

Choice Set Size Shapes Self-Expression

Nathan N. Cheek¹ , Barry Schwartz², and Eldar Shafir¹

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Abstract

Across six studies (total $N = 3,549$), we find that participants who were randomly assigned to choose from larger assortments thought their choices were more self-expressive, an effect that emerged regardless of whether larger sets actually enabled participants to better satisfy their preferences. Studies examining the moderating role of choice domain and cultural context show that the effect of choice set size on perceived self-expression may be particular to contexts in which choices have some initial potential to express choosers' identities. We then test novel predictions from this theoretical perspective, finding that self-expression mediates the effect of choice set size on choice satisfaction, the likelihood of publicly sharing choices, and the perceived importance of choices. Together, these studies show that choice set size shapes perceived self-expression and illustrate how this meaning-based theoretical lens provides both novel explanations for existing effects and novel predictions for future research.

Keywords

choice, choice set size, assortment size, self-expression, preferences

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Modern life offers unprecedented choice. There are more clothes to try on, more ice cream flavors to sample, and more movies to preview than ever before (Schwartz, 2016). And the expansion of choice extends far beyond everyday consumer domains—people have more freedom to choose where to live, who, if anyone, to marry, and even who to be. Over the past several decades, the growing proliferation of options has prompted psychologists, economists, and consumer researchers to study the effects of choice set size, resulting in insights about both the benefits and the costs of choosing from larger versus smaller assortments. For example, having more options can provide choosers with a better opportunity to satisfy their preferences (Baumol & Ide, 1956; von Neumann & Morgenstern, 1944) and can encourage feelings of autonomy and control central to the pursuit of self-determination (Ryan & Deci, 2000). Yet, larger choice sets can also pose an increased burden on choosers' cognitive resources and lead to greater choice conflict, deferral, regret, and the experience of “choice overload” (Iyengar & Lepper, 2000; Jacoby et al., 1974; Redelmeier & Shafir, 1995; Schwartz, 2016; Tversky & Shafir, 1992). In the present research, we go beyond debates about the positive and negative consequences of larger choice sets (Chernev et al., 2015; Scheibehenne et al., 2010) to propose that having more options changes the very meaning of choice itself.

world (e.g., Grubb & Grathwohl, 1967; Kim & Markus, 1999; Levy, 1959; Schwartz & Cheek, 2017). Self-expression differs from evaluations of choice such as satisfaction in that it is about the interpreted *meaning* of decisions—how much a choice expresses the chooser's identity—rather than being an assessment of how positively or negatively the chooser feels about a choice. In the growing literature on choice and self-expression, one focus has been on contextual and individual factors that influence the degree to which choosers see their choices as expressing who they are. For example, polarized product reviews can make choices feel more self-expressive (Rozenkrants et al., 2017), whereas salient self-control can make choices feel less self-expressive (Sela et al., 2017). Here, we suggest that choice set size is itself an important contextual feature that can shape how choosers perceive their choices: Choosers tend to feel that their choices are more self-expressive when made from larger versus smaller assortments.

When larger choice sets provide more alternatives that better match choosers' preferences, it would make sense for them to feel that they have more strongly expressed something about their identity—their choice, after all, really is a more accurate reflection of at least part of who they are. Indeed, previous research shows that choices feel more

Choice Set Size and Self-Expression

Choices are *acts of meaning* (Bruner, 1990) or *sign-vehicles* (Goffman, 1959) that have the potential to reveal information about the identities of choosers to themselves and to the

¹Princeton University, NJ, USA

²University of California, Berkeley, CA, USA

Corresponding Author:

Nathan N. Cheek, Department of Psychology, Princeton University,
Peretsman Scully Hall, Princeton, NJ 08544, USA.

Email: nncheek@princeton.edu

expressive when choosers perceive them to be more tightly linked to their preferences (e.g., Rozenkrants et al., 2017; Sela et al., 2017). We suggest, however, that the effect of choice set size on self-expression emerges not simply because larger sets truly afford better preference matching. Rather, we hypothesize that having more options can provide an *illusory* sense of preference matching even when the additional options in a larger set are unappealing and unchosen.

Because, particularly in Western, independent cultural contexts, the freedom to choose is seen as a fundamental means through which preferences are satisfied and expressed (e.g., Bellah et al., 1985; Markus & Kitayama, 1991; Schwartz & Cheek, 2017), people may feel they have better matched their preferences when choosing from a larger choice set even when that is not the case. This perception may, in turn, explain people's feeling that they have better expressed who they are although they have made the same choice they would have made from a more restricted assortment. In sum, we predict that the perception that the match between one's choice and one's preferences is greater for larger choice sets will mediate the effect of choice set size on perceived self-expression regardless of whether having more options has actually improved one's choice-preference match.

Hedonic Versus Utilitarian Choices

Although having more options may often increase self-expression, there are domains in which this effect is more or less likely. One potentially important dimension is the extent to which choices are perceived as more *hedonic* or more *utilitarian*. Hedonic choices aim to provide desired emotional or sensory consumption experiences (e.g., choosing what to watch on TV for entertainment), whereas utilitarian choices are instrumental, serving to accomplish functional goals (e.g., choosing which mop to buy to clean most effectively; Babin et al., 1994; Dhar & Wertenbroch, 2000; Khan et al., 2005). Whereas hedonic choices often feel self-expressive, choices of utilitarian, commonly used, and privately consumed products often have relatively little expressive value: They are typically chosen for their instrumental usefulness rather than for their connection to the self (e.g., Bearden & Etzel, 1982; Shavitt, 1990; Shavitt & Nelson, 1999). Thus, although larger choice sets may affect the perceived self-expressiveness of more hedonic choices, this effect may be less likely to emerge in utilitarian, relatively unexpressive domains.

Independent Versus Interdependent Cultural Contexts

Cultural contexts vary in the extent to which people see choice as driven by personal preferences and as reflective of individual identities (e.g., Markus & Schwartz, 2010; Savani et al., 2008; Stephens et al., 2007). We theorize that larger

choice sets make choice feel more self-expressive because having more options affords a greater perception of having matched personal preferences. However, in more interdependent cultural contexts, choice may be less linked to preference satisfaction and self-expression. In Indian cultural contexts, for instance, choices may not be made based on, or be seen as expressing, personal preferences; indeed, personal preferences may not be constructed before choices are made (Savani et al., 2008). Accordingly, the effect of choice set size on self-expression may be smaller in a more interdependent, Indian cultural context than in a more independent, U.S. cultural context.

Self-Expression and Satisfaction

Classic economic perspectives on choice set size focus on the utility provided to choosers as a function of how well the available options satisfied choosers' preferences (von Neumann & Morgenstern, 1944). The straightforward prediction from this tradition, as well as more recent psychological treatments, is that having more options will produce more satisfying choices because choosers are provided with additional alternatives that may better satisfy their preferences, ultimately leading to more pleasurable consumption (notwithstanding choice overload; see the General Discussion for further consideration). But, as Loewenstein (1999) illustrated with the case of mountaineering, utility can come from more varied sources than traditional economic accounts recognize, including those related to the self-concept such as self-expression (see also Miller & Prentice, 2013). It may be that having more options also produces more satisfying choices because choices seem to better reflect the self. This may be particularly true in the United States, where unique self-expression is often a central goal of choice (Kim & Sherman, 2007). In the present research, we test whether self-expression mediates the effect of choice set size on choice satisfaction even when accounting for choosers' perceptions that the options in a larger choice set provided a better opportunity to satisfy their preferences.

Downstream Consequences of Increased Self-Expression

Understanding the effects of choice set size through the lens of self-expression suggests some new predictions about the implications of having more options from which to choose. Two fundamental questions choosers may ask themselves about choices are: (1) "Does this choice matter?" and (2) "Should I share that I made this choice with others?" Self-expression may explain how choice set size shapes the answers to both of these questions.

