Bundle Selection and Variety Seeking: The Importance of Combinatorics

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When consumers select bundles of goods, they may construct those sequentially (e.g., building a bouquet one flower at a time) or make a single choice of a prepackaged bundle (e.g., selecting an already-complete bouquet). Previous research suggested that the sequential construction of bundles encourages variety seeking. The present research revisits this claim and offers a theoretical explanation rooted in combinatorics and norm communication. When constructing a bundle, a consumer chooses among different choice permutations, but when selecting amongst prepackaged bundles, the consumer typically considers unique choice combinations. Because variety is typically overrepresented among permutations compared to combinations, certain consumers (in particular, those with similar attitudes toward items that could compose a bundle) are induced by these different numbers of pathways to variety to display more or less variety-seeking behavior. This is in part explained by the variety norms communicated by different choice architectures, cues most likely to be inferred and used by those who are indifferent between the potential bundle components and thus looking for guidance. Across 5 studies in the main text and 11 in the web appendix, this article tests this account and offers preliminary exploration of newly identified residual effects that the pathways-to-variety account cannot explain.

Keywords: product bundles, choice, offer framing effect, combinatorics, relative preferences

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Even when consumers have favorites, they may still want to mix things up. Taco Tuesday is the highlight of some consumers' week, but few of them eat tacos for every meal. With repetition, consumers experience diminished marginal utility. This is why people tend to find less satisfaction in the twenty-first Swedish Fish than the first (Galak, Redden, and Kruger 2009; Jung, Gonzalez, and Critcher 2020; Ratner, Kahn, and Kahneman 1999; Redden 2008). Anticipating this, consumers add variety to what they consume (Inman 2001; McAlister 1982; Menon and Kahn 1995) and even how they make choices (Drolet 2002; Kim and Drolet 2003).

Consumption and choice are frequently separated in time (Read and Loewenstein 1995). For example, grocery store purchases are essentially choices for eating later in the week. Two psychological mechanisms can lead consumers to prefer more variety at the time of choice than what they would ultimately prefer at the time of consumption. One mechanism rests on the phenomenon that two

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points in the future seem subjectively closer to each other today than they ultimately will feel. Due to this *time contraction*, people overestimate how long it will be before they will be ready to consume their most preferred option again (Read and Loewenstein 1995). Taco Tuesday fans underestimate how ready they will be for Taco Thursday. Second, when choosing multiple options at a single point in time, people fail to appreciate that although they are considering all of these selections at a single time when choosing, they will actually consume them in distinct, individual episodes. This is a demonstration of *broad choice bracketing* (Read, Loewenstein, and Rabin 1999; Simonson 1990; Simonson and Winer 1992): when all the choices are considered together, the same psychology that discourages people from consuming too much of the same item at once may encourage people to seek more variety for consumption down the road. But given that one's entire grocery cart will not be consumed in one sitting, broad choice bracketing may encourage more diversity of choice than is ultimately desired at the time of consumption.

Although there is often a delay between when one selects a bundle of goods and when one ultimately consumes that bundle, note that the very selection of a bundle can also occur all at once (as when a consumer selects a preassembled six-pack of beer) or sequentially and thus with small temporal separations between each choice (as when a consumer builds that six-pack herself). Given these two distinct choice architectures—one that requires the selection of a *prepackaged* bundle and one that requires the actual *construction* of a bundle—do not place different demands on people's ability to forecast their future preferences, then neither time contraction nor choice bracketing would be able to explain why consumers may differ in their preferences for variety in these two contexts. But across four experiments, Mittelman et al. (2014) provided evidence that constructing bundles through multiple, sequential choices (like the shopper building her own six-pack) encourages the selection of bundles with more variety in comparison to what is selected from prepackaged bundles (like the shopper choosing among preassembled six-packs). Although their work was intriguing (and certainly a primary motivation behind our own work), it remains unclear why this *offer framing effect* (OFE) occurs.

In this article, we seek to better understand why the way that bundles are selected may invite consumers to select more or less variety. Though let us foreshadow that this explanation will be multi-layered. We will begin by considering that the OFE may not (or may not only) reflect a consequence of constructing bundles sequentially as opposed to choosing among prepackaged bundles. Instead, we will appeal to combinatorics to highlight a feature of choice architectures that is often confounded with whether a bundle is constructed by consumers or preassembled. At that point, we will posit two reasons—one of which lends itself more naturally to direct empirical test—why this feature may change consumers' selection of variety. Through this process, we will identify and (partially) explain why it is for certain types of consumers and certain bundle selection contexts that the bundle selection method is especially likely to induce more or less selection of variety.

PATHWAYS TO VARIETY

In the casino die game craps, players take turns shooting (throwing) two dice. If a player throws a 1 and a 3, this is called an "easy 4." But when a player throws a 2 and a 2, this is called a "hard 4." In this purely stochastic game, a player is more likely (twice as likely, in fact) to achieve a 4 by throwing two different numbers than by throwing the same number twice. This is because there are multiple pathways to variety (the first throw can be either a 1 or a 3), but only a single way by which a no-variety 4 can be achieved. In craps parlance, it is easier—that is, there are more pathways to get there—to throw a 1 and a 3 than a 2 and a 2. We introduce this analogy because the sequential construction of a bundle is analogous to throwing dice one at a time (by which more pathways to variety often exist; 2 out of 3 in the above example), whereas the consideration of a prepackaged bundle is like observing the outcome of the multi-die roll (for which the number of high-variety dice throws is proportionately reduced to 1 out of 2 in the above example).

Now consider a consumer who wishes to purchase a bouquet of flowers. If he wishes to construct a bouquet of two tulips and two roses, there are six different ways to achieve that outcome. In the language of combinatorics, there are 6 unique permutations (of 16 total, 2^4) of 2 tulips and 2 roses: $4!/(2! \times 2!)$. But constructing a bouquet with no variety—much like achieving a hard 4—can occur in fewer (in this example, only 2) ways. One must either repeatedly select tulips or repeatedly select roses. This means that when choosing sequentially, there are many distinct pathways that produce a high-variety bundle, but many fewer that produce an unvaried bundle. As the craps jargon reflects, sequential choice quite literally makes it easier to achieve variety.

In contrast, when selecting among prepackaged bundles, one typically observes unique combinations, not all the possible permutations that could define them. To extend the craps analogy, the shooter observers one of two outcomes (1 and 3, 2 and 2) without a straightforward way to differentiate the unique permutations of "1 and 3" from "3 and 1." To return to the bouquets, a florist might have on display the five different combinations of tulips and roses that could compose them (i.e., bouquets with 0, 1, 2, 3, or 4 tulips). But it is unlikely that the florist would show the 16 unique permutations that could emerge. This means that variety would be relatively underrepresented among the

permutations that choosers of prepackaged bundles see. In our preferred language, we would say that constructing the bundle oneself offers more pathways to variety than does choosing among prepackaged bundles.

Although those constructing bundles themselves often confront more pathways to variety than do those selecting among prepackaged bundles, note that this need not necessarily be the case. For example, if the florist did offer the 16 unique permutations of roses and tulips instead of merely the 5 unique combinations, then it would no longer be the case that those constructing the bundles themselves would have more pathways to variety. Similarly, if the florist first had sequential choosers seed their bouquets with a starter set of two tulips or two roses (because, after all, every possible bouquet has at least two flowers of one of the two types), then the proportion of pathways that lead to variety would be reduced. Our studies will exploit this reality: although each choice architecture—the sequential construction of a bundle oneself or the selection of a prepackaged bundle—often offers a greater or smaller proportion of pathways to variety in practice, this need not be the case.

HOW PATHWAYS TO VARIETY MAY GUIDE CHOICE

If the OFE is in part a pathways-to-variety effect, then this naturally leads to the question of why pathways to variety would influence choice of variety. We suspect this phenomenon is multiply determined. In fact, as we will first argue, basic properties of how choices are psychologically enacted almost guarantee there will be some stochastic component of choice that leads to some spreading across available alternatives. Empirically attributing spreading to this type of error is difficult. Instead, we will test for several symptoms that would be consistent with a more trivial sort of randomness that we do not think drives the effects, the sort of pure randomness that would be reflected in, say, blindfolded participants' patterns of choices. But we also argue that normative information may be communicated by the choice architectures themselves, which may be detected and relied upon by those who may most need and want external guidance on how to make a decision. We proceed by unpacking both of these routes.

Making a choice allows for the expression of a preference (O'Donnell and Evers 2019; Reibstein, Youngblood, and Fromkin 1975; Von Neumann and Morgenstern 1944). One selects A over B to the extent one expects A to offer more utility than B, or when $EU(A) > EU(B)$. Of course, such attempts at utility maximization are prone to error. Such error could be systematic and thus foreseeable: For example, people may decide to (A) take instead of (B) forgo that second piece of apple pie *a la mode*, for they tend to fail to appreciate just how uncomfortably full taking option A over option B will ultimately leave them. But other errors are more variable.

As one considers available options, one recruits information in support of each choice. Although this consideration process is in part a deterministic recruitment of preexisting preferences, it includes a stochastic (epsilon) component as well. Drift diffusion models offer formal descriptions of this process, which have been applied to consumer-relevant choices (Krajbich, Armel and Rangel 2010). Decision-makers internally accumulate information in support of one option or another until a threshold is met, thereby triggering the decision (Ratcliff, Smith, Brown and McKoon 2016). But this process is noisy and partly guided by stochastic processes. Especially when one's true preferences between options are close to indifferent, the decision-maker is more likely to be ultimately swayed to select one option or another by this random component (Konovalov and Krajbich 2019). This logic applies to a choice made at a single point in time (as one does when selecting among prepackaged bundles) or through a sequence of choices (as when constructing a bundle).

Even if the stable component of one's preference for A is slightly stronger than the stable component of one's preference for B, one may still select B over A if the unstable, partly stochastic component tips the scales in the other direction. This stochastic component can arise at various stages (Loomes 2005)—influencing what aspect of one's own stable preferences one consults, the final determination of one's expected utility for an outcome, or one's translation of one's expected utility into an external expression (e.g., a choice)—all of which add some variability to statements of preference. After all, when preferences are measured, test–retest reliability essentially never reaches 1.00. That there is variability and uncertainty in how true preferences translate into external expression of preferences (e.g., choice, ratings) has been used to explain and thus reinterpret apparent preference reversals (Alós-Ferrer, Granić, Kern, and Wagner 2016) and post-choice dissonance (Chen and Risen 2010).

Now let us return to the person who is constructing the bouquet of roses and/or tulips. Most obviously, the person who is closer to indifferent between the two flowers is more likely to select a varied bouquet. Conversely, the chooser who cherishes roses but is uninterested in tulips is relatively less likely to select a varied bouquet. More generally, people should be more likely to select a varied bouquet to the extent that they do not have a strong preference for one type of flower over the other. This part is straightforward and intuitive.

