcome. As mentioned earlier, Botti and McGill (2011) found that consumers who freely make an intrinsic choice have greater autonomy than when consumers have it chosen for them by someone else. I propose that another situation for intrinsic choices that increases autonomy is when there is more choice because consumers feel that they are determining their own outcome.

However, why would more choice not increase autonomy from extrinsic choices and not
increase difficulty with intrinsic ones? For extrinsic choices, prior research has found that when a choice is difficult to make, consumers prefer to defer choosing in order to avoid feeling of regret, which is akin to a preference for inaction to action (Baron and Ritov 1994; Spranca, Minsk, and Baron 1991). For example, choices that are easy to make, such as when there clearly is a superior option (Huber, Payne, and Puto 1982), increase the probability that consumers would choose, but choices that are hard to make, such as when there are many trade-offs to make between the options (Tversky and Shafir 1992) or when the options in the choice set are similarly attractive and so it is not clear which option is superior (Dhar 1997), increase the likelihood that consumers would defer choosing. Thus, for extrinsic choices, when consumers have no option to defer choosing, they should perceive less – not more – autonomy because they want to defer choosing but are nonetheless forced to make a choice (Schwartz, Markus, and Snibbe 2006).

For intrinsic choices, prior research has found that autonomy “vitalizes” or “energizes” consumers (Kasser and Ryan 1999; Moller et al. 2006; Ryan and Frederick 1997). In turn, this vitality replenishes the pool of cognitive resources, which makes tasks less difficult to pursue. For example, Choi and Fishbach (2011) found that intrinsic motivation increases consumers’ cognitive resources but extrinsic motivation depletes them, and so consumers who choose for the sheer pleasure of choosing, which is akin to intrinsic motivation, find a demanding task as less difficult than those who choose with a particular purpose in mind, which is akin to extrinsic motivation. Similarly, Laran and Janiszewski (2011) found that performing tasks described as “fun”, which is akin to intrinsic motivation, increases consumers’ ability to exert or maintain self-control, compared to performing tasks described as “work”, which is akin to extrinsic motivation. These findings are consistent with the theorized notion that higher levels of autonomy are correlated with lower levels of difficulty (Deci and Ryan 1985). Thus, for intrinsic
choices, the positive impact of autonomy from choosing among many options should outweigh the negative impact of difficulty.

Nonetheless, there is an alternative explanation for intrinsic choices why more choice might increase satisfaction. These choices are inherently rewarding, and consumers tend to know what makes them happy and what does not (Diener and Biswas-Diener 2002; Stigler and Becker 1977; Veenhoven 1991). In other words, consumers likely know what option would be most rewarding or pleasurable to them – maybe they already have a specific or an ideal option in mind prior to choosing. In such a situation, might more choice increase satisfaction because it increases their likelihood of finding that preferred option? However, as mentioned earlier, the assumption that more choice means a greater objective amount of variety is not necessarily true, in that more choice does not necessarily mean greater variety in the actual distribution of the options (Broniarczyk et al. 1998; Hoch et al. 1999; Kahn and Wansink 2004; Pratkanis and Farquhar 1992; Reibstein et al. 1975; van Herpen and Pieters 2002). Indeed, Diehl and Poynor (2010) found that consumers’ expectations that they would find their preferred option when choosing among many options are often so unrealistic that they are unable to realize them, which actually decreases satisfaction. Thus, from an expectation-disconfirmation perspective (Oliver 1980), if consumers are more satisfied with intrinsic choices because they are more likely to find their preferred option, then in situations where more choice does not mean a greater objective amount of variety, their expectations of finding a match should increase disproportionately, such that satisfaction should actually decrease, not increase.

However, from an autonomy perspective, even when more choice does not mean greater variety, consumers’ perceived variety should still increase their satisfaction with intrinsic choices. Prior research has found that consumers often cast their choices in a positive light
(Brehm 1966; Clee and Wicklund 1980; Kunda 1990; Tetlock, Stitka, and Boettger 1989). Even if there might be a cognitive dissonance between one’s chosen option and one’s preference (Festinger 1957), consumers reduce this emotional discomfort with the chosen option that may not be their most preferred by convincing themselves that they have chosen the best-matching option that is available. In turn, reducing this discomfort allows consumers to experience greater consistency between their attitudes and behaviours, which increases their satisfaction with the chosen option (Bem 1967; Cialdini, Trost, and Newsom 1995; Festinger 1957). Critically, this positive bias for the chosen option only occurs when consumers are free to choose it, such as when they have an intrinsic motivation, compared to when they are pressured or coerced to do so, such as when they have an extrinsic motivation, (Brehm 1966; Clee and Wicklund 1980). Thus, for intrinsic choices, even when more choice does not mean a greater objective amount of variety, consumers’ perceived variety should still increase satisfaction because they feel that they are determining their own outcome.
The Current Research

In sum, I propose that more choice impacts consumers’ satisfaction with the chosen option differently depending on the motivation for choosing. For extrinsic choices where consumers are choosing an option to achieve some separable consequence, more choice increases the difficulty with choosing, which decreases satisfaction. For intrinsic choices where consumers are choosing an option for its inherent rewards, more choice increases the autonomy from choosing, which increases satisfaction. Crucially, this difficulty with extrinsic choices or autonomy from intrinsic choices occurs because consumers perceive variety with more choice, even when more choice does not mean a greater objective amount of variety. Figure 1 presents the proposed theoretical models for both extrinsic and intrinsic choices.

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Four experiments test these hypotheses empirically. Experiment 1 uses mediation analyses to show that for extrinsic choices, participants’ perceived variety with more choice increases the difficulty with choosing, which decreases satisfaction. For intrinsic choices, their perceived variety with more choice increases the autonomy from choosing, which increases satisfaction. Experiment 2 brings in the concept of self-efficacy (Bandura 1977) to show that it moderates the effects for extrinsic and intrinsic choices – but in different directions. For extrinsic choices, more choice decreases satisfaction for participants with low (but not high) self-efficacy because these individuals are unable to handle the difficult task of choosing from many options. In contrast, for intrinsic choices, more choice increases satisfaction for participants with high...
(but not low) self-efficacy because these individuals see themselves not only determining their own outcome (autonomy) but also as able or competent (self-efficacy). This is consistent with motivation theory, according to which autonomy by itself does not increase intrinsic motivation without feelings of competence (Deci and Ryan 1985; Gagné 2003; Moller et al. 2006; Ryan and Deci 2000; Ryan, Rigby, and Przybylski 2006). Thus, results from these two experiments provide evidence that for extrinsic choices, more choice increases difficulty to decrease satisfaction, but for intrinsic choices, more choice increases autonomy to increase it.

In the last two experiments, I examine the role of perceived variety more closely because I propose that perceived (and not the objective amount of) variety increases difficulty with extrinsic choices and autonomy from intrinsic ones. In these experiments, I hold the actual number of options amount constant – and so the objective amount of variety is also held constant – but I manipulate participants’ perceived variety in two different ways in order to examine whether or not it mediates the effects. Experiment 3 demonstrates that simply considering how different the options are from each other decreases satisfaction with extrinsic choices but increases it with intrinsic ones, compared to considering how similar they are to each other. Experiment 4 demonstrates that categorizing the choice set, which increase consumers’ perceived variety while holding the objective amount of variety constant (Mogilner et al. 2008; Rosch 2002; Sloutsky 2003), also decreases satisfaction with extrinsic choices but increases it with intrinsic ones. Together, results from these two experiments provide evidence that it is consumers’ perceived variety and not the objective amount of variety that produces the effects. They also provide evidence against the possibility that for intrinsic choices, more choice increases satisfaction by increasing consumers’ ability to find their preferred option. I hold the objective amount of variety constant, and so participants should not differ in the ability to find
their preferred option in these two experiments.

The experiments further support my hypotheses in other crucial ways. First, the options from which participants choose are the same and only the motivation for choosing differs (Botti and McGill 2011; Pham 1998), such that the distinction between extrinsic and intrinsic choices lies solely in whether the chosen option is a means to an end (extrinsic choice) or an end in itself (intrinsic choice) and not differences in the options themselves. Second, the experiments use choice domains with which participants have some familiarity but are nonetheless hypothetical, such that they should have no prior preferences. This provides another argument against the possibility that for intrinsic choices, more choice increases satisfaction by increasing consumers’ ability to find their preferred option. Finally, participants receive a minimal amount of information about each option. Thus, for extrinsic choices, more choice should increase the difficulty with choosing by increasing the amount of trade-offs that participants must make between the options and not by increasing the amount of information that they must process, which can also exacerbate the difficulty with choosing independent of the amount of trade-offs that consumers must make (Greifeneder et al. 2010).
Experiment 1

The purpose of this experiment is to test the hypotheses that more choice increases perceived variety for both extrinsic and intrinsic choices, but whereas this perceived variety increases consumers’ difficulty with extrinsic choices because there are more trade-offs that they must make between options, which decreases satisfaction with extrinsic choices, it increases the autonomy from intrinsic choices because they perceive themselves as determining their own outcome, which increases satisfaction with intrinsic choices. This experiment uses mediation analysis to assess the roles of perceived variety, difficulty, and autonomy on satisfaction in a 2 (extrinsic vs. intrinsic choice) × 2 (small vs. large choice set) between-participants design.

Procedure

Participants were undergraduates from the University of Toronto subject pool ($N = 160$, mean age of 21.8 years old, 85 men, 75 women). They were told that the study was to assess potential birthday card designs for Hallmark. They first received either an extrinsic or intrinsic motivation for choosing a card. For the extrinsic choice condition, participants imagined the following scenario and received the following instruction:

Imagine that in your part-time job, your boss tells you to choose a birthday card for a new co-worker to make him or her feel welcome. Please choose one card from the following.

For the intrinsic choice condition, participants imagined the following scenario and received the following instruction:
Imagine that your close friend’s birthday is coming up, and you want to choose a card that would please him or her. Please choose one card from the following.

It was assumed that in the extrinsic choice condition, the chosen birthday card was to satisfy the boss in addition to making the new co-worker feel welcome, which is akin to achieving some separable consequence in extrinsic motivation. In the intrinsic choice condition, the chosen birthday card would itself be pleasing for a close friend, which is akin to a terminal goal in intrinsic motivation. After reading these instructions, participants saw the cover images of six or 15 cards in colour and chose one card. Appendix 1 presents the birthday card choices that participants saw. They did not see the inside messages of the cards.

Participants then responded to the following measures in order. To measure satisfaction, participants indicated how satisfied they were with the chosen card (1 = Not at All, 9 = Very Satisfied). To measure difficulty, they indicated (1) how confusing and (2) how frustrating it was to choose, on separate scales (1 = Not at All, 9 = Very Confusing/Frustrating). To measure autonomy, they indicated their agreement with five items taken from the Intrinsic Motivation Inventory (Ryan et al. 1991) on separate scales: “I had choice when selecting a card”, “I selected this card because I wanted to”, “I selected this card because I had to”, “I selected this card freely and without pressure”, and “I selected this card because I had no choice” (1 = Strongly Disagree, 9 = Strongly Agree). Finally, to measure perceived variety, participants indicated (1) how similar and (2) how different the cards were from each other, on separate scales (1 = Not at All, 9 = Very Similar/Different), and to control for possible mood effects, they indicated how they felt at the moment on three separate measures (1 = Sad/Negative/Displeased, 9 = Happy/Positive/Pleased).
Results

**Perceived variety.** The measures of perceived similarity and perceived difference correlated negatively with each other \((r = .85, p < .001)\), and so I averaged them (with perceived similarity reverse-scored) to form a single measure of perceived variety, with higher scores indicating greater perceived variety. As predicted, participants perceived greater variety in the large \((M = 7.27, S.D. = 1.68)\) than small choice set \((M = 5.79, S.D. = 1.70)\), \(F(1, 157) = 38.09, p < .001, d = .88\). There was neither a main effect of motivation nor a two-way interaction between motivation and choice set size \((ps > .21)\).