Choices may seem to matter more when made from larger sets because changes in self-expression may alter the perceived stakes of choice, causing choices to feel more important (Krijnen et al., 2015; Sela & Berger, 2012) when made

from larger sets. That is, when a choice feels more self-expressive, it may no longer be “just” a choice but rather a statement about the self. Accordingly, we predict that having more options will increase the perceived importance of even trivial choices and that this increase will be mediated by perceived self-expression.

Choosers may also be more inclined to share their choices publicly after choosing from larger sets because choices will feel more self-expressive and people enjoy sharing information about themselves (e.g., Tamir & Mitchell, 2012). Research on social media sharing behavior, for example, shows that, because people use social media to express themselves, they are more likely to share content that they perceive as self-expressive (e.g., de Vries et al., 2017; Pounders et al., 2016; Taylor et al., 2012). Our proposal that choice set size shapes the perceived self-expressiveness of choice thus leads to the additional novel prediction that larger assortments increase participants’ proclivity to share their choices on social media. If having more options indeed increases social media sharing, this increase should be mediated by an increase in perceived self-expression.

The Present Research

In what follows, we present six studies that investigate the effects of having more options on perceived self-expression. Study 1 tested our basic hypothesis that larger choice sets make choices feel more self-expressive. Study 2 replicated this effect in a context where having more options did not afford better preference matching. In Studies 3 and 4, we examined whether the choice domain and cultural context, respectively, moderate the effect of choice set size on self-expression. Study 5 disentangled the roles of perceived preference satisfaction and perceived self-expression in the effect of choice set size on choice satisfaction. Finally, in line with this novel theoretical perspective, Study 6 tested whether larger sets make people more likely to share their choice on social media and more likely to perceive even trivial decisions as important. We expected both of these latter effects to be mediated by perceived self-expression.

All studies aimed to ensure adequate power by recruiting at least enough participants to have an 80% chance to detect moderately-sized effects of $d = .30$. For each study, we describe specific power analyses and details of sample size determination as well as all manipulations, measures, and exclusions. All studies but one were preregistered, and we report preregistered analyses in all cases except in Study 2 (see Study 2 Results for details on deviations from our preregistration and Supplemental Material for preregistered analyses). Data, code, and materials for all studies are available through the Open Science Framework (<https://osf.io/3tmb6/>).

Study 1

Our first study tested our hypothesis that larger choice sets make choices feel more self-expressive by randomly assigning

participants to choose from a smaller or a larger assortment. We also expected the effect of assortment size on self-expression to be mediated by participants’ perception of improved preference matching when choosing from a larger set. This study was preregistered through AsPredicted.org (<https://aspredicted.org/k2he4.pdf>).

Method

Participants. We aimed to recruit 390 participants through Prolific to achieve a final sample of at least 352, which provides an 80% chance of detecting an effect of $d = .30$ with $\alpha = .05$.¹ To be included in our analyses, participants had to pass two instructional manipulation checks (Oppenheimer et al., 2009) and confirm that they had not responded randomly. In total, 391 participants completed the study, of whom 362 met the inclusion criteria and were included in analyses (see Supplemental Material for number of participants excluded by condition for all studies). We report participant demographics in Supplemental Material.

Materials and procedure. Participants were shown a list of beverages (e.g., soda, liquor, juice, milk) and asked to indicate which they would most want to drink. Participants in the large choice set condition ($n = 181$) chose among 20 options. Participants in the small choice set condition ($n = 181$) chose from a subset of three options taken from the larger set of 20, randomly determined for each participant. In this and all subsequent studies, options appeared in a random order.

After making their choice, all participants completed a manipulation check and the main dependent measures. The manipulation check consisted of two questions about how much choice participants felt they had (e.g., “How much do you agree with this statement: There were a lot of options to choose from.” $\alpha = .91$). The main dependent measures were a two-item measure of perceived preference matching (e.g., “How well did your choice match your preferences?”; $\alpha = .91$) and a four-item measure of the perceived self-expressiveness of the choice (e.g., “How much did your choice reflect your identity?”; $\alpha = .94$). Participants answered all questions on a scale from 1 to 9, with higher numbers indicating greater perceived choice, preference matching, or self-expression.

Results

Confirming our manipulation, participants in the large choice set condition felt that they had more choice ($M = 7.71$, $SD = 1.53$) than participants in the small choice set condition ($M = 4.25$, $SD = 1.89$), $t(345.50) = 19.15$, $p < .001$, $d = 2.01$, 95% confidence interval (CI): [1.76, 2.26].² As predicted, participants in the large choice set condition also thought they had better matched their preferences ($M = 7.19$, $SD = 1.66$) compared with those in the small choice set condition ($M = 5.03$, $SD = 2.35$), $t(323.65) = 10.06$, $p < .001$, $d = 1.06$, 95% CI [.84, 1.28], and that their choices were more self-expressive ($M = 4.61$, $SD = 2.13$) than those of

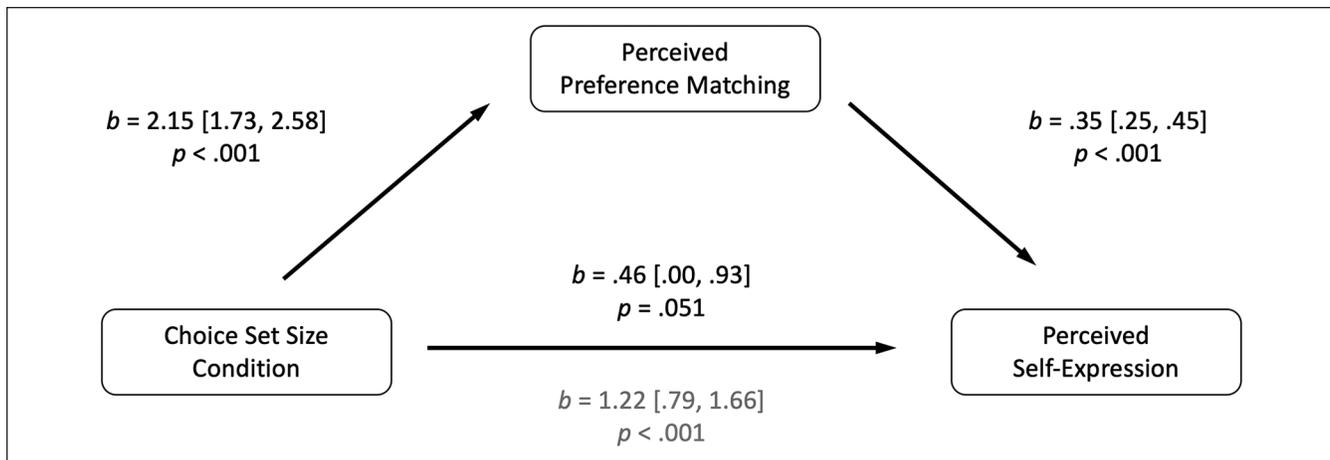


Figure 1. Mediation analysis in Study 1.

Note. Coefficients are unstandardized. The total effect of choice set size on self-expression is shown in gray. Condition coded 0 = small choice set; 1 = large choice set.

participants in the small choice set condition ($M = 3.39$, $SD = 2.10$), $t(360) = 5.50$, $p < .001$, $d = .58$, 95% CI [.37, .79].

To test our hypothesis that perceived preference matching mediates the effect of choice set size on perceived self-expressiveness, we conducted a bootstrap mediation analysis with 5,000 samples using Hayes' (2013) PROCESS macro for SPSS. Reported preference matching significantly mediated the effect of choice set size on perceived self-expression, indirect effect = .76, 95% CI [.52, 1.05] (see Figure 1).

Discussion

The results of Study 1 support our hypothesis that having more options makes choices feel more self-expressive. We also found that this effect was mediated by participants' perception that they had better matched their preferences after choosing among more alternatives. Of course, this mediation analysis is correlational, but our findings are in line with what we would expect if perceived preference matching at least partly explained the effect of choice set size on self-expression. Continuing our exploration of self-expression and perceived preference matching, in the next study, we attempted to replicate the effects of Study 1 in a context in which having more options did not actually afford choosers a better opportunity to match their preferences.

