TRADEOFFS IN CHOICE

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ABSTRACT

How do people resolve tradeoffs in choice? Numerous decision phenomena have been proposed, each paired with a separate theory and idiosyncratic vocabulary. Yet they ultimately reflect just one of two basic tradeoff-resolution strategies: mixed solutions versus extreme solutions. For example, people employ mixed solutions whenever they allow exercising to "license" indulgence afterward (balancing between goals), read different literary genres (variety seeking), and order medium coffees (the compromise effect). Meanwhile, when people employ extreme solutions for resolving tradeoffs, these choice effects reverse—yielding highlighting, consistency seeking, and compromise avoidance, respectively. We first explain how many seemingly unrelated decision phenomena actually share the same underlying psychology. We then identify variables that shape tradeoff resolution directly—thereby systematically influencing which of opposite choice effects will arise. Finally, we argue that several "mistakes" people purport to make can instead be reinterpreted as mixed solutions. We conclude with guidance for distinguishing mistakes from mixed solutions.

Keywords

tradeoffs, motivation, substitution, judgment and decision making, behavioral decision theory

Decision making requires resolving tradeoffs. For example, when a college student enrolls in additional psychology courses, she has to settle for fewer economics courses. If a theater buff wants to enjoy a better view, she will have to spend more money. A dieter cannot eat chocolate cake without sacrificing some progress toward a weight-loss goal. In each of these cases, people must decide whether and to what extent one consideration or goal can or should substitute for another. That is, people must resolve tradeoffs in choice. Maximizing one typically requires minimizing another.

Moreover, there are ultimately just two basic strategies for resolving these tradeoffs: mixed solutions versus extreme solutions. When people employ mixed solutions, they endorse outcomes that partially satisfy multiple considerations; when people employ extreme solutions, they endorse outcomes that fully satisfy a single consideration. For example, if in addition to her core psychology courses, the college student described above were to sample economics, biology, and anthropology electives, this would represent a mixed solution—partially satisfying multiple goals (i.e., interest in different subjects). If, however, she were to instead take only psychology electives, this would represent an extreme solution—fully satisfying just a single goal (i.e., interest in psychology).

In Section I, we explain how this distinction between different types of tradeoff resolution strategies underlies and, critically, links many seemingly unrelated choice effects across the motivation and decision making literatures. That is, when viewed in light of tradeoff resolution, many decision phenomena that have been treated as both distinct and independent—often paired with separate theories and idiosyncratic vocabularies—actually seem to share the same underlying psychology.

For example, consider variety seeking, which occurs when people switch between various options over time (e.g., purchasing different flavors of yogurt each week; Simonson 1990). Compared to balancing, which describes the tendency to switch between pursuit of different goals over time (e.g., studying on Friday night, partying on Saturday night; Fishbach, Dhar, & Zhang 2006), variety seeking seems remarkably analogous. Both involve switching over time—switching between competing tastes for variety seeking and switching between competing goals for balancing.

Or consider yet a different instantiation of variety seeking, which occurs when people select several different options from a choice set (e.g., simultaneously selecting different candy bars for sequential future consumption). This "diversification heuristic" (Read & Loewenstein 1995) parallels the compromise effect, which describes people's tendency to choose middle options (e.g., ordering a moderately-priced, medium-size coffee; Simonson 1989). Both involve avoiding maximums within a decision episode—maximum selections of a particular option for variety seeking and maximum levels of a particular attribute for the compromise effect.

If these decision phenomena all represent mixed solutions for resolving tradeoffs among various considerations or goals, then the opposite of each should represent extreme solutions. And indeed they do, further underscoring a conceptual link. For example, rather than balancing between conflicting goals, people sometimes highlight (and pursue) a single goal (Fishbach et al. 2006). Rather than seeking variety, people often seek consistency—in fact, much of human behavior can be explained by the desire for consistency (Festinger 1957; Bem 1972). And rather than choosing compromise options, people occasionally choose extreme options (i.e., compromise avoidance; Simonson & Tversky 1992). In each of these cases, people pursue a single goal to the exclusion of all others (highlighting), express a single preference (consistency

seeking), or choose options with the highest level of a particular attribute (compromise avoidance).

So, when do people endorse mixed versus extreme solutions?

In Section II, we answer this question by identifying variables that shape tradeoff resolution directly. These variables, in turn, systematically influence the choice effects highlighted in Section I. For example, invoking identity (i.e., viewing a decision as an expression of self-concept) promotes extreme solutions, which attenuates balancing, variety seeking and the compromise effect (i.e., decision phenomena reflecting mixed solutions). Consequently, Section II not only helps reconcile potentially competing predictions for when opposite choice effects will arise (e.g., balancing vs. highlighting), but also helps explicate the psychological processes governing tradeoff resolution, more broadly.

Finally, in Section III, we explain how our tradeoff-resolution framework can potentially offer a new perspective on various "mistakes" people purport to make. That is, many such mistakes may instead reflect mixed solutions for resolving tradeoffs. For example, people often make decisions that are inconsistent with long-term goals (Fishbach & Trope 2005; Loewenstein 1996; Rachlin 1995; Thaler & Shefrin 1981). In other words, dieters sometimes eat doughnuts. But these "failures" of self-control are usually judged with respect to a single consideration. When judged with respect to multiple considerations, however—both short-term and long-term goals, for example—eating a doughnut while dieting may not be a mistake at all. Perhaps it was a reward for finishing a marathon. Only when it represents an inability to exercise willpower should it be interpreted as a mistake—not when it reflects a mixed solution.

SECTION I: VARIATIONS ON A THEME

In Section I, we identify five pairs of choice effects. Within each pair, one can be characterized as a mixed solution for resolving tradeoffs and the other can be characterized as an extreme solution (Table 1). We thus contend that these decision phenomena are neither universal—because their opposites sometimes arise—nor unique—because they are linked by tradeoff resolution.

[Table 1]

Balancing Versus Highlighting

Balancing and the licensing effect represent mixed solutions for resolving tradeoffs between competing goals. Balancing occurs whenever people switch between pursuit of different goals over time (Fishbach & Dhar 2005); a licensing effect describes situations in which past behavior excuses actions that would otherwise generate negative attributions for the self (Effron, Cameron, & Monin 2009; Monin & Miller 2001). Both can be said to occur when the perception of progress toward a focal goal liberates people to pursue a conflicting goal (Fishbach, Zhang, & Koo 2009). So, for example, when people feel they have made progress toward a weight-loss goal, they are more likely to choose an unhealthy food. Similarly, purchasing "green" (i.e., environmentally friendly) products causes people to cheat and behave less altruistically (Mazar & Zhong 2010). And recalling utilitarian purchases can justify purchasing luxuries for the same reason (Khan & Dhar 2006). In each of these cases, people pursue and partially satisfy conflicting goals over time, rather than fully satisfying a single goal.

The opposite of balancing is highlighting, which represents an extreme solution for resolving tradeoffs between competing goals. This occurs when people prioritize a focal goal and take actions consistent with that goal. For example, highlighting would occur if, after a workout, someone chose a healthy (vs. unhealthy) food, because both exercising and eating healthily serve the same weight-loss goal.