**Mood.** I averaged the three mood measures \((\alpha = .94)\), with higher scores indicating a more positive mood. Neither the main effects of motivation nor choice set size was significant \((ps > .22)\). The two-way interaction between motivation and choice set size was also not significant \((p = .43)\). These findings rule out the influence of mood on the remaining analyses.

**Satisfaction.** The two-way interaction between motivation and choice set size for satisfaction was significant, \(F(1, 157) = 12.11, p < .001, d = .55\). Participants choosing a card for a co-worker were less satisfied with the chosen option choosing from the large \((M = 7.19, S.D. = 1.84)\) than small choice set \((M = 7.95, S.D. = 1.00)\), \(t(78) = 2.25, p < .05, d = .49\). However, participants choosing for a close friend were more satisfied from the large \((M = 8.15, S.D. = 1.18)\) than small choice set \((M = 7.38, S.D. = 1.36)\), \(t(79) = 2.27, p < .01, d = .61\). The main effects of motivation and choice set size were not significant \((ps > .40)\). Figure 2 presents the results for satisfaction. Thus, more choice decreased satisfaction with extrinsic choices, but it increased it with intrinsic ones.

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Difficulty. The measures of confusion and frustration correlated positively with each other ($r = .66, p < .001$), and so I averaged them to form a single measure of difficulty, with higher scores indicating greater difficulty. The main effect of choice set size on difficulty was not significant ($p = .14$), but the main effect of motivation was. Participants choosing for a co-worker found it more difficult ($M = 3.38, S.D. = 1.98$) than those choosing for a close friend ($M = 2.70, S.D. = 2.06$), $F(1, 157) = 4.15, p < .05, d = .32$. This is consistent with the notion that extrinsic choices are more difficult than intrinsic choices. The main effect was qualified by a significant two-way interaction, $F(1, 157) = 7.49, p < .01, d = .43$. Participants choosing for a co-worker found it more difficult from the large ($M = 3.99, S.D. = 2.20$) than small choice set ($M = 2.66, S.D. = 1.44$), $t(78) = 3.15, p < .01, d = .70$. However, participants choosing for a close friend found it just as difficult from both the large ($M = 2.50, S.D. = 2.19$) and small choice sets ($M = 2.88, S.D. = 1.91$) ($p = .41$). Figure 3 presents the results for difficulty. Thus, more choice increased difficulty with extrinsic choices, but it had no impact on difficulty with intrinsic choices.

Autonomy. The five measures of autonomy were averaged with the third and fifth items reverse-coded to form a single measure of autonomy ($\alpha = .70$), with higher scores indicating greater perceptions of autonomy. The main effect of choice set size on autonomy was not significant ($p = .25$), but the main effect of motivation was. Participants choosing for a close friend perceived greater autonomy ($M = 7.51, S.D. = 1.61$) than those choosing for a co-worker ($M = 6.71, S.D. = 1.74$), $F(1, 157) = 9.98, p < .001, d = .51$. This is consistent with the notion that intrinsic choices are more autonomous than extrinsic choices. The main effect was qualified.
by a two-way interaction, $F(1, 157) = 16.72, p < .001, d = .66$. Participants choosing for a co-worker perceived marginally less autonomy from the large ($M = 6.36, S.D. = 1.92$) than small choice set ($M = 7.10, S.D. = 1.44$), $t(78) = 1.92, p = .06$, $d = .44$. However, participants choosing for a close friend perceived greater autonomy from the large ($M = 8.20, S.D. = 1.39$) than small choice set ($M = 6.87, S.D. = 1.54$), $t(79) = 4.06, p < .001$, $d = .91$. Figure 4 presents the results for autonomy. Thus, more choice increased autonomy from intrinsic choices, but it marginally reduced it from extrinsic ones.

**Mediation analyses.** I then conducted mediation analyses separately for extrinsic and intrinsic choices using the bootstrapping protocol by Preacher and Hayes (2008). If the confidence interval for the indirect effect of the independent variable $X$ on the dependent variable $Y$ through the presumed mediating variable $M$ does not include 0, mediation is said to occur, in that $X \rightarrow M \rightarrow Y$. Bootstrapping is a stronger test than the Baron and Kenny (1986) and Sobel tests (1982) in two primary ways. First, Baron and Kenny argued that there must be a significant zero-order effect of $X$ on $Y$. Without it, there is no reason to further examine whether or not $M$ mediates the effect. Recent research has criticized the requirement of a direct effect for a meaningful mediation analysis (Preacher and Hayes 2004; Zhao, Lynch, and Chen 2010). Second, according to Preacher and Hayes (2004, 2008), the Sobel test improperly relies on normal distribution theory, yet the indirect effect in its analysis is the product of two parameters, which means that the sampling distribution of products is not necessarily normal. Bootstrapping corrects the issue by using the sample data to estimate the sampling distribution of the indirect effect by re-sampling the data.

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Insert Figure 5 about Here
My proposed model includes two mediators in a sequence (perceived variety and difficulty with extrinsic choices, and perceived variety and autonomy from intrinsic choices), and so I used Model 6 of the PROCESS macro for SPSS 14 (Hayes 2013). This program estimates the indirect effect of X on Y through M1 and M2 in serial using the model $a_1d_{21}b_2$, where $a_1$ is the effect of X on M1, $d_{21}$ is the effect of M1 on M2, and $b_2$ is the effect of M2 on Y. If the confidence interval for these indirect effects does not include 0, dual mediation is said to occur, in that $X \rightarrow M_1 \rightarrow M_2 \rightarrow Y$. For extrinsic choices, the indirect effect of more choice on satisfaction through perceived variety and difficulty in serial was estimated at -.01 ($S.E. = .01, p < .03$), which meant that mediation was successful. For intrinsic choices, the indirect effect of more choice on satisfaction through perceived variety and autonomy in serial was estimated at .07 ($S.E. = .03, p < .01$), which meant that mediation was successful. Figure 5 presents the results for both extrinsic and intrinsic choices.

I conducted two further analyses to see if autonomy mediated the effects for extrinsic choices and if difficulty mediated the effects for intrinsic choices. For extrinsic choices, the indirect effect of more choice on satisfaction through perceived variety and autonomy in serial was estimated at -.01 ($S.E. = .01, p = .23$), which meant that mediation was not successful. For intrinsic choices, the indirect effect of more choice on satisfaction through perceived variety and autonomy in serial was estimated at -.01 ($S.E. = .03, p = .12$), which also meant that mediation was not successful. Thus, more choice increased perceived variety for both extrinsic and intrinsic choices, but while this perceived variety increased difficulty (but not autonomy) for extrinsic choices to decrease satisfaction, it increased autonomy (but not difficulty) for intrinsic choices to increase it.


**Discussion**

More choice increases difficulty with extrinsic choices to decrease satisfaction with extrinsic choices, but it increases autonomy from intrinsic choices to increase satisfaction with intrinsic ones. Mediation analyses indicate that consumers’ perceived variety with more choice produces the effects. Autonomy does not mediate satisfaction with extrinsic choices, nor difficulty with intrinsic ones, which further strengthen the notions that extrinsic choices are not as autonomous and intrinsic choices are not as difficult, compared to the other. There is also no difference in mood, which indicates that the distinction between extrinsic and intrinsic choices does not lie in differences in mood.

However, there may be an alternative explanation for these results. For the extrinsic choice condition, there is a boss instructing participants to choose a card. It may be the presence of an external agent compelling the choice and not the need to choose a card that makes the new co-worker feel welcome that increases difficulty (Botti and McGill 2011; Zuckerman et al. 1978). This may have artificially inflated the results because participants in the intrinsic choice condition had no external agent compelling them to choose a card. Again, the distinction between extrinsic and intrinsic choices lies solely in whether the chosen option is a means to an end (extrinsic choice) or an end in itself (intrinsic choice). The current manipulations meet this distinction, but they may have impacted other variables that could have also biased the results, which made the current manipulations weak. Thus, to show explicitly that the results for satisfaction, difficulty, autonomy only arise from the extrinsic or intrinsic motivation underlying choice, the next experiment uses a different manipulation. Indeed, there are many ways to tease
apart extrinsic and intrinsic choices. The variety of paradigms that I use provides converging evidence that the motivation for choosing and not another aspect of the choice moderates choice overload.
Experiment 2

The purpose of this experiment is to show that for extrinsic choices, more choice decreases satisfaction because it increases the difficulty with choosing, but for intrinsic choices, more choice increases satisfaction because it increases the autonomy from choosing. Accordingly, I bring in the concept of self-efficacy (Bandura 1977) in this experiment. Self-efficacy refers to the belief that a person has about her ability to produce a desirable outcome. In turn, this belief influences how she thinks, feels, and behaves. Whereas people with high self-efficacy are able to overcome or master difficult challenges and recover quickly from setbacks, those with low self-efficacy are unable to cope with such challenges and see these tasks as beyond their abilities. For example, people with high self-efficacy have a greater ability to withstand physical pain than those with low self-efficacy (Litt 1988).

The rationale for considering self-efficacy in this experiment is to explore a potential variable that moderates both the difficulty with extrinsic choices as well as the autonomy from intrinsic ones, rather than having two separate moderating variables for each type of motivation. The construct of self-efficacy fulfils this criteria. Specifically, I propose that self-efficacy moderates the effects for extrinsic and intrinsic choices – but in different directions. In other words, there should be an interaction between difficulty and self-efficacy for extrinsic choices, and between autonomy and self-efficacy for intrinsic choices. Figure 6 presents the proposed theoretical models with self-efficacy and its respective interaction for extrinsic and intrinsic choices.
choices. For extrinsic choices, the difficulty with choosing among many options should primarily decrease satisfaction for consumers with low (but not high) self-efficacy. Consumers with low self-efficacy are unable to face the challenge of choosing among many options, and so they are likely to express uncertainty or regret regarding which option would best achieve the separable consequence. This difficulty with choosing should decrease their satisfaction with the chosen option. However, consumers with high self-efficacy are able to face this challenge, and so the difficulty with choosing among many options is unlikely to decrease satisfaction for these individuals. These predictions, if confirmed, would indicate that difficulty mediates satisfaction with extrinsic choices.

For intrinsic choices, the autonomy from choosing among many options should primarily increase satisfaction for consumers with high (but not low) self-efficacy. According to motivation theory, autonomy facilitates intrinsic motivation only when accompanied with competence – which is the terminology that motivation theorists use for self-efficacy (Deci and Ryan 1985; Moller et al. 2006; Ryan and Deci 2000). That is, in order for autonomy to facilitate intrinsic motivation, people must also see themselves as able or competent. Autonomy and competence are both crucial elements that facilitate intrinsic motivation. For example, Ryan et al. (2006) found that students who do not usually play video games and so are less competent or have low self-efficacy have lower levels of intrinsic motivation than those who usually do so, even when they have high levels of autonomy. Similarly, Gagné (2003) found that female gymnasts express greater intrinsic motivation in their sport only when they have autonomy and perceive themselves as capable athletes. Thus, for intrinsic choices, consumers’ autonomy from choosing among many options should increase satisfaction primarily for those with high (but not low) self-efficacy. These predictions, if confirmed, would indicate that autonomy mediates
satisfaction with intrinsic choices.

This experiment tests these hypotheses regarding difficulty with extrinsic choices and autonomy from intrinsic ones using a 2 (extrinsic vs. intrinsic choice) × 2 (small vs. large choice set) × (self-efficacy) between-participants design.

Procedure

Participants were undergraduates from the University of Toronto subject pool (N = 223, mean age of 21.1 years old, 104 men, 119 women). They first completed the General Self-Efficacy Scale (GSES; Schwarzer 1993), a validated 10-item psychometric scale that examines optimistic self-beliefs to cope with a variety of difficult demands in life. An example item is “I can always manage to solve difficult problems if I try hard enough”, to which participants responded on a 9-point scale (1 = Strongly Disagree, 9 = Strongly Agree). Afterwards, participants made coffee choices ostensibly for an unspecified coffee chain looking to expand on campus. They received either an extrinsic or intrinsic motivation for choosing a coffee to help the coffee chain assess coffee preferences among the student population. For the extrinsic choice condition, participants imagined the following scenario and received the following instruction:

Imagine that you have a midterm tomorrow morning and you need to study. Please choose one coffee to help you stay awake and study.