Study 2

In Study 1, participants who chose from the larger set had a better chance of matching their preferences because there was a wider array of potentially appealing options. In fact, it appears almost normative that choices are more self-expressive in cases where they may indeed be more reflective of choosers' tastes. But what about situations where larger assortments do not provide a better opportunity to match preferences? The addition of unappealing alternatives to a

choice set may not alter the perceived expressiveness of choice or may even make choices feel *less* self-expressive by restricting choosers' sense of decision freedom. For instance, Steiner (1970) and Brehm and Cohen (1962) proposed that adding unwanted alternatives makes choosers feel more constrained because they do not feel free to choose inferior options.

In contrast to these possibilities, we expected larger choice sets to increase perceived self-expression even when some alternatives were relatively unappealing. We hypothesized that, because choice set size is so intimately linked to preference matching (at least in Western cultural contexts; e.g., Markus & Schwartz, 2010; Schwartz & Cheek, 2017), participants would *perceive* that they had better matched their preferences when choosing among a greater number of alternatives even when the added alternatives afforded no better opportunity to match preferences. This study was pre-registered through AsPredicted.org (<https://aspredicted.org/re2jt.pdf>).

Method

Participants. We aimed to recruit 390 participants using CloudResearch (Litman et al., 2017) to collect data through Mechanical Turk (MTurk), with the goal of achieving a final sample of at least 352 based on the power analysis from Study 1. In total, 389 participants completed the study, of whom 352 met the inclusion criteria described in Study 1.

Materials and procedure. Participants were shown a list of fictional Italian restaurants and asked to indicate where they would want to eat. For each restaurant, we provided information regarding the restaurant's name, quality (number of stars out of five), price (number of dollar signs out of five), parking availability (free, meter, or paid parking garage), and whether the restaurant took reservations. Participants in the

small choice set condition ($n = 174$) chose from a set of three options, whereas participants in the large choice set condition ($n = 178$) chose from a set of 20 options.

All three options in the small choice set condition received five stars and one dollar sign (i.e., were high-quality and very affordable), offered free parking, and accepted reservations. The additional 17 options in the large choice set condition were all worse on at least one dimension—they had a lower rating, were more expensive, offered less convenient parking, and/or did not accept reservations. In other words, the three options in the small choice set dominated the alternatives added to create the large choice set. Thus, the additional options in the large choice set were not expected to better match participants' preferences than those already available in the small choice set.

After choosing a restaurant, participants completed the two-item manipulation check ($\alpha = .86$), the two-item measure of perceived preference matching ($\alpha = .88$), and the four-item measure of self-expression ($\alpha = .95$) used in Study 1.

Results

Seven participants (4%) presented with the large choice set chose one of the (presumably dominated) options exclusive to that set. Assuming that a comparable 4% presented with the small choice set would have preferred one of the alternatives only available in the larger set, we deviated from our preregistered analysis to exclude 4% of participants ($n = 7$) with the lowest scores on the preference matching dependent variable in the small choice set condition. That is, 4% of participants in the large choice set condition may have matched their preferences better by choosing options exclusive to that set, and because of random assignment to condition, we can assume that approximately 4% of participants in the small choice set condition would similarly have better matched their preferences with those additional options. To avoid the potential for lower average perceptions of self-expression in the small set condition to be driven by those participants who would have better matched their preferences in the large set, we excluded the seven participants in the small choice set condition with the lowest 4% of preference matching scores from analyses. (See Supplemental Material for preregistered analyses, which do not properly account for the potential of the options to have better-matched participants' preferences, but nonetheless produce the same pattern of results.)

Confirming our manipulation, participants in the large choice set condition felt they had more choice ($M = 6.53$, $SD = 1.93$) than participants in the small choice set condition ($M = 3.11$, $SD = 1.97$), $t(343) = 16.27$, $p < .001$, $d = 1.75$, 95% CI [1.50, 2.00]. As predicted, participants in the large choice set condition thought that they had better matched their preferences ($M = 7.31$, $SD = 1.55$) than those in the small choice set condition ($M = 5.94$, $SD = 1.84$), $t(325.32) = 7.47$, $p < .001$, $d = .81$, 95% CI [.59, 1.03], and that their choices were more self-expressive ($M = 5.02$, $SD = 2.20$)

than those of participants in the small choice set condition ($M = 3.71$, $SD = 2.21$), $t(343) = 5.49$, $p < .001$, $d = .59$, 95% CI [.38, .81]. As in Study 1, reported preference matching significantly mediated the effect of choice set size on perceived self-expression, indirect effect = .69, 95% CI [.46, .98] (see Figure 2).

Discussion

Participants in Study 2 reported greater preference matching when they chose from a larger assortment, although the chosen options were also available in the smaller choice set. This illusory perception of better preference matching may, in turn, help explain why choosers felt their choice was more self-expressive even when the additional (and dominated) options afforded no better chance to match their preferences.³ Taken together, our first two studies demonstrate that a greater number of options can make choice feel more self-expressive, regardless of whether a larger assortment actually allows for improved preference matching or not. The two studies also show that the effect of choice set size on self-expression generalizes across differently structured sets, such as those with mostly attractive options versus those with dominant options (see, for example, Jessup et al., 2020, on “uniform” vs. “exponential” distributions). The next two studies explore potential boundary conditions by testing whether choice domain and cultural context moderate the proposed effect of choice set size on self-expression.

Study 3

Choices in utilitarian domains, which are largely instrumental, are typically less expressive than choices in more hedonic domains (Bearden & Etzel, 1982; Shavitt, 1990). Choice set size may therefore be less likely to shape self-expression in more utilitarian domains relative to more hedonic domains.

As a preliminary investigation of this idea, we conducted two pilot studies in which we sampled two utilitarian, relatively unexpressive domains (Dhar & Wertenbroch, 2000)—pens and vacuums (additional piloting confirmed these domains are perceived as relatively unexpressive; see Supplemental Study 2). In the first pilot, 252 MTurk participants were randomly assigned to choose a pen from either 3 or 30 options. We observed no significant difference in perceived self-expression between the small and large choice set size conditions, $t(250) = 1.22$, $p = .225$, $d = .15$, 95% CI [-0.09, .40]. In the second pilot, 250 MTurk participants were randomly assigned to choose a vacuum from either 3 or 30 options. Again there was no significant difference in perceived self-expression between conditions $t(248) = .74$, $p = .458$, $d = .09$, 95% CI [-0.15, .34]. For this latter domain, we further ruled out the possibility that participants simply did not think they had better matched their preferences when offered the larger set. In a follow-up pilot, 262 participants were again randomly assigned to choose from either 3 or 30

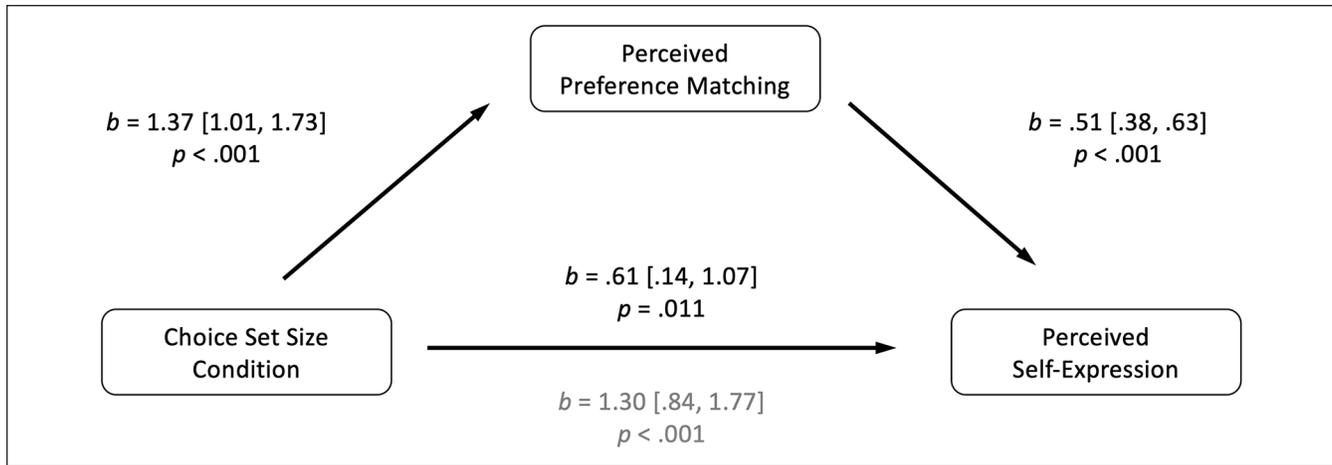


Figure 2. Mediation analysis in Study 2.