Whether a goal-related action is interpreted as a sign of commitment or progress determines which tradeoff resolution strategy people employ (Fishbach & Zhang 2009). Specifically, when people construe a goal-related action as a sign of progress, they balance, subsequently shifting to pursuit of conflicting goals—a mixed solution. Highlighting arises when people interpret an action as an expression of commitment. Here, people infer, based on previous choices, that a focal goal is within reach and important. As a result, they prioritize it over others in subsequent choice and behave consistently—an extreme solution. Broadly speaking, increasing commitment to a particular goal has the implicit effect of decreasing commitment to conflicting goals. It thus becomes less important to find a mixed solution.

Variety Seeking Versus Consistency Seeking

Variety seeking represents a mixed solution for resolving tradeoffs among different tastes or preferences. It occurs when people switch between options over time (Kahn, Kalwani, & Morrison 1986; McAlister & Pessemier 1982) or select different options within a given choice set (Ratner & Kahn 2002; Simonson 1990). For example, in an experiment conducted on Halloween night, Read & Loewenstein (1995) offered trick-or-treaters different candy bars. Every single child opted for variety when selecting multiple candy bars from a single house, thereby endorsing a mixed solution by choosing one of each.

Variety seeking occurs for several reasons. First, repeat consumption can lead to satiation or boredom (Inman 2001; McAlister 1982). A mixed solution reflecting different tastes or preferences increases stimulation (Gullo, Berger, Etkin, & Bollinger 2018; Huang, Liang, Weinberg, & Gorn 2019), thus forestalling satiation and preventing boredom (Menon & Kahn 1995; Raju 1980; Steenkamp & Baumgartner 1992). Variety seeking also facilitates discovery, allowing people to learn about their preferences (Fiske & Maddi 1961; Herrnstein & Prelec 1991) and hedges against the risk that future tastes will change (Simonson 1990).

The opposite of variety seeking is consistency seeking, which represents an extreme solution for resolving tradeoffs among different tastes or preferences. Consistency theories in psychology have long argued that people inherently desire consistency, particularly when actions signal stable preferences (Cialdini, Trost, & Newsom 1995; Heider 1958). To that end, cognitive dissonance theory suggests people are uncomfortable when their actions appear inconsistent (Cooper & Fazio 1984; Festinger 1957), and self-perception theory assumes people infer their own preferences from consistent behavior (Bem 1972).

Consistency seeking can arise when people strive to achieve a goal over a sequence of similar actions. For example, loyalty programs cause people to accelerate the pace of repeat purchases (e.g., one free coffee after purchasing 10; Kivetz, Urminsky, & Zheng 2006; Nunes & Dreze 2006). Fishbach, Ratner, & Zhang (2011) similarly found that priming the concept of "loyalty" caused participants to seek consistency—for example, by choosing a collection of songs by the same artist (vs. different artists). Here, a mixed solution reflecting different artists would have made for a relatively ineffective expression of loyalty. People also form habits, which are learned dispositions to repeat past tendencies (Wood & Neal 2007). And repetition is an extreme solution.

The Compromise Effect Versus Compromise Avoidance

The compromise effect (Simonson 1989) represents a mixed solution for resolving tradeoffs among attributes. It describes the tendency for options in a choice set to gain share when they become intermediate (vs. extreme) options. Unlike extreme options, which have a maximum or minimum level of a particular attribute, "compromise" options have intermediate levels of all attributes. For example, when deciding between stair climbers with (a) two-year warranty and four resistance levels and (b) a three-year warranty and three resistance levels, 37% of participants chose (b). However, when a third option was added to the choice set—(c) a stair climber with a four-year warranty and two resistance levels—the choice share of (b) increased to 61% (Sheng, Parker, & Nakamoto 2005). This is because its attribute levels became intermediate on both dimensions.

The compromise effect stems from extremeness aversion. That is, people generally avoid options with extremely high or low attribute levels (Chernev 2005). This further implies that the compromise effect represents a mixed solution—the opposite of an extreme solution. The compromise effect is also sometimes characterized as an implication of loss aversion. Specifically, for an option with the maximum level of one attribute and the minimum level of another, the relatively disadvantaged attribute "looms larger" (Kivetz, Netzer, & Srinivasan 2004; Simonson & Tversky 1992). Choosing the middle option blunts loss aversion because people do not have to "give up" on any particular attribute. They thus are able to partially satisfy multiple considerations.

Other times people exhibit compromise avoidance, which represents an extreme solution for resolving tradeoffs among attributes. For example, when presented with insurance options

that varied according to coverage percentage and annual premium, participants chose the option with the highest coverage percentage, irrespective of price (Simonson & Tversky 1992). This suggests people do not desire a mixed solution of coverage and price. Here, they prefer to maximize a single consideration: coverage. In addition, people who maintain high need for uniqueness (NFU) tend to make unconventional choices and are thus more likely to exhibit compromise avoidance (Simonson & Nowlis 2000).

Compromise avoidance can furthermore arise when choices are not restricted to a single selection (Bonezzi, Chernev, & Brough 2012). For example, when people were restricted to a single selection of pain medication, they exhibited the compromise effect, choosing the option offering moderate relief for a moderate duration. But when they could choose any number of options, they preferred a combination of extreme options, choosing one option offering immediate relief for a short duration and another offering delayed relief for a long duration. Each individual choice reflects an extreme solution, but taken together these choices represent a mixed solution and are driven by the same tradeoff resolution strategy underlying balancing, variety seeking, and the compromise effect.

Sacred Values Versus Secular Values

Reluctance to make "taboo tradeoffs" (Fiske & Tetlock 1997; McGraw & Tetlock 2005; Tetlock, Kristel, Elson, Green, & Lerner 2000) represents an extreme solution for resolving tradeoffs between values. For example, the prospect of exchanging something sacred (e.g., a human organ) for something secular (e.g., money) elicits moral outrage, anger, and disgust. Tetlock et al. (2000) found that people believed paying for organs, political votes, and sexual favors was upsetting, offensive, and immoral. Even resistance to genetically modified foods can

be traced to a refusal to violate sacred values (Scott, Inbar, & Rozin 2016). When faced with such a violation, people become inflexible in negotiation and insensitive to cost-benefit analyses. Rather than trying to partially satisfy multiple sacred and secular considerations, they stick to and refuse to deviate from a particular moral conviction.

A willingness to make tradeoffs between values, on the other hand, represents a mixed solution. For example, people will compromise when it is in their self-interest. McGraw & Tetlock (2005) found that after the so-called "Lincoln bedroom scandal" of the Clinton presidency—when it was discovered that large campaign donors were rewarded with overnight stays in the White House, violating its sanctity—liberals (i.e., Clinton supporters) were more likely to recruit an excuse to permit the transgression than were conservatives. As such, they settled on a mixed solution of values (i.e., acknowledging a potential violation, while offering the benefit of doubt).

Lower commitment to the violated norm can have the same effect. McGraw & Warren (2010), for example, presented participants with a scenario in which a church raffled off a new Hummer (an ostentatious sports utility vehicle) to recruit new members. Both churchgoers and nonchurchgoers were disgusted by the violation: Secular promotions violate the sanctity of the church. However, nonchurchgoers were also amused, exhibiting a willingness to consider the promotion a "benign violation"—a humorous mixture of immorality and amusement. Less commitment, therefore, increased willingness to violate sacred values, which reflects a mixed solution. Consider the parallel here to the dynamics described above: In the course of goal pursuit, less commitment increases balancing, which also reflects a mixed solution.