But more central to our predictions, our account posits that those who have a less clear preference for one flower or the other should be those whose selections of variety will be more influenced by the number of pathways to variety the choice architecture offers. One reason is due to the stochastic-based logic advanced above. That is, the less

that stable preferences push for the selection of one bundle component over another ("Do I want my bouquet's third flower to be a rose or a tulip?"), the more room there is for the stochastic component of preferences to encourage consumers to spread their selections among the available options. This alone is sufficient to predict that the greater number of pathways to variety that sequential choice typically offers should be particularly influential for those who are closer to indifferent between the bundle options. This means that those who are more torn between options should not only be more likely to select more varied bundles, but more importantly, be even more likely to select more varied bundles when there are more pathways to variety.

Of course, the influence of this stochastic process is just that, a random perturbation that is likely to affect people with less well-defined preferences. As a result, it is not straightforward to definitively prove that the stochastic component of preference expression is determinative, as it is primarily suggested by the absence of other causes. Thus, a second proposal—and one we can more directly document—identifies one such cause that may supplement the influence of stochastic processes. More specifically, we propose that the choice architecture itself may communicate information about whether the selection of variety is normative. Furthermore, this external cue may be of special interest to those whose decisions receive less clear guidance from their own internal preferences.

Norms carry with them a *descriptive* component (i.e., what we expect others to do) as well as an *injunctive* component (i.e., what others expect us to do; Cialdini, Reno, and Kallgren 1990). Norms can gain their power over behavior, or become *normative*, because people expect them to be followed. In some contexts, norm violation can carry real or anticipated consequences (Bicchieri 2016). For example, restaurant-goers are subject to a strong social norm not to match their tablemates' orders, meaning those who order last often end up choosing meals that are not what they would have chosen otherwise, in an effort to conform to the norm (Ariely and Levav 2000; Quester and Steyer 2010).

But even without any coercive threat of sanction, norms can provide useful guidance. For this reason, norms have been discussed as conventions, consensually endorsed information that can facilitate social functioning and even simple choices (Anderson and Dunning 2014). When a bartender asks whether a daiquiri is wanted "up or on the rocks," the unopinionated patron may look for signs in the bartender's tone itself or may even follow up with a question about how people usually order it, to infer what is normative and thus advisable. In that sense, norms are functional. As Cialdini et al. (1990, 1015) argued, by registering norms, people "can usually choose efficiently and well." As a result, norms are especially influential in contexts in which one's judgments and decisions cannot simply be informed by objectively defensible details of what is right, but instead by more subjective conclusions like what should be valued (Kaplan and Miller 1987).

To follow a norm, one must know what the norm is. Norms are communicated and perceived (or misperceived) based on the beliefs and behaviors of others. A norm can be explicitly communicated to consumers by someone (e.g., a helpful waiter, an experimenter) who can indicate what people tend to choose (Schram and Charness 2015). In some research, there is simply an assumption that the most commonly observed behaviors are indeed those that are normative (Cialdini et al. 1990; and in the context of variety-seeking, Read and Loewenstein, 1995). That said, Prentice and Miller (1993) call into question this assumption. After noting that it is rarer for researchers to directly measure perceptions of norms, they show consumers can frequently find themselves in a state of *pluralistic ignorance*, unaware that they are wrong in believing themselves to be members of the minority. Based on their (mis)perceptions of what others find normative, some people are induced to conform to those perceived norms. Thus, even though norm detection can be difficult or ambiguous (Berkowitz 2003; Neighbors et al. 2008), the combination of what one expects others to do and one's second-order beliefs about what others expect of us converge to identify what is normative (Bicchieri 2016).

In the context of our own work, we consider that certain consumers—especially those who feel relatively indifferent between the options that can compose bundles—may be interested in deferring to (perceived) norms when making their selections. Without the ability to observe others' behavior directly, such consumers may look to the choice architecture itself to infer what is normative. For these consumers, the number of pathways to variety offered may be an informative cue as to how much variety they may want to select. Fox, Ratner, and Lieb (2005) considered a similar possibility in the context of partition dependence—that is, whether choice sets were partitioned into more ("fruits" and "vegetables") or fewer ("fruits and vegetables") categories. They speculated that such partitioning may influence choice due to the norms they communicate, but they did not measure this possibility directly.

That the number of pathways to variety may itself cue a norm for variety would be loosely consistent with Gricean maxims for communication (Grice 1975). The maxim of relevance suggests that communicators supply information because it matters to the interaction at hand. Relatedly, the maxim of quantity suggests that communicators only communicate as much information as is required to make their point, and no more than that. By extension, the choice architect may be assumed to offer more ways to achieve a varied (as opposed to an unvaried) bundle because the selection of variety is of particular interest and thus normative. Those interested in deferring to such a norm may both be sensitive to such cues and be swayed by them. Getting

closer to the present context, Reit and Critcher (2020) found that consumers believe that the more shelf space that is devoted to a specific product, the more often people buy that product. This offers one illustration of how the choice *set* can guide inferences about norms. We go a step further in suggesting that a shift in the choice *architecture*—in particular, whether it offers more pathways to variety—may offer a cue to a variety norm. Thus, the consumer who is relatively indifferent between the potential bundle components may be swayed by the number of pathways to variety not merely due to the stochastic component that influences choice, but because they will be more sensitive to external cues (due to their own internal indifference) as to what is normative.

RELATION TO PREVIOUSLY DOCUMENTED PHENOMENA

Previous work has found that as the composition of a response set changes—even in arbitrary ways—judgments and decisions shift to spread across them (Benartzi and Thaler 2001; Fox et al. 2005). In a classic example, survey respondents reported vastly reduced TV-watching habits when selecting their daily viewing patterns from among shorter options instead of longer options; Schwarz et al. 1985). Of course, most people do not carefully track their viewing habits, so the different response ranges may provide some respondents with seemingly meaningful information about how to translate their own subjective self-knowledge ("I'm pretty sure I watch less TV than do others I know. . .") into an objective amount (". . .so I'm probably in one of those smaller categories.") Whether (at least some) consumers are similarly likely to show analogous evidence of spreading across available options when there are no longer demands on one's memory and a more straightforward way to express oneself (the preference for an all-rose bouquet prompts the selection of an all-rose bouquet) is therefore unclear.

There is some evidence that this spreading phenomenon extends to choice. Benartzi and Thaler (2001) identified how it applied to investment decisions. As retirement providers offered different sets of funds that skewed toward riskier versus safer options, they found investors continued to spread their money relatively evenly across the available choices. This meant that investors seemed to follow something of a $1/n$ rule, placing $1/n$ of their money in each of n funds. Such decisions did not reflect stable attitudes about risk, but instead a tendency for choices to conform to the distributions of available choices. Of course, in this version of spread, choosers were essentially permitted to avoid making a choice. They declined to favor one fund over another.

In the contexts we study, this pattern would merely predict selecting a bundle that is defined by maximal variety. When consumers construct their bundles sequentially or choose among prepackaged bundles, they have the potential to arrive at the same bundles. And if they wish to follow a simple rule like $1/n$, they each have the same opportunity to do that (and choose high variety, as a result). Instead, we recognize that choice architectures differ in the number of pathways available to reach the same (varied) bundle. These pathways to variety are hypothesized to lure some to select more variety.

OVERVIEW OF THE PRESENT STUDIES

In study 1, we had participants select a bundle by constructing it sequentially or choosing among prepackaged donation bundles. By tweaking each selection method, we were able to unconfound these two bundle selection methods from the number of pathways to variety offered. Study 2 moved to a new bundling context and expanded (from 2 to 3) the number of options that could define each component of a bundle to again test whether the number of available pathways to variety helped to explain why constructing bundles sequentially invites more variety seeking than choosing among prepackaged bundles. Study 3 (and a direct replication) tested whether the OFE—the greater choice of variety when constructing a bundle sequentially as opposed to choosing among prepackaged bundles—was indeed driven by those who were relatively indifferent between the potential bundle components (two flavors of jellybeans). Furthermore, the study tested whether this is merely because the relatively indifferent give little thought to the decision.

Study 4 used a bouquet-selection paradigm that unconfounded the bundle selection method (constructed vs. prepackaged) from pathways to variety to test whether pathways to variety, in particular, change the perception of a variety norm. We tested whether such perceptions statistically mediate the effects of pathways to variety on choice of variety. Finally, study 5 assigned participants to sequentially construct or choose among prepackaged bundles of M&M's whose components could vary on an attribute for which people tend to have preferences (filling) or between which they are relatively indifferent (color). We examined whether in the latter case in particular, consumers look to choice architecture to infer a variety norm that may then especially guide their choices.

Ten additional studies in the web appendix provide additional support for the pathways-to-variety account (studies A1–A2 and C), provide a causal replication of a key correlational finding in study 3 (study B), offer a validation of study 5's manipulation (study C), probe more deeply previously published evidence that questions the importance of the pathways-to-variety account in explaining the OFE (studies D1–D3 and E), and attempt to gain initial insight into the emergence of a *reverse* OFE we uncovered in

certain contexts after equating pathways to variety (studies F and G). All studies in the main text and the web appendix were preregistered. Our data, materials, and preregistration documents—including *a priori* exclusion criteria—can be found online at the OSF project page for this article: https://osf.io/ms23d/ (last accessed May 6, 2022).

STUDY 1

Study 1 was inspired by a paradigm introduced by Mittelman et al. (2014, experiment 3) to test the OFE. But crucially, it introduces two new conditions that unconfound the manner in which a bundle is selected (constructed vs. prepackaged) from the number of pathways to variety each choice architecture offers. In the present study, participants had the opportunity to make three small, 5-cent donations to one of two charities: Doctors Without Borders (DWB; D) or Save the Children (STC; S). Each individual donation was of course relatively small, but we informed participants of the total sample size so they would appreciate that collectively their choices would have impact. Furthermore, previous research has found that research participants care about 5-cent charitable donations, finding them affectively rewarding (prompting ratings, on average, above 5 on a 1 [weak]-to-7 [strong] happiness scale) and consistently so (without habituation) across multiple 5-cent donations (O'Brien and Kassirer 2019).

Some participants selected among the four unique combinations of prepackaged bundles (DDD, DDS, DSS, SSS), 50% of which contained variety. Other participants constructed the bundles sequentially and thus confronted eight unique pathways, 75% of which led to variety. Only two (25%) of the pathways led to an unvaried bundle: DDD or SSS. These bundle conditions, which we call *prepackaged* and *constructed*, respectively, mirror those used in Mittelman et al. (2014, experiment 3).

