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# Eternal Quest for the Best: Sequential (vs. Simultaneous) Option Presentation Undermines Choice Commitment

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A series of laboratory and field experiments reveals a detrimental effect of presenting options sequentially (one at a time) versus simultaneously (all at once) on choosers' satisfaction with and commitment to their chosen option. This is because choosers presented with their options simultaneously tend to remain focused on the current set of options, comparing them among each other; whereas choosers presented with their options sequentially tend to imagine a better option, hoping it will become available. This feeling of hope undermines how choosers subsequently experience their selected option, resulting in lower satisfaction and commitment levels. Sequential choosers consequently exhibit lower outcome satisfaction regardless of which option they choose, whether sequentially passed-up options remain available, and whether they have equivalent option information to simultaneous choosers. Thus, enjoying the most satisfaction from one's choice might require being willing to give up the eternal quest for the best.

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A great source of calamity lies in regret and anticipation; therefore a person is wise who thinks of the present alone, regardless of the past or future. (Attributed to Oliver Goldsmith [1730–74])

Many decisions—such as selecting a bar of soap from the drugstore aisle, an entrée from a restaurant menu, or a pair of running shoes from Zappos—involve choosing from simultaneously presented options, where the full set of options is presented at the same time (Chandon et al.

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2009). Sometimes, however, choosers are faced with the task of selecting from sequentially presented options, where the set of options is presented one at a time and the chooser has little knowledge of what the next option will be. For instance, in high-end retail stores selling watches, fine jewelry, or fancy handbags, there is typically a salesperson who presents one product at a time from an inaccessible display case for the customer to consider before returning it to the case as the next option is presented. Or what about such examples as a venture capitalist deciding whether to make an investment in a promising startup, or a professor debating whether to accept a position at another university, or (most importantly) an individual choosing whom to marry? Does the way options are presented affect how choosers experience whatever outcome they select?

In many cases, circumstances dictate whether options are presented simultaneously or sequentially, and choosers have little control over how they are presented with their options. On the other hand, retailers (online, as well as offline) must determine not only what assortment to present to their customers but also how to present their assortment so as to maximize customer satisfaction. This attention to choosers' satisfaction is in line with a growing body of research that focuses on how individuals subsequently experience and live with the decisions they make (Botti and Iyengar 2004; Carmon, Wertenbroch, and Zeelenberg 2003; Dijksterhuis and

van Olden 2006; Mogilner, Rudnick, and Iyengar 2008; Wilson et al. 1993). This approach benefits consumers and retailers alike because higher levels of satisfaction with a product reduce the number of product returns and help marketers cultivate ongoing relationships with their customers, motivating repeat purchases and positive word of mouth (Fournier 1998). The question we thus address in this research is whether choosers will enjoy greater satisfaction and be more committed to their chosen option if their options are presented simultaneously or sequentially.

To this point, the answer to this question remains largely unexamined since consumer research has traditionally focused on cases in which option sets are presented simultaneously (Hsee and Leclerc 1998). Furthermore, the separate body of work that has examined cases where options are presented sequentially focuses more on choosers' search behavior—investigating which option in a sequence choosers should objectively select instead of their experienced satisfaction with whichever option they select (Diehl and Zauberman 2005; Gilbert and Mosteller 1966; Weitzman 1979). For instance, researchers investigating what is often called the Secretary Problem (or the Marriage Problem) have developed formal rules for when choosers should select the current option versus continue searching in order to maximize their chance of selecting the top-ranked option (Ferguson 1989; Samuels 1991; Shu 2008; Zwick et al. 2003). Perhaps not surprisingly, people do not naturally follow the objectively optimal strategy, but instead use heuristics in determining whether to continue their search (Seale and Rapoport 1997).