Scope Insensitivity Versus Scope Sensitivity

Scope insensitivity represents an extreme solution for resolving tradeoffs between magnitudes. It occurs when the evaluation of a problem is sensitive to the severity of a single case, but insensitive to how many cases are involved (Frederick & Fischhoff 1998; Kahneman, Ritov, & Schkade 1999). For example, when asked to donate money, people tend not to offer a larger amount when thinking about saving 200,000 birds versus 2,000 birds (Desvousges, Johnson, Dunford, Wilson, & Boyle 1993). This reflects an extreme solution because valuation is based on a single consideration. People weigh only their affective response to the severity of a single case (e.g., the heart-wrenching image of a dying bird), basing valuation on feeling (Hsee & Rottenstreich 2004).

Scope sensitivity, meanwhile, represents a mixed solution because valuation depends on multiple considerations. In addition to their affective response to the severity of a single case, people consider how many cases are involved and weigh the potential impact of their actions (e.g., how many dying birds will be saved). They thus base valuation partially on feeling and partially on calculation, so the prospect of saving more birds increases the amount people are willing to donate.

Scope (in)sensitivity can depend on evaluability, which refers to the ease with which something can be evaluated in isolation (Hsee 1996). For example, the appropriate temperature for an office is relatively evaluable. Even in isolation, people inherently know whether it is too hot or too cold. The appropriate price for a glass of French wine at a nice restaurant, however, is relatively inevaluable. Only by comparing it to the price of a glass of Californian wine can a diner infer whether it is relatively expensive or cheap.

Evaluability is greater when people are either already familiar with the stimuli or possess relevant distributional information about attributes. For example, Morewedge, Kassam, Hsee, & Caruso (2009) found that the pleasantness of a familiar sound (e.g., a telephone ring) was sensitive to its length. A short telephone ring was rated as pleasant, while a long telephone ring was rated as unpleasant. No such difference arose when participants rated an unfamiliar sound (e.g., a synthesized tone) that also varied in length. When people are already familiar with the stimuli or possess relevant distributional information about attributes, it is easier to find a mixed solution between different magnitudes.

Semantic Similarities

Further underscoring the link between these decision phenomena are the numerous semantic similarities that emerge across disconnected literatures. In many cases, one choice effect can just as easily be described as another. For example, Fishbach et al. (2011) tested for variety seeking by examining candy choices. Participants first chose between two milk chocolate Hershey's kisses and two dark chocolate Dove minis. After an intervening task, participants made a second choice between the same two options. Switching to different type of candy for the second choice reflected variety seeking. Viewed together, however, these decisions resemble a compromise effect. Participants effectively faced three options: (a) four Hershey's kisses, (b) two Hershey's kisses and two Dove minis, and (c) four Dove minis. Option (b) represents a "compromise" between two attributes: quantity and chocolate type (milk vs. dark). While Fishbach et al. (2011) called this variety seeking, it can just as compellingly be characterized as a compromise effect.

Or consider people's unwillingness to make taboo tradeoffs. As noted above, people generally refuse to make tradeoffs between sacred and secular values. To offer a classic example: Suppose a $200 million government program saved 200 lives last year. This year, the same program can save 200 lives for only half the amount ($100 million). Should the government spend the same amount as last year ($200 million) and save 400 lives? Or should it spend half the amount as last year ($100 million), save the same number of lives (200), and use the savings to reduce the deficit? Tetlock et al. (2000) found that most people objected to the latter option. Saving lives is a sacred value that should not be violated in the interest of a secular value like saving money. As a result, people are effectively scope insensitive here, as well—they do not respond to the magnitude of the potential cost savings when resisting the moral violation.

Alternatively, to use the vocabulary of the motivation literature, this stubbornness could also reflect highlighting. People have prioritized a focal goal (e.g., saving lives) and continue taking actions consistent with that goal. That is, despite the progress made last year, they are unwilling to switch to a competing goal (e.g., reducing the deficit) this year. Tetlock et al. (2000) further found that violation of a sacred value was more tolerable when invoking another sacred value. For example, while people generally find the buying and selling of human organs morally repugnant, 40% of people changed their minds when they learned market pricing was the only way to save lives that would otherwise be lost. This pits one sacred value (e.g., "commodifying" organs) against another (e.g., saving human lives). To the extent that it also implicitly pits one goal against another, it reflects balancing.

Implications of Tradeoff Resolution Strategy

We contend that the decision phenomena described above are not only semantically related, but also psychologically linked. Here, we review initial evidence and implications.

First, these choice effects are correlated. For example, we presented participants with one of three choice effect pairs (e.g., balancing-compromise, balancing-variety, or compromise-variety; Shaddy, Fishbach, & Simonson 2020a). Each pair employed a different scenario and tested a different combination of choice effects. For example, the balancing-variety pair involved choosing meals. To test for balancing, participants indicated whether making progress toward a health goal by exercising increased their likelihood of subsequently choosing an indulgent (vs. healthy) meal. To test for variety seeking, participants scheduled two consecutive lunches. They chose between indulgent and healthy meals and indicated their likelihood of choosing different meals for each day. The correlation coefficient for each choice effect pair was significantly positive. This meant that any given participant's propensity to display one of the choice effects (e.g., balancing between exercise and indulgence) predicted that participant's propensity to display any of the other choice effects (e.g., variety seeking when planning meals).

Second, activation of one choice effect triggers another. For example, we asked participants to explain the benefits of choosing either middle options (i.e., the compromise effect) or extreme options (i.e., compromise avoidance). Participants who extolled the virtues of compromise were more likely to exhibit variety seeking in a subsequent—and ostensibly unrelated—choice of candy bars (i.e., opting for different flavors). Participants who instead espoused compromise avoidance were more likely to exhibit consistency seeking with respect to the same choice (i.e., opting for the same flavors repeatedly; Shaddy et al. 2020a).

Third, if researchers have demonstrated that a particular variable influences one of the choice effects described in Section I—and the variable does so by shaping the underlying tradeoff resolution strategy—it likely influences all of the choice effects described in Section I. We identify examples in Section II.

SECTION II: WHEN TO EXPECT MIXED VERSUS EXTREME SOLUTIONS

In Section II, we identify three classes of variables that systematically shape tradeoff resolution (Table 2). We identified these variables by either deriving them theoretically or noting that they have already been shown to statistically moderate at least one of the choice effects highlighted in Section I.

[Table 2]

The first class describes variables that affect how the decision maker relates to the options. For example, when people view their decisions as expressions of their identity, they make decisions consistent with that identity (Markus & Wurf 1987). So when risky health behaviors (e.g., binge drinking alcohol) were linked to identities that college freshmen did not wish to signal, students reported drinking less. That is, they behaved consistently with identities they desired signaling (Berger & Rand 2008). The second class describes variables that affect how the options in the choice set relate to each other. For example, substitutability among options should yield mixed solutions, while complementarity should yield extreme solutions. When two news articles are substitutes, people only need to read one before switching to a

different topic (i.e., seek variety). When two news articles are complements (e.g., the first helps readers understand the second), people will read both (i.e., seek consistency; Shaddy & Fishbach 2018). The third class describes variables that affect tradeoff ease. For example, it is easier to resolve tradeoffs when attribute levels are described quantitatively (e.g., a 90-calorie snack for $4 vs. a 200-calorie snack for $2) than qualitatively (e.g., an expensive, low-calorie snack vs. a cheap, high-calorie snack). Mixed solutions are more likely in the former case.