Note. Coefficients are unstandardized. The total effect of choice set size on self-expression is shown in gray. Condition coded 0 = small choice set; 1 = large choice set.

vacuums, but this time they reported how well they matched their preferences. Participants in the large choice set condition indeed thought they had better matched their preferences, $t(224.75) = 7.15, p < .001, d = .90, 95\% \text{ CI } [.64, 1.16]$. Full details for the pilot studies are available in Supplemental Material (see Supplemental Studies 3–5).

The preceding results provide initial evidence that choice set size may not affect perceived self-expressiveness in relatively unexpressive domains. But perhaps we happened to recruit participants in these pilots who, for whatever reason, did not generally see their choices as expressive. A cleaner test would be to randomly assign participants to choose from either a small or a large set of options in either a relatively hedonic or a utilitarian domain. Accordingly, participants in Study 3 were assigned to choose among either 3 or 30 vacuums or movies (see Supplemental Study 2 for piloting on perceived domain expressiveness). This study was preregistered through AsPredicted.org (<https://aspredicted.org/aw8gm.pdf>).

Method

Participants. Unsure of what effect size to predict, we aimed to recruit 800 participants through MTurk to be able to reliably detect moderate to large effects. In total, 801 participants completed the study, of whom 699 met the same inclusion criteria from previous studies and were included in the analyses. This sample size allows for an 80% chance of detecting an effect as small as $\eta_p^2 = .01$.

Materials and procedure. Participants were randomly assigned to one of four conditions in a 2 (choice set size: 3 vs. 30) \times 2 (domain: movies vs. vacuums) design. The small choice set comprised 3 options that were randomly selected from the larger set of 30 for each participant. The choice sets

included vacuums that varied along multiple dimensions (e.g., weight and surface for use) or movies of different genres (e.g., horror, comedy, and drama). Thus, for both vacuums and movies, the larger choice sets offered many more options and a greater chance at preference matching than the smaller choice sets. After making their choice, participants completed the two-item manipulation check of perceived amount of choice ($\alpha = .86$) and four-item measure of self-expression ($\alpha = .94$) used in previous studies.

Results

Manipulation check. We first conducted a 2 (choice set size) \times 2 (choice domain) analysis of variance (ANOVA) on the manipulation and confirmed a significant main effect of choice set size, $F(1, 695) = 780.98, p < .001, \eta_p^2 = .53, 90\% \text{ CI } [.49, .56]$. There was no significant main effect of choice domain, $F(1, 695) = 3.01, p = .083, \eta_p^2 = .00, 90\% \text{ CI } [.00, .02]$, and no interaction between choice set size and domain, $F(1, 695) = 1.42, p = .234, \eta_p^2 = .00, 90\% \text{ CI } [.00, .01]$. Thus, participants in the large choice set condition felt that they had more choice than participants in the small choice set condition in both the movie domain ($M_{\text{large}} = 8.12, SD_{\text{large}} = 1.26$ vs. $M_{\text{small}} = 4.62, SD_{\text{small}} = 1.97$), $t(695) = 20.49, p < .001, d = 1.55, 95\% \text{ CI } [1.38, 1.72]$ and the vacuum domain ($M_{\text{large}} = 8.19, SD_{\text{large}} = 1.18$ vs. $M_{\text{small}} = 4.97, SD_{\text{small}} = 1.78$), $t(695) = 19.02, p < .001, d = 1.44, 95\% \text{ CI } [1.28, 1.61]$.

Self-expression. To test our main prediction, we next conducted a 2 \times 2 ANOVA on perceived self-expression. Consistent with our expectations, there was a significant main effect of domain, $F(1, 695) = 70.87, p < .001, \eta_p^2 = .09, 90\% \text{ CI } [.06, .13]$, indicating that participants who chose a movie thought their choice was more self-expressive than

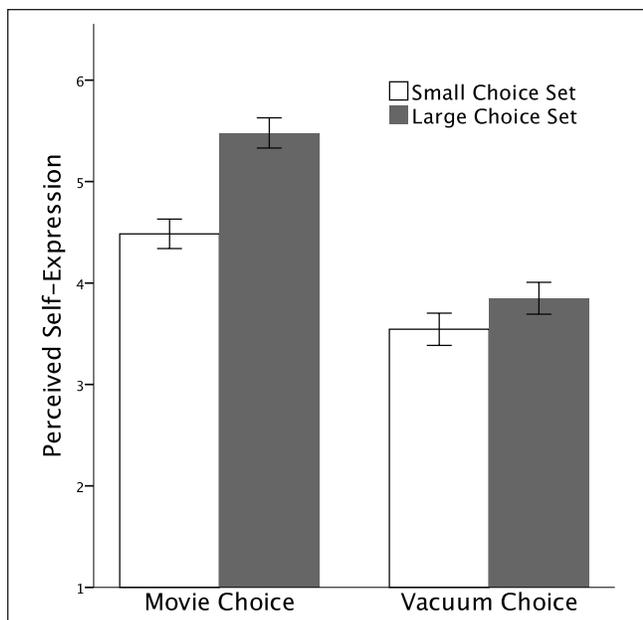


Figure 3. The effect of choice set size and choice domain on self-expression in Study 3.

Note. Error bars represent the standard error of the mean.

participants who chose a vacuum ($M_{\text{movie}} = 4.96$, $SD_{\text{movie}} = 1.99$ vs. $M_{\text{vacuum}} = 3.70$, $SD_{\text{vacuum}} = 2.10$). There was also a significant effect of choice set size, $F(1, 695) = 18.13$, $p < .001$, $\eta_p^2 = .03$, 90% CI [.01, .05], indicating that participants who chose from larger sets thought their choice was more self-expressive than those who chose from smaller sets ($M_{\text{large}} = 4.64$, $SD_{\text{large}} = 2.17$ vs. $M_{\text{small}} = 4.02$, $SD_{\text{small}} = 2.07$).

Importantly, the effect of choice set size was qualified by a significant interaction with choice domain, $F(1, 695) = 5.09$, $p = .024$, $\eta_p^2 = .01$, 90% CI [.00, .02]. In the movie domain, participants in the large set condition thought their choice was significantly more self-expressive ($M = 5.48$, $SD = 1.93$) than participants in the small set condition ($M = 4.48$, $SD = 1.94$), $t(695) = 4.58$, $p < .001$, $d = .35$, 95% CI [.20, .50]. In contrast, in the vacuum domain, the difference in perceived self-expression between the large ($M = 3.85$, $SD = 2.09$) and small ($M = 3.54$, $SD = 2.10$) choice set conditions was smaller and not significant, $t(695) = 1.42$, $p = .155$, $d = .11$, 95% CI [-.04, .26] (see Figure 3).

Discussion

Whereas Studies 1 and 2 showed that larger choice sets render choices more self-expressive, Study 3 provided evidence for an important boundary condition. In domains in which choices have little expressive value, as is often the case with utilitarian domains, having more options may not affect the perceived self-expressiveness of choice. Indeed, despite the much larger choice set and the ability to better match their

preferences (as evidenced by Supplemental Study 5), participants who chose among 30 vacuums did not find their choice significantly more self-expressive than participants who chose among only 3 vacuums. Having established choice domain as a potential moderator of our effect, we now turn to a second potential boundary condition: cultural context.