In the current investigation, we not only compare choosers' satisfaction between these two methods of option presentation (simultaneous vs. sequential), but we also account for search by holding the information choosers ultimately have about their options constant in experiment 1 and by varying whether search is endogenous (i.e., determined by the chooser) or exogenous (i.e., determined for the chooser) in experiment 3. Furthermore, we explore a potential mechanism underlying why presenting options sequentially versus simultaneously would influence choosers' satisfaction and commitment. Whereas previous work has examined the influence of memory, norms, and learning on individuals' evaluations of sequentially presented options (Carney and Banaji 2011; Mantonakis et al. 2009; Payne et al. 2000), based on our theorizing, we test for the role that emotion (in particular, hope) plays in determining satisfaction among sequential versus simultaneous choosers.

Previewing briefly, the results of three studies conducted in the laboratory and the field converge to reveal a detrimental effect of sequential (vs. simultaneous) option presentation on choosers' satisfaction and commitment to their chosen option. Our findings suggest that when options are presented sequentially, choosers are more likely to imagine a better option, hoping for it to become available. When options are presented simultaneously, however, choosers tend to remain focused on the current set of options, making simultaneous choosers less likely to feel hope. Our findings suggest that the hope induced from presenting options sequentially results in choosers being

less satisfied with and committed to their chosen option regardless of which option in a sequence individuals choose, whether sequentially passed-up options remain available, or whether sequential and simultaneous choosers have equivalent information about the options. We conclude this article by highlighting the implications of these findings, discussing practical ways by which decision makers faced with sequential options can overcome the reduction in satisfaction by converting the sequential presentation to a quasi-simultaneous presentation of options, thereby minimizing feelings of hope.

## THE ROLE OF HOPE

The method of option presentation affects what choosers compare their selected outcome to when determining their satisfaction, and the primary difference between sequentially and simultaneously presented choice sets is the presence of alternatives. In the case of sequentially presented options, one option is presented at a time, forcing choosers to evaluate that option relative to a reference in their mind (Farquhar and Pratkanis 1993). Prior research has shown that when individuals evaluate an option separately, they compare that option's list of attributes against those of a typical option (Hsee and Leclerc 1998). For instance, in one study, participants' judgments of a brand of light bulb depended on whether the reference (i.e., "most light bulbs") offered greater or fewer lumens and hours of life expectancy (Hsee and Leclerc 1998). Notably, however, when (a) choosers are presented with options that vary along an unspecified list of attributes, (b) a natural reference is not available, and/or (c) choosers know that a series of alternatives will become available in the future, the judgment becomes more complex. This complexity increases the likelihood that choosers will conjure a more ideal reference option, rather than a prototypical one (Griffin and Broniarczyk 2010). Thus, sequential choosers are likely to compare each option presented against an imagined better option. In contrast, simultaneous choosers will remain focused on the fixed set of currently presented options, in line with the prominence effect, rather than expending the cognitive resources required to imagine other possible options (Fischer et al. 1999; Hsee, Dube, and Zhang 2008; Hsee and Leclerc 1998; Shiv and Huber 2000; Tversky and Kahneman 1973, 1974; Tversky, Sattah, and Slovic 1988).

Therefore, when options are presented simultaneously, the presence of alternatives makes the decision fairly certain: choosers can feel confident that they are selecting the best option from among those available. Sequentially presented choice sets, in contrast, resign choosers to greater uncertainty. These choosers know that alternatives will become available in the future, but not what those alternatives will be. There is a possibility that an upcoming option will be better, but it is also possible that the current option is the best they are going to get. Appraisal theory of emotions asserts that individuals experience emotions in response to their perception of a given situation, and certainty is a primary dimension that determines which emotions will be evoked by a particular situation (Frijda, Kuipers, and

Schure 1989; Roseman 1991; Smith and Ellsworth 1985). Because hope is the emotion elicited in situations that suggest a desirable but uncertain outcome (MacInnis and de Mello 2005), choosing from sequentially presented options is likely to evoke feelings of hope.