1. How the Decision Maker Relates to the Options

Variables that change how the people relate to the options will change how people choose to resolve tradeoffs. These variables typically depend on the trait characteristics of choosers.

1.1 Identity

Invoking identity in choice should increase endorsement of extreme solutions. And when people make choices based on identity (i.e., who someone was, is, or will become; Belk 1988; Kleine, Kleine, & Kernan 1993), they aim to fully satisfy a single consideration, rather than partially satisfy multiple considerations. This is because when a decision invokes the self, people do not want to send mixed signals.

People constantly compare their current and future selves to prototypes consistent with desired identities and act congruently. So, for example, invoking the self can increase willingness to donate time because volunteers want to affirm and reinforce their moral identities (Reed, Kay, Aquino, & Levy 2016). Bankers, however, will behave more dishonestly when their professional identities are salient because recent scandals and fraud in the industry have characterized the culture as dishonest (Cohn, Fehr, & Maréchal 2014).

Moreover, we empirically tested the prediction that invoking identity increases endorsement of extreme solutions for resolving tradeoffs by observing the choices of passers-by in a university student union (Shaddy, Fishbach, & Simonson 2020b). Specifically, we set up a table to offer two free snacks to people in return for registering for a paid research pool. The choices included an indulgent versus healthy option: potato chips versus pea crisps. We manipulated the contents of the signs advertising the free bags of snacks. The identity-invoking sign read: "Who are you?" And it displayed two options: "I am a health-conscious snacker" and "I am an indulgent fun-loving snacker." The control sign simply read: "Which snacks will you choose?" In the identity condition, students were less likely to exhibit variety seeking by selecting one of each, consistent with the notion that invoking identity increases the appeal of extreme solutions—in this case, by encouraging consistency. This finding dovetails with recent work demonstrating that variety in self-expression—choosing to read different genres of books or listen to different types of music, for example—undermines self-continuity (Rifkin & Etkin 2019).

1.2 Preference (Un)certainty

Preference certainty should increase endorsement of extreme solutions. This is because fully satisfying only a single consideration increases the risk that a decision maker "doubles down" on the wrong one. For example, many craft breweries offer "beer flights" (i.e., small pours of several different types of beer) because first-time visitors with uncertain preferences do not want to risk ordering a full glass they end up disliking. Partially satisfying multiple considerations diversifies exposure to risk.

How might preference (un)certainty affect decision phenomena driven by tradeoff resolution? Consider, for example, someone adopting a New Year's Resolution to exercise more

frequently. He might be unsure which kinds of exercise are most effective for weight loss. Someone training for a long-distance bike race, however, might know exactly what kinds of exercise are most effective for endurance cycling. Because the former gymgoer faces more preference uncertainty, he might enroll in a gym with different types of classes (e.g., spinning, yoga, strength training) and equipment (e.g., exercise bikes, yoga studios, weights). This reflects variety seeking—a mixed solution. The latter gymgoer, meanwhile, faces less preference uncertainty, so he might enroll in a gym with only a single type of class (e.g., spinning) and equipment (e.g., exercise bikes). This reflects consistency seeking—an extreme solution.

1.3 Expertise

Related to preference certainty is expertise, which should also increase endorsement of extreme solutions. Experts have specific domain knowledge and are less susceptible to framing effects. They have established and well-formed criteria for evaluating options (Alba & Hutchinson 1987; Brucks 1985). Consequently, experts exhibit less scope insensitivity—a choice effect representing a mixed solution (Hsee, Loewenstein, Blount, & Bazerman 1999; Morewedge et al. 2009). They also believe variety betrays a lack of discernment, so they choose less variety themselves, in order to communicate their expertise (Sela, Hader, Morgan, & Maimaran 2019). Experts are more willing to seek an extreme solution that fully satisfies only a single consideration because they know which is most important.

Take the difference, for example, between a wine novice and a wine expert ordering wine from a vineyard. The novice likely prefers a case containing many different varietals because she faces greater preference uncertainty. The expert likely prefers a case containing only her favorite varietal because she maintains less preference uncertainty. She knows which is the best. So variety seeking and other mixed solutions should be attenuated among experts. And indeed, part

of the reason why experts tend to seek negative feedback during the course of goal pursuit is that they are more certain about the value of the goal they are pursuing (Finkelstein & Fishbach 2011). Hadar & Sood (2014) further reason that people with less knowledge prefer larger choice sets because they allow for greater variety seeking.

1.4 Ethics

Following deontological rules—evaluating actions based on ethical principles rather than practical consequences—should increase endorsement of extreme solutions. For example, many moral dilemmas implicate a tradeoff between sacrificing a single innocent life and saving multiple people (e.g., the trolley problem, the footbridge dilemma). A deontologist would argue that sacrificing an innocent life is universally wrong, irrespective of its consequences. A consequentialist, on the other hand, follows utilitarian rules to maximize total welfare (Holyoak & Powell 2016). So sacrificing an innocent life may sometimes be acceptable—for example, when the mixed solution results in saving more lives overall.

Importantly, common tradeoffs in everyday choice do not need to invoke these dramatic life-or-death scenarios to similarly arouse a sense of ethics. For example, two cars might differ according to price and safety. Suppose the expensive option ($30,000) carries a higher safety rating, while the affordable option ($20,000) carries a lower safety rating. Weighing this price-safety tradeoff is aversive because people detest quantifying the value of human life (Luce 1998). A deontologist who endorses this view would therefore always choose the option with the higher safety rating, even if it were more expensive (subject to budget constraints, of course). A consequentialist, on the other hand, would calculate whether the higher safety rating is worth $10,000. This implies that if a third option were added to the choice set—an even more expensive option ($40,000) that carries the highest possible safety rating—the deontologist

would choose it without hesitation, thereby exhibiting compromise avoidance—an extreme solution. The consequentialist would be more likely to exhibit the compromise effect—a mixed solution.

2. How the Options Relate to Each Other

Variables that change the perceived or actual relationships between available options will shape tradeoff resolution. These variables depend on the nature of the choice set, not the nature of the chooser.

2.1 Substitutes and Complements

Substitutability should increase endorsement of mixed solutions, while complementarity should increase endorsement of extreme solutions. For example, peanut butter and jelly are complements; peanut butter and almond butter are substitutes. Complements represent actions or items that are better together, and this incentivizes decision makers to fully satisfy a single consideration. Substitutes serve as replacements for each other, and this incentivizes decision makers to partially satisfy multiple considerations.

For example, Apple products are complements because they run compatible operating systems. So purchasing an iPhone increases the likelihood of seeking brand consistency when purchasing a tablet. An iPhone user will therefore prefer an iPad to an alternative like the Microsoft Surface, which runs a different operating system. On the other hand, travel guides for a particular destination are substitutes. So purchasing a travel guide for Malta increases the likelihood of seeking variety when purchasing the next travel guide—a travel guide for Mexico, for example, not another travel guide for Malta.