For the intrinsic choice condition, participants imagined the following scenario and received the following instruction:

Imagine that it is a pleasant midsummer’s afternoon and you just want to relax and shoot the breeze. Please choose one coffee to enjoy.
Thus, in the extrinsic choice condition, participants were choosing a coffee to help them stay awake. In the intrinsic choice condition, they were choosing a coffee for its inherent rewards. After reading these instructions, participants saw a selection of six or 18 coffees with a short description of each and chose one. Appendix 2 presents the coffee menu that participants saw. The measures for satisfaction, difficulty, autonomy, and perceived variety were the same as Experiment 1. There was no measure for mood.

Results

Analysis approach. My approach to analyzing the data from this experiment is as follows. First, in order to examine whether I replicated the overall two-way interactions between motivation and choice set size for satisfaction, difficulty, and autonomy as in Experiment 1, I conducted 2 (motivation) × 2 (choice set size) ANOVAs for each of these outcomes. Next, I examined whether these two-way interactions were dependent on self-efficacy. Thus, I conducted multiple regression analyses to see if the three-way interactions between motivation, choice set size, and self-efficacy for each of satisfaction, difficulty, and autonomy were significant. I then used spotlight analyses to examine how these outcomes may (or may not) have differed not only between motivation and choice set size, but also between participants with low and high self-efficacy. Finally, I conducted mediation analyses to see if for extrinsic choices, the perceived variety with more choice increased difficulty to decrease satisfaction for participants with low (but not high) self-efficacy, and if for intrinsic choices, the perceived variety with more choice increased autonomy to increase satisfaction for those with high (but not low) self-
efficacy.

**Perceived variety.** As predicted, participants perceived greater variety in the large ($M = 6.62, S.D. = 1.54$) than small choice set ($M = 5.78, S.D. = 1.44$), $F(1, 219) = 17.09, p < .001, d = .57$. There was neither a main effect of motivation nor a two-way interaction between motivation and choice set size ($ps > .53$). Further analysis reported below revealed that there was also no three-way interaction between motivation, choice set size, and self-efficacy.

Insert Figures 7, 8, and 9 about Here

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**Overall predictions.** The two-way interactions between motivation and choice set size for satisfaction and difficulty were significant, $Fs > 4.95, ps < .02, ds > .30$. The two-way interaction for autonomy was marginally significant, $F = 2.58, p = .10, d = .22$. These findings replicate those from Experiment 1 and support the overall predictions. On satisfaction, participants choosing a coffee to stay awake were marginally less satisfied from the large ($M = 6.63, S.D. = 1.33$) than small choice set ($M = 7.89, S.D. = 1.09$), $t(106) = 2.01, p = .10, d = .15$. However, those choosing one to enjoy were more satisfied from the large ($M = 8.05, S.D. = 1.00$) than small choice set ($M = 7.49, S.D. = 1.30$), $t(112) = 2.58, p < .02, d = .49$. On difficulty, participants choosing a coffee to stay awake found it more difficult from the large ($M = 4.31, S.D. = 2.96$) than small choice set ($M = 3.25, S.D. = 2.04$), $t(106) = 2.53, p < .02, d = .49$. However, those choosing one to enjoy found it just as difficult from both the large ($M = 3.56, S.D. = 1.99$) and small choice sets ($M = 3.74, S.D. = 1.85$) ($p = .63$). Finally, on autonomy, participants choosing a coffee to stay awake perceived autonomy to be the same from both the large ($M = 6.54, S.D. = 1.33$) and small choice sets ($M = 6.57, S.D. = 1.24$) ($p = .92$). However,
those choosing one to enjoy perceived greater autonomy from the large ($M = 6.72, S.D. = 1.26$) than small choice set ($M = 6.21, S.D. = 1.02$), $t(112) = 2.30, p < .03, d = .43$. Figures 7, 8, and 9 present the overall results for satisfaction, difficulty, and autonomy. Thus, for extrinsic choices, more choice decreased satisfaction, increased difficulty, and it had no impact on autonomy. For intrinsic choices, more choice increased satisfaction, increased autonomy, and it had no impact on difficulty.

**Multiple regression analyses.** In order to examine whether there were three-way interactions between motivation, choice set size, and self-efficacy for each of satisfaction, difficulty, autonomy, and perceived variety, I averaged the 10 items on the GSES to form a single measure of self-efficacy ($\alpha = .89$), with higher scores indicating higher self-efficacy. I then submitted motivation, choice set size, self-efficacy, and all constitutive terms to the following regression model:

$$ Y = a + bM + cO + dG + eMO + fMG + gOG + hMOG $$

where $M$ was motivation ($-1 = \text{extrinsic}, 1 = \text{intrinsic}$), $O$ was choice set size ($0 = \text{small}, 1 = \text{large}$), $G$ was self-efficacy (standardized), $a$ through $h$ being the respective co-efficients, and $Y$ was each of satisfaction, difficulty, autonomy, and perceived variety. This produced four separate models. I used contrast coding for motivation because I wanted to examine potential differences for each of satisfaction, difficulty, autonomy, and perceived variety between extrinsic or intrinsic choices and the grand mean across motivation type, and not simply between extrinsic and intrinsic choices (Buckless and Ravenscroft 1990). I used dummy coding for choice set size because I wanted to compare differences for each outcome between the large and small choice sets. Table 1 presents the co-efficient results for each model.
On perceived variety, there was only a main effect of choice set size, which indicated that participants perceived greater variety with more choice. There was no two-way interaction between motivation and choice set size. These findings replicated earlier results. Finally, there was no three-way interaction between motivation, choice set size, and self-efficacy, which indicated that only choice set size impacted participants’ perceived variety.

The three-way interactions between motivation, choice set size, and self-efficacy for both satisfaction and autonomy were significant, which indicated that the two-way interactions between motivation and choice set size for these outcomes were dependent on self-efficacy. The three-way interaction for difficulty was not significant, which indicated that the interaction between motivation and choice set size for difficulty was not dependent on self-efficacy. Figures 9 through 14 plot participants’ satisfaction, difficulty, and autonomy separately for extrinsic and intrinsic choices not just depending on whether they chose from the large or small choice set, but also on their self-efficacy. In order to examine the differences in satisfaction and autonomy between the large and small choice sets for participants with low self-efficacy, as well as for those with high self-efficacy, I conducted spotlight analyses (Aiken and West 1991; Spiller et al. 2013) with -1 standard deviation on GSES representing participants with low self-efficacy and +1 standard deviation representing those with high self-efficacy.
Spotlight analyses. For satisfaction with extrinsic choices (Figure 10), participants with low self-efficacy were less satisfied choosing from the large \((M = 6.76, S.D. = 1.57)\) than small choice set \((M = 7.57, S.D. = 1.07)\), \(t(49) = 2.17, p < .04, d = .62\). However, those with high self-efficacy were just as satisfied choosing from both the large \((M = 8.13, S.D. = 1.20)\) and small choice sets \((M = 8.26, S.D. = 1.00)\) \((p = .65)\). Thus, for extrinsic choices, more choice decreased satisfaction for participants with low self-efficacy, but it had no impact on satisfaction for those with high self-efficacy. For autonomy from extrinsic choices (Figure 12), participants with low self-efficacy perceived autonomy to be the same from both the large \((M = 6.35, S.D. = 1.51)\) and small choice sets \((M = 6.00, S.D. = 1.03)\) \((p = .33)\). However, those with high self-efficacy perceived marginally less autonomy from the large \((M = 6.68, S.D. = 1.20)\) than small choice set \((M = 7.23, S.D. = 1.14)\), \(t(55) = 1.77, p = .08, d = .48\). Thus, for extrinsic choices, more choice marginally increased autonomy for participants with high self-efficacy, but it had no impact on autonomy for those with low self-efficacy.

For satisfaction with intrinsic choices (Figure 13), participants with low self-efficacy were just as satisfied choosing from both the large \((M = 7.63, S.D. = 1.11)\) and small choice sets \((M = 7.25, S.D. = 1.55)\) \((p = .28)\). However, those with high self-efficacy were more satisfied choosing from the large \((M = 8.48, S.D. = .67)\) than small choice set \((M = 7.78, S.D. = .85)\), \(t(52) = 3.37, p < .001, d = .93\). Thus, for intrinsic choices, more choice increased satisfaction for those with high self-efficacy, but it had no impact on satisfaction for those with low self-efficacy. For autonomy from intrinsic choices (Figure 15), participants with low self-efficacy perceived autonomy to be the same from both the large \((M = 6.15, S.D. = 1.20)\) and small choice sets \((M = 6.02, S.D. = 1.11)\) \((p = .67)\). However, those with high self-efficacy perceived greater autonomy from the large \((M = 7.30, S.D. = 1.05)\) than small choice set \((M = 6.44, S.D. = .86)\), \(t(52) = 3.19, p = .93\).
Thus, for intrinsic choices, more choice increased autonomy for participants with high self-efficacy, but it had no impact on autonomy for those with low self-efficacy.

These findings explain the three-way interactions between motivation, choice set size, and self-efficacy for satisfaction and autonomy by demonstrating that the two-way interactions between motivation and choice set size for these outcomes were dependent on self-efficacy. That is, participants had different levels of satisfaction and autonomy not only depending on their motivation to choose and the number options from which to choose, but also on their self-efficacy. Next, in order to examine why I did not obtain the same three-way interaction for difficulty, I conducted another set of spotlight analyses for difficulty separately for extrinsic and intrinsic choices.

For extrinsic choices (Figure 1), participants with low self-efficacy found it more difficult to choose from the large \( (M = 5.29, S.D. = 1.62) \) than small choice set \( (M = 4.07, S.D. = 1.88) \), \( t(49) = 2.40, p < .02, d = .69 \). Participants with high self-efficacy also found it more difficult to choose from the large \( (M = 3.64, S.D. = 2.46) \) than small choice set \( (M = 2.38, S.D. = 1.83) \), \( t(55) = 2.25, p < .03, d = .61 \). Thus, for extrinsic choices, more choice increased difficulty regardless of self-efficacy. For intrinsic choices (Figure 14), participants with low self-efficacy found it just as difficult to choose from the large \( (M = 4.09, S.D. = 1.93) \) and small choice sets \( (M = 4.32, S.D. = 1.77) \) \( (p = .64) \). Participants with high self-efficacy also found it just as difficult to choose from the large \( (M = 3.01, S.D. = 1.93) \) and small choice sets \( (M = 3.02, S.D. = 1.72) \) \( (p = .99) \). Thus, for intrinsic choices, more choice had no impact on difficulty regardless of self-efficacy. In summary, the two-way interaction between motivation and choice set size for difficulty was not dependent on self-efficacy, which explains why the three-way interaction between motivation, choice set size, and self-efficacy was not significant.
Mediation analyses. As there is no single bootstrapping model or PROCESS protocol developed by Preacher and Hayes (2004) to assess the moderating role of a variable on the second mediating variable in a mediation analysis with two mediating variables in serial, I approached the analyses by combining the regression co-efficients that I obtained from various models, as follows, separately for extrinsic and intrinsic choice. First, I used Model 1 to examine the direct effect of more choice on satisfaction moderated by self-efficacy. If the direct effect is moderated by self-efficacy, then this would require me to use Model 59, which examines whether self-efficacy moderates the direct effect of the independent variable on the dependent variable along with whether self-efficacy moderates the indirect effect of the independent variable on the mediating variable as well as the indirect effect of the mediating variable on the dependent variable. However, if the direct effect from Model 1 is not moderated by self-efficacy, this would require me to use Model 58, which only examines whether self-efficacy moderates the indirect effect of the independent variable on the mediating variable and that of the mediating variable on the dependent variable, but not whether it moderates the direct effect of the independent variable on the dependent variable.