“Hope” is defined as a “positive emotion that varies as a function of the degree of yearning for a goal congruent, future oriented outcome appraised as uncertain, yet possible” (MacInnis and Chun 2007, 11). That is, hope is experienced as wanting (or yearning for) a desired potential outcome. This emotion “hope” has been distinguished from other closely related future-oriented emotions such as “hopefulness” and “optimism” (MacInnis and Chun 2007; Winterich and Haws 2011). But whereas hope relates to the degree to which one yearns for the possible outcome, hopefulness relates to how likely that outcome is believed to be (de Mello and MacInnis 2005; Nenkov, MacInnis, and Morrin 2009). And whereas hope focuses on a particular desired outcome, optimism reflects a more generalized belief that all future outcomes are likely to be positive (MacInnis and Chun 2007; Norem and Chang 2001; Scheier and Carver 1985, 1987; Synder et al. 1991). In comparing the effect of presenting options sequentially (vs. simultaneously), we test for the role of hope, as opposed to hopefulness or optimism, because presenting options one at a time likely increases choosers’ yearning for a particular outcome (i.e., a better option). And although knowing that there are more options yet to be presented implies the possibility that one will be better, the mere presence of future options says nothing about how likely they are to be better than the current option.

Not only are sequential choosers more likely to feel hope than simultaneous choosers, but it is this yearning for a better option that we predict reduces sequential choosers’ satisfaction with whatever option they select. This is because people’s satisfaction with their chosen option depends less on the objective merits of that option and more on how well that option fares against alternatives—real or imagined (Brehm 1956; Carmon et al. 2003). Indeed, prior research has demonstrated that when choosers remain focused on other possible options, they are less satisfied with the choices they make (Gilbert and Ebert 2002; Hafner, White, and Handley 2011; Markman et al. 1993). These choosers are also less likely to stick with their selected option when given the opportunity to switch (Hafner et al. 2011), which indicates that this dissatisfaction will further manifest in reduced commitment. Indeed, individuals’ commitment to their romantic partners has been shown to depend less on their partners’ desirability than on the relative perceived desirability of and focus on other potential partners (Gangé and Lydon 2001; Johnson and Rusbult 1989; Lydon et al. 1999; Rusbult, Martz, and Agnew 1998). We therefore predict that sequential choosers’ hope for a better option will reduce their choice satisfaction, along with their commitment to their chosen option.

## THE ROLE OF REGRET

Presenting options sequentially may not just pull choosers’ attention toward an imagined better option that could possibly become available in the future but also toward a better option that had been available in the past. In many sequential choice scenarios (such as a used car market or hiring an employee), options that are passed up tend not to remain available for long. Researchers investigating the Secretary Problem therefore structure sequential decision tasks so that an unselected option immediately becomes unavailable (Ferguson 1989; Gilbert and Mosteller 1966; Samuels 1991; Seale and Rapoport 1997; Shu 2008). With forgone options being particularly vivid, it is likely that sequential choosers will focus on these forgone options (in addition to possible future options) when assessing the quality of their ultimate choice. An emotion associated with focusing on the past is regret—a feeling of sorrow or disappointment that stems from focusing on alternatives that “could have been” (Bell 1982; Kahneman and Miller 1986; Landman 1987; Miller, Turnbull, and McFarland 1990; Simonson 1992). Thus, in contexts where passed-up options become unavailable, regret (in addition to hope) may contribute to sequential choosers’ reduced choice commitment (Abendroth and Diehl 2006).

Notably, however, there are also cases of sequentially presented options where unselected options remain available. For example, a house can sit on the market for a year or more during an economic downturn, or a highly qualified worker can remain unemployed for many months in a highly competitive job market. In these cases, although the options are presented in sequence, choosers are not forced to decide to accept or reject each option as it is presented (Mantonakis et al. 2009; Payne et al. 2000). In these more flexible cases of sequential choice, regret poses little threat because the chooser can simply select a previously presented option when making his or her final decision. Hope, however, would still play a role. Therefore, whereas regret is likely only to be felt among sequential choosers for whom passed-up options become unavailable, hope will likely be felt by sequential choosers regardless of whether passed-up options remain available.