Study 4

Thus far, our theoretical analyses of choice set size, preference matching, and self-expression have largely emerged from models of agency common to Western cultural contexts (Kitayama & Uchida, 2005; Markus & Schwartz, 2010; Schwartz & Cheek, 2017). This perspective may not apply as well to other, non-Western cultural contexts. For instance, in Indian cultural contexts, choices may not be seen as emerging from personal preferences to the same extent as in the United States—in fact, personal preferences may often not even be constructed prior to choice in India (Savani et al., 2008). Thus, it is possible that, in an Indian cultural context in which choices are less about individual goal pursuit than about conforming to others' expectations and norms, choice set size has less of an effect on perceived self-expression than in the United States. Study 4, which was not preregistered, tested this possibility.

Method

Participants. We initially recruited 956 participants from the United States and India through MTurk with the goal of obtaining a sample size of at least 850 participants to detect small to moderate interaction effects. However, prior to conducting our main analyses, we observed that only 551 participants passed the attention check measures and confirmed that they did not respond randomly. Consequently, we recruited an additional sample of 853 participants (oversampling participants from India because they were more likely to fail attention check measures) to achieve our target sample size. To be included in analyses, participants had to pass two instructional manipulation checks, report that they had not responded randomly, and report that they were fluent in English. Furthermore, they had to confirm their country of residence (i.e., United States for U.S. participants and India for Indian participants). In total, 1,053 participants of the 1,809 recruited met all criteria and were included in the analyses. This sample size allows for an 80% chance of detecting an effect as small as $\eta_p^2 = .008$.

Materials and procedure. Participants chose a vacation destination they would want to travel to from either a set of 30 destinations or a subset of 3 destinations randomly selected for each participant from the larger set of 30. All destinations were outside the United States and India. After making their choice, participants completed the two manipulation check questions about the perceived amount of choice ($\alpha = .85$)

Table 1. Descriptive Statistics for U.S. and Indian Participants.

Measure	Small choice set condition			Large choice set condition		
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>
Manipulation Check						
India	250	6.16	2.00	253	7.77	1.29
United States	278	5.81	1.88	272	8.43	.92
Perceived Self-Expression						
India	250	7.01	1.33	253	7.11	1.26
United States	278	5.44	1.92	272	5.99	1.73

and the four self-expression questions ($\alpha = .93$) used in previous studies.

Results and Discussion

Descriptive statistics are presented in Table 1.

Manipulation check. We conducted a 2 (United States vs. India) \times 2 (small choice set vs. large choice set) ANOVA on the measure of perceived choice. There was a main effect of choice set size such that participants felt they had more choice in the large choice set condition than in the small choice set condition, $F(1, 1049) = 470.52, p < .001, \eta_p^2 = .31, 90\% \text{ CI } [.27, .34]$. There was no main effect of country, $F(1, 1049) = 2.76, p = .097, \eta_p^2 = .00, 90\% \text{ CI } [.00, .01]$, but there was a significant interaction between choice set size condition and country, $F(1, 1049) = 26.87, p < .001, \eta_p^2 = .02, 90\% \text{ CI } [.01, .04]$. Although participants in both countries felt that they had substantially more choice in the large choice set condition, the difference between conditions was larger for participants from the United States, $t(1049) = 19.44, p < .001, d = 1.20, 95\% \text{ CI } [1.07, 1.33]$, than for participants from India, $t(1049) = 11.42, p < .001, d = .71, 95\% \text{ CI } [.58, .83]$. Most important, though, is that the manipulation of choice set size was effective in both cultural contexts.

Self-expression. We conducted a 2 \times 2 ANOVA on the perceived expressiveness of choices. Replicating our previous studies, there was a main effect of choice set size, $F(1, 1049) = 11.01, p = .001, \eta_p^2 = .01, 90\% \text{ CI } [.00, .02]$, such that participants thought their choices were more expressive in the large choice set condition. Interestingly, there was also a main effect of cultural context on perceived self-expression, $F(1, 1049) = 186.60, p < .001, \eta_p^2 = .15, 90\% \text{ CI } [.12, .18]$ such that participants from India thought their choices were more expressive than participants from the United States. This is somewhat unexpected because preferences and choices are thought to be seen as less connected in an Indian cultural context than a U.S. cultural context. However, it is difficult to compare ratings across cultural contexts where people may use response scales and reference points

differently (e.g., Kitayama, 2002). For example, vacation choices may generally be seen as more expressive in India than in the United States, or perhaps the options on our Likert-type scale were perceived a bit differently in India and in the United States. Our main analyses of interest, therefore, focus on the effect of choice set size within each context.

Importantly, there was also a significant interaction between choice set condition and country, $F(1, 1049) = 5.46, p = .020, \eta_p^2 = .01, 90\% \text{ CI } [.00, .01]$. Looking at the effect of choice set condition separately in the U.S. and Indian samples reveals that U.S. participants thought their choices were more self-expressive in the large choice set condition than in the small choice set condition, $t(1049) = 4.09, p < .001, d = .25, 95\% \text{ CI } [.13, .37]$, whereas the difference in perceived self-expression between choice sets was smaller and nonsignificant for the Indian participants, $t(1049) = .68, p = .498, d = .04, 95\% \text{ CI } [-.08, .16]$. The effect of choice set size on the perceived expressiveness of choice thus may not extend to an Indian cultural context.

Discussion

The results of Study 4 suggest a second boundary condition for the effect of choice set size on self-expression—cultural context. Although participants in the United States felt their choice was more self-expressive when choosing from a larger assortment, participants in India felt their choice was equally as self-expressive regardless of choice set size. Future research, across domains and cultural contexts, will help elaborate and deepen our understanding of cultural differences in choice set size and self-expression, but for now, at least in the domain of international vacation choice, it appears our effects may not necessarily generalize to some non-Western societies.

Having explored our proposed effect in Studies 1 and 2 and boundary conditions in Studies 3 and 4, we turned in the next study to how self-expression relates to choice satisfaction.

Study 5

Study 5 explored whether, advancing beyond a typical focus on preference satisfaction-based utility, self-expression provides a novel lens through which to understand the effect of having more options on choice satisfaction. Participants were randomly assigned to choose from either a set of 3 or 12 restaurants. To control for the possibility that having more options objectively afforded better potential preference satisfaction, the larger set included the three options from the small set and nine additional, unappealing alternatives (following the logic of Study 2). We tested whether self-expression would mediate the effect of choice set size on choice satisfaction even when accounting for choosers' perception that having more options provided a better opportunity to satisfy their preferences. This study

was preregistered through AsPredicted.org (<https://aspredicted.org/ue7y2.pdf>).

Method

Participants. We aimed to recruit 600 participants from MTurk to achieve a final sample of at least 506, which provides an 80% chance of detecting an effect of $d = .25$ with $\alpha = .05$. To be included in the analyses, participants had to pass two instructional manipulation checks and confirm that they did not respond randomly. We further excluded five participants from the small choice set condition based on our preregistered analysis plan (see Results section). In total, 600 participants completed the study, of whom 566 met the inclusion criteria and were included in the analyses.

Materials and procedure. Participants first read that they were going to make a restaurant choice, after which they were told that they should take the choice seriously because we would select some participants to receive an additional bonus compensation to allow them to eat at the restaurant in their area that was most similar to their choice. At the end of the study, five participants were indeed randomly chosen to receive a bonus US\$25.

Next, participants were shown a list of fictional Italian restaurants and asked to indicate the restaurant at which they would most like to dine. We adapted the restaurant options from Study 2, in which the larger choice set included the options from the smaller choice set alongside additional unappealing options, in three ways. First, instead of providing information about the pricing of each restaurant, we added a new “average customer rating,” and specified that the star rating present in Study 2 was an “average critic rating.” We did this to prevent participants from simply choosing the most expensive restaurant to maximize their additional compensation. Second, we provided only 12 options in the large choice set condition to decrease the likelihood that some participants would choose options exclusive to the larger set, as some did in Study 2. Third, one of the three options in the small choice set condition was made inferior to the other two (lower critic and customer ratings, and no reservations possible). We did this to ensure that there were dominant options in both the small and the large choice sets, thereby reducing the likelihood that any effect of choice set size emerged from an “attraction effect” (Huber et al., 1982) caused by the dominated options in the large choice set.