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Insert Figure 16 about Here
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Finally, I used Model 14 to examine whether self-efficacy moderates the effect of perceived variety on difficulty or autonomy (depending on extrinsic or intrinsic choice), or the indirect effect of more choice on difficulty or autonomy (depending on extrinsic or intrinsic choice) through perceived variety. The resulting statistics allowed me to determine the indirect effect of more choice on satisfaction through perceived variety and difficulty or autonomy.
(depending on extrinsic or intrinsic choice) in serial with the moderating role of self-efficacy using the formula $a_3(a_1 + a_2W)(b_1 + b_3W)$, where $a_3$ is the regression co-efficient of perceived variety on more choice obtained from Model 14, $W$ was the moderator of self-efficacy, while $a_1$, $a_2$, $b_1$, and $b_3$ were the regression co-efficients obtained from Model 59. Finally, I used a Sobel test to determine whether or not the entire moderated mediation model with two mediators in serial was successful. Figure 16 presents these models in sequence.

For extrinsic choices, Model 1 revealed that the direct effect of more choice on satisfaction was moderated by self-efficacy ($indirect\ effect = -3.60, S.E. = 1.42, p < .02$). I then examined self-efficacy at ±1 S.D. to determine whether the direct effect was significant at different self-efficacy levels. At -1 S.D., the direct effect was estimated at -.81 (S.E. = .14, $p < .001$). However, at +1 S.D., the direct effect was estimated at .23 (S.E. = .11, $p = .69$). These findings indicate that more choice decreased satisfaction for participants for low self-efficacy. I then used Model 59 to examine whether self-efficacy moderated (1) the indirect effect of perceived variety on difficulty, (2) the indirect effect of difficulty on satisfaction, and (3) the indirect effect of perceived variety on satisfaction, simultaneously. The analysis revealed that self-efficacy moderated the effect of perceived variety on difficulty, the effect of difficulty on satisfaction, and the indirect effect ($indirect\ effect = -1.95, S.E. = .79, p < .02$). More specifically, at -1 S.D., the indirect effect was estimated at -.31 (S.E. = .11, $p < .001$). However, at +1 S.D., the indirect effect was estimated at 3.24 (S.E. = 1.20, $p = .14$). These findings indicate that perceived variety increased difficulty to decrease satisfaction primarily for participants for
low self-efficacy. Finally, I used Model 14 to assess the indirect effect of more choice on
difficulty through perceived variety, which was significant ($\beta = .73$, $S.E. = .30$, $p < .02$). More
specifically, at -1 S.D., the indirect effect was estimated at -.54 ($S.E. = .31$, $p < .01$), which meant
that the effect was significant for low self-efficacy. However, at +1 S.D., the indirect effect was
estimated at -.08 ($S.E. = .17$, $p = .38$), which meant that the effect was significant for high self-
efficacy. Together, these findings also allowed me to examine the indirect effect of more choice
on satisfaction through perceived variety and difficulty in serial with self-efficacy as a moderator
using the above formula, which was significant (indirect effect = -1.30, $S.E. = .13$, $p < .04$). The
Sobel test was also significant, $Z = 2.19$, $p < .05$. Figure 17 presents the results for extrinsic
choices.

For intrinsic choices, Model 1 revealed that the direct effect of more choice on
satisfaction was moderated by self-efficacy (indirect effect = .54, $S.E. = .13$, $p < .001$). I then
examined self-efficacy at ±1 S.D. to determine whether the direct effect was significant at
different self-efficacy levels. At -1 S.D., the direct effect was estimated at .25 ($S.E. = .10$, $p = .39$). However, at +1 S.D., the direct effect was estimated at .78 ($S.E. = .24$, $p < .01$). These
findings indicate that more choice increased satisfaction for participants for high self-efficacy. I
then used Model 59 to examine whether self-efficacy moderated (1) the indirect effect of
perceived variety on autonomy, (2) the indirect effect of autonomy on satisfaction, and (3) the
indirect effect of perceived variety on satisfaction, simultaneously. The analysis revealed that
self-efficacy moderated the effect of perceived variety on autonomy, the effect of autonomy on
satisfaction, and the indirect effect \((\text{indirect effect} = .75, \text{S.E.} = .37, p < .05)\). More specifically, at -1 S.D., the indirect effect was estimated at -0.04 (\(S.E. = .02, p = .18\)). However, at +1 S.D., the indirect effect was estimated at 0.12 (\(S.E. = .06, p < .001\)). These findings indicate that perceived variety increased autonomy to increase satisfaction primarily for participants for high self-efficacy. Finally, I used Model 14 to assess the indirect effect of more choice on autonomy through perceived variety, which was significant \((\text{indirect effect} = .98, \text{S.E.} = .27, p < .001)\). More specifically, at -1 S.D., the indirect effect was estimated at 0.11 (\(S.E. = .11, p = .28\)), which meant that the effect was not significant for low self-efficacy. However, at +1 S.D., the indirect effect was estimated at 0.29 (\(S.E. = .12, p < .001\)), which meant that the effect was significant for high self-efficacy. Together, these findings also allowed me to examine the indirect effect of more choice on satisfaction through perceived variety and autonomy in serial with self-efficacy as a moderator using the above formula, which was significant \((\beta = .53, \text{S.E.} = .07, p < .02)\). The Sobel test was also significant, \(Z = 2.80, p < .01\). Figure 18 presents the results for intrinsic choices.

**Discussion**

Results from this experiment confirm that difficulty mediates satisfaction with extrinsic choices but autonomy mediates it with intrinsic ones. For extrinsic choices, more choice increases difficulty to decrease satisfaction primarily for consumers with low (but not high) self-efficacy. That is, the difficulty from more choice primarily decreases satisfaction for those with low self-efficacy. This is consistent with the notion that consumers with low self-efficacy are unable to cope with difficult tasks, and so the difficulty of choosing decreases their satisfaction
with the chosen option. Those with high self-efficacy are, and so difficulty does not impact their satisfaction. For intrinsic choices, it increases autonomy to increase satisfaction primarily for consumers with high (but not low) self-efficacy. That is, the autonomy from more choice primarily increases satisfaction for consumers with high (but not low) self-efficacy. This is consistent with motivation theory, according to which autonomy increases intrinsic motivation only when accompanied with competence. These findings are consistent with the theoretical models for both extrinsic and intrinsic choices with self-efficacy playing a moderating role on self-efficacy. Taken together, the results confirm that the extrinsic or intrinsic nature of the choice – and not something else about it such as someone else compelling consumers to choose – increases difficulty or autonomy depending on the motivation for choosing.
Experiment 3

The hypothesis that more choice increases consumers’ difficulty with extrinsic choices to decrease satisfaction, but it increases the autonomy from intrinsic choices to increase satisfaction, relies on the premise that more choice increases perceived variety. Experiments 1 and 2 provided mediational support for this premise. The next two experiments provide empirical evidence for this role of perceived variety. Perceived variety is important because more choice does not necessarily mean a greater objective amount of variety (Broniarczyk et al. 1998; Hoch et al. 1999; Morales et al. 2005; Pratkanis and Farquhar 1992). Indeed, in situations where more choice does not mean greater variety, more choice might actually decrease satisfaction since consumers are unable to find their preferred option (Diehl and Poynor 2010; Oliver 1980). However, an autonomy framework would still posit that consumers’ perceived variety increases satisfaction with intrinsic choices (Brehm 1966; Clee and Wicklund 1980; Festinger 1957; Kunda 1990; Tetlock, Stitka, and Boettger 1989). Thus, the purpose of these two experiments is to demonstrate that consumers’ perceived variety – and not the objective amount of variety – with more choice increases difficulty with extrinsic choices, while it increases autonomy from intrinsic ones. Accordingly, I manipulate perceived variety in different ways while holding the objective amount of variety constant.

In this experiment, participants focus on the similarities among or differences between the options. If perceived variety influences satisfaction, then focusing on differences should increase difficulty with extrinsic choices to decrease satisfaction and it should increase autonomy from intrinsic ones to increase satisfaction. In contrast, focusing on similarities should attenuate the effects because participants should not see the options as varied from each other. However, if
perceived variety has no impact, then focusing on either similarities or differences should have no impact either on difficulty or autonomy, and so no impact on satisfaction. This approach to assessing the role of perceived variety is consistent with the moderation-of-process strategy (Spencer, Zanna, and Fong 2005) by manipulating the presumed mediating variable (perceived variety) to see whether its variation moderates the link between the independent variable (choice set size) and the dependent variables (difficulty and autonomy). This experiment tests these hypotheses using a 2 (extrinsic vs. intrinsic choice) × 2 (small vs. large choice set) × 2 (focus on similarities or differences) between-participants design. Figure 19 presents the proposed theoretical models with the focus on differences moderating the effect of more choice on difficulty for extrinsic choices and on autonomy for intrinsic choices.

If these hypotheses are confirmed, this would argue against the possibility that for intrinsic choices, more choice increases satisfaction by increasing consumers’ ability to find their preferred option. However, since I hold the actual number of options constant – and so the objective amount of variety is also constant – participants’ ability to do so should not differ whether they focus on the similarities among or differences between the options. And as mentioned earlier, prior research has found that even if the option is not a “perfect” match, consumers are more satisfied with it as long as they choose it freely (Brehm 1966; Clee and Wicklund 1980; Kunda 1990; Tetlock et al. 1989). This further argues that more choice increases satisfaction with intrinsic choices because it increases consumers’ autonomy and not the ability to find their preferred option.
Procedure

Participants were undergraduates from the University of Toronto subject pool (N = 193, mean age of 21.9 years old, 109 men, 84 women). They were told that the study was to examine documentary preferences for the Canadian Broadcasting Corporation (CBC). They first received either an extrinsic or intrinsic motivation for choosing a documentary. For the extrinsic choice condition, participants imagined the following scenario and received the following instruction:

The Canadian Broadcasting Corporation offers a series of documentaries in its programming schedule. We are currently conducting market research for the CBC to help determine what type of documentaries would appeal to viewers on its international affiliates (e.g., BBC, Al-Jazeera, and CNN). Below, you will see a selection of documentaries. Which documentary is most educational for you to watch?

For the intrinsic choice condition, participants imagined the following scenario and received the following instruction:

The Canadian Broadcasting Corporation offers a series of documentaries in its programming schedule. We are currently conducting market research for the CBC to help determine what type of documentaries would appeal to viewers on its international affiliates (e.g., BBC, Al-Jazeera, and CNN). Below, you will see a selection of documentaries. Which documentary would you enjoy watching the most?

However, prior to choosing, participants also received a manipulation to focus on either similarities or differences. In the similarities condition, they were instructed to focus on how similar the documentaries were to each other. In the differences condition, they were told to focus on how different they were from each other. No justification for this instruction was given. All participants then received a list with four or 21 documentaries along with a brief description
of each and chose one from this list. Appendix 3 presents the list of documentaries that participants saw. The measures for satisfaction, difficulty, autonomy, perceived variety, and mood were the same as the previous experiments.

Results

**Perceived variety.** As predicted, participants perceived greater variety in the large \( (M = 6.43, S.D. = 1.79) \) than small choice set \( (M = 5.81, S.D. = 1.50) \), \( F(1, 185) = 7.27, p < .01, d = .40 \). There was neither a main effect of motivation nor a two-way interaction between motivation and choice set size \( (ps > .19) \). However, the three-way interaction between motivation, choice set size, and focus on similarities or differences was marginally significant, \( F(1, 185) = 3.39, p = .07 \). Participants who focused on similarities perceived an equal amount of variety in both the large \( (M = 6.28, S.D. = 1.76) \) and small choice sets \( (M = 5.96, S.D. = 1.50) \) \( (p = .34) \). However, participants who focused on differences perceived greater variety in the large \( (M = 6.56, S.D. = 1.81) \) than small choice set \( (M = 5.66, S.D. = 1.50) \), \( t(95) = 2.65, p < .01, d = .54 \). Thus, manipulating participants’ focus on similarities or differences exaggerated perceived variety for participants who focused on differences but attenuated it for those who focused on similarities.