## OVERVIEW

We predict that choosing from sequentially presented options will lead to lower satisfaction and commitment levels than choosing from simultaneously presented options. We propose that this occurs because, unlike simultaneously presented choice sets where choosers remain focused on the known set of alternatives, sequentially presented choice sets lead choosers to imagine and hope for a better option. Furthermore, this hope diminishes sequential choosers’ satisfaction with and commitment to their choices. In sequential decision tasks where rejected options become unavailable, regret associated with forgone options should also contribute to choosers’ reduced commitment and satisfaction.

We tested these predictions in the following series of studies



through tests of moderation (experiments 1 and 2) and mediation (experiment 3). First, we influenced sequential choosers' ability to imagine a better option by manipulating cognitive load (experiment 1). Then, we directly manipulated choosers' feelings of hope (experiment 2). In the last study, we measured choosers' feelings of hope and regret and compared across three conditions: (a) a sequential condition in which passed-up options remained available, (b) a sequential condition in which passed-up options became unavailable, and (c) a simultaneous condition in which all options were presented at once.

## EXPERIMENT 1: IMAGINING A BETTER CHOCOLATE

In the context of choosing a piece of gourmet chocolate to taste, participants were presented with five options either sequentially or simultaneously, and their satisfaction with and commitment to their chosen chocolate were measured. We proposed that presenting options sequentially makes choosers more likely to imagine and hope for a better option (thus reducing their satisfaction with and commitment to their chosen option). If so, limiting sequential choosers' ability to imagine a better option should result in their having similarly high levels of satisfaction and commitment as simultaneous choosers. Because imagining other options requires cognitive resources (Hafner et al. 2011; Ward and Mann 2000), we tested this by manipulating the amount of elaboration participants could engage in during the choosing task. This experiment thus followed a 2 (cognitive load: low vs. high)  $\times$  2 (option presentation: sequential vs. simultaneous) between-subjects design.

### Method

*Participants.* Eighty-seven individuals participated in this chocolate study conducted in Wharton's Behavioral Lab to earn \$10. Participants ranged in age from 18 to 38 ( $M = 22$ ), and 62% were female.

*Procedure.* To manipulate the cognitive resources that participants had available to elaborate on a better option while choosing, participants were first presented with either a two-digit number (in the low cognitive load condition) or a 10-digit number (in the high cognitive load condition) and were instructed to remember that number for the duration of the study (McFerran et al. 2010; Shiv and Fedorikhin 1999). They were then presented with the names and descriptions of five chocolates from a local gourmet chocolate shop (e.g., "Waikiki—dark chocolate ganache with a blend of coconut, pineapple, and passion fruit") and were instructed to choose one to taste. To make the choice more consequential, participants were informed that they would be entered into a lottery to win a 25-piece box of their chosen chocolate. The options were explicitly presented in random order across participants.

In the simultaneous condition, the five options were presented at the same time and participants indicated their

choice. In the sequential condition, the five options were presented one at a time and participants clicked "next" in order to be shown the subsequent option in the sequence while the previous options remained available. Once all five options had been presented, participants indicated their choice. Notably, only the method of option presentation varied between the two conditions; choosers in both conditions had the same information available to them when selecting their chocolate.

Participants tasted a piece of their chosen chocolate and rated (1 = not at all satisfied, 7 = very satisfied) how satisfied they were with it. To check whether the elaboration manipulation influenced participants' ability to imagine a better option, hoping that it would become available, participants were asked to consider their experience while selecting their chocolate and to rate (1 = not at all, 7 = very much) the extent to which they had been "imagining the most perfect chocolate possible," "yearning for a more perfect chocolate," and "hoping for a more perfect chocolate option." Responses on these three items were averaged to create an index of hope ( $\alpha = .76$ ). To test whether the method of option presentation influenced other emotions in addition to hope, participants also reported their mood using the PANAS scale (Watson, Clark, and Tellegen 1988), as well as the extent to which they experienced anticipated regret, fear, happiness, and excitement while selecting their chocolate (1 = not at all, 7 = very much).