Moreover, the same set of actions or items can potentially be framed as either complements or substitutes. Consequently, the resulting tradeoff resolution strategy should differ. For example, toothbrush/toothpaste, mouthwash, and mint chewing gum can be presented as either different ways to achieve fresh breath (i.e., substitutes) or three elements of a complete dental hygiene program (i.e., complements). Presenting these items as substitutes might lead to balancing. After brushing their teeth, people will feel licensed to switch to a different goal (e.g., putting on makeup). Presenting these items as complements, meanwhile, might lead to highlighting. After brushing their teeth, people will continue pursuing the same goal (e.g., next using mouthwash). They may even pay more for these items when presented as complements, rather than substitutes (Sarantopoulos, Theotokis, Pramatari, & Roggeveen 2019).

2.2 Marginal Utility

Actions or items that exhibit decreasing marginal utility should increase endorsement of mixed solutions. For example, most people would derive a lot of utility from a morning workout. A second workout, perhaps at lunch, might still be useful, but less so than the first. Working out for yet a third time, after work, would be overkill. The instrumental value of this third workout would be miniscule, relative to the previous two. The utility function for these actions is thus said to be concave. Put differently, because these are substitutable means for achieving the same goal, each successive workout yields less benefit than the last. As a result, people prefer mixed solutions when marginal utility decreases. So exercising in the morning and at lunch would more likely yield balancing after work (e.g., switching to leisure).

Actions or items that exhibit increasing marginal utility, on the other hand, should increase endorsement of extreme solutions. For example, the frequent flyer miles accrued by a business traveler striving to earn premier status on an airline are increasingly valuable. Each

additional flight on that particular airline gets her closer to priority boarding privileges and complimentary cabin upgrades. The utility function is now said to be convex. So, even when loyalty requires layovers—because her chosen airline does not offer nonstop flights to a particular destination, for example—she tolerates it. Consistency is more valuable when marginal utility is increasing.

2.3 Gestalt Perceptions

Perceiving a "whole" as greater than the sum of its parts should increase endorsement of extreme solutions. This tendency to organize or integrate disparate elements into a "whole" is an automatic psychological process that results in the formation of a gestalt (Koffka 1935; Kohler 1970). For example, people perceive product bundles (e.g., three suitcases packaged together and sold for a single price) as a distinct, inseparable gestalt unit (Shaddy & Fishbach 2017). This occurs when items are all the same with respect to salient attributes (e.g., similar colors, shapes, brands, etc.; Evers, Inbar, & Zeelenberg 2013). And when people perceive a cohesive entity that is greater than the sum of the parts, this sense of a "whole" reduces the substitutability of each element, resulting in extreme solutions.

Take, for example, the difference between ordering multiple restaurant dishes a la carte and a prix fixe tasting menu where multiple courses are arranged by the chef. The latter format conveys a greater sense of a cohesive "whole." The meal is an integrated experience, and variety should be less appealing. People, for example, would prefer the same type of cuisine throughout the meal, reflecting consistency—an extreme solution. When ordering a la carte, however, this same perception of an integrated experience is diminished, and diners could find different cuisines more appealing, reflecting variety—a mixed solution.

2.4 Competition and Conflict

Goals often compete for resources and attention, and this should increase endorsement of mixed solutions. Other times, goals are in direct conflict, and this should increase endorsement of extreme solutions. For example, a snacking decision can invoke competition for calories within a daily budget (e.g., this cookie contains 200 calories, while this apple contains 90 calories). So perhaps a snacker chooses to eat an apple in the morning and a cookie in the afternoon, thereby exhibiting balancing. The same options can also be framed as directly undermining each other (e.g., this cookie is unhealthy, while this apple is healthy). Now, the snacker might be more likely to highlight a health goal by choosing to eat an apple in the morning and another fruit in the afternoon.

Critically, the distinction between competition and conflict implicates many self-control dilemmas. Fishbach & Zhang (2008), for example, found that when alternatives are presented separately and organized by the underlying goals they represent, people infer conflict and pursue an extreme solution. So a food menu on which healthy and unhealthy items were separated into different sections encouraged diners to select only healthy or only unhealthy items. However, when alternatives are presented together, people infer competition and pursue a mixed solution. So a food menu on which healthy and unhealthy items were mixed together encouraged diners to select a combination of healthy and unhealthy items.

2.5 Order Effects

Tradeoffs often follow a specific order. And in general, moving from negative to positive (i.e., bad-to-good) should increase the appeal of mixed solutions. This is because people generally want to balance out negative considerations with positive ones (Kahneman, Fredrickson, Schreiber, & Redelmeier 1993). For example, people prefer event sequences that

improve over time (Loewenstein & Prelec 1993). A person who prefers French to Greek restaurants will schedule dinner at the Greek restaurant this week and dinner at the French restaurant next week. Sequences that get worse over time should produce the opposite effect, increasing endorsement of extreme solutions. People do not want to undermine positive considerations with negative ones.

As a result, the same actions presented in different orders might elicit different strategies for resolving tradeoffs. For example, it might be more acceptable to add something healthy to something unhealthy, but less acceptable to add something unhealthy to something healthy. In other words, adding fruit to ice cream might seem more sensible than adding ice cream to fruit. This is because ice cream is generally perceived as unhealthy, while fruit is perceived as healthy. Adding fruit to ice cream, therefore (i.e., negative-to-positive order) mirrors balancing between goals—a mixed solution. Adding ice cream to fruit, on the other hand (i.e., positive-to-negative order), would be less appealing because people would prefer highlighting—an extreme solution.

3. Tradeoff Ease

Variables that affect tradeoff ease serve as cues for which tradeoff resolution strategy should be followed. For example, if it is easier to identify a mixed solution, then perhaps a mixed solution is more appropriate.

3.1 Quantitative Versus Qualitative Framing

Quantitative information cues mixed solutions. This is because quantitative information—such as number of calories, specific prices, or quality ratings—increases evaluability (Hsee 1996; Hsee et al. 1999; Nowlis & Simonson 1997). When attribute levels are

defined quantitatively, people can "calculate" the exchange rate between relevant considerations. This implies that a mixed solution is the correct way to resolve the tradeoff.

For example, someone selecting a snack from a display case offering an apple, a cookie, and a croissant might simplify the decision by choosing the option she believes is the tastiest or healthiest, thereby fully satisfying a single consideration, reflecting an extreme solution. However, if each item included a calorie label, she would feel compelled to find the right balance. She now has to consider whether the tastiness of the cookie is worth the extra calories, relative to the next-tastiest option, with fewer calories. She thus switches to partially satisfying multiple considerations, reflecting a mixed solution. In the absence of quantitative information, people simply decide which attribute to prioritize; in the presence of quantitative information, people have to determine which option possesses the best overall combination of specific attribute levels.

To test this prediction empirically, we asked participants to choose a food processor (Shaddy, Fishbach, & Simonson 2020c). Available models in the choice set differed by power and size, such that powerful options were smaller. Consistent with the notion that quantitative information increases endorsement of mixed solutions for resolving tradeoffs, participants were more likely to choose the middle option—average power and average size—when they viewed quantitative descriptions (e.g., "Model A: 600 watt motor, 6-cup capacity") than when they viewed qualitative descriptions (e.g., "Model A: highest wattage motor, smallest capacity"). Here, quantitative information facilitated the compromise effect—a mixed solution.