We introduced two new conditions that led participants to choose among prepackaged bundles or to construct bundles sequentially, but with modifications that offered relatively more or fewer pathways to variety, respectively. In a new *expanded prepackaged* condition, we retained one feature of the prepackaged condition (i.e., making a single selection among prepackaged bundles) but increased pathways to variety to match the constructed bundle condition. We did this by providing every unique bundle permutation (e.g., DSD, SDD, SDS, and SSD) instead of only the unique bundle combinations. This meant that, like in the constructed condition, 75% of pathways led to variety.

In a new *restricted constructed* bundle condition, we took advantage of the fact that every three-item bundle that can draw on two unique options must include at least two identical components. As such, we first had participants select two donations to the same charity. In this way, when participants were selecting their third and final donation, they were making a choice that would create a high-variety bundle (by selecting the other charity) or a low-variety bundle (by selecting the same charity again). In other words, just as in the original prepackaged bundle condition, only 50% of pathways led to variety (thereby matching the prepackaged condition). See figure 1 for a visualization of the pathways to variety available to participants in each bundle condition.

We expected that those in the constructed bundle condition would create more varied bundles than those in the prepackaged bundle condition choose. If our pathways-to-variety account at least partially explains the OFE, we should observe two additional effects. First, those in the expanded prepackaged condition should choose *more* variety than those in the standard prepackaged condition. Second, those in the restricted constructed bundle condition should settle on *less* variety than those in the standard constructed bundle condition. As promised, we ended up donating over $100 to these charities on participants' behalf.

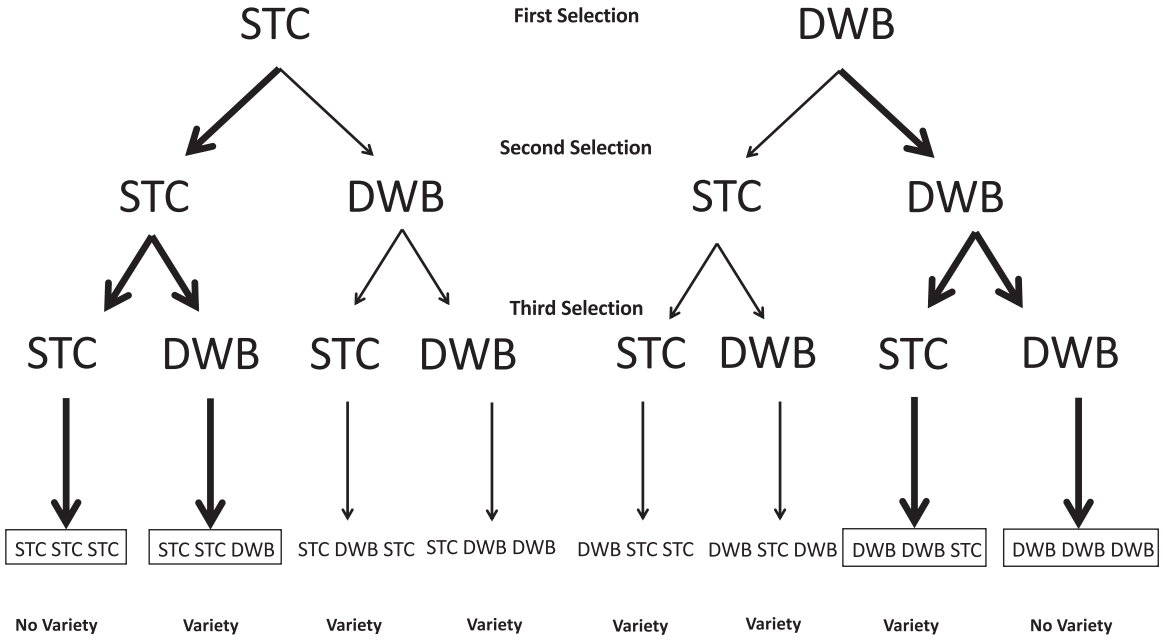
Methods

Participants and Design. Eight hundred fifteen Americans were recruited from Amazon Mechanical Turk (AMT). All had a prior approval rating of at least 95%. Participants were randomly assigned to one of four conditions: constructed, prepackaged, restricted constructed, or expanded prepackaged. Thirty-one responses came from workers who completed the study more than once. Twenty-nine participants responded incorrectly to an attention check item that asked them to identify their favorite member of the Beatles (all participants were instructed to select "Ringo"). After the exclusion of these participants' responses from further consideration, data from the remaining 755 participants are included in all analyses reported below.

Procedure. We explained to participants that they were one of at least 800 taking part in a study that would decide how to allocate donations between two charities. Participants learned that they would be responsible for deciding to which of two charities—DWB and/or STC—three 5-cent donations would go. Those in the constructed bundle condition formed their donation bundle by selecting three logos from a set of six DWB and six STC logos. Each selection was for a 5-cent donation, which meant they constructed their 15-cent donation bundle through three iterative choices. Those in the prepackaged bundle condition selected among the four unique combinations of DWB and STC logos that can form three-logo bundles. Participants in the restricted constructed bundle condition had to first decide whether to make two, five-cent donations to DWB or STC before making a decision to make the third donation to the same or the other charity. Those in

FIGURE 1

AN ILLUSTRATION OF THE PATHWAYS TO VARIETY AVAILABLE TO PARTICIPANTS IN ALL FOUR CONDITIONS IN STUDY 1. WHEREAS ALL BUNDLES IN THE BOTTOM ROW WERE PRESENTED IN THE EXPANDED PREPACKAGED CONDITION, ONLY THE BOXED BUNDLES WERE AVAILABLE IN THE PREPACKAGED CONDITION. THE CHOICE PATHWAYS FOR THE RESTRICTED CONSTRUCTED CONDITION PARTICIPANTS ARE REPRESENTED BY THE HEAVIER ARROWS, WHEREAS ALL PATHWAYS WERE AVAILABLE TO THOSE IN THE CONSTRUCTED CONDITION. PARTICIPANTS SAW THE ACTUAL LOGOS FOR THE CHARITIES.



the expanded prepackaged bundle condition directly selected among all eight permutations of donation bundles (see figure 1 for a visualization of the pathways to variety available to participants in each condition). After completing their bundle selection, participants completed an attention check item and some brief demographic questions (OSF page). Finally, participants received a link that would allow them to verify that their donation bundle had actually been transmitted to the charity by the promised date.

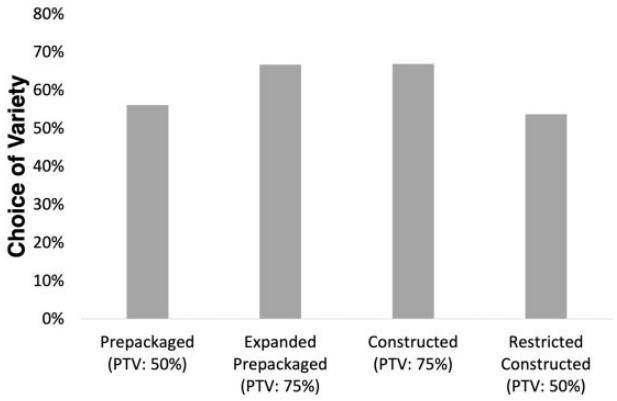
Results and Discussion

First, we classified participants' selections in terms of whether their donation bundle included variety (donations to both charities) or not (donations to only one charity). Preferences for variety significantly varied by condition, $\chi^2(3, N = 755) = 11.40$, $p = .010$ (figure 2). To begin to decompose this effect, we conducted two contrasts that offered omnibus tests of the OFE (constructed vs. prepackaged conditions) as well as the pathways-to-variety effect (more vs. fewer pathways to variety). First, more participants chose variety when three-quarters of pathways led to variety than when only half of them did, $z = 3.33$, $p = .001$. But those who constructed their bundles themselves were no more likely to select variety than those who chose among prepackaged bundles, $z = -0.35$, $p = .724$.

We deconstruct these effects further by examining a series of comparisons that would allow us to more precisely test for evidence of the pathways-to-variety account across conditions. First, those in the (standard) constructed bundle condition were more likely to create a varied bundle (66.85%; 123/184) than those in the prepackaged condition who selected among the four unique combinations of donations (56.08%; 106/189), $\chi^2(1, N = 373) = 4.56$, $p = .033$. This comparison confounds the bundle selection method and the pathways to variety. Second, we found that those who confronted the expanded set of prepackaged bundles—thereby choosing among prepackaged bundles that offered more pathways to variety—were more likely to select a variety of charities (66.67%; 128/192) compared to those in the standard prepackaged condition, $\chi^2(1, N = 381) = 4.50$, $p = .034$. Those in the constructed and expanded prepackaged bundle condition displayed a statistically indistinguishable preference for variety, $\chi^2 < 1$. Third, our restricted constructed bundle condition significantly reduced interest in variety (53.68%; 102/190) compared to the standard constructed bundle condition, $\chi^2(1 N = 374) = 6.76$, $p = .009$. With 50% of their choice pathways leading to variety, restricted constructed bundle

FIGURE 2

PROPORTION CHOOSING VARIETY (I.E., ALLOCATING A PORTION OF THEIR BONUS TO BOTH CHARITIES) IN STUDY 1, BY CONDITION. THE PERCENTAGES IN PARENTHESES REPRESENT THE PROPORTION OF PATHWAYS TO VARIETY (PTV) AVAILABLE TO PARTICIPANTS



participants displayed no more of a preference for variety than those in the standard prepackaged bundle condition, $\chi^2 < 1$.

To determine whether these results may have emerged due to idiosyncratic features of the donation bundle context, we conducted two additional studies that leaned on the bouquet-selection paradigm used by Mittelman et al. (2014, experiment 3). Participants were asked to select a bouquet of three orange and/or yellow roses. In supplemental study A1 ($N = 806$), Americans recruited from AMT were assigned to a constructed, prepackaged, or expanded prepackaged condition. In supplemental study A2 ($N = 1{,}871$), Americans recruited from a sample of Americans managed by Luth Research were assigned to one of those three conditions or a fourth, the restricted constructed condition. Both studies replicated the original OFE (constructed vs. prepackaged) and found support for the pathways-to-variety account. Supplemental study A1 found some evidence of a residual OFE, even once pathways to variety were controlled. Supplemental study A2 found some evidence of a residual *reverse* OFE. In the General Discussion, we will return to a more careful consideration of such residual effects and the circumstances in which they appear to emerge (sometimes in the direction of an OFE, sometimes in the reverse direction).