After completing the survey, participants were reminded that they would be entered into a drawing with the chance to win a 25-piece box of their chosen chocolate. To measure choice commitment, participants were then given the opportunity to change their choice of chocolate for this drawing. Specifically, they could stick with a box of their originally chosen chocolate, they could switch to one of the other chocolates in the original choice set (the names and descriptions of the five options were again listed), or they could switch to a box of an unknown chocolate. Only the name (Troubadour), but not a description, of this unknown chocolate was provided. Participants were told that Troubadour had been randomly selected from the same gourmet chocolate shop, so that their decisions to switch to the unknown option would reflect hope for a better option, rather than an assumption that it was offered separately for being special in some way. Once participants made their decision to stick to or switch away from their originally chosen chocolate, they were asked to rate how they expected a Troubadour chocolate to taste compared to their originally chosen chocolate ( $-3 =$  much worse than my chosen chocolate,  $0 =$  the same as my chosen chocolate,  $+3 =$  much better than my chosen chocolate). Upon completing the study, participants were thanked and paid. One randomly selected participant received a 25-piece box of the chocolate she or he ultimately chose.

### Results and Discussion

*Hope.* To check whether the cognitive load manipulation influenced participants' ability to imagine a better option, a

2 (cognitive load)  $\times$  2 (option presentation) ANOVA was conducted on the hope index, which reflected participants' imagining, hoping for, and yearning for a more perfect chocolate option. The resulting interaction ( $F(1, 83) = 6.19, p < .05$ ) suggests that the manipulation had the predicted effect. Contrasts revealed that among participants in the low cognitive load condition, sequential choosers ( $M = 5.23$ ) reported greater hope than simultaneous choosers ( $M = 3.88; F(1, 83) = 7.47, p < .01$ ); however, among those under high cognitive load, sequential choosers ( $M = 4.14$ ) reported equally low levels of hope as simultaneous choosers ( $M = 4.44; F(1, 83) = .48, p > .10$ ). These results suggest that the sequential presentation of options tends to lead choosers to imagine and hope for a better option, but this process is contingent on having cognitive resources available. Notably, an examination of participants' overall mood, as well as their happiness, excitement, fear, and anticipated regret during the selection process, revealed no main effects (all  $p > .10$ ) and no interaction effects (all  $p > .10$ ). This suggests that it is indeed hope, and not other emotions, that is elicited by the sequential (vs. simultaneous) presentation of options.

**Satisfaction.** We next examined the effect on satisfaction using a 2 (cognitive load)  $\times$  2 (option presentation) ANOVA. The results revealed a main effect of presentation method, whereby those presented with options sequentially ( $M = 5.65$ ) were less satisfied with their chosen chocolate than those presented with options simultaneously ( $M = 6.22; F(1, 83) = 6.32, p = .01$ ). There was also a marginal interaction effect ( $F(1, 83) = 2.93, p = .09$ ) indicating that the main effect was moderated by cognitive load. A closer look reveals that among those under low cognitive load, sequential choosers ( $M = 5.37$ ) were indeed less satisfied than simultaneous choosers ( $M = 6.40; F(1, 83) = 8.15, p < .01$ ); however, among those under high cognitive load, sequential choosers ( $M = 5.85$ ) and simultaneous choosers ( $M = 6.05$ ) did not differ in their levels of satisfaction ( $F(1, 83) = .356, p > .10$ ). This suggests that the tendency of sequential choosers to imagine a better option may contribute to their lower satisfaction with the options they select.