After choosing a restaurant, participants completed the two-item manipulation check measure about perceived choice ($\alpha = .76$) and the four-item self-expression measure ($\alpha = .95$) from previous studies. Participants also completed a two-item measure of the extent to which they perceived the options in the choice set capable of satisfying their preferences (e.g., “To what degree do the restaurant options we provided include the features you typically look for in a restaurant?,” $\alpha = .90$) and a one-item measure of choice

Table 2. Descriptive Statistics From Study 5.

Measure	Small choice set condition		Large choice set condition	
	M	SD	M	SD
Manipulation Check	3.40	1.59	5.76	1.93
Perceived Preference Satisfaction	4.97	1.85	5.76	1.89
Perceived Self-Expression	3.46	2.03	3.98	2.12
Choice Satisfaction	6.24	1.83	7.11	1.84

satisfaction (“How satisfied are you with your choice?”). All questions were answered on 1- to 9-point Likert-type scales.

Results

Five (2%) participants presented with the large choice set chose one of the options exclusive to that set. As in Study 2, we assumed that a comparable 2% presented with the small choice set would have preferred one of the alternatives only available in the larger set. We therefore excluded 2% of participants ($n = 5$) with the lowest scores on the preference satisfaction dependent variable in the small choice set condition to rule out any effect of objective preference satisfaction.

Descriptive statistics for Study 5 are presented in Table 2. Confirming our manipulation, participants in the large choice set condition felt they had more choice than participants in the small choice set condition, $t(548.11) = 15.88, p < .001, d = 1.33, 95\% \text{ CI } [1.15, 1.51]$. As predicted, participants in the large choice set condition also thought that their choices were more self-expressive, $t(564) = 2.97, p = .003, d = .25, 95\% \text{ CI } [.08, .41]$, and that the array of choices had the potential to better satisfy their preferences, $t(564) = 5.02, p < .001, d = .42, 95\% \text{ CI } [.26, .59]$. Finally, participants reported higher satisfaction with their chosen option in the large choice set condition, $t(564) = 5.61, p < .001, d = .47, 95\% \text{ CI } [.30, .64]$.

To test whether self-expression provides a novel pathway linking choice set size and choice satisfaction, we used Hayes’ (2013) PROCESS macro to conduct a bootstrap mediation model with 5,000 samples including perceived self-expression and perceived preference satisfaction as mediators, choice set size as the predictor, and choice satisfaction as the outcome. As shown in Figure 4, both perceived self-expression and perceived preference satisfaction mediated the effect of choice set size on choice satisfaction.

Discussion

Study 5 showed that self-expression is a novel link between choice set size and satisfaction, thereby broadening perspectives on choice sets and satisfaction that focus more narrowly on perceptions of preference satisfaction (Loewenstein, 1999). In our final study, we further explored the potential downstream consequences of increased self-expression.

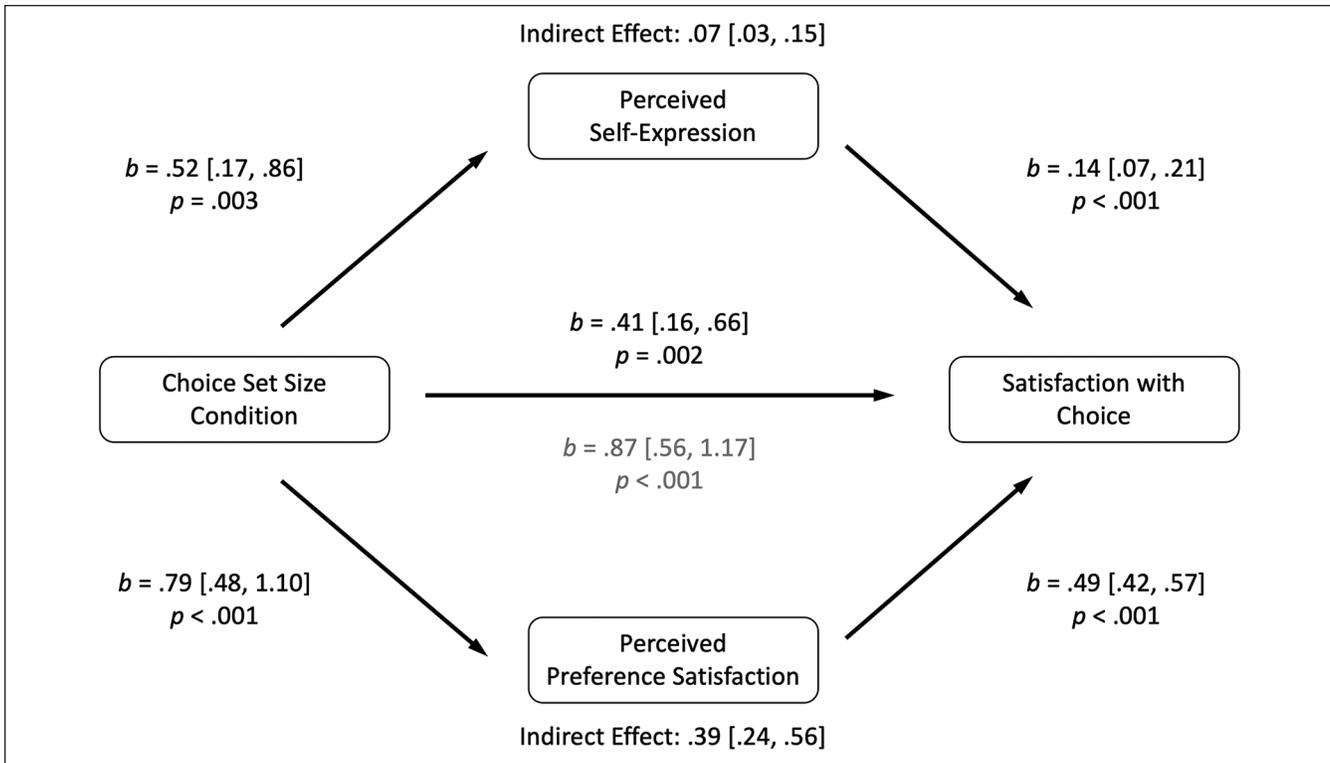


Figure 4. Multiple mediation analysis predicting choice satisfaction in Study 5.

Note. Coefficients are unstandardized. Total effect is shown in gray. Condition coded 0 = small choice set; 1 = large choice set.

Study 6

In Study 6, we tested two novel predictions about the effects of choice set size that emerge from our proposal that having more options makes choices feel more self-expressive. First, we tested the hypothesis that larger choice sets would make choices feel more important (Krijnen et al., 2015; Sela & Berger, 2012). When choices say more about the self, the stakes are raised—even trivial choices may now feel like consequential decisions. Accordingly, we predicted that participants would feel that their choices were more important when choosing from a larger choice set and that this effect would be mediated by perceived self-expression.

Second, we tested the hypothesis that choice set size may affect choosers' intentions to share their choice publicly. Because it was ecologically appropriate given the choice provided to participants in this study (which YouTube video to watch, described below), we operationalized public sharing as sharing through social media. Social media is a widespread forum used by billions of people around the world to express themselves by sharing content—including information about purchases and other choices—that reflects facets of their identity (e.g., de Vries et al., 2017; Herhold, 2019; Pounders et al., 2016; Taylor et al., 2012). We predicted that having more options would increase people's proclivity to share their choices on social media and that this increase would be mediated by perceived self-expression.