3.2 Availability of Mental Resources

Limited mental resources should increase endorsement of extreme solutions. This is because people tend to follow simple heuristics when cognition is impaired. And as described

earlier, partially satisfying multiple considerations with mixed solutions often requires greater mental effort than fully satisfying a single consideration with extreme solutions. For example, committing to a savings goal, such as setting aside 10% of income every month, is relatively straightforward. Balancing between savings and discretionary spending goals, however, is relatively complicated. People need to continuously monitor their savings progress in order to responsibly calibrate their discretionary spending.

As such, time pressure causes people to shift from compensatory strategies—where higher levels of one attribute can compensate for lower levels of another attribute—to non-compensatory strategies—where people follow decision rules (Payne, Bettman, & Johnson 1988; Svenson, Edland, & Slovic 1990). As such, Dhar, Nowlis, & Sherman (2000) similarly found that cognitive load attenuates the compromise effect because people are less able to give proportional weight to the local comparative features of the choice context (i.e., attributes). Lichters, Brunnlieb, Nave, Sarstedt, & Vogt (2016) provide additional neurobiological evidence by demonstrating that pharmacologically reducing serotonin levels in the brain, thereby limiting mental resources, also attenuates the compromise effect.

Note, however, that this reasoning assumes that the relevant heuristic or decision rule to which people default is itself an extreme solution. In many situations, it is. However, in other cases, when the relevant heuristic or decision rule represents a mixed solution, lacking mental resources will increase endorsement of extreme solutions. For example, someone in a rush at a coffee shop might default to the medium size, thereby exhibiting the compromise effect. This is because the default strategy in this situation is satisficing, rather than maximizing (Schwartz, Ward, Monterosso, Lyubomirsky, White, & Lehman 2002).

3.3 Thinking Versus Feeling (Cognition Versus Emotion)

Basing decisions on thinking and cognition should increase endorsement of mixed solutions, relative to basing decisions on feeling and emotion. For example, scope insensitivity, which reflects an extreme solution, is greater when the affective system is engaged (Chang & Pham 2018).

The distinction between thinking and cognition versus feeling and emotion parallels other models of dual-system processing. For example, Kahneman & Frederick (2002) distinguish between type I and type II processes. Type I is intuitive. It is automatic and effortless, sensitive to affect and prototypes. Type II is reflective. It is slow and effortful, responsive to statistics and deduction. Other models include a hot versus cold system (Metcalfe & Mischel 1999), reflexive versus reflective thinking (Lieberman et al. 2002), and nonverbal versus verbal processes (Paivio 1986). In each case, the former class—type I, the hot system, reflexive thinking, and nonverbal processes—should yield extreme solutions, because mixed solutions usually require additional effort and reflection.

Again, however, whenever the mixed solution is automatic and effortless, we anticipate the association to reverse. For example, people often mindlessly choose the medium-size coffee. And Benartzi & Thaler (2001) found that investors sometimes follow a "naïve diversification" strategy, dividing their retirement contributions evenly across all available funds in a retirement plan. So if 10 funds are available, investors will designate 10% to each. This is a mixed solution, but it is simplifying heuristic that most economists would caution needs to be overridden by additional thinking and cognition (lest investors end up with sub-optimal asset allocations).

3.4 Construal Level

Low-level construal should increase endorsement of mixed solutions. This is because thinking concretely facilitates comparison across multiple considerations. High-level construal, on the other hand, should increase endorsement of extreme solutions. When thinking abstractly, people are more likely to prioritize and emphasize a single consideration. For example, balancing, which reflects a mixed solution, is more likely when people focus on the concrete versus abstract meaning of their actions. And because actions scheduled for the near (vs. distant) future are construed more concretely, balancing is more likely the more proximal an action is (Conway & Peetz 2012). For example, thinking about working out in the near future (e.g., next week) caused participants to infer progress and plan to work out less than did thinking about working out in the distant future (Fishbach et al. 2006).

Moreover, Malkoc, Zauberman, & Ulu (2005) found that thinking about the near future (i.e., low-level construal) caused participants to attend more to alignable differences among options. These are common attributes with different levels across alternatives (e.g., one type of potato chip has six grams of fat, while another has nine grams of fat). Alignable differences are similar to quantitative information in that they are more evaluable and are thus associated with mixed solutions. However, Malkoc et al. (2006) also found that thinking about the distant future (i.e., high-level construal) caused participants to attend more to nonalignable differences. These are aspects of an option that do not correspond to any other attributes of alternatives (e.g., one type of potato chip has an oily appearance, while another has a strong taste). Nonalignable differences are similar to qualitative information in that they are less evaluable and are thus associated with extreme solutions. And indeed, Khan, Zhu, & Kalra (2011) found that thinking

about the future, which the foregoing analysis suggests should increase endorsement of extreme solutions, attenuates the compromise effect—a mixed solution.

3.5 Simultaneous Versus Sequential Choice

Making choices simultaneously should increase endorsement of mixed solutions, while making choices sequentially should increase endorsement of extreme solutions. For example, a shopper might visit a grocery store on a Sunday and make simultaneous choices about what to cook for each of the following five days. Or the same shopper might visit the grocery store each day during the week and make sequential decisions on five consecutive days. In the former case, the shopper resolves more tradeoffs. She has to predict her preferences for meals each day, resulting in greater variety seeking. In the latter case, she resolves fewer tradeoffs. She simply decides what she is in the mood for each night. This results in less variety seeking.

Moreover, simultaneous choice has been associated with both greater variety seeking and the licensing effect—mixed solutions. For example, Simonson & Winer (1992) used scanner panel data to document a positive association between the number of items purchased in a particular category (e.g., yogurt) and the amount of variety selected (e.g., the number of unique flavors selected). Khan & Dhar (2007), meanwhile, asked participants to choose movies to rent and manipulated whether participants considered these decisions in isolation or alongside future decisions. Options included highbrow movies, such as *Schindler's List*, and lowbrow movies, such as *Ocean's Eleven*. Participants who considered their decisions simultaneously alongside future decisions were more likely to balance by choosing a lowbrow movie this week and a highbrow movie next week.

SECTION III: REINTERPRETING "MISTAKES"

The motivation and decision-making literatures abound with examples of "mistakes" people purport to make. For example, it has been argued that people generally fail at self-control (Mischel, Shoda, & Rodriguez 1989; Rachlin 1995; Thaler & Shefrin 1981), mistakenly choose material over experiential purchases (Van Boven & Gilovich 2003), and spend on the self when they should spend on others (Dunn, Aknin, & Norton 2008). But do decision makers themselves believe these to be mistakes?

For example, when a dieter eats a doughnut, it is possible that this indeed reflects a self-control failure, resulting from a momentary lapse of willpower. However, it is equally possible that it instead reflects balancing between goals, in which case it would not. Perhaps she just completed a strenuous workout, which yielded a significant sense of progress toward a weight-loss goal. She now feels licensed to reward herself. In this latter case, it is unlikely even a dieter would admit failure. She is simply balancing—resolving a tradeoff with a mixed solution.

How, then, to distinguish mistakes from mixed solutions?

In this section, we explain how our tradeoff-resolution framework can cast in new light several such purported mistakes, which in many cases should be reinterpreted as mixed solution strategies for resolving tradeoffs—particularly when decision makers themselves do not believe them to be mistakes. And while we do not wish to define mistakes normatively, we submit that researchers are often quick to describe any action incongruent with previous behaviors or stated goals as mistakes, leaving little room for the possibility that they simply reflect mixed solutions. We therefore conclude with guidance for distinguishing mistakes from mixed solutions.