**Commitment.** We then tested whether the method of option presentation (and cognitive load) affected individuals'

commitment to their originally chosen option. See table 1 for participants' switching behavior. First, to assess participants' commitment, a logistic regression was conducted on participants' decision to stick with their original choice. The results revealed a main effect of option presentation ( $Wald(1) = 8.42, p < .01$ ), whereby sequential choosers were less likely to stick with their original choice than simultaneous choosers. There was also a main effect of cognitive load ( $Wald(1) = 7.99, p < .01$ ), whereby those under low load were less likely to stick with their choice than those under high load. Finally, the results also revealed the predicted interaction effect ( $Wald(1) = 4.54, p < .05$ ). A closer examination into this effect showed that among those under low cognitive load, sequential choosers (26%) were less likely to stick with their choice than were simultaneous choosers (75%;  $\chi^2(1) = 9.24, p < .01$ ); however, among those under high cognitive load, sequential choosers (70%) were as likely to stick to their choice as simultaneous choosers (71%;  $\chi^2(1) = .01, p > .10$ ). These results suggest that individuals presented with options sequentially tend to be less committed to their chosen option than individuals presented with their options simultaneously; however, when sequential choosers do not have the cognitive resources necessary to elaborate on a better option, they become equally as committed as simultaneous choosers. This, therefore, implies that elaborating on potential better options is detrimental to choice commitment.

To assess whether participants' decisions to switch away from their originally chosen option reflects hoping for a better option, we next conducted a logistic regression on their decisions to switch to the unknown option. The results revealed a main effect of cognitive load ( $Wald(1) = 5.85, p < .05$ ) whereby those under low cognitive load were more likely to switch to the unknown option than those under high cognitive load. There was also a marginal effect of option presentation ( $Wald(1) = 3.52, p = .06$ ), whereby sequential choosers were more likely to switch to the unknown option than simultaneous choosers. A closer examination showed that among those under low cognitive load, sequential choosers (37%) were more likely to switch to the unknown option than simultaneous choosers (10%;  $\chi^2(1) = 3.96, p < .05$ ); however, among those under high cognitive load, neither sequential choosers (4%) nor simultaneous

TABLE 1  
EXPERIMENT 1: CHOICE COMMITMENT AND SATISFACTION BY CONDITION

	Low cognitive load		High cognitive load	
	Simultaneous	Sequential	Simultaneous	Sequential
Commitment:				
Stick	75% <sub>a</sub>	26% <sub>b</sub>	71% <sub>a</sub>	70% <sub>a</sub>
Switch to known	15% <sub>a</sub>	37% <sub>a</sub>	24% <sub>a</sub>	26% <sub>a</sub>
Switch to unknown	10% <sub>a</sub>	37% <sub>b</sub>	5% <sub>a</sub>	4% <sub>a</sub>
Satisfaction	6.40 <sub>a</sub>	5.37 <sub>b</sub>	6.05 <sub>a</sub>	5.85 <sub>a</sub>
	(.75)	(1.21)	(.92)	(1.41)

NOTE.—Numbers in parentheses represent standard deviations. Within each row, percentages or means with different subscripts are significantly different,  $p \leq .05$ .

choosers (5%) were likely to switch to the unknown option ( $\chi^2(1) = .03, p > .10$ ). An examination of conditional probabilities reveals a similar pattern of results. Of the switchers in the low cognitive load condition, 50% of sequential choosers switched to the unknown option instead of to one of the other known options, and this was slightly more than the 40% of simultaneous choosers who switched to the unknown option. Additionally, among the switchers under high cognitive load, only 13% of sequential choosers and 17% of simultaneous choosers switched to the unknown option. These results suggest that when sequential choosers have the cognitive resources available to imagine a better option, they will. They in turn become more likely to switch to that unknown option, hoping it will be better.