Insert Figures 20, 21, and 22 about Here

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**Overall predictions.** The two-way interaction between motivation and choice set size for satisfaction was significant, \( F(1, 185) = 6.55, p < .02, d = .38 \). The two-way interactions for difficulty and autonomy were not significant, but they were in the expected directions \( (ps > .28) \).
The lack of significant interactions for difficulty and autonomy is not against predictions because this experiment used a balanced design by manipulating participants’ focus on similarities or differences. On satisfaction, participants choosing a documentary that was educational were less satisfied from the large ($M = 7.36$, $S.D. = 1.79$) than small choice set ($M = 7.73$, $S.D. = 1.28$). This difference was in the expected direction but not significant ($p = .24$). However, participants choosing a documentary that was enjoyable were more satisfied from the large ($M = 7.80$, $S.D. = 1.27$) than small choice set ($M = 7.09$, $S.D. = 1.45$), $t(90) = 2.51$, $p < .02$, $d = .52$. On difficulty, participants choosing a documentary that was educational found it more difficult from the large ($M = 4.08$, $S.D. = 1.92$) than small choice set ($M = 3.45$, $S.D. = 1.27$). This difference was in the expected direction but not significant ($p = .13$). However, participants choosing a documentary that was enjoyable found it just as difficult from both the large ($M = 3.67$, $S.D. = 2.28$) and small choice sets ($M = 3.74$, $S.D. = 2.34$) ($p = .89$). Finally, on autonomy, participants choosing a documentary that was educational perceived autonomy to be the same from both the large ($M = 6.85$, $S.D. = 1.59$) and small choice sets ($M = 6.78$, $S.D. = 1.33$) ($p = .80$). However, participants choosing a documentary that was enjoyable perceived greater autonomy from the large ($M = 7.10$, $S.D. = 1.35$) than small choice set ($M = 6.47$, $S.D. = 1.36$), $t(90) = 2.19$, $p < .04$, $d = .46$.

Figures 20, 21, and 22 present the overall results for satisfaction, difficulty, and autonomy. Thus, for extrinsic choices, more choice decreased satisfaction, increased difficulty, and it had no impact on autonomy. For intrinsic choices, more choice increased satisfaction, increased autonomy, and it had no impact on difficulty.

Insert Figures 23, 24, and 25 about Here
**Satisfaction.** The three-way interaction for satisfaction was significant, $F(1, 185) = 11.67, p < .001, d = .50$. For participants who focused on similarities, the 2 (motivation) × 2 (choice set size) interaction was not significant ($p = .54$). The main effects of motivation and choice set size were also not significant ($ps > .26$). However, for participants who focused on differences, the two-way interaction was significant, $F(1, 93) = 17.65, p < .001, d = .87$.

Participants choosing a documentary that was educational were less satisfied with the chosen option choosing from the large ($M = 6.78, S.D. = 1.62$) than small choice set ($M = 7.92, S.D. = 1.11$), $t(50) = 2.93, p < .01, d = .83$. However, participants choosing one that was enjoyable were more satisfied from the large ($M = 7.96, S.D. = 1.26$) than small choice set ($M = 6.64, S.D. = 1.67$), $t(43) = 2.99, p < .01, d = .91$. The main effects of motivation and choice set size were not significant ($ps > .76$). Figure 23 presents the results for satisfaction. Thus, for participants who focused on differences (vs. similarities), more choice decreased satisfaction with extrinsic choices, but it increased it for intrinsic choices.

**Difficulty.** The three-way interaction for difficulty was also significant, $F(1, 185) = 6.56, p < .05, d = .38$. For participants who focused on similarities, the 2 (motivation) × 2 (choice set size) interaction was not significant ($p = .31$). The main effects of motivation and choice set size were also not significant ($ps > .51$). However, for participants who focused on differences, the two-way interaction was significant, $F(1, 93) = 6.89, p < .01, d = .54$. Participants choosing a documentary that was educational found it more difficult from the large ($M = 4.50, S.D. = 1.91$) than small choice set ($M = 3.14, S.D. = 2.08$), $t(50) = 2.45, p < .05, d = .69$. However, participants choosing one that was enjoyable found it just as difficult from both the large ($M = 3.11, S.D. = 2.26$) and small choice sets ($M = 4.02, S.D. = 2.27$) ($p = .18$). The main effects of motivation and choice set size were not significant ($ps > .55$). Figure 24 presents the results for
difficulty. Thus, for participants who focused on differences (but not similarities), more choice increased difficulty with extrinsic choices, but it had no impact on difficulty with intrinsic choices.

**Autonomy.** The three-way interaction for autonomy was also significant, $F(1, 185) = 6.34, p < .05, d = .37$. For participants who focused on similarities, the 2 (motivation) × 2 (choice set size) interaction was not significant ($p = .39$). The main effects of motivation and choice set size were also not significant ($ps > .26$). However, for participants who focused on differences, the two-way interaction was significant, $F(1, 93) = 6.86, p < .01, d = .54$. Participants choosing a documentary that was educational perceived autonomy to be the same from both the large ($M = 6.60, S.D. = 1.64$) and small choice sets ($M = 6.96, S.D. = 1.45$) ($p = .41$). However, participants choosing one that was enjoyable perceived greater autonomy from the large ($M = 7.23, S.D. = 1.21$) than small choice set ($M = 6.02, S.D. = 1.50$), $t(43) = 2.97, p < .01, d = .91$. The main effects of motivation and choice set size were not significant ($p = .16$). Figure 25 presents the results for autonomy. Thus, for participants who focused on differences (but not similarities), more choice had no impact on autonomy for extrinsic choices, but it increased it for intrinsic choices.

**Mood.** Finally, the three-way interaction for mood was significant, $F(1, 185) = 6.73, p < .01, d = .38$. For participants who focused on similarities, the 2 (motivation) × 2 (choice set size) interaction was not significant ($p = .25$). The main effects of motivation and choice set size were also not significant ($ps > .11$). However, for participants who focused on differences, the two-way interaction was significant, $F(1, 93) = 7.09, p < .01, d = .55$. Participants choosing a documentary that was educational had the same mood whether they chose from the large ($M = 7.83, S.D. = 1.02$) or small choice set ($M = 7.18, S.D. = 1.92$) ($p = .15$). However, participants
choosing one that was enjoyable had a more positive mood choosing from the large ($M = 7.79$, $S.D. = 1.22$) than small choice set ($M = 6.79$, $S.D. = 1.47$), $t(43) = 2.36, p < .03, d = .72$. However, mediation analysis revealed that for intrinsic choices, the indirect effect of more choice on satisfaction through mood was estimated at .04 ($S.E. = .01, p = .19$), which meant that more choice did not increase satisfaction with these choices by increasing participants’ mood.

**Mediation analyses.** I then conducted mediation analyses to examine the mediating role of difficulty and autonomy between more choice and satisfaction depending on the motivation for choosing. I used Model 8, which allowed me to assess whether the moderating variable (focus on similarities or differences) moderated the relationship between the independent variable (more choice) and the mediating variable (difficulty on autonomy), and between the independent variable and the dependent variable (satisfaction). Figure 24 presents the conceptual model with focus on similarities or differences as the moderating variable.

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Insert Figures 24 and 25 about Here

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For extrinsic choices, the indirect effect of more choice on satisfaction through difficulty, where the focus on similarities or differences was the moderating variable, was estimated at -.03 ($S.E. = .01, p = .08$), which meant that mediation was marginally significant. To examine if mediation was successful for either focus on similarities or differences (or both), I examined the indirect effects for each type of focus. More specifically, the indirect effect was estimated at -.01 ($S.E. = .01, p < .001$) when participants were focused on differences, which meant that mediation was successful, but it was estimated at -.01 ($S.E. = .01, p = .46$) when participants were focused on similarities, which meant that mediation was not successful.
Another analysis revealed that the indirect effect of more choice on satisfaction through autonomy with the focus on similarities or differences was the moderating variable was estimated at -.03 (\(S.E. = .02, p = .33\)), which meant that autonomy did not mediate the effects for extrinsic choices. Thus, for extrinsic choices, more choice decreased satisfaction by increasing difficulty for participants who focused on how different the documentaries were from each other, but not how similar they were to each other. Figure 26 presents the results for extrinsic choices.

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For intrinsic choices, the indirect effect of more choice on satisfaction through autonomy, where the focus on similarities or differences was the moderating variable, was estimated at .04 (\(S.E. = .02, p < .001\)), which meant that mediation was successful. More specifically, the indirect effect was estimated at .03 (\(S.E. = .01, p < .001\)) when participants were focused on differences, which meant that mediation was successful, but it was estimated at -.01 (\(S.E. = .01, p = .67\)) when participants were focused on similarities, which meant that mediation was not successful. Another analysis revealed that the indirect effect of more choice on satisfaction through difficulty with focus on similarities or differences as the moderating variable was estimated at .01 (\(S.E. = .01, p = .23\)) which meant that difficulty did not mediate the effects for extrinsic choices. Thus, for extrinsic choices, more choice increased satisfaction by increasing autonomy for participants focused on how different the documentaries were from each other, but not how similar they were to each other. Figure 26 presents the results for intrinsic choices.
Discussion

When consumers perceive variety, more choice increases the difficulty with choosing the option that best satisfies some separable consequence (extrinsic choice), which decreases satisfaction, but it increases the autonomy from choosing the option for its inherent rewards (intrinsic choice), which increases satisfaction. The results from Experiments 1 and 2 used mediation analyses to support this hypothesis. This experiment uses a moderation-of-process strategy by manipulating perceived variety to provide empirical evidence. I hold the actual number of options constant, but nonetheless, consumers’ perceived variety increases difficulty with extrinsic choices and increases autonomy from intrinsic ones. The results are consistent with the notion that more choice does not necessarily mean a greater objective amount of variety, but rather, variety is merely perceived by consumers (Broniarczyk et al. 1998; Kahn and Wansink 2004; Reibstein et al. 1975; van Herpen and Pieters 2002).

These results also rule out the alternative explanation for intrinsic choices that more choice increases satisfaction by increasing consumers’ ability to find their preferred option. Since I hold the actual number of options constant – and so the objective amount of variety is also constant – participants’ ability to find their preferred option should not differ whether they focused on the similarities among or differences between the options. This being said, it is still possible that consumers may find their preferred option even when variety is perceived to be and not objectively greater. This experiment is unable to rule out this possibility since it does not measure directly (such as by asking them) whether participants felt that they had found their preferred option. Accordingly, to rule out this possibility, in the next experiment, I also manipulate perceived variety while holding the actual number of options constant, but I measure
participants’ satisfaction with actual consumption of option that was in fact the same for all participants. If participants’ satisfaction nonetheless increases with more choice, this would offer stronger evidence that the actual chosen option has little impact on satisfaction with intrinsic choices, but the autonomy from choosing does. This is consistent with the notion that even if the option is not a perfect match, consumers are more satisfied with it as long as they choose it freely (Brehm 1966; Clee and Wicklund 1980; Kunda 1990; Tetlock et al. 1989).
Experiment 4

This experiment manipulates perceived variety by grouping the options in a choice set into various categories while holding the actual number of options constant. Categorization increases perceived variety by communicating to consumers that options within categories are similar to and those between categories are different from each other (Rosch 2002; Sloutsky 2003). For example, consumers who have no prior preferences perceive greater variety in a set of categorized options than in a set of uncategorized ones, which increases satisfaction with the chosen option – something called the “mere categorization effect” (Mogilner et al. 2008). Thus, if consumers perceive options in a categorized choice set to be varied, then this should increase the difficulty with extrinsic choices and decrease satisfaction, but it should increase the autonomy from intrinsic choices and increase satisfaction. However, with an uncategorized choice set, consumers should perceive the options to be similar, which should attenuate the difficulty with or autonomy from choosing. This experiment tests these hypotheses using a 2 (extrinsic vs. intrinsic choice) × 2 (uncategorized vs. categorized choice set) between-participants design. Figure 27 presents the proposed theoretical models with categorization for both extrinsic and intrinsic choices.