In this study, participants chose a YouTube video to watch from a set of either 2 or 10 options. We used YouTube videos as a choice domain because such choices are relatively trivial—the video is over quickly and is unlikely to have any serious or lasting consequences for the chooser. As a result, if having more options makes video choices feel more important, it would appear that having more options can raise the perceived stakes of even relatively trivial decisions because they become statements about the self. Moreover, sharing YouTube videos through social media is both common and ecologically valid. Finally, because participants actually watched their chosen video prior to completing the dependent measures, we were able to study a consumed (vs. hypothetical) choice. This study was preregistered through AsPredicted.org (<https://aspredicted.org/vq68p.pdf>).

Method

Participants. Using the power analysis from Study 5, we aimed to recruit 600 participants through Prolific. In total, 594 participants completed the study, of whom 517 met the inclusion criteria from Study 5 and confirmed that they had watched their chosen video.

Materials and procedure. Participants were presented with a list of YouTube videos and instructed to choose one to watch in the next part of the study. For each video, a picture was

Table 3. Descriptive Statistics From Study 6.

Measure	Small choice set condition		Large choice set condition	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Manipulation Check	3.29	1.66	6.93	1.74
Perceived Self-Expression	4.24	2.04	5.11	1.77
Perceived Decision Importance	4.36	2.15	4.79	2.10
Social Media Sharing Likelihood	3.27	2.54	4.15	2.79

displayed that showed the same information present when the video appears in the search results from YouTube (i.e., the video title, length, a thumbnail image, and a brief description). Below this information appeared the title and genre of the video to aid participants' selection. Participants in the large choice set condition ($n = 261$) chose from 10 video options: two comedy sketches from the TV show *Saturday Night Live*; three music videos of different genres (country, hip-hop, and classical); the trailer for the movie *Joker*; a clip from the movie *Pretty Woman*; a compilation of great sports moments; an arts-and-crafts tutorial; and a celebrity gossip news report. Participants in the small choice set condition ($n = 256$) chose from a subset of two options randomly selected for each participant from the larger set of 10.

After making their choice, participants advanced to a new page to watch their chosen video; they could not continue further until an amount of time at least equal to the length of their chosen video had elapsed. Participants then completed the same two-item manipulation check about the perceived amount of choice ($\alpha = .89$) and four-item measure of self-expression ($\alpha = .93$) used in previous studies. Participants also completed a two-item measure of perceived decision importance (e.g., "How important did your decision seem?"; $\alpha = .84$) from Sela and Berger (2012) and indicated the likelihood of sharing their chosen video on social media ("How likely would you be to share the video you chose on social media?"). All questions were answered on 1- to 9-point Likert-type scales with higher numbers indicating greater perceived choice, self-expression, decision importance, or likelihood of sharing on social media.

Results

Descriptive statistics for Study 6 are presented in Table 3. Confirming our manipulation, participants in the large choice set condition felt they had more choice than participants in the small choice set condition, $t(515) = 24.31, p < .001, d = 2.14, 95\% \text{ CI } [1.92, 2.35]$. As predicted, participants in the large choice set condition also thought that their choices were more self-expressive, $t(502.13) = 5.17, p < .001, d = .46, 95\% \text{ CI } [.28, .63]$, and more important, $t(515) = 2.32, p = .021, d = .20, 95\% \text{ CI } [.03, .38]$. Finally, they reported being more likely to share their chosen option on social media, $t(512.20) = 3.72, p < .001, d = .33, 95\% \text{ CI } [.15, .50]$.

To test our hypotheses that perceived self-expression would mediate the effect of choice set size on perceived decision importance and social media sharing likelihood, we conducted two bootstrap mediation analyses with 5,000 samples—one with each of the two measures of interest as the outcome. Perceived self-expression mediated the effect of choice set size on both perceived decision importance, indirect effect = .51, 95% CI [.31, .73], and social media sharing, indirect effect = .46, 95% CI [.27, .68] (see Figures 5 and 6).

Discussion

The results of Study 6 provide support for our hypothesis that larger choice sets increase social media sharing likelihood. Of course, we only measured self-reported intent to share the video on social media, and thus future research should replicate our findings with behavioral measures of sharing. Nonetheless, research shows that self-reported intent is a relatively accurate reflection of actual online sharing (Mosleh et al., 2020). We further found that larger sets increased the perceived importance of choices, even when choices are merely about what short YouTube video to watch. Finally, perceived self-expression mediated the effect of choice set size on both outcomes. Our correlational evidence is consistent with the hypothesis that larger sets increase public sharing and perceived importance in part because choices from larger sets feel more like reflections of the self.

General Discussion

Across six studies, we investigated whether having more options makes choices feel more self-expressive. In Study 1, participants perceived choices from a larger set to be more self-expressive, and this effect was mediated by perceived preference matching. Interestingly, participants who chose among more options also thought their choices were more self-expressive in Study 2, although the additional options did not better match their preferences. Indeed, participants appeared to have the *illusion* of better matching their preferences, despite choosing the same options chosen by those presented with the smaller set. Thus, having more options makes choices feel more self-expressive even when additional options are unappealing or unchosen.

Studies 3-6 explored boundaries and implications of the effect of choice set size on perceived self-expression. Study 3 showed that, in a domain where choice lacks expressive value (a utilitarian choice among vacuum cleaners), having more options did not affect perceived self-expression. Study 4 found that a greater number of options increased the perceived self-expression of choice in a U.S. context but did not have that effect on choices made by participants in India. Thus, our proposed effect may also be specific to cultural contexts with more independent models of agency and choice. In Study 5, we found that self-expression mediates the effect of choice set size on satisfaction even when

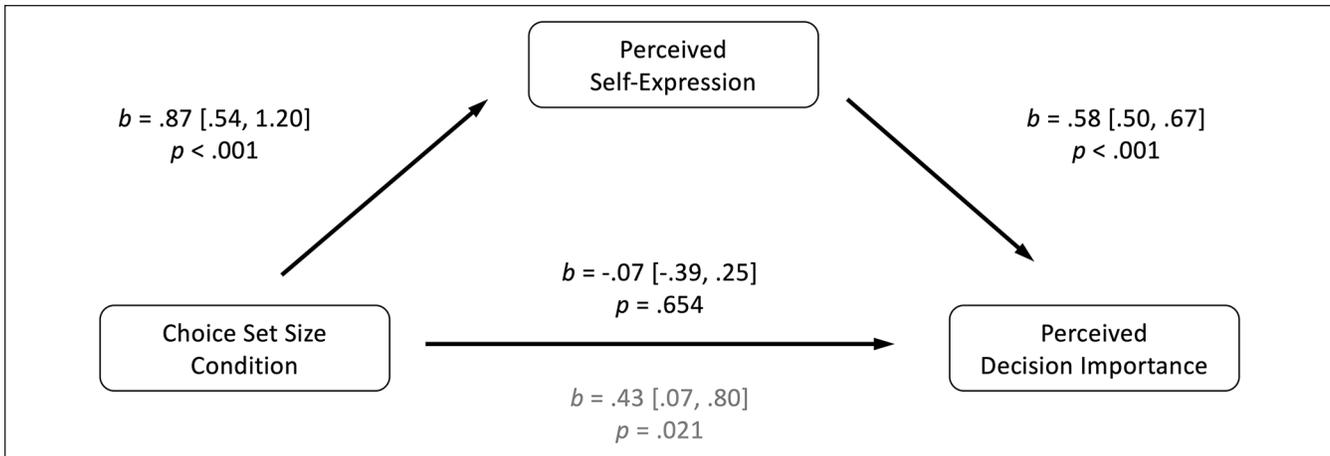


Figure 5. Mediation analysis predicting decision importance in Study 6.

Note. Coefficients are unstandardized. Total effect is shown in gray. Condition coded 0 = small choice set; 1 = large choice set.