STUDY 2

In study 1 (and, to foreshadow, our remaining studies), participants selected bundles that could be composed of up to two options. This decision is largely practical: as the number of potential bundle components increase, the number of unique permutations (that would need to be presented in the expanded prepackaged condition) grows exponentially. That said, there is nothing inherent to the pathways-to-variety account that requires bundles be limited to two options. For that reason, we wished to test its robustness by using a three-component context. Participants selected bouquets that could include not only orange and yellow flowers (like in supplemental studies A1 and A2), but red flowers as well.

Study 2 included three conditions: constructed, prepackaged, and expanded prepackaged. In building a three-item bouquet from three colors of roses, note there are no longer 8 (2^3) but now 27 (3^3) unique permutations of bouquets. Furthermore, in this context, the relationship between pathways to variety and amount of variety is no longer monotonic. Once we move to three colors, note there is now a possibility for a no-variety bouquet (all one color), a mid-variety bouquet (two flowers of one color, one flower of a different color), or a high-variety bouquet (one flower of each color). Those choosing among (the unique combinations of) prepackaged bundles will see 30% (3 of 10) one-color bouquets, 60% (6 of 10) two-color bouquets, and 10% (1 of 10) three-color bouquets. In contrast, those constructing the bundles themselves have 11% of pathways (3 of 27) leading to one-color bouquets, 67% (18 of 27) two-color bouquets, and 22% (6 of 27) three-color bouquets (table 1). Although the mid-variety (two-color) bouquets offer a roughly similar proportion of pathways regardless of bundle construction method, those selecting among prepackaged bundles (compared to those in the other two conditions) are offered almost three times as many no-variety pathways but half as many full-variety pathways.

This means that our pathways-to-variety logic suggests that we should mostly clearly see effects of our bundle manipulation in participants' selection of no-variety and high-variety bundles. More specifically, those choosing among prepackaged bundles should be more likely to select a no-variety bundle, but less likely to select a high-variety bundle than those in the other two conditions. The OFE anticipates similar differences between the prepackaged and constructed bundle conditions but does not anticipate that the expanded prepackaged condition should differ from the prepackaged condition. Comparisons between the expanded prepackaged and constructed conditions—for which pathways to variety are equated—would allow for the detection of a residual OFE.

Methods

Participants and Design. Participants were 605 Americans recruited from AMT. Participants were randomly assigned to choose their bundle in one of three ways. *Prepackaged* bundle participants saw the 10 unique combinations of three-rose bouquets that the three unique

TABLE 1

PROPORTION OF PATHWAYS TO NO, MID-, AND HIGH VARIETY IN EACH OF THE THREE BUNDLE CONDITIONS IN STUDY 2

	Amount of bundle variety		
	No variety	Mid-variety	High variety
Constructed	11.1% (3/27 pathways)	66.67% (18/27 pathways)	22.22% (6/27 pathways)
Prepackaged	30% (3/10 pathways)	60% (6/10 pathways)	10% (1/10 pathways)
Expanded prepackaged	11.1% (3/27 pathways)	66.67% (18/27 pathways)	22.22% (6/27 pathways)

colors permitted. *Constructed* bundle participants selected three roses sequentially. Because there were 27 ways by which such sequential selection could proceed, *expanded prepackaged* participants saw the 27 unique permutations of bouquets.

Procedure. Participants were asked to consider that while shopping for flowers, they decided to select a bouquet of three roses from a florist who sells orange, yellow, and red roses. Participants in the *constructed* bundle condition were prompted to choose three roses by dragging and dropping them one at a time from a bank of six red roses, six yellow roses, and six orange roses into a box labeled "Your Bouquet." Participants in the *prepackaged* condition saw 10 complete, non-redundant bundles of roses (i.e., the unique combinations). They selected their bouquet by dragging their chosen bouquet into a box labeled "Your Bouquet." Finally, participants in the *expanded prepackaged* condition saw 27 completed bundles of roses (i.e., the unique permutations available to those in the constructed bundle condition) and made their selection using the same method as those in the prepackaged condition. In all three conditions, the order of the stimuli was randomized. Participants then completed additional measures (gender, liking for roses, frequency of purchasing roses) that were not part of our hypotheses.

Results and Discussion

First, we coded participants' bouquets for whether they contained no variety (all one color), moderate variety (two roses of one color, one of another), or full variety (roses of all different colors). To begin, we found the proportion of those who selected a no-variety bouquet varied by condition, $\chi^2(2, N = 605) = 24.82$, $p < .001$. Consistent with the pathways-to-variety account, more participants selected no variety in the prepackaged bundle condition (108/203, 53.20%) than did those in the expanded prepackaged condition (69/198, 34.85%), $\chi^2(1, N = 401) = 13.69$, $p < .001$, and the constructed bundle condition (62/204, 30.39%), $\chi^2(1, N = 407) = 21.77$, $p < .001$. The expanded prepackaged and constructed bundle participants—who varied in their bundle construction method, but not the proportion of pathways to (no) variety, were similarly likely to select no-variety bundles, $\chi^2 < 1$ (figure 3).

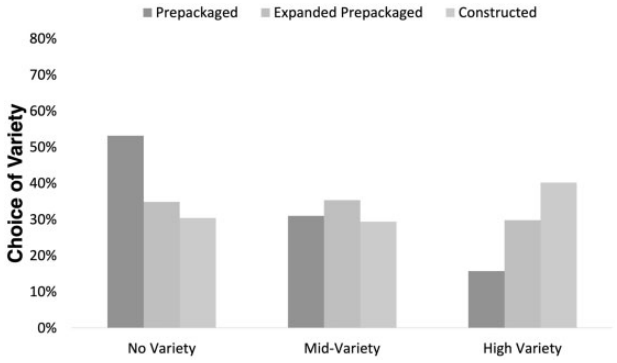
Next, we found that the proportion choosing high variety varied by condition, $\chi^2(2, N = 605) = 29.96$, $p < .001$. As anticipated by the pathways-to-variety account, this pattern largely mirrored that observed in the selection of no variety. Prepackaged bundle participants were less likely to select high variety (32/203, 15.76%) than those in the expanded prepackaged condition (59/198, 29.80%), $\chi^2(1, N = 401) = 11.25$, $p = .001$, as well as those in the constructed bundle condition (82/204, 40.20%), $\chi^2(1, N = 407) = 30.12$, $p < .001$. There remained a residual difference between the expanded prepackaged and constructed bundle conditions, $\chi^2(1, N = 402) = 4.77$, $p = .029$. Although we did not find an analogous difference in our analysis of no-variety bouquets, this reflects a residual OFE even with pathways to variety equated.

Finally, we turned to the selection of mid-variety. This is the choice outcome for which the pathways to variety varied least among the bundle conditions. And indeed, we did not observe a difference among the three conditions, $\chi^2(2, N = 605) = 1.74$, $p = .419$. Future research that uses a much larger sample size may find that this difference would emerge as well, but the pathways-to-variety account does identify it as likely being the smallest effect.

One concern is that our findings presented are consistent not only with our pathways-to-variety account, but with some fraction of participants being disengaged subjects who essentially responded randomly. Mittelman et al. (2014) were also sensitive to this concern and provided evidence that spoke against it: when they varied the distribution of flowers from which participants constructed their bundles (by presenting an unbalanced set of more yellow than orange roses), this did not encourage a greater selection of yellow flowers (as would have emerged from purely random grabs). Although that null effect is reassuring, it cannot definitively speak to the engagement of the participants in our studies. Our subsequent studies will show that this pathways-to-variety effect emerges predictably: for certain participants, in certain contexts, and as a function of certain perceptions.

FIGURE 3

PROPORTION OF PARTICIPANTS WHO SELECTED NO VARIETY, MID-VARIETY (TWO OF ONE COLOR AND ONE OF ANOTHER), AND HIGH VARIETY (THREE DIFFERENT COLORS) IN STUDY 2, BY BUNDLE CONDITION



STUDY 3

By unconfounding the way bundles are selected (constructed vs. prepackaged) from the number of pathways to variety different choice architectures offered, studies 1 and 2 (and A1 and A2) showed that consumers' selection of variety was robustly influenced by the number of pathways to variety choice architectures offered. But might these findings be somewhat artifactual, driven by disengaged participants who responded thoughtlessly to our experimental materials? Study 3 moved to a new choice context (selection of jellybean bundles) but returned to a typical OFE paradigm (by including only a constructed and prepackaged bundle condition). We added two new measures. One assessed whether participants had a relative preference between the two flavors of jellybeans (raspberry and blackberry). The second asked participants to self-report the amount of deliberation they engaged in when making their bundle selection.

First, we predicted that the greater selection of variety in the constructed (compared to the prepackaged) condition would be strongest for those who are relatively indifferent between the two flavors. Mittelman et al. (2014) also hypothesized this pattern of moderation but did not test it. By our reasoning, it is these participants who: (1) should be most influenced by the stochastic component that guides choice and thus be more influenced by the number of pathways to variety and (2) should be most interested in what norms may be communicated by the choice architecture itself. To be clear, it is not until a later study that we directly document this latter pathway, but we remind readers of this here to highlight the logic behind the prediction. But notably, if the OFE is driven by purely random responders, then this would work against our ability to identify this predicted pattern of moderation. That is, purely random responders who show the OFE cannot be counted upon to systematically report the indifferent option on the 5-point scale that captures relative preferences between the potential bundle components.

Second, we were interested in addressing whether it is simply that those who were relatively indifferent would report engaging in less deliberation when selecting the bundle, which might explain the greater OFE they are hypothesized to show. By this concern, the OFE may not be an artifact of random responding, but it may be a particularly fragile phenomenon that only emerges because of disengagement and low deliberation. One might be concerned that those who are relatively indifferent between the bundle components—those hypothesized to show the OFE more clearly—might not approach the choice with more deliberation (to think carefully about what they should choose) but less deliberation (given the final bundles may seem all the same anyway). Although those who engage in less deliberation likely are induced by more pathways to variety to choose more variety, we saw nothing in our logic to suggest that those who engage in more deliberation should not be as well. For that reason, we preregistered that we expected the OFE—and its stronger emergence among the relatively indifferent—should not depend on how much participants report deliberating on their bundle selection.

Methods

Participants and Design. We recruited 2,030 Americans from AMT who had at least a 95% approval rate. Participants were randomly assigned to one of two bundle conditions: prepackaged or constructed. Two hundred thirty participants responded incorrectly to a multiple-choice attention check at the study's conclusion that asked which flavors of jellybeans could compose the bundles (correct response: blackberry and raspberry), yielding a final sample of 1,800 included in all analyses reported below.

Procedure. Participants were told the study related to consumer preferences toward jellybeans. Before conducting the main study, we conducted a pretest ($N = 2{,}062$ Americans from AMT) to identify two flavors of jellybeans that many consumers are relatively indifferent between. Participants saw 10 flavors of jellybeans and ranked them in order from their favorite to least favorite. We calculated the average (absolute value) difference in rankings between all 45 possible pairs of flavors. We selected the two flavors with the smallest such difference: raspberry and blackberry.