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Insert Figure 27 about Here
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The crucial difference in this experiment from the earlier ones is that earlier, participants indicated their satisfaction with what they had chosen without actually consuming it. Here, participants consume the actual option that they choose and indicate their satisfaction with what
they consume. Thus, this experiment measures satisfaction with the chosen option not just hypothetically but also actually. Nonetheless, I predict that the same pattern of results should emerge. For extrinsic choices, categorization should increase difficulty to decrease satisfaction. For intrinsic choices, it should increase autonomy to increase satisfaction. This measure of satisfaction also rules out finding one’s preferred option as an alternative explanation for intrinsic choices because all participants consume the same option in reality and so the consumed option is randomly higher or lower than their expectations. If satisfaction comes from choosing their preferred option, then satisfaction should be similar across all participants. Thus, measuring satisfaction with actual consumption and not hypothetical choices offers a stronger test to rule out this alternative explanation.

**Procedure**

Participants were undergraduates from the University of Toronto subject pool (N = 146, mean age of 18.6 years old, 87 men, 59 women). They made coffee choices ostensibly for an unspecified coffee chain looking to expand on campus with the same extrinsic or intrinsic motivation for choosing a coffee as in Experiment 2.

All participants received a menu with a list of 18 coffees. However, half of the participants received a menu with six categories with three coffees in each one. Common key words were taken from the coffee descriptions to derive the categories. For example, the “Golden Retriever” blend described as “steamed milk and rum raisin with caramel drizzle” was under the Caramels category along with other coffees with caramel in the description. The other half of participants received an uncategorized menu with the same 18 coffees. Thus, all participants had
the same amount of information about the coffees whether they received the categorized or uncategorized menu. After participants made their choice, the experimenter left the room to pour a small sample of the coffee that they chose. The experimenter came back after approximately two minutes with the coffee in a paper cup with the name of the chosen coffee handwritten on it. In reality, all the coffees that the participants tasted were the same – approximately 30 ounces of coffee with a teaspoon of 2% cream and sugar each, with a dash of vanilla syrup and cinnamon for flavouring. Participants indicated their satisfaction with the coffee after tasting it. The measures for difficulty, autonomy, and perceived variety were the same as the previous experiments. There was no measure for mood.

**Results**

*Perceived variety.* As predicted, participants perceived greater variety in the categorized $(M = 7.84, S.D. = 1.07)$ than uncategorized menu $(M = 7.07, S.D. = 1.17)$, $F(1, 142) = 16.06, p < .001, d = .67$. There were neither a main effect of motivation $(p = .87)$ nor a two-way interaction between motivation and categorization $(p = .64)$.

Insert Figures 28, 29, and 30 about Here

*Satification.* The two-way interaction between motivation and categorization for satisfaction was significant, $F(1, 142) = 10.37, p < .01, d = .54$. Participants choosing a coffee to stay awake were less satisfied with the chosen option when choosing from the categorized $(M = 7.30, S.D. = 1.46)$ than uncategorized menu $(M = 8.00, S.D. = .69)$, $t(61) = 2.37, p < .05, d = .61$. 

However, participants choosing one to enjoy were more satisfied from the categorized ($M = 8.22$, $S.D. = 1.69$) than uncategorized one ($M = 7.54$, $S.D. = 1.60$), $t(81) = 2.28$, $p < .05$, $d = .51$. The main effects of motivation and categorization were not significant ($ps > .29$). Figure 28 presents the results for satisfaction. Thus, categorization decreased satisfaction with extrinsic choices, but it increased it for intrinsic choices.

**Difficulty.** The two-way interaction for difficulty was also significant, $F(1, 142) = 13.56$, $p < .001$, $d = .62$. Participants choosing a coffee to stay awake found it more difficult from the categorized ($M = 4.75$, $S.D. = 2.09$) than uncategorized menu ($M = 3.30$, $S.D. = 1.52$), $t(61) = 3.13$, $p < .01$, $d = .80$. However, participants choosing one to enjoy found it less difficult from the categorized ($M = 3.53$, $S.D. = 2.19$) than uncategorized one ($M = 4.61$, $S.D. = 2.35$), $t(81) = 2.50$, $p < .05$, $d = .56$. The main effects of motivation and categorization were not significant ($ps > .64$). Figure 29 presents the results for difficulty. Thus, categorization increased difficulty with extrinsic choices, but it decreased difficulty with intrinsic choices.

**Autonomy.** The two-way interaction for autonomy was also significant, $F(1, 142) = 4.73$, $p < .05$, $d = .37$. Participants choosing a coffee to stay awake perceived autonomy to be the same from the categorized ($M = 7.74$, $S.D. = 1.06$) and uncategorized menu ($M = 7.90$, $S.D. = 1.10$) ($p = .56$). However, participants choosing one to enjoy perceived greater autonomy from the categorized ($M = 8.31$, $S.D. = .97$) than uncategorized one ($M = 7.58$, $S.D. = 1.66$), $t(81) = 2.50$, $p < .05$, $d = .56$. The main effects of motivation and categorization were not significant ($ps > .17$). Figure 30 presents the results for autonomy. Thus, categorization increased autonomy from intrinsic choices, but it had no impact on autonomy for extrinsic ones.

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Insert Figure 31 about Here
Mediation analyses. I then conducted mediation analyses using Model 6 separately for extrinsic and intrinsic choices to assess the indirect effect of more choice through perceived variety and either difficulty or autonomy (depending on extrinsic or intrinsic choice) on satisfaction. For extrinsic choices, the indirect effect of categorization on satisfaction through perceived variety and difficulty in serial was estimated at -.11 (S.E. = .04, p < .01), which meant that mediation was successful. For intrinsic choices, the indirect effect of categorization on satisfaction through perceived variety and autonomy in serial was estimated at .23 (S.E. = .12, p < .001), which also meant that mediation was successful. I conducted two further analyses to see if autonomy mediated the effects for extrinsic choices and if difficulty mediated the effects for intrinsic choices. For extrinsic choices, the indirect effect of categorization on satisfaction through perceived variety and autonomy in serial was estimated at .14 (S.E. = .05, p = .31), which meant that mediation was not successful. For intrinsic choices, the indirect effect of categorization on satisfaction through perceived variety and autonomy in serial was estimated at .04 (S.E. = .02, p = .15), which also meant that mediation was not successful. Thus, categorization increased perceived variety for both extrinsic and intrinsic choices, but while this perceived variety increased difficulty (but not autonomy) for extrinsic choices to decrease satisfaction, it increased autonomy (but not difficulty) for intrinsic choices to increase it. Figure 31 presents the results for both extrinsic and intrinsic choices.

Discussion

Whereas Experiment 3 manipulated participants’ perceived variety while holding the
actual number of options by instructing them to focus on how different the options were from each other, this experiment manipulates it by categorizing the options. Both provide converging evidence using different manipulations that perceived variety increases difficulty with making trade-offs between options to find the one that best satisfies some separable consequence, which decreases satisfaction, but it increases the autonomy from choosing the option for its inherent rewards, which increases satisfaction (Broniarczyk et al. 1998; Kahn and Wansink 2004; Reibstein et al. 1975; van Herpen and Pieters 2002). Crucially, the point of difference between the previous experiments and this one lies in the measure of satisfaction. Whereas the previous ones measured satisfaction with the chosen option without participants actually consuming it, this experiment measures satisfaction with actual consumption. Thus, this rules out participants’ greater ability to find their preferred option among many options as an alternative explanation for why more choice increases satisfaction with intrinsic choices. If it were the actual option that impacts satisfaction, then categorizing the options should have no impact on satisfaction with such choices.
General Discussion

It is not clear whether more choice is harmful or beneficial for consumers. Some research argues that increasing the number of options increases consumers’ inability to justify choosing any particular option (Fasolo et al. 2007; Sela et al. 2009) and induces fear of not choosing optimally (Fasolo et al. 2007; Iyengar et al. 2006; Schwartz 2004). However, other research argues that more choice satisfies consumers’ diverse tastes (Hoch et al. 1999; Hotelling 1929; Kuksov and Villas-Boas 2009; Reibstein et al. 1975) and meets their variety-seeking needs (Ariely and Levav 2000; Kahn 1995; Simonson 1990). These mixed findings suggest that the question is not whether – but when – is more choice bad or good? I distinguish between the two primary motivations for choosing by proposing that more choice increases consumers’ difficulty with choosing the option that best satisfies some separable consequence (extrinsic choice), which decreases satisfaction, but it increases the autonomy from choosing the option is inherently rewarding (intrinsic choice), which increases satisfaction. This difficulty or autonomy occurs because consumers perceive variety with more choice. Figure A summarizes the theoretical models for both extrinsic and intrinsic choices.

Experiment 1 uses mediation analyses to demonstrate that while consumers perceive greater variety when the number of options increases for both extrinsic and intrinsic choices, this perceived variety increases difficulty with extrinsic choices, which decreases satisfaction, but it increases autonomy from intrinsic choices, which increases satisfaction. Experiment 2 finds that for extrinsic choices, more choice decreases satisfaction by increasing difficulty with consumers with low (vs. high) self-efficacy. For intrinsic choices, more choice increases satisfaction by increasing autonomy for consumers with high (vs. low) self-efficacy, which buttresses the notion
that the extrinsic or intrinsic nature of the choice moderates choice overload. Experiment 3 manipulates participants’ focus on similarities or differences between the options; Experiment 4 manipulates perceived variety by categorizing the options. Both find that even when holding the actual number of options constant – and so the objective amount of variety is also constant – perceived variety increases difficulty with extrinsic choices to decrease satisfaction, but it increases autonomy from intrinsic ones to increase it.

An alternative explanation for intrinsic choices was also ruled out. More choice does not increase consumers’ satisfaction by increasing the ability to find their preferred option. Both Experiments 3 and 4 demonstrate that more choice increases satisfaction even when the actual number of options is constant, which limits the possibility that consumers would find the option that best matches their preference in one instance but not another. This is important because intrinsic choices are likely those for which consumers already have some prior preference, but this does not drive the increase in satisfaction from choosing among many options for these choices. The findings provide evidence that more choice increases satisfaction by increasing consumers’ perception of themselves as determining their own outcome and not the ability to find their preferred option (Brehm 1966; Clee and Wicklund 1980; Kunda 1990; Tetlock et al. 1989).

Nonetheless, it may still be that participants in Experiments 3 and 4 who perceived variety could have found their preferred option because they perceived that they did, which increased satisfaction. This research is unable to rule out this possibility. To do so unequivocally, future research needs to assess whether consumers perceive the information that they are given about the options as helpful for them to find their preferred option. Ruling out preference matching as an alternative explanation would require that consumers are unable to “map” the
information that they are given onto their prior preferences, and yet more choice nonetheless increases their satisfaction with the chosen option. One measurement approach might be via self-report. For example, Diehl and Poynor (2010) asked consumers to indicate whether the chosen option matches their expectations using a 9-point scale where 1 indicates a “very poor match” and 9 indicates a “perfect match”. Consumers should score low but still indicate higher satisfaction with their chosen option when given more choice. An experimental approach might be to offer participants with two large choice sets – one with a dominating or preferred option, and one without. If more choice increases satisfaction because consumers are better able to find their preferred option, then satisfaction should increase only in the large choice set with the dominating option, compared to a small choice set. However, if more choice increases satisfaction because it increases their autonomy, then satisfaction should increase even in the large choice set without the dominating option.