Self-Control Failure

People often make decisions that are inconsistent with long-term goals (Baumeister & Vohs 2007; Fishbach, Friedman, & Kruglanski 2003; Hoch & Loewenstein 1991; Hofmann, Friese, & Strack 2009; Trope & Fishbach 2000; Wertenbroch 1998). And when judged in light of a single consideration—whether a specific action is consistent with the long-term goal to lose weight, for example—these decisions are typically characterized as mistakes. Indeed, a dieter sometimes eats a doughnut because she is depleted (Baumeister, Bratslavsky, & Muraven 1998) or lacks the requisite willpower to resist (Metcalfe & Mischel 1999).

However, when viewed in light of multiple considerations—whether a specific action is consistent with either the long-term goal to lose weight or the short-term goal to indulge—these decisions can seem more like mixed solutions. The same dieter could choose to eat a doughnut to balance between other competing and equally valuable goals (Fishbach & Dhar 2005), to avoid exercising too much self-control (Kivetz & Simonson 2002), or because she is simply not motivated at that particular moment (Inzlicht & Schmeichel 2012). In any of these cases, she herself would probably not register a self-control failure.

Similarly, impatience—choosing, for example, smaller-sooner rewards over larger-later ones—is often portrayed as a breakdown of will (e.g., Mischel et al. 1989). Yet recent research has identified many factors that are unrelated to self-control and more suggestive of mixed motives (Bartels & Urminsky 2011; Dai & Fishbach 2013; Ersner-Hershfield, Wimmer, & Knutson 2009; Imas, Kuhn, & Mironova 2016; McGuire & Kable 2013; Michaelson & Munakata 2016; Shaddy & Lee 2020). Patience can also depend on how much people like what it is they are waiting for. So, for example, college students were more willing to incur an actual weeks-long delay for a higher quality t-shirt when they liked its graphic design more, relative to

when they liked it less (Roberts, Shaddy, & Fishbach 2020). This does not imply that those who were unwilling to incur the delay and instead opted for the lower quality t-shirt failed at self-control. They simply weighed the cost of waiting against the attractiveness of the reward and decided it was not worth it—that is, they resolved a tradeoff.

Moreover, minor violations in the short-term can even facilitate goal achievement in the long-term. For example, Milkman, Minson, & Volpp (2014) propose temptation bundling—combining "want" experiences (e.g., listening to a binge-worthy audiobook) with "should" behaviors (e.g., exercising)—as a strategy for improving self-control. By harnessing their motivation to listen to the next chapter of the *Hunger Games*, people are able to drag themselves to the gym. So listening to a relatively lowbrow audiobook when a relatively highbrow audiobook is available should probably not be viewed as self-control failure when it encourages additional exercise.

People sometimes repent "hyperopia," as well—when choosing virtues over vices causes greater retrospective regret than does choosing vices over virtues (Kivetz & Keinan 2006; Haws & Poynor 2008). This form of self-control failure arises when people exercise too much self-control. For example, college students said they regretted not enjoying themselves, traveling, and spending more when reflecting on their winter breaks 40 years ago. In these cases, indulgence regret is the single consideration by which choosing virtues over vices is judged to be a mistake. However, when reinterpreted as a mixed solution that partially satisfies multiple considerations, these feelings may subside.

For example, over winter break, spending time with family might be less enjoyable than spending time with friends; studying for the Law School Admission Test (LSAT) is probably less fun than traveling; earning money as a temporary worker is definitely less fun than spending

it. Yet people nevertheless recognize the importance of at least partially satisfying some of these other considerations (e.g., family, career, personal finances), even when it engenders regret with respect to another specific consideration (e.g., indulgence). Indulgence regret, therefore, may simply be a privilege of success.

Finally, Vosgerau, Scopelliti, & Huh (2019) note that while researchers often conceptualize self-control as abstinence from hedonic consumption, people do not necessarily believe that sacrificing immediate pleasure is inconsistent with long-term goals. For example, in one experiment, a majority of participants (62%) believed that someone who chose chocolate cake over fruit salad for dessert would not construe this decision as a self-control failure. In fact, only a small minority (14%) described it as such. These findings further underscore the importance of considering whether people themselves would describe their actions as mistakes.

Material Versus Experiential Purchases

People tend to derive less happiness from material discretionary purchases than from experiential discretionary purchases (Carter & Gilovich 2010; Chan & Mogilner 2017; Van Boven & Gilovich 2003). This is because experiences are more open to positive reinterpretation, resistant to hedonic adaptation, identity-defining, and interpersonally connecting. Yet, a closer examination reveals that when people regret a material purchase, it is typically because they judge it with respect to just a single consideration—its hedonic value. But what if they judged it with respect to a mixed solution of hedonic and utilitarian values?

For example, consumers tend to choose hedonic goods over utilitarian goods because choice is often driven by an affect heuristic (i.e., do what feels best). So they choose two pints of ice cream over a similarly priced box of trash bags when given the option. Yet they express

greater willingness to pay (WTP) for the trash bags, relative to the ice cream, when expressing WTP. This is because determining WTP increases deliberation—leading to integration of additional considerations like the perceived value of the product and whether it is a good use of money (O'Donnell & Evers 2018). That WTP increases when people partially satisfy additional considerations implies a mixed solution.

Even for discretionary purchases, people nevertheless likely prefer the best combination of total hedonic and utilitarian value. For example, suppose someone spent $2,000 on a new mattress, as opposed to a Caribbean vacation. This is clearly a mistake if the goal were to maximize only hedonic benefits like fun, pleasure, and excitement (Dhar & Wertenbroch 2000). No one is fondly recalling their mattress a year later. But the magnitude of the potential utilitarian benefits—more and better quality sleep—surely outweighs any enduring retrospective satisfaction culled from beach memories. That is, the mattress probably maximizes total hedonic and utilitarian value, relative to the vacation. Weingarten & Goodman (2020) thus similarly conclude that the relative advantages conferred by experiential purchases should decrease when either the utilitarian value of a material purchase wanes or its hedonic value waxes.

Finally, material and experiential purchases have been shown to make lower-income individuals equally happy (Lee, Hall, & Wood 2018). While all spenders, irrespective of social class, presumably enjoy hedonic benefits, resource scarcity increases concern for utilitarian benefits, which favor material purchases (Tully, Hershfield, & Meyvis 2015; Weidman & Dunn 2016). Consequently, because lower-income individuals are more attuned to their need to partially satisfy additional considerations like purchase longevity, they are happier with a mixed solution of utilitarian and hedonic benefits.

Spending on Others Versus Spending on the Self

Spending money on others promotes greater happiness than does spending money on the self (Aknin et al. 2013; Dunn et al. 2008). It even causes greater activation in the brain's reward centers (Harbaugh, Mayr, & Bughart 2007; Tankersley, Stowe, & Huettel 2007). Yet people nevertheless believe spending on the self yields greater immediate happiness (Dunn, Aknin, & Norton 2014). Consequently, when an expenditure is judged with respect to this single criterion—the immediate happiness it engenders—spending on the self may seem like a mistake.