In the main study, all participants would select a bundle of three handfuls of jellybeans. Each of the three handfuls could be raspberry or blackberry flavored. Those in the

prepackaged bundle condition saw the four unique bundles that could be created from the two flavors. Those in the *constructed* bundle condition instead added each handful one at a time to their final bundle. Regardless of the choice architecture, each handful of jellybeans was represented by a picture of raspberry or blackberry jellybeans.

Next, participants completed in a random sequence two measures. One measure was designed to identify participants who were relatively indifferent between the two flavors of jellybeans versus those who had a relative preference between them. Participants were asked, "How much do you like raspberry jellybeans relative to how much you like blackberry jellybeans?" Responses were provided on a 5-point scale anchored at −2 (*I greatly prefer raspberry jellybeans*) and +2 (*I greatly prefer blackberry jellybeans*). The midpoint 0 was labeled "I like the two equally." Participants who responded with 0 were classified as *relatively indifferent* (18.33%). All other participants were labeled as having a relative preference (81.67%).

The other measure—comprising two items—assessed the *amount of deliberation*. Each item was measured on a 7-point scale with 1 (*not at all*) and 7 (*very much so*) as the scale endpoints: "I didn't give too much thought to my selection" and "When making my selection, I went with my first instinct." The two items were correlated, though weakly ($r = 0.20$, $p < .001$). We reverse-scored and averaged the items so that higher numbers reflected greater deliberation.

Results

To begin, we replicated the OFE: participants who constructed their bundles sequentially were more likely to select a varied bundle (80.56%, 721/895) than those who chose among the prepackaged bundles (72.27%, 654/905), $\chi^2(1, N = 1{,}800) = 17.16$, $p < .001$. This OFE was heightened among those who were relatively indifferent between the two flavors of candies, $z = 2.13$, $p = .033$. Among those who were relatively indifferent between blackberry and raspberry jellybeans, an OFE emerged of 10.52 percentage points emerged (95.80% vs. 85.28%). But among those who preferred one flavor over the other, the OFE was reduced to 7.47 percentage points (77.06% vs. 69.41%). Note that this difference is significant but modest, which may in part be a reflection of the ceiling effect among the relatively indifferent given their extremely high selection of variety.

Did this effect emerge simply because those who were relatively indifferent between the two flavors engaged in little deliberation? To the contrary, there was a small effect that those who were relatively indifferent reported having engaged in *more* deliberation ($M = 3.49$, $SD = 1.35$) than those who had a relative preference ($M = 3.32$, $SD = 1.40$), $t(1{,}798) = 1.97$, $p = .049$, $d = 0.12$. Furthermore, the OFE itself did not reliably depend on this deliberation, $z = -0.31$, $p = .753$, nor was the focal bundle × relative indifference interaction further moderated by deliberation, $z = 0.82$, $p = .414$.

Direct Replication. Although study 3 was preregistered, to test the robustness of the patterns we documented, we conducted a preregistered direct replication ($N = 2{,}000$ Americans from AMT; web appendix). We found that: (1) the OFE emerged (marginally more) strongly for those who were relatively indifferent (vs. had a relative preference) between the components ($p = .065$), (2) those who were relatively indifferent reported a more deliberative approach to the bundle selection ($p = .004$), and (3) self-reported deliberativeness did not predict the size of the OFE in the sample overall ($p = .187$), nor did it qualify the bundle × relative indifference interaction ($p = .455$).

Supplemental Study B. In study 3, we measured participants' relative preference for the two bundle components at the study's conclusion to identify *ex post* who was relatively indifferent or not. This leaves open the possibility that it was not relative indifference per se that made certain consumers more susceptible to the OFE, but instead some unmeasured variable (i.e., something beyond deliberation) that accounted for these differences. To more definitively test whether having a preference between the components actually *causes* a reduction in the OFE, we conducted supplemental study B, in which participants selected bundles of Girl Scout Cookies. We experimentally manipulated whether participants were first supposed to clarify their preferences—that is, indicate why they liked one bundle option (one of two types of Girl Scout cookies) over the other. A pretest validated that this manipulation pushed participants to form a relative preference toward one bundle component over the other. This preference clarification manipulation fully eliminated the OFE, $\chi^2(1, N = 1{,}434) = 8.96$, $p = .003$.

Discussion

Study 3 found that those who were relatively indifferent between the potential bundle components were more likely to show the OFE. Furthermore, we addressed a worry that this might simply be because the relatively indifferent engaged in little deliberation when selecting a bundle. To the contrary, they reported (somewhat) more deliberation. These results help support three conclusions. First, that the OFE was moderated by participants' stated preferences toward the potential bundle components provides reassurance that it is not purely random responders who are induced by the available pathways to select more variety. Second, relative indifference did not induce participants to approach the bundle selection without thought or deliberation; in fact, they reported somewhat more. Third, nether the OFE nor its clearer emergence among the relatively

indifferent depended on how much deliberation participants (reported) expending.

Although study 3 shows that the bundle selection method does not influence selection of variety only among those who avoid careful deliberation, it also does not provide positive support for a reason why the number of available pathways to variety influences choice of variety. We have argued that a stochastic component that emerges in the process of translating internal preferences into observable choices, which should emerge even among those who think deliberatively through a decision, is sufficient to produce such spreading (especially among those who are more indifferent between the bundle components). Our remaining two studies explore a more directly measurable process, one that suggests that choice-informing normative information may be communicated by the choice architecture itself.

STUDY 4

Study 4 returns to the four-condition paradigm that fully unconfounds the number of pathways to variety from the bundle selection method (constructed vs. prepackaged). Like in study 2, participants selected bouquets of flowers, but like in Mittelman et al. (2014), these bouquets could be built using only two colors of flowers (orange and yellow). We again predicted that the number of available pathways to variety would predict when people were relatively likely to select variety as opposed to not. But in this case, we also measured whether participants perceived a norm, a belief that the choice architect expected choosers to be relatively more or less likely to choose variety. This allowed us to test whether either the number of pathways to variety (or, alternatively, the bundle selection method) influenced perceived norms. We also could test whether perceived norms statistically mediated effects on choice of variety.

Methods

Participants and Design. We recruited 2,003 American workers from AMT who had at least a 95% approval rate. Participants were randomly assigned to one of the four bundle conditions: prepackaged, constructed, expanded prepackaged, or restricted constructed. Eighty-eight participants incorrectly responded to a preregistered attention check at the study's conclusion that required them to recall which color roses they could select (correct response: orange and yellow). One participant did not select a final bundle. Removing these participants left a final sample of 1,914 included in all analyses reported below.

Procedure. Participants were told the study related to consumer preferences toward flowers. All participants would select a bouquet of three roses, composed of orange and/or yellow roses. Each individual rose was represented by a picture. Those in the *prepackaged* bundle condition saw the four unique bouquets that could be created. Those in the *constructed* bundle condition instead added their flowers to the bouquet one at a time. Those in the *expanded prepackaged* condition chose among all eight permutations of flowers. Those in the *restricted prepackaged* condition were first required to choose two roses of the same color before being asked to add a third rose of either color.

Next, participants completed a single *perceived variety norm* item that asked whether participants believed that there was an expectation that participants would make a choice of variety or not: "Is your sense that the experimenter—the one asking you to select three roses—is expecting people to choose three roses of the same color or a mix of colors?" Participants responded on a 7-point scale anchored at 1 (*definitely expecting to choose a mix of colors*) and 7 (*definitely expecting to choose 3 roses of the same color*). The neutral midpoint of 4 was labeled "*no expectation either way*." We reverse-scored responses to this item, so that higher numbers would reflect a greater perceived variety norm.

Results and Discussion

Choice of Variety. We first conducted an omnibus test that revealed between-condition differences in the proportion of participants who selected variety, χ^2 (3, $N = 1{,}914$) $= 121.47$, $p < .001$ (table 2). Like in study 1, we next conducted two orthogonal contrasts. One showed that participants in the conditions that offered more pathways to variety were more likely to select variety than in the conditions that offered fewer pathways to variety, $z = 9.90$, $p < .001$. In contrast, participants who constructed a bundle across multiple choices did not choose more variety than those who selected among prepackaged bundles, $z = 0.53$, $p = .596$.

We proceeded to conduct pairwise comparisons that allowed us to understand the results more precisely. First, those in the constructed bundle condition were more likely to create a varied bundle (74.51%; 342/459) than those in the prepackaged condition who selected among the four unique combinations of roses (50.20%; 249/496), $\chi^2(1, N = 955) = 59.72$, $p < .001$). Second, those who confronted the expanded set of prepackaged bundles—meaning they confronted more pathways to variety—were more likely to select a bouquet containing variety (62.63%; 300/479) compared to those in the standard prepackaged condition, $\chi^2(1, N = 381) = 15.30$, $p < .001$. That said, those in the constructed condition displayed an even stronger preference for variety, $\chi^2(1, N = 938) = 15.32$, $p < .001$. This reflects a residual OFE, even with pathways to variety controlled. Third, the restricted constructed bundle condition significantly reduced selection of variety (41.25%; 198/480) compared to the standard constructed bundle condition, $\chi^2(1\ N = 939) = 106.22$, $p < .001$. However,

TABLE 2

PERCENTAGE OF PARTICIPANTS SELECTING VARIETY AND MEAN PERCEIVED VARIETY NORM IN STUDY 4, BY CONDITION

	Prepackaged (PTV: 50%)	Expanded prepackaged (PTV: 75%)	Constructed (PTV: 75%)	Restricted constructed (PTV: 50%)
Proportion selecting variety	50.20%[c] (249/496)	62.63%[b] (300/479)	74.51%[a] (342/459)	41.25%[d] (198/480)
Perceived variety norm	3.49[b] (1.63)	3.85[a] (1.73)	4.06[a] (1.69)	3.51[b] (1.66)

NOTE.— Parenthetical values following means are SDs. PTV = pathways to variety. Values in the same row that do not share a superscript differ at the $p < .05$ level.

restricted constructed bundle participants also displayed less of a preference for variety than those in the standard prepackaged bundle condition, $\chi^2(1\ N = 976) = 7.87$, $p = .005$. This reflects a residual reverse OFE.