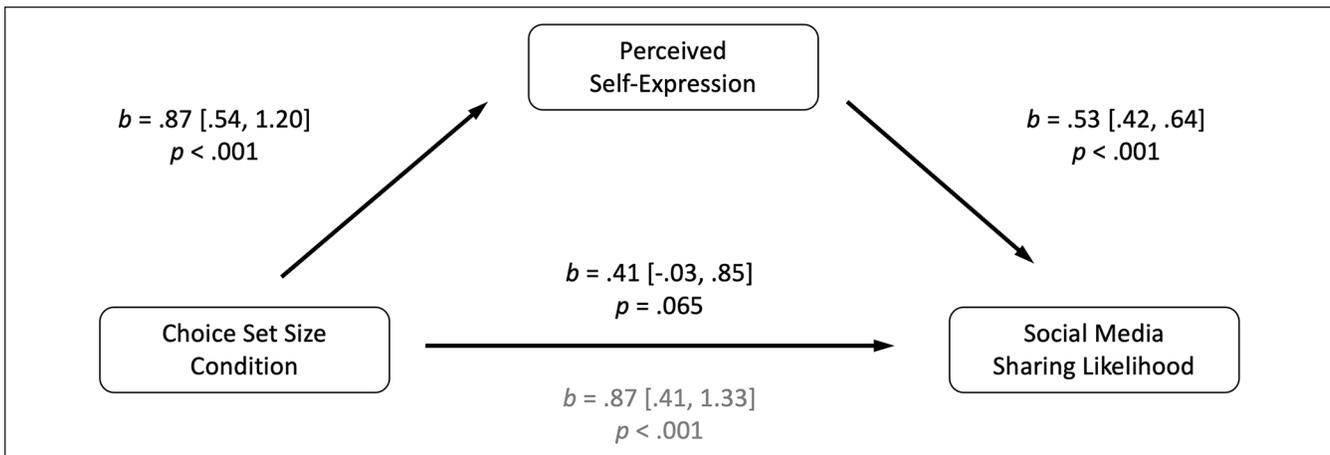


Figure 6. Mediation analysis predicting social media sharing likelihood in Study 6.

Note. Coefficients are unstandardized. Total effect is shown in gray. Condition coded 0 = small choice set; 1 = large choice set.

accounting for perceived preference satisfaction. Finally, Study 6 showed that larger choice sets increase public sharing and perceived decision importance. Predictions about these latter two outcomes were generated from our theory of choice set size and self-expression; in line with our thinking, self-expression mediated the effect of choice set size on both outcomes.

Implications and Future Directions

The present research contributes to a growing literature on factors that influence the degree to which people see their choices as self-expressive (e.g., Rozenkrants et al., 2017; Sela et al., 2017; Touré-Tillery & Fishbach, 2015). Drawing from this existing literature, we focused on the hypothesis that people perceive their choices from larger sets to better match their preferences, thereby feeling a greater sense of

self-expression. Other possible mechanisms for increases in self-expression could also be explored. For instance, when choosers encounter more alternatives during choice, they leave a greater number of options *unchosen*, and what is unchosen may say quite a bit—such as when a consumer forgoes cheaper appliances to choose one that is more costly but also more environmentally friendly. As long as many options in a larger set are appealing to many choosers, it is also true that a given choice from a larger set will be more *distinctive*. If there are only two options, many choosers will make the same choice. But if there are dozens, choosers will make more varied choices, which may also increase the perceived expressive meaning of choices.

Many previous theoretical treatments of choice set size have taken a cognitive perspective that highlights the potential cognitive burden of having to search through and compare a large assortment of alternatives (Dhar, 1997; Dhar &

Nowlis, 1999; Tversky & Shafir, 1992). Indeed, if there are too many options, that burden may be too high, and people may prefer not to choose at all (Dhar, 1997; Tversky & Shafir, 1992), especially if they encounter a particularly daunting visual array of options (Townsend & Kahn, 2014) or if they are prone to exhaustively comparing all alternatives (Cheek & Schwartz, 2016; Schwartz et al., 2002). In our work, we brought a more social psychological perspective to the question of choice set size and proposed that, by increasing self-expressiveness, larger assortments may increase satisfaction. This previous cognitive work, however, suggests that there may be a tipping point at which larger choice sets are so overwhelming or inspire so much comparison and cognitive load that they begin decreasing satisfaction.

An overload perspective presents an interesting question for future research about self-expression—when choice sets are overwhelmingly large, do choices still feel more self-expressive than those made from more moderate sets? It may be that at some point, choosers feel their choice loses self-expressive value with the addition of further alternatives because they feel unable to make a careful choice (or perhaps simply give up and choose at random). On the other hand, it may be that a paradox of sorts emerges whereby people feel their choice is more self-expressive and yet also feel less positively about that choice.

Consideration of previous choice overload work also raises the question of how our results shed new light on existing findings. For example, a classic finding in the choice overload literature is that people are more likely to defer choice when facing many options (e.g., Iyengar & Lepper, 2000), and previous research shows that people are more likely to defer choices that feel more important (Krijnen et al., 2015). The fact that having more options make choices feel more self-expressive, and thus raises the stakes because they feel more important, may further explain why having more options increases choice deferral (possibly in addition to increased decision conflict, decision costs, etc.). When choice becomes more expressive, even trivial decisions may pose an increased burden—having many options may suddenly make many previously mundane choices feel like more important choices about the self. Future research should thus continue to explore the benefits *and* the costs to having more options through the lens of self-expression.

Limitations and Constraints on Generalizability

When thinking about the generalizability of our effects, it is useful to consider the assumptions underlying our theory and studies—namely, that *choices are seen as expressing the self* and that *preferences are seen as guiding choices*. If these assumptions do not hold, then our effects may not generalize. For example, as Study 3 showed, there are likely to be

important differences across domains and having more options in unexpressive domains may not make choices feel more self-expressive. Individuals also vary in the extent to which they attend to the expressive value of choice; we would expect, for example, that individuals low in self-monitoring (Snyder, 1974) or low in public identity orientation (Cheek & Cheek, 2018) may not see their choices as particularly self-expressive and would thus be less affected by choice set size.

Similarly, the proposed effects may not hold in cultural contexts in which choices, preferences, and self-expression are not so tightly linked. In Study 4, we found that choice set size did not influence the perceived expressiveness of choice among Indian participants. Social class may also moderate the effect of choice set size on self-expression. Indeed, in a working-class cultural context, one may be less prone to think of choice as a vehicle for individual self-expression. Rather, interdependent norms and models of agency may push choices to be more aligned with those of peers (Stephens et al., 2007). Future research should move beyond the online convenience samples used in the present research to build a more complete picture of how choice set size and self-expression relate in more diverse samples and varied cultural contexts.

Conclusion

“Sometimes a cigar is just a cigar,” Sigmund Freud is reported to have quipped about his theory of the rich symbolism that marks our dreams and other unconscious processes (though according to Elms, 2001, there is no evidence that Freud ever said it). A major lesson of the studies reported here is that, although sometimes a drink is only a drink, a movie is only a movie, and a YouTube video is only a YouTube video, when people confront large choice sets, drinks, movies, and videos (and many other choices) may become statements about the self. And when choices become statements about the self, people may be both more likely to share their decisions publicly and more likely to see even trivial decisions as important. By considering the self-expressiveness of choice, we can better understand the effects of choice set size as well as other important aspects of the decisions we make throughout everyday life.

Declaration of Conflicting Interests

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ORCID iD

Nathan N. Cheek  <https://orcid.org/0000-0003-3515-4141>

Supplemental Material

Supplemental material is available online with this article.

Notes

1. Power analyses for Studies 1, 2, 5, and 6 were conducted using the “pwr” package (Champely, 2020) and power analyses for Studies 3 and 4 were conducted using G*Power (Faul et al., 2007).
2. Where degrees of freedom are fractionated, variances differed between conditions, so we used Welch’s *t* test. In no case did this substantively change the significance of differences.
3. It is possible that, by asking participants how much choice they had as a manipulation check, we inadvertently created a demand effect, leading them to focus more on assortment size than they might otherwise have. We conducted a replication of Study 1 ($n = 267$) with one key change: the manipulation check items were presented on a separate page after the main dependent measures. We found the same pattern of results despite this change in procedure (see Supplemental Study 1 for details).

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