Extant research on the effect of number of options on satisfaction has tended to see motivation as a singular construct, in that consumers all choose for the same reason. However, a casual reflection will reveal that this is not a valid assumption. This dissertation distinguishes between the two primary motivations that consumers have in mind for choosing as either extrinsic or intrinsic (Alderson 1957; Batra and Ahtola 1990; Deci and Ryan 1985; Pham 1998). This motivational perspective has similarities with other dichotomies in the marketing literature on consumer choice. For example, there is the distinction between utilitarian and hedonic products (Dhar and Wertenbroch 2000) and between material and experiential goods (van Boven and Gilovich 2003). Consumers choosing among utilitarian products or material goods likely have an extrinsic motive in mind. Those choosing among hedonic products or experiential goods likely have an intrinsic motive. If true, then the distinction between the two primary motivations
for choosing offers a framework from which to understand how consumers choose among other classifications of choices, products, or goods.

On the surface, the current results may appear to contradict the findings reported by Iyengar and Lepper (2000). They found that increasing the number of jams decreased consumers’ likelihood of making any purchase at all – and jams are quite possibly a product that consumers choose with an intrinsic motivation. However, their study offered either six or 24 different jams for participants to sample, but participants did not differ in the actual number of jams that they sampled. Participants (after sampling the jams) also made their choice of jam to purchase from the entire selection regardless of how many jams that they were offered to sample or actually sampled. Thus, it is not clear whether some participants had more choice while other participants had fewer, which makes it hard to understand whether participants were more or less likely to purchase a jam because there were too many options or because of some other factor. Moreover, Iyengar and Lepper themselves noted several crucial conditions under which their effects would occur, such as time pressure. For example, participants who were offered six jams to sample did not feel pressure to try the jams but those who were offered 24 jams did due to the sheer number of jams to try, and this difference in perceived pressure and not the actual number of options may have been the contributing factor to whether or not participants actually purchased a jam.

Moreover, further attention should be made to other results reported by Iyengar and Lepper. For example, their participants found it more difficult to choose from more jams (consistent with the current results for extrinsic choice), they also found it more enjoyable to do so (consistent with the current results for intrinsic choice). The distinction between the findings reported here and those by Iyengar and Lepper, as well as their other results, point to the
importance of discriminating between extrinsic and intrinsic motivation in choice because each
highlights a different factor (difficulty or autonomy) that impacts satisfaction with the chosen
option.

Nonetheless, there is a possible limitation to this research. In Experiments 2 and 4, I
provided minimal amounts of information about the options. On the one hand, the information
presented to participants may be beneficial for extrinsic choices because the descriptions about
the coffees indicate chocolate, and chocolate has caffeine that is useful to help stay awake. On
the other hand, the information presented may also be more beneficial for intrinsic choices
because the descriptions speak more to one’s tastes and preferences than to whether or not the
option would best fulfil some separable consequence. For example, the information presented
about the coffees may speak more about matters of taste. Meanwhile, Experiment 1 presented no
text-based information about the birthday cards, and Experiment 3 presented information about
the documentaries that was likely useful to help consumers make both extrinsic and intrinsic
choices – and yet I found the same overall effect on satisfaction depending on the choice set size
in both experiments. Thus, it is likely that what information is presented may be less of a
concern, but what matters is whether consumers need to make trade-offs between the options in
extrinsic choices and whether consumers experience autonomy from intrinsic choices, both of
which occurs when the number of choices increases. Nonetheless, further research is necessary
to see if information presented about the options may moderate the effects on satisfaction for
both extrinsic and intrinsic choices.

There are also several boundary conditions under which the current results may not
occur. First, this dissertation teases apart the distinction between extrinsic and intrinsic choices,
but it is possible for consumers to choose with both motivations in mind. I do not examine how
more choice would influence satisfaction in such a circumstance, but rather tease apart these distinctions through various manipulations. In a situation where both motivations co-occur, the choice is extrinsic on the one hand, and so more choice decreases satisfaction. However, the choice is intrinsic on the other hand, and so more choice increases satisfaction. This may suggest that there would simply be a flat effect of more choice on satisfaction with the chosen option. Second, in the reported experiments, I give participants either a small or a large choice set – but the largest choice set size was Experiment 4 with 21 options. It may be that after a certain number of options, there is an inherent difficulty with choosing among so many options, and the increase in satisfaction with intrinsic choices may attenuate. It may also be that consumers may naturally consider only a subset of options, such that it may not be as difficult for them to choose as one might expect. More research is necessary to explore these limitations of this dissertation.

Limitations aside, the distinction between extrinsic and intrinsic choices forms the primary theoretical contribution of this dissertation. Prior research concluding that more choice only makes it more difficult to choose disregards the autonomy that more choice also affords consumers. Not distinguishing between the motivations for choosing restricts the understanding of how more choice is not necessarily a recipe for unhappiness, but it is also beautiful when consumers determine their own outcome. Autonomy is something that people strive to achieve. It is the major factor that underlies intrinsic motivation and permit people to pursue an outcome for its own sake (deCharms 1968; Deci and Ryan 1985). When people speak of the importance of having choice, they refer to having autonomy and not the number of options available from which to choose. Autonomy may be central more for intrinsic than extrinsic choices, but to the extent that consumers pursue happiness and intrinsic choices are most relevant to that pursuit, an understanding of autonomy is necessary.
However, a word of caution about what autonomy is and what it isn’t. Some research has mistakenly defined autonomy in terms of independence, generating concerns regarding autonomy’s relevance in societies that stress interdependent goals (Iyengar and Lepper 1999). However, an interdependent consumer may choose a certain option to please her friends and family, but as long as she chooses to do so volitionally, she has autonomy (Chirkov et al. 2003). And as mentioned earlier, autonomy is about determining one’s own outcome, not about the ability for consumers to find their preferred option. This important distinction indicates that the experience of choosing impacts how consumers perceive an outcome more so than the impact from the actual outcome itself (Botti and McGill 2006; Brehm 1966; Clee and Wicklund 1980; Kunda 1990; Shiv and Fedorikhin 1999; Tetlock et al. 1989). These considerations reveal the importance of understanding autonomy as a distinct construct with unique implications for choice. This dissertation explores autonomy only in the particular context of choice overload. It nonetheless offers a crucial next step in understanding the important role of autonomy and what it means for choice generally. Without this understanding, little would we understand and appreciate what it means to choose at all.
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Figure 1

*Proposed Theoretical Models for Extrinsic and Intrinsic Choices*

**Extrinsic Choices**

1. More Choice
2. Greater Perceived Variety
3. Difficulty Increases
4. Satisfaction Decreases

**Intrinsic Choices**

1. More Choice
2. Greater Perceived Variety
3. Autonomy Increases
4. Satisfaction Increases
Figure 2

Experiment 1: Satisfaction with Chosen Birthday Card

![Bar chart showing satisfaction levels for extrinsic and intrinsic satisfaction with chosen birthday cards. The chart compares satisfaction levels between 6 cards and 15 cards, with p-values indicating statistical significance.](chart.png)

- Extrinsic: 7.95 (p < .05) for 6 cards, 7.19 for 15 cards.
- Intrinsic: 8.15 (p < .01) for 6 cards, 7.38 for 15 cards.

Legend: □ 6 Cards □ 15 Cards
Figure 3

Experiment 1: Difficulty with Choosing Birthday Card

$p < .01$
Figure 4

Experiment 1: Autonomy from Choosing Birthday Card

![Bar graph showing Autonomy levels for Extrinsic and Intrinsic options with p-values and comparisons.]

- Extrinsics: 6 Cards (7.10) vs. 15 Cards (6.37), $p = .06$
- Intrinsics: 6 Cards (6.87) vs. 15 Cards (8.20), $p < .001$
Figure 5

Experiment 1: Bootstrapping Results for Extrinsic and Intrinsic Choices

Extrinsic Choices with Difficulty (indirect effect = -.01, S.E. = .01, p < .03; Model 6)
Indirect effect: $a_1d_2b_2$

$$a_1 = .13, \text{S.E.} = .02, p < .05 \quad d_2 = .18, \text{S.E.} = .02, p < .05 \quad b_2 = -.43, \text{S.E.} = .05, p < .03$$

Intrinsic Choices with Autonomy (indirect effect = .07, S.E. = .03, p < .01; Model 6)
Indirect effect: $a_1d_2b_2$

$$a_1 = .28, \text{S.E.} = .04, p < .01 \quad d_2 = .25, \text{S.E.} = .05, p < .01 \quad b_2 = 1.00, \text{S.E.} = .10, p < .001$$
Figure 6

Experiment 2: Proposed Theoretical Models with Self-Efficacy as Moderator

Extrinsic Choices

Intrinsic Choices
Figure 7

Experiment 2: Satisfaction with Chosen Coffee

Extrinsic

Intrinsic

$p = .10$

$p < .02$

6 Coffees

18 Coffees

6 Coffees

18 Coffees
Figure 8

Experiment 2: Difficulty with Choosing Coffee

![Bar chart showing difficulty with choosing coffee for extrinsic and intrinsic tasks with p < .02 difference between 6 coffees and 18 coffees.](chart.png)
Figure 9

Experiment 2: Autonomy from Choosing Coffee

Extrinsic

Intrinsic

\( p < .03 \)
Figure 10

Experiment 2: Satisfaction with Chosen Coffee for Extrinsic Choices

$p < .04$
Figure 11

Experiment 2: Difficulty with Choosing Coffee for Extrinsic Choices
Figure 12

Experiment 2: Autonomy from Choosing Coffee for Extrinsic Choices

![Graph showing the relationship between self-efficacy and autonomy for coffee choices.](image)

- Low Self-Efficacy
  - Autonomy: 6.00
  - Number of Coffees: 6
- High Self-Efficacy
  - Autonomy: 7.23
  - Number of Coffees: 18

$p = .08$
Figure 13

Experiment 2: Satisfaction with Chosen Coffee for Intrinsic Choices

![Graph showing satisfaction levels for low and high self-efficacy groups with different numbers of coffees.](image)
Figure 14

Experiment 2: Difficulty with Choosing Coffee for Intrinsic Choices
Figure 15

Experiment 2: Autonomy from Choosing Coffee for Intrinsic Choices

![Graph showing the relationship between self-efficacy and autonomy with a trend line for different numbers of coffees chosen. The graph indicates a significant effect with p < .001.]
Figure 16

Experiment 2: Conceptual Models of Mediation Analyses with Self-Efficacy as Moderator

Step 1: Effect of More Choice on Satisfaction Moderated by Self-Efficacy (Model 1)

Step 2: Moderated Mediation Analysis with One Mediator (Model 59)

Step 3: Effect of More Choice on Difficulty/Autonomy Through Perceived Variety (Model 14)
Figure 17

Experiment 2: Bootstrapping Results for Extrinsic Choices with Self-Efficacy as Moderator

Step 1 Using Model 1 (indirect effect = -3.60, S.E. = 1.42, p < .02)
Conditional effect: \( b_2W \)

\[
\begin{align*}
\text{More Choice} & \quad \downarrow \quad \text{Low Self-Efficacy} \quad \downarrow \quad b_2 = -1.66, \text{S.E.} = .21, p < .01 \\
\end{align*}
\]

Step 2 Using Model 59 (indirect effect = -1.95, S.E. = .79, p < .02)
Conditional indirect effect: \((a_1 + a_2W)(b_1 + b_3W)\)

\[
\begin{align*}
\text{Low Self-Efficacy} & \quad \downarrow \quad a_2 = -0.78, \text{S.E.} = .12, \quad p < .01 \\
\text{Greater Perceived Variety} & \quad \downarrow \quad \text{Difficulty Increases} \quad \downarrow \quad b_3 = -1.42, \text{S.E.} = .13, \quad p < .001 \\
\text{Satisfaction Decreases} & \\
\end{align*}
\]

\[
\begin{align*}
\text{Low Self-Efficacy} & \quad \downarrow \quad a_1 = 1.47, \text{S.E.} = .14, \quad p < .02 \\
\text{Difficulty Increases} & \quad \downarrow \quad b_1 = -1.40, \text{S.E.} = .12, \quad p < .01 \\
\end{align*}
\]