But often these expenditures are the result of a mixed solution strategy for resolving a tradeoff between immediate and delayed rewards. For example, spending on the self represents a form of saving—a delayed reward. Someone who receives an unexpected $20 windfall might pay a bill. The same person who spends the windfall on a gift might indeed experience a "warm glow" (Andreoni 1990)—an immediate reward. But while the latter person is happier at the end of the day, the former might be happier at the end of the month (when bills come due). Based on our tradeoff-resolution framework, therefore, when people think about satisfying multiple considerations—a mixed solution of immediate and delayed rewards, for example—they should be less likely to perceive spending on the self as a mistake.

Distinguishing Mistakes From Mixed Solutions

We suggest that in many cases mixed solutions for resolving tradeoffs have been erroneously described as mistakes. How, then, to distinguish mistakes from mixed solutions? We propose several criteria (Table 3).

We also note that mistakes and mixed solutions for resolving tradeoffs are not mutually exclusive. For example, when people select less-preferred options to maximize variety (a mixed

solution), this could, in fact, represent a genuine mistake. Perhaps a shopper failed to anticipate how temporally segregating consumption attenuates hedonic adaptation. That a decision is merely inconsistent with one's stated goals or evaluated negatively in light of one's stated interests, however, does itself imply a mistake.

[Table 3]

1. Additional Deliberation

Partially satisfying multiple considerations (a mixed solution) is typically more difficult than fully satisfying a single consideration (an extreme solution). For example, research exploring the compromise effect reveals that evaluating the attribute-level tradeoffs for middle options is more cognitively demanding than simply prioritizing attributes and choosing the corresponding extreme option (Dhar et al. 2000). A broader implication is that if additional deliberation causes people to reverse course, the original decision was probably a mistake.

For example, suppose a dieter is either in a rush or has plenty of time to choose what to eat. That is, she either has the opportunity to deliberate or not. If she were to select a doughnut in the former case and an apple in the latter, this would imply the original choice of a doughnut indeed represented a failure of self-control. Upon reflection, she recruits additional cognitive resources to override her gut-level desire for the unhealthy doughnut and selects the healthy apple. If, however, she were to select the doughnut in both situations, irrespective of time spent deliberating, this would imply a mixed solution. As noted above, there are many reasons dieters can justify doughnuts.

2. Subjective Meaning

How people themselves interpret their own actions matters for distinguishing between mistakes and mixed solutions (Vosgerau et al. 2019). That is, what does the action mean to the person taking it? Would they admit a mistake in retrospect, or even in prospect? For example, would the dieter herself characterize her decision to eat the doughnut a mistake? If it were a reward for finishing a marathon, the answer would likely be no, suggesting a mixed solution. If it were mindless snacking before bed, the answer would likely be yes, suggesting a mistake.

Despite people's ability to articulate these subjective interpretations, researchers often neglect to ask them directly, taking for granted a disconnect between action and intention. It is important to surface these perceptions because someone who experiences a breakdown of will has a very different subjective interpretation of the experience than someone balancing between inconsistent, but equally important goals. Capturing these intuitions can illuminate the underlying choice principle.

3. Advice to Others

What would a person advise others to do? People generally try to give good advice (Jonas & Frey 2003; cf. Kray & Gonzalez 1999) and believe what they advocate (Aronson 1999). Advice thus typically reflects what people believe is normatively correct. So, if a dieter recommended to a dieting friend that she eat a doughnut, this implies a mixed solution. Perhaps they both just spent several hours in the gym. Here, a trip to the doughnut shop would reflect balancing between health, social, and indulgence goals. However, if she instead recommended abstention, this implies a mistake. She would presumably not wish failure upon her friend.

Importantly, recent work has started to examine the various positive effects of both giving and seeking advice. For example, people who give advice become more confident (Eskreis-Winkler, Fishbach & Duckworth 2018), and people who seek advice are perceived to be more competent (Brooks, Gino, & Schweitzer 2015). This raises the intriguing possibility that eliciting advice from decision makers can not only help distinguish mistakes from mixed solutions, but also may even lead people to make fewer mistakes altogether.

4. Future Intentions

If a person plans to repeat the "mistake" in the future, this would imply a mixed solution. For example, if at the grocery store a dieter always purchased healthy, nutritious food and then added a candy bar to her cart while checking out, this could suggest something like temptation bundling—combining "wants" and "shoulds" to facilitate self-control (Milkman et al., 2014). And as discussed, temptation bundling represents a mixed solution that can facilitate achievement of long-term goals. However, if this same decision were judged in light of only a single consideration—whether she purchased anything unhealthy—it would be incorrectly interpreted as a mistake. People generally do not want to repeat mistakes, so capturing future intentions would be diagnostic.

Concluding Remark

Our specific goals in this review were threefold. First, we aimed to provide a unique theoretical lens through which to integrate various otherwise unrelated choice effects across the motivation and decision-making literatures. We furthermore identified variables that shape tradeoff resolution directly and thus systematically influence these decision phenomena. Finally,

we explained how our tradeoff-resolution framework potentially permits reinterpretation of several “mistakes” people purport to make and provided criteria for distinguishing mistakes from mixed solutions. More broadly, we hope this article can serve as a fertile roadmap for future interdisciplinary work examining tradeoffs in choice.

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Table 1. Examples of choice effects categorized as either mixed or extreme solutions for resolving tradeoffs between different considerations

Mixed solutions	Extreme solutions	Considerations
• Balancing between goals • Variety seeking • The compromise effect • Willingness to make tradeoffs between sacred and secular values • Scope sensitivity	• Highlighting a single goal • Consistency seeking • Compromise avoidance • Unwillingness to make tradeoffs between sacred and secular values • Scope insensitivity	• Goals • Tastes, preferences • Attributes • Values, morals, principles • Magnitudes

Table 2. Three classes of variables that influence tradeoff resolution

1. How the decision maker relates to the options		
	Factors yielding mixed solutions	*Factors yielding extreme solutions*
1.1	Ignoring identity in choice	Invoking identity in choice
1.2	Preference uncertainty	Preference certainty
1.3	Novice in the choice domain	Expert in the choice domain
1.4	Consequentialist ethics	Deontological ethics
2. How the options relate to each other		
	Factors yielding mixed solutions	*Factors yielding extreme solutions*
2.1	Available options are substitutes	Available options are complements
2.2	Decreasing marginal utility	Increasing marginal utility
2.3	Options are independent of each other	Options form a gestalt (a “whole”)
2.4	Options compete for resources	Options undermine each other (conflict)
2.5	Positive-to-negative order	Negative-to-positive order
3. Tradeoff ease		
	Factors yielding mixed solutions	*Factors yielding extreme solutions*
3.1	Quantitative framing of considerations	Qualitative framing of considerations
3.2	Available mental resources	Limited mental resources
3.3	Thinking (cognition)	Feeling (emotion)
3.4	Concrete construal	Abstract construal
3.5	Simultaneous choice	Sequential choice

Table 3. Proposed criteria for distinguishing mistakes from mixed solutions

	Criterion	A decision is more likely to be a mistake if—
1.	Deliberation	—additional deliberation changes the decision.
2.	Subjective meaning	—the decision maker considers it a mistake.
3	Advice to others	—it is incongruent with the decision maker's advice to others.
4.	Future intentions	—the decision maker does not wish to repeat the it in the future.