Perceived Variety Norm. We conducted parallel tests on the perceived variety norm measure. Once again, the omnibus test revealed significant between-condition differences in perceptions of the norm, $F(3, 1{,}911) = 12.68$, $p < .001$, $\eta_p^2 = 0.02$ (table 2). We first decomposed this effect using two orthogonal contrasts. The first showed that as the number of pathways to variety increased, there was a stronger perceived norm to select variety ($M = 3.95$, $SD = 1.71$) than when there were fewer such pathways ($M = 3.50$, $SD = 1.65$), $t(1{,}913) = 5.84$, $p < .001$, $d = 0.27$. In contrast, we did not find that those who constructed their bundle sequentially believed there to be more of a norm for variety ($M = 4.21$, $SD = 1.70$) than those who selected among prepackaged bundles ($M = 4.33$, $SD = 1.69$), $t(1{,}913) = -1.49$, $p = .137$, $d = -0.07$.

As with choice, we decomposed these effects further. Those in the constructed condition perceived more of a variety norm than did those in the prepackaged condition, $t(953) = 5.29$, $p < .001$, $d = 0.34$. Those in the expanded prepackaged condition saw more of a variety norm than did those in the prepackaged condition, $t(973) = 3.29$, $p = .001$, $d = 0.21$, but (marginally) less than those in the constructed condition, $t(936) = 1.93$, $p = .054$, $d = 0.13$. Mirroring these results, those in the restricted constructed condition perceived less of a variety norm than those in the constructed condition, $t(938) = 5.00$, $p < .001$, $d = 0.33$, but no more (or less) than those in the prepackaged condition, $t(975) = 0.20$, $p = .838$, $d = 0.01$. Note that this pattern of results helps to address a concern that perhaps the two conditions newly introduced in this article—expanded prepackaged and restricted constructed—may have had their effects on choice of variety because those two conditions alone communicated a variety norm. That is, one may worry that these choice architectures were more unusual, which may have been taken a signal that they were meant to communicate some expectation. The fact that the standard constructed and prepackaged conditions communicated similar information suggests the more parsimonious interpretation that the available pathways to variety communicated the norm.

Statistical Mediation. Finally, we tested whether the perceived variety norm statistically mediated the effect of pathways to variety (the 2 vs. 2 contrast) on choice of variety. In a single model, perceived variety norm predicted choice of variety, $b = 0.36$ (SE = 0.03), $z = 11.57$, $p < .001$, but the pathways-to-variety contrast continued to strongly predict choice as well, $b = 0.86$ (SE = 0.10), $z = 8.70$, $p < .001$. We observed an indirect effect of pathways to variety on choice of variety through perceived variety norms, $b_{\text{indirect}} = 0.0350$, 95% CI = (0.0220, 0.0479). We note that the perceived norm only partly explained the effect of pathways to variety on choice of variety. This leaves room for another component—an unmeasured mediator and/or the stochastic component posited to encourage choice to fill available pathways to variety—to explain more of the effect.

Second, we highlight that these statistical mediation results are consistent with, but do not logically demand, that the number of pathways to variety causes a shift in selection of variety *because* of the shift in the perceived variety norm. One alternative possibility is that pathways to variety guided selection of variety (perhaps only due to the stochastic process), and then participants merely projected their own choice patterns (i.e., whether they ultimately selected a varied or unvaried bundle) when indicating the perceived norm. One empirical detail casts doubt on this explanation: the between-condition patterns on the perceived variety norm conformed to the number of pathways variety more cleanly than did the between-condition patterns of choice. This is consistent with the idea that pathways to variety communicated variety norms, but variety norms were only one of multiple reasons why the manipulations influenced choice. (After all, the choice patterns yielded evidence of both a residual OFE and a residual reverse OFE.) If a perceived variety norm was merely inferred from one's past choices, we might have expected—

for example—those in the restricted constructed condition to have perceived significantly less (not non-significantly more) of a variety norm than those in the prepackaged condition. That said, study 5 will explore the role of perceived norms in a more nuanced way by asking *who* should be most interested in deferring to perceived norms as they make their choices. By identifying systematicity to *whose* choices lean on choice-architecture-informed variety norms, we could be even more confident that the perceived variety norm is not merely a consequence, but is instead a likely cause, of choice.

STUDY 5

Study 4 demonstrated that with more available pathways to variety, consumers perceived a stronger variety norm, which in part explained their greater selection of variety. But we have argued that not all consumers should be equally interested in looking to perceived variety norms to aid their selection of bundles. That is, we hypothesized that it is those consumers who are relatively indifferent between a bundle's potential components who should be most interested in looking to the choice architecture for a cue as to what choice pattern is normative. This prediction is important because it predicts a pattern of results that is different from the alternative explanation that argues that the causal sequencing implied by study 4's mediation model may have been mis-specified—that is, that the proposed mediator (perceived variety norm) may have been a consequence and not a cause of the choice of variety. This possibility is made plausible by the well-known phenomenon of projection, by which consumers use their own preferences and behaviors as a cue to what others think and do (Reit and Critcher 2020; Ross, Greene, and House 1977), a strategy that is in part normatively defensible (Dawes and Mulford 1996; Krueger 2008). A simple projection account, most parsimoniously, should apply to those who do and those who do not have a relative preference between the different possible bundle components. In contrast, we predict that it is those who may be most interested in looking to the choice architecture for a cue to what is normative (i.e., the component indifferent) for whom perceived norms should be most strongly associated with choice. As a result, it is these consumers who should show clearest evidence of seeking and following the guidance that such choice architecture could offer.

Study 5 both replicated and extended our previous studies in two primary ways. First, we tested our ideas using new types of bundles—ones composed of M&M's candies. Moreover, in study 5, rather than measuring indifference (study 3) or nudging participants to shift away from indifference (supplemental study B), we manipulated the attribute on which the M&M's varied to achieve a similar effect. That is, the bundles of M&M's could vary according to their color (blue or green) or their filling (milk chocolate or peanut). Before conducting our main study, we conducted supplemental study C ($N = 1{,}713$ Americans from AMT), which validated the appropriateness of this paradigm. First, this validated that consumers are more likely to have a relative preference between M&M's based on their fill (89.53%, 761/850) as opposed to their color (51.22%, 442/863), $\chi^2(1, N = 1{,}713) = 300.63$, $p < .001$. Second, we validated that the OFE was indeed larger in the color (attribute indifference) compared to the fill (attribute preference) conditions, $\chi^2(1, N = 1{,}096) = 5.79$, $p = .016$. Third, we conducted supplemental analyses showing that this gap was indeed driven by the differences between the conditions in participants' reporting less or more of a relative preference between the bundle components. Although less focal to the present study, the supplemental study also replicated the finding that an expanded prepackaged condition increased choice of variety compared to the prepackaged condition, thereby demonstrating the importance of pathways to variety in this experimental context as well.

Study 5 made use of a similar paradigm. But as a crucial change, study 5 also measured perceived norms. Whereas study 4 measured perceived norms using only a single measure (that assessed the perceived injunctive norm of what the choice architect expected of choosers), study 5 added a perceived descriptive norm item as well. We again expected to replicate the finding that the OFE would be larger when participants selected among bundles for which they were more likely to be indifferent (green vs. blue M&M's) as opposed to have a relative preference (plain vs. peanut M&M's). In the relative indifference condition, we hypothesized that participants would lean on the choice architecture to infer a variety norm, which would strongly predict participants' choice of variety. But in the relative preference condition, we expected these patterns to be more muted.

Methods

Participants and Design. We recruited 2,414 Americans from AMT who had at least a 95% approval rate. Participants were randomly assigned to one of four conditions in a 2 (bundle: prepackaged or constructed) × 2 (attribute: relative indifference or relative preference) full-factorial design. Three hundred forty-three participants incorrectly responded to a memory-based attention check that required them to remember the distinguishing features of the M&M's they decided between (correct answers: green and blue, milk chocolate and peanut). Excluding these participants yielded a final sample of 2,071 in all analyses below.

Procedure. Participants were told the study related to consumer preferences. More specifically, participants would select a bundle of M&M's candies. For those in the

relative indifference condition, they constructed bundles of M&M's whose components had the potential to differ on color (blue or green). For those in the relative preference condition, they constructed bundles whose components had the potential to differ on their fill (milk chocolate or peanut).

Those in the *prepackaged* bundle condition saw the four bundles that reflected every unique combination that could be created of candies of the two types (specific to attribute condition). In contrast, those in the *constructed* bundle condition added each bag of M&M's one at a time to create their bundle sequentially. In both conditions, each bag of M&M's was depicted with an image. A bundle comprised three bags.

Next, participants completed two measures designed to capture perceived variety *norms*. One item was nearly identical to that used in study 4. It asked whether "the researcher—the one who set up how you would select which three bags of M&M's you wanted in your final bundle—is expecting people to select three identical bags. . .or a mix of both types of bags." The second item asked what percentage of others, who were provided the same options as the participant themselves, would select "a bundle that included 3 identical bags. . .as opposed to a mix of both types of bags." In both cases participants responded on a 0-to-100 slider scale, so that lower numbers reflected a perception that choosing variety was the norm. We reverse-scored the items and averaged them ($r = 0.67$, $p < .001$) so that higher numbers would reflect a perceived variety norm.

Results and Discussion

We again found evidence of the OFE. Participants who constructed their bundle sequentially were more likely to choose a varied bundle (73.43%, 760/1,035) than those who selected from the set of prepackaged bundles (60.9%, 631/1,036), X^2 (1, $N = 2{,}071$) = 36.82, $p < .001$ (table 3). Furthermore, the size of the OFE depended on whether the bundles comprised options among which people tended to be relatively indifferent (green vs. blue) as opposed to have a relative preference (plain vs. peanut), $z = 2.21$, $p = .027$. When the bundles could vary by color (relative indifference condition), an OFE of 15.82 percentage points emerged (81.58% vs. 65.76%). When the bundles could vary by fill (relative preference condition), the OFE dropped to 9.59 percentage points (65.66% vs. 56.07%).

Next, we asked whether perceived norms statistically mediated both of these effects—that is, the larger one (relative indifference attribute condition) and the smaller one (relative preference attribute condition). Although we observed an indirect effect of bundle condition (constructed vs. prepackaged) on choice of variety through perceived variety norms in the relative indifference (color) condition, $b_{\text{indirect}} = 0.0145$, 95% CI = (0.0006, 0.0284), we observed no hint of one in the relative preference (filling) condition, $b_{\text{indirect}} = -0.0015$, 95% CI = (−0.0038, 0.0008). To better understand why these effects differed by attribute condition, we considered separately: (1) whether perceived norms predicted choice (and differently so) in each attribute condition and (2) whether the choice architecture (constructed vs. prepackaged) was used as a signal of perceived norms (and differently so) in each attribute condition.