Step 3 Using Model 14 (indirect effect = .73, S.E. = .30, p < .02)
Conditional indirect effect: \(a_3(b_4 + b_5W)\)

\[
\begin{align*}
\text{More Choice} & \quad \downarrow \quad \text{Low Self-Efficacy} \quad \downarrow \quad b_5 = -0.24, \text{S.E.} = .07, \quad p = .11 \\
\text{Greater Perceived Variety} & \quad \downarrow \quad \text{Difficulty Increases} \quad \downarrow \quad b_3 = -1.42, \text{S.E.} = .13, \quad p < .001 \\
\text{Satisfaction Decreases} & \\
\end{align*}
\]

\[
\begin{align*}
\text{Low Self-Efficacy} & \quad \downarrow \quad a_3 = 0.67, \text{S.E.} = .11, \quad p < .05 \\
\text{Difficulty Increases} & \quad \downarrow \quad b_4 = 1.33, \text{S.E.} = .21, \quad p < .03 \\
\end{align*}
\]
Experiment 2: Bootstrapping Results for Intrinsic Choices with Self-Efficacy as Moderator

Step 1 Using Model 1 (indirect effect = 0.54, S.E. = 0.13, p < 0.001)  
Conditional effect: $b_2W$

Step 2 Using Model 59 (indirect effect = 0.75, S.E. = 0.37, p < 0.05)  
Conditional indirect effect: $(a_1 + a_2W)(b_1 + b_3W)$

Step 3 Using Model 14 (indirect effect = 0.98, S.E. = 0.27, p < 0.001)  
Conditional indirect effect: $a_3(b_4 + b_5W)$
Figure 19

Experiment 3: Proposed Theoretical Models for Extrinsic and Intrinsic Choices with Focus on Differences as Moderator
Figure 20

Experiment 3: Satisfaction with Chosen Documentary

![Bar chart showing satisfaction levels for extrinsic and intrinsic documentaries]

<table>
<thead>
<tr>
<th></th>
<th>4 Documentaries</th>
<th>21 Documentaries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extrinsic</td>
<td>7.73</td>
<td>7.36</td>
</tr>
<tr>
<td>Intrinsic</td>
<td>7.80</td>
<td>7.09</td>
</tr>
</tbody>
</table>

$p = .24 \quad p < .02$
Figure 21

Experiment 3: Difficulty with Choosing Documentary

Extrinsic vs. Intrinsic Difficulty for 4 and 21 Documentaries

$p = .13$
Figure 22

Experiment 3: Autonomy from Choosing Documentary

![Graph showing the comparison of Autonomy scores between Extrinsic and Intrinsic conditions. The graph displays the mean autonomy scores for 4 Documentaries and 21 Documentaries, with a statistically significant difference indicated by $p < .04$.](image-url)
Figure 23

Experiment 3: Satisfaction with Chosen Documentary by Focus on Similarities or differences

![Bar chart showing satisfaction levels for Extrinsic and Intrinsic similarities and differences with p < .01 for both comparisons.](image-url)
Figure 24

Experiment 3: Difficulty with Choosing Documentary by Focus on Similarities or differences

<table>
<thead>
<tr>
<th>Similarities</th>
<th>Differences</th>
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<tr>
<td>Extrinsic</td>
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<tr>
<td>Intrinsic</td>
<td>3.59</td>
</tr>
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<td>Extrinsic</td>
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<td>Intrinsic</td>
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<tr>
<td>Extrinsic</td>
<td>4.50</td>
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<tr>
<td>Intrinsic</td>
<td>4.02</td>
</tr>
</tbody>
</table>

*p < .05

4 Documentaries
21 Documentaries
Experiment 3: Autonomy from Choosing Documentary by Focus on Similarities or differences

Figure 25

$p < .01$
Experiment 3: Bootstrapping Results for Extrinsic and Intrinsic Choices with Focus on Differences as Moderator

Extrinsic Choices with Difficulty (indirect effect = -.03, S.E. = .01, p = .08; Model 8)
Conditional indirect effect: \((a_4 + a_5W)b_6\)

Intrinsic Choices with Autonomy (indirect effect = .04, S.E. = .02, p < .001; Model 8)
Conditional indirect effect: \((a_4 + a_5W)b_6\)
Figure 27

Experiment 4: Proposed Theoretical Models with Categorization

Extrinsic Choices

Categorization → Greater Perceived Variety → Difficulty Increases → Satisfaction Decreases

Intrinsic Choices

Categorization → Greater Perceived Variety → Autonomy Increases → Satisfaction Increases
Figure 28

Experiment 4: Satisfaction with Chosen Coffee

Extrinsic

Uncategorized

Intrinsic

Categorized

p < .05

p < .05
Figure 29

Experiment 4: Difficulty with Choosing Coffee

![Bar chart showing difficulty levels for Extrinsic and Intrinsic categories with p-values](image)
Figure 30

Experiment 4: Autonomy from Choosing Coffee
Figure 31

Experiment 4: Bootstrapping Results for Extrinsic and Intrinsic Choices with Categorization

Extrinsic Choices with Difficulty (*indirect effect* = -.11, *S.E.* = .04, *p* < .01; Model 6)
Indirect effect: \( a_1d_2b_2 \)

\[
\begin{align*}
a_1 &= .24, \text{ S.E.} = .10, p < .05 \\
d_2 &= .34, \text{ S.E.} = .10, p < .05 \\
b_2 &= -1.35, \text{ S.E.} = .12, p < .01
\end{align*}
\]

[Diagram showing the relationship between Categorization, Greater Perceived Variety, Difficulty Increases, and Satisfaction Decreases.]

Intrinsic Choices with Autonomy (*indirect effect* = .23, *S.E.* = .12, *p* < .001; Model 6)
Indirect effect: \( a_1d_2b_2 \)

\[
\begin{align*}
a_1 &= 1.02, \text{ S.E.} = .11, p < .001 \\
d_2 &= .34, \text{ S.E.} = .07, p < .05 \\
b_2 &= .66, \text{ S.E.} = .06, p < .01
\end{align*}
\]

[Diagram showing the relationship between Categorization, Greater Perceived Variety, Autonomy Increases, and Satisfaction Increases.]
### Table 1

*Regression Co-Efficient Results for Experiment 2*

<table>
<thead>
<tr>
<th>Variable</th>
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<th>p</th>
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<td></td>
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<td>.88</td>
<td>.38</td>
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<td>.29</td>
<td>2.96</td>
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<td></td>
<td></td>
</tr>
<tr>
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<td>.20</td>
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<td>Choice Set Size</td>
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<td>.01</td>
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<td>Choice Set Size</td>
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<td>Motivation×GSES</td>
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<td>Choice Set Size</td>
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<td>2.92</td>
<td>&lt; .01</td>
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<td>GSES</td>
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<td>Motivation×GSES</td>
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<td>.79</td>
<td>.26</td>
<td>.80</td>
</tr>
</tbody>
</table>
Appendix 1

Birthday Card Choices in Experiment 1
Appendix 2

Coffee Choices in Experiments 2 and 4

Nutty

_Eagle Creek Blend_: Freshly roasted with caramel and milk, with whipped cream and hazelnut.  
_Rift Valley Blend_: Almond flavours with half skimmed milk and half milk froth.  
_Yorkie_: Hazelnut with caramel drizzle.

Chocolates

_Gazebo Blend_: Chocolate topped with whipped topping.  
_Cocker Spaniel_: Chocolate with whipped topping and caramel drizzle.  
_Basset Hound_: Steamed milk with chocolate drizzle.

International

_Cascada_: Kenyan roast combined with hot water, creating a gourmet brewed coffee.  
_Monsoon_: Cafe mocha with Irish cream and caramel drizzle.  
_Carabobo_: An Austrian roast with fresh whipped cream.

Dark & Rich

_Major Dickinson's Blend_: An extra rich version made with half milk and half whipped cream.  
_Kona_: The essence of coffee extracted into a one-ounce beverage.  
_San Francisco Blend_: Tall, short and strong black coffee.

Classics

_Grey Hound_: American roast with your choice of regular, skim or soy milk.  
_New Yorker_: American roast and hot water.  
_Great Dane_: House coffee with a swirl of caramel.

Spices

_Dalmatian_: Rich blend with gingerbread crumbles.  
_Top Blend_: Freshly roasted with cinnamon spice and half & half.  
_Golden Retriever_: Steamed milk and rum raisin with caramel drizzle.

Note that participants in Experiment 2 and in the uncategorized condition in Experiment 4 received a menu without the categorical labels. The coffee choices were presented randomly across participants.
Appendix 3

Documentary Choices in Experiment 3

*The Five Obstructions*: Lars Von Trier will ask legendary director Martin Scorsese to revisit his seminal classic “Taxi Driver”, offering five ‘obstructions’ as Scorsese attempts to remake the film.

*Walking with Dinosaurs*: Two brothers looking to follow in their father’s footsteps leads to a showdown with dinosaurs in the Arctic North.

*All the Labor*: A genre-defying band forms in Texas, creates its own acclaimed roots music, and becomes a touring institution while striving to find its place in the challenging landscape of the music industry.

*An American Promise*: This intimate documentary follows the 12-year journey of two African-American families pursuing the promise of opportunity through the education of their sons.

*Anton Corbijn Inside Out*: An intimate portrait of this internationally renowned photographer and filmmaker whose work combines his love of photography and music.

*Backyard Blockbusters*: A feature documentary about fanfilms and fan filmmakers, from the award-winning director of American Scary.

*Aroused*: Get up close and personal with 16 of the most successful women in the Adult Film Industry as they shed their clothes for an intimate photo shoot with director Deborah Anderson.

*Bay of All Saints*: As the last of the notorious water slums is demolished in Bahia, Brazil, will three single mothers face homelessness or rally for a better life?

*BBoy for Life*: A powerful story on how the lives of break dancers in Guatemala City are affected by the world’s most dangerous gangs.

*Original Madman*: In the unconventional documentary Becoming Bert Stern, the original madman photographer reveals himself for the first time.

*Nothing Can Hurt Me*: A feature-length documentary about the massive critical acclaim, dismal commercial failure, and enduring legacy of pop music’s greatest cult phenomenon, Big Star.

*Blood Brother*: This documentary follows Rocky Braat, a disenchanted young American who travels to India and decides to join the volunteer staff of an orphanage that specializes in helping HIV infected children.
DeapSea Challenge: A joint scientific project by James Cameron, the National Geographic Society and Rolex to conduct research and exploration to expand our knowledge and understanding of the deep oceans.

Don’t Stop Believin’: Follows the real life rock ‘n’ roll fairy tale of Filipino Arnel Pineda, who was plucked from YouTube to become the front man for iconic American rock band Journey.

Downloaded: A documentary that explores the downloading revolution, the kids that created it, the bands and the businesses that were effected by it, and its impact on the world at large.

Egypt through the Glass Shop: A young entrepreneur and talented glass blower who set up a shop in Cairo and provides an update to the original method of glass blowing.

The Man Behind the Poster: A feature-length documentary film highlighting the career of poster artist Drew Struzan, whose most popular works include the “Indiana Jones”, “Back to the Future” and “Star Wars” movie posters.

Bully: Directed by Sundance and Emmy-award winning filmmaker Lee Hirsch, at its heart are those with huge stakes in this issue whose stories each represent a different facet of America’s bullying crisis.

Sing Your Song: Wonderfully archived, and told with a remarkable sense of intimacy, visual style, and musical panache, Sing Your Song surveys the life and times of singer, actor, and activist Harry Belafonte.

Comic-Con: Have you ever imagined a place where Vulcans and vampires get along? Where wizards and wookies can be themselves? Welcome to Comic-Con San Diego!

Time, the Fourth Dimension: Much as he did in the Back to the Future trilogy, Lloyd will portray an eccentric professor who will explore and explain various dimensions with a focus on space-time.

×Note that the documentary choices were presented in a random order across participants.