How Perceived Variety Norms Were Associated with Choice of Variety. To begin, we asked whether the choice of variety was more strongly a function of perceived norms in the relative indifference attribute (color) condition than the relative preference attribute (filling) condition. In a model predicting choice of variety, we included the two manipulations (bundle, attribute), the norms composite (standardized), as well as the three two-way interaction terms. Crucially, the norms × attribute interaction was significant, $b = 0.0109$ (SE = 0.0022), $z = 4.96$, $p < .001$. We then conducted separate models by attribute condition that included both bundle (constructed or prepackaged) and perceived norms as simultaneous predictors of choice of variety. In the relative indifference attribute (color) condition, both bundle condition, $b = 0.421$ (SE = 0.077), $z = 5.48$, $p < .001$, and perceived variety norms, $b = 0.028$ (SE = 0.003), $z = 8.37$, $p < .001$, were independent predictors of choice of variety. In the relative preference attribute (filling) condition, it was also the case that both bundle condition, $b = 0.209$ (SE = 0.064), $z = 3.28$, $p = .001$, as well as the perceived variety norms, $b = 0.006$ (SE = 0.003), $z = 2.23$, $p = .026$, were independent predictors of the choice of variety. But as reflected by the significant interaction (and as seen in the different sizes of the perceived variety norms betas), the effect of perceived norms on choice was significantly reduced in the relative preference condition. This is consistent with the account that the relatively indifferent more defer to perceived norms but can less parsimoniously be accounted for by the possibility that participants simply projected their own choice of variety when estimating the norm.

How Choice Architecture (Bundle Condition) Was Used as a Cue to Perceived Variety Norms. We submitted the perceived norms composite to a two-way 2 (bundle: constructed or prepackaged) × 2 (attribute: relative preference or relative indifference) ANOVA. The interaction emerged as significant, $F(1, 2{,}067) = 5.94$, $p = .015$, $\eta_p^2 = 0.003$. In the relative indifference attribute (color) condition, those who were asked to construct a bundle inferred a modestly stronger variety norm ($M = 48.19$, SD = 25.22) than those who chose among prepackaged bundles ($M = 45.21$, SD = 27.72), $t(2{,}067) = 2.04$, $p = .042$, $d = 0.12$. In contrast, those in the relative preference attribute (filling) condition showed a different pattern: those who constructed a bundle sequentially did not infer more of a variety norm ($M = 44.89$, SD = 23.02) than did those who chose among prepackaged bundles ($M = 46.93$, SD = 22.71), $t(2{,}067) =$

TABLE 3

PERCENTAGE OF PARTICIPANTS SELECTING VARIETY AND MEAN PERCEIVED VARIETY NORM IN STUDY 5, BY CONDITION

	Relative indifference attribute		Relative preference attribute	
	Prepackaged	Constructed	Prepackaged	Constructed
Proportion selecting variety	65.76%[b] (340/517)	81.58%[a] (412/505)	56.07%[c] (291/519)	65.66%[b] (348/530)
Perceived variety norm composite	45.21[b] (22.72)	48.19[a] (25.22)	46.93[ab] (22.71)	44.89[b] (23.02)
Injunctive norm	46.09[b] (26.08)	49.47[a] (29.38)	47.96[ab] (26.15)	47.32[ab] (27.05)
Descriptive norm	44.33[a†b] (23.03)	46.91[a†] (25.54)	45.89[a] (24.14)	42.47[b] (23.30)

NOTE.— Parenthetical values following means are SDs and following proportions are counts. Values in the same row that do not share a superscript differ at the $p < .05$ level. Values in the same row that share a superscript denoted by † indicates a difference at the $p < .10$ level.

-1.41, $p = .160$, $d = -0.09$. The significant interaction attests to the difference between these patterns. We should note that *a priori*, we were more focused on whether the link between perceived norms and choice of variety was stronger for those we believed would be more interested in deferring to norms—that is, those asked to construct bundles composed of components for which they tended to be relatively indifferent. That said, this interaction is consistent with these same participants not merely being more likely to defer to norms, but being more likely to look to choice architectures to glean potential information about norms. In other words, this pattern as well may reflect these participants' greater interest in external (even implicit) guidance when making the choices.

GENERAL DISCUSSION

When consumers select bundles, they can do so by constructing a bundle sequentially (by adding items iteratively to a bundle) or by choosing among a set of prepackaged bundles. Previous research suggested that consumers are more likely to choose variety when constructing bundles sequentially than when choosing among already-assembled sets, an effect termed the OFE (Mittelman et al. 2014). First, we showed that the OFE is largely a pathways-to-variety effect. That is, when we tweaked choice architectures to unconfound the way a bundle was selected (constructed vs. prepackaged) from the number of available pathways that would lead to variety, it was primarily the latter that explained the OFE (studies 1–2 and 4; supplemental studies A1–A2 and C).

This naturally raised the question of why more available pathways to variety encourage choice of variety. One argument is that a stochastic component that characterizes choice processes encourages some randomness in the selection of bundles—even among engaged and deliberative responders—one that should lead choices to fill the available pathways. A second, complementary account is that there may be some information communicated in the available pathways to variety, at least for those interested in seeking it. In study 4, we returned to a paradigm in which we unconfounded the way a bundle was selected (constructed vs. prepackaged) from the number of pathways to variety such choice architectures offered. We observed a statistically significant indirect effect of the number of pathways to variety—but not the bundle selection method (i.e., constructed vs. prepackaged)—on choice of variety through a perceived variety norm. Building on a pattern of moderation first identified in study 3, study 5 showed that consumers vary systematically in whether they look to the choice architecture for guidance as to what choice pattern is likely normative and thus advisable to follow. When consumers selected bundles whose possible components were less likely to invite relative preferences (different color M&M's)—as opposed to more likely to do so (differently filled M&M's)—these consumers were unique in drawing inferences about variety norms based on the choice architecture and were more likely to make choices that were in line with the perceived variety norms. Features of both study 4's and study 5's results reduced the plausibility of a reverse causality account, one that saw perceived norms as merely a consequence of, instead of a contributor to, consumer choice.

The present research is the first to recognize the importance of choice architecture in producing different numbers of pathways to variety and, in turn, variety-seeking behavior. We earlier drew parallels to previous research that examined how judgments and decisions tend to spread over available sets. Our work offers three primary advances. First, we hold the possible set of final bundles constant, in contrast to research that has examined what happens when the set of available options expands (Benartzi and Thaler 2001). Second, we did not unpack superordinate, higher-order categories into subordinate, narrower categories (e.g., referring to "fruits and vegetables" as a single category of snack options or two separate ones), a move that

changes the specificity and meaning of the options at one's disposal (Fox et al. 2005). That is, our work focuses on the role of choice architecture not in modifying the choice outcomes themselves, but merely in affecting the pathways to get to them, and the role these pathways play in affecting perceptions of norms. Third, we documented the role of perceived norms in explaining these effects, whereas previous research only speculated on their possible role in analogous effects (Fox et al. 2005).

Behavioral researchers have long understood that norms are important to consumer behavior. People observe others' behavior directly or the residue of such behaviors (e.g., litter on the sidewalk) in order to understand how people do behave and are expected to behave—that is, what is normative (Allison 1992; Cialdini et al. 1990; Cialdini, Kallgren, and Reno 1991). In contrast, we considered how the choice architecture itself may serve a similar function. When previous researchers have discussed a variety norm, they have done so to describe social pressures people feel to not match others' choices (Ariely and Levav 2000) or patterns of variety seeking that are labeled "normative" merely to refer to their common occurrence (Read and Loewenstein 1995). The present work examined within-person (instead of between-person) variety seeking and aimed to measure perceived norms directly. Furthermore, we argued and offered initial evidence that consumers predictably vary in the extent to which they attend to such normative cues and follow their dictates.

Evaluating the Comprehensiveness of the Pathways-to-Variety Account

In considering the comprehensiveness of this article's pathways-to-variety account, we can pose this question at two levels. One is to ask whether differences in the number of pathways to variety entirely explain the effects of bundle selection method (constructed vs. prepackaged), or whether there is likely a residual effect of bundle selection method once pathways to variety have been equated. A second is to ask whether the reason why pathways to variety encourage choice of variety has been comprehensively documented. We consider both questions, in turn:

The Effects of Bundle Selection Method, Independent of Pathways to Variety, on Choice. One way to broach this question is to consider whether our expanded prepackaged condition encouraged as much choice of variety (or as little choice of no variety) as did the (standard) constructed bundle condition. It did in studies 1, 2 (choice of no variety), and A2, but not in studies 2 (choice of high variety), 4, A1, and C. These latter findings reflect residual OFEs—that is, the greater choice of variety when constructing a bundle oneself than when choosing among prepackaged bundles. We can also ask whether the restricted constructed condition encouraged (as little) choice of variety as did the (standard) prepackaged condition. Not only did it do so in the three studies in which it was included (studies 1, 4, and A2), but it encouraged even less choice of variety in studies 4 and A2. These findings reflect a residual *reverse* OFE.

Before aiming to synthesize these inconsistent findings, we wish to consider further that Mittelman et al. (2014) offered evidence of an OFE in three studies for which the constructed and prepackaged conditions did not differ in their number of pathways to variety. For one of these studies (experiment 4), we conducted three conceptual replications—with several modifications from the original (larger sample size, conducted online instead of in person with physical goods)—and were unable to replicate the original results (supplemental studies D1–D3). Although this does not foreclose the possibility that the original findings would have replicated under more precisely matching conditions, these results do suggest that that paradigm does not offer clear evidence for the importance of bundle construction method independent of pathways to variety.

For the other two studies (experiments 1 and 2), we suspected that a methodological detail may have artifactually produced evidence of an OFE. Participants constructed two-item (or selected among prepackaged) bundles of sodas (Coke or Sprite) or candy bars (Snickers or Twix). Notably, in the case of two-item bundles, 50% of pathways led to variety regardless of the bundle selection method. Those in the constructed bundle condition responded to the prompts "My first choice would be:" and "My second choice would be:." If some participants misinterpreted these prompts as requesting their more-preferred (first choice) and less-preferred (second choice) bundle components instead of their first and second addition to their two-item bundle, then this potential confusion—not the constructed nature of the bundle—might have induced more selection of variety. Supplemental study E both replicates the OFE using the original language but then found that the effect *reversed* (significantly so for sodas, $p = .007$; marginally so for candy bars, $p = .073$) when the language was disambiguated.

Although pathways to variety consistently predicted the choice of variety, the residual effects of bundle selection method—which were sometimes OFEs and sometimes reverse OFEs—did not seem to emerge randomly. When constructing a bundle through three choices, this often prompted a *more* varied bundle than when choosing among an expanded set of prepackaged bundles. But when constructing a bundle through two choices, this often prompted a *less* varied bundle than when choosing among a matching set of prepackaged bundles. The contrasting directionality of these two residual effects suggests it may not make sense to talk about a general OFE that is independent of pathways to variety, but instead one whose directionality depends on details of the choice context. Especially given the reverse OFE was more unexpected in light of the

current literature, we conducted additional studies to understand whether the effect is indeed replicable and to explore why it emerges.

Supplemental study F had all participants ($N = 604$ Americans from AMT) sequentially construct a two-item soda bundle. All we varied was whether participants stated their relative preferences (for Coke vs. Sprite) before, in the middle of, or after constructing their two-item bundles. Although 21.21% of participants started out indifferent between Coke and Sprite, that number declined to 13.30% after making a first choice, $\chi^2(1, N = 386) = 4.21$, $p = .040$, and did not decline further (9.63%) after making the second choice, $\chi^2(1, N = 375) = 1.25$, $p = .264$). In other words, forcing consumers to make that first choice pushed them away from indifference. And crucially, this drop emerged after just one choice, meaning it was not a retrospective response to having chosen a low-variety bundle. In a complementary study (supplemental study G, $N = 900$ Americans from AMT), we replicated the reverse OFE in this paradigm: 41.77% chose a varied bundle when choosing among prepackaged two-soda bundles, whereas 22.40% constructed a varied bundle themselves, $\chi^2(1, N = 846) = 35.63$, $p < .001$. As foreshadowed by supplemental study F, constructing the bundle oneself pushed people away from indifference, $\chi^2(1, N = 846) = 4.42$, $p = .035$, an effect that partially mediated the reverse OFE, $b_{\text{indirect}} = 0.021$ (0.001, 0.042).

These findings are certainly intriguing. They highlight that constructing bundles oneself—especially given they require an either-or selection at each step—can cause consumers to clarify their preferences and thus discourage variety-seeking. This mechanism is reminiscent of a core idea behind self-perception theory (Bem 1972), that through overt actions people reveal their preferences not merely to others but also to themselves. Such effects emerge even when the actual cause of the behavior is cued by the situation and is thus not simply a product of one's internal preferences (Tanner et al. 2008). At the same time, note that this finding appears to be specific to two-choice bundles. That is, as we reviewed above, there was no tendency for participants who constructed three-item bundles sequentially to choose any less variety (and, in fact, they often chose a bit more) than those who selected among prepackaged bundles, even with pathways to variety equated. As such, this reverse OFE appears to be a robust residual effect, but one that emerges under specific conditions. One speculation is that as bundles are constructed in more than two choices, people can still select a varied bundle while choosing their favored item more frequently. This idea could be probed most directly by varying in one study, using the same possible bundle components, whether participants are to select a 2-item or a 3-item bundle. Regardless, these patterns reinforce that under some conditions, there exist effects of bundle selection method that pathways to variety cannot explain.

The Effect of Pathways to Variety on Choice (of Variety). Separately, one can ask whether we have completely explained why the number of pathways to variety encourages more choice of variety. Empirically, this question is hard to answer. We highlighted that a stochastic component in the choice process is sufficient to encourage consumers to spread their choices across the available pathways. Though this process is easier to posit theoretically than establish empirically. The process that we did directly capture—that consumers (at least when constructing bundles whose potential components tend not to invite clear relative preferences) look to the choice architecture to infer a variety norm—did not explain the entirety of the pathways-to-variety effect. Of course, there is ambiguity in whether the norm measures were insufficiently sensitive to capture the full influence of perceived norms or whether the role of norms complements other mechanisms (beyond the stochastic element in choice) to give rise to the effects on choice of variety.

Crucially, we did not observe a signature of what would be a relatively trivial randomness-related account, the sort that would also anticipate why blindfolded participants would display the OFE. Although we of course cannot be confident that every participant was fully engaged, five features of our—or Mittelman et al.'s (2014)—results suggest that this concern does not account for our effect. First, Mittelman et al. (2014) had a similar worry. They noted that if participants merely selected among the available options completely at random, then participants would sometimes select more variety when constructing a bundle than when choosing among prepackaged bundles (to use our language, due to the former's greater pathways to variety). As such, they tested for the presence of purely random responding by varying the distribution of options present in the supply bank (i.e., by placing more yellow than orange flowers in the supplied set) from which participants drew when constructing their bundles. (Our supplemental study A1 took this same approach.) If many participants were drawing from the supply bank at random, this would have had predictable consequences on the color composition of the bouquets. Neither we nor they found such an effect.

Second, study 1 used a paradigm that had a consequential choice. To the extent that hypothetical choice contexts may increase the risk that participants respond randomly, this provided a stronger context in which to test (and find support for) our ideas. Third, studies 3 and 5 (and supplemental studies B and C) aimed to identify or manipulate which participants would be more (vs. less) influenced by the bundle selection method. If random responders were the ones who produced these differences to begin with, they could not be counted upon to indicate relative indifference between the choice options (study 3) or to be especially responsive to our experimental manipulations (study 5 and supplemental study C). Fourth, although random

responding can lead people's choice of variety to fill the available pathways, it would not produce the effect of pathways to variety on a perceived variety norm (study 4) or, fifth, the moderated mediation pattern whereby the choice architecture communicates norms and encourages choice that aligns with those norms in some contexts over others (study 5). That said, research participants, much like real-world consumers, are sometimes disengaged. The existence of any such people will help to produce a pathways-to-variety effect. The just-reviewed features of our studies suggest that the pathways-to-variety effect reflects something more.

Choice Contexts in Which Combinations and Permutations Are Not Interchangeable

In our studies, consumers constructed bundles such that each component was not being selected *for* a particular consumption occasion. In many cases, when one purchases a prepackaged bundle, the items are not differentiable. Each flower in a bouquet is just that, one flower in a set; if one later decides one would like to move the lone yellow rose to be in between instead of to the left of the two orange ones, such a change is simple. But in other cases, the selection of the bundle may require one to differentiate the role played by each item. For example, if one purchases a 3-night cruise ship package for which one must indicate for each night whether one wishes to eat in the standard dining room or in the high-end, on-board restaurant, then one must register this choice by being presented with each unique permutation, not merely the unique combinations. In such contexts, firms of course still could vary the bundle selection method: consumers could construct their bundles sequentially or choose among the full set of permutations of prepackaged bundles. Note that our comparisons between the (standard) constructed bundle condition and the expanded prepackaged conditions essentially mirror these choice sets. We often found residual OFEs in these contexts, despite their not varying in their number of pathways to variety.

Now consider a variant on the choice problem. Even though the cruisegoers will have to consume their bundles sequentially—only one dinner per evening on the ship—the cruise line may not have passengers decide on which nights they want to redeem their "standard" versus "high-end" dining vouchers until they arrive onboard. In this way, the cruise could still sell the meal bundles in a prepackaged form that presents only the unique offer combinations, not every unique permutation. Understanding whether and how much the bundle selection method (constructed vs. prepackaged) would influence the choice of variety in this context would depend on the confluence of at least three factors. First, it would depend on whether cruisegoers spontaneously reframe the prepackaged choice as a sequential choice. We suspect that many if not most consumers would display a certain myopia and not fully reframe the choice as they should. Second, especially for consumers who are relatively indifferent between the standard dining experience and the more upscale version (that would no doubt come with a surcharge), then they may look to the choice architecture to infer a norm about how much it makes sense to choose a mix of options or stick with one. Third, the stochastic component of choice would exert a similar push. Note that all three of these forces would push to preserve an effect by which constructing the bundle oneself would encourage more selection of variety than would be displayed by those who chose among the unique combinations of prepackaged bundles. But in those contexts in which consumers are especially unlikely to be myopic (e.g., planners who are scheduling out each day when booking the trip) *and* when those consumers have a relative preference between the two options, then we would expect the effects of choice architecture on choice of variety to be diminished.

Implications for Marketing Practice

How should sellers structure the bundle selection process? Taking the perspective of the consumer, we can ask whether one structure is likely to lead to *better* choices than the other. This is of course a difficult question. By one perspective, we might think it best to consider which choice process unfolds most similarly to how the actual consumption episodes ultimately will. Through this lens, it might seem that decision makers would be better off (sequentially) constructing their bundles themselves when ultimate consumption will happen in sequence. For example, a six-pack of beer is not consumed all at once. Just as pathways to variety are increased when constructing the bundle sequentially, the sequential unfolding of reality offers the same elevated opportunity for variety in consumption. As our cruise ship example exemplified, life unfolds in meaningfully different permutations instead of the combinations of experiences by which it can be retrospectively summarized. On the other hand, previous research has suggested that decision makers select more variety for their future than their future selves ultimately would prefer (Ratner et al. 1999; Read and Loewenstein 1995). For this reason, pushing decision makers to select among prepackaged bundles (at least when those bundles restrict pathways to variety) may nudge them toward more optimal choices.

Marketers themselves may have their own incentives for wanting consumers to select more or less variety. Consider the beer manufacturer who is attempting to promote sales of a new style. To encourage trial, the seller may wish to include the beer in certain bundled offerings. Such sellers may have more luck getting customers to add the new style to their bundles when customers construct their own six-packs (thereby offering six chances for the new style to be chosen) instead of having them select among prepackaged

bundles. Furthermore, this approach may prove economically savvy, especially compared to a more traditional approach like an introductory price promotion. Examination of this possibility awaits relevant field research.

Conclusion

Even when scientists work in isolation, they take part in a collaborative enterprise. Researchers look to the efforts of others for guidance on what questions need asking, and which answers are most plausible. The present work greatly benefited from Mittelman et al.'s (2014) recognition and demonstration that the bundle selection process is a key contributor to variety seeking. That said, advancing the field's theoretical and empirical understanding of any research question often requires reconsidering and reinterpreting earlier evidence. We hope the present article is seen to affirm the importance of Mittelman et al.'s (2014) research question even as it tested a novel account—one that placed less importance on the actual way a bundle is selected and more importance on the pathways to variety that such choice architecture offered. But as our own data illustrated, this new account too is incomplete. Even when equating pathways to variety (this article's focus), we found evidence that in some choice contexts constructing bundles sequentially invites more selection of variety while in others it encourages less selection of variety. Although we offered preliminary evidence in understanding the latter phenomenon, we look forward to the fuller resolution of these lingering mysteries. Scientific progress emerges not from arriving at, but from continually inching toward truth.

DATA COLLECTION INFORMATION

The data for each study were collected online from Amazon's Mechanical Turk, except for supplemental study A2, which was collected from Luth Research. Data for study 1 were collected in April 2019; study 2, in December 2014; studies 3 and 4, in August 2021; and study 5, in December 2021. Data for the Supplemental studies were collected between the fall of 2014 and winter of 2022. Data were collected and analyzed by the lead author in collaboration with the second and third authors. Data, materials, and pre-registration documents for every study are available on the OSF project page for this article: https://osf.io/ms23d/.

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