A 2 (cognitive load)  $\times$  2 (option presentation) ANOVA conducted on participants' reported beliefs that the unknown option would be better than their originally chosen chocolate supports this. The results revealed a main effect of option presentation: those who were presented with the options sequentially believed the unknown option would be better than their chosen chocolate ( $M = .13$ ), whereas those who were presented with their options simultaneously believed the unknown option would be worse than their chosen chocolate ( $M = -.44; F(1, 83) = 7.40, p < .01$ ). Furthermore, a marginal interaction effect ( $F(1, 83) = 3.06, p = .08$ ) indicates that among those under low cognitive load, sequential choosers ( $M = .47$ ) believed the unknown option would be more desirable than did the simultaneous choosers ( $M = -.55; F(1, 83) = 9.11, p < .01$ ); however, among those under high cognitive load, both sequential choosers ( $M = -.11$ ) and simultaneous choosers ( $M = -.33$ ) believed the unknown option would be worse than their chosen option ( $F(1, 83) = .52, p > .10$ ). These results are consistent with our proposition that sequential choosers tend to be less committed to their choice than simultaneous choosers because they are hoping for a better option to become available in the future. It further suggests that sequential choosers may also be hopeful, thinking that the unknown future option is likely to be better.

## EXPERIMENT 2: HOPING FOR A BETTER CHOCOLATE

Experiment 2 built on the previous experiment in two ways. First, it directly manipulated whether participants felt hope while choosing. In experiment 1, participants' ability to imagine a better option was manipulated, influencing whether they felt hope for a better option. The results showed that sequential choosers who were able to imagine a better option felt the most hope, and their satisfaction and commitment suffered. In this experiment, we directly manipulated the emotion of hope, predicting that simultaneous choosers who felt hope while choosing would exhibit similarly low levels of satisfaction and commitment as sequential choosers. This experiment thus followed a 2 (emotion: hope vs. control)  $\times$  2 (option presentation: sequential vs. simultaneous) between-subjects design.

Second, we wanted to test the effect of presenting options simultaneously versus sequentially using a more restrictive instance of sequential choice—where passed-up options no longer remained available and sequential choosers were allowed to endogenously determine when they would stop searching, even if they had not yet viewed all the options (Diehl and Zauberman 2005). As a pilot study for this comparison between simultaneous and strict sequential choice, we conducted a field experiment at a nail salon among patrons selecting their nail polish color for a manicure ( $N = 39$ , ages 19–57;  $M = 25$ ). In this context (where women exhibit a surprisingly high amount of care while choosing), we manipulated whether the color options were presented simultaneously or sequentially. While simultaneous choosers were presented with the color options all at once, sequential choosers were presented with the options one at a time and were instructed to either choose or reject each option before being shown the next. We then measured participants' commitment to their manicure color by allowing them to switch colors when offered a free bottle of nail polish before exiting the salon. Sequential choosers demonstrated lower choice commitment than simultaneous choosers, with 83% of simultaneous choosers sticking with their chosen color and only 43% of sequential choosers sticking with theirs ( $\chi^2 = 6.71, p = .01$ ). Experiment 2 was conducted in the same choice context as experiment 1, with lab participants choosing from an assortment of five gourmet chocolates to taste; however, like in this manicure study, choosers who were presented with their options sequentially could only select the option currently presented—not a passed-up option or an option yet to come.

## Method

*Participants.* One hundred and ninety-eight individuals participated in a chocolate study conducted in Wharton's Behavioral Lab to earn \$10. Sixty percent were female, and they ranged in age from 18 to 38 ( $M = 20$ ).

*Procedure.* First, participants were presented with an ostensibly unrelated study that served to induce hope or not. Participants in the hope condition were instructed to reflect on and vividly describe a time they felt hope (Bless et al. 1990), whereas those in the control condition were instructed to describe a neutral topic (the path they traveled leaving home that morning; Vohs and Heatherton 2001).

Next, in the chocolate study, participants were informed that they would be presented with an assortment of five gourmet chocolate options and were randomly assigned to either the simultaneous condition or the sequential condition. Those in the simultaneous condition were told that they would be presented with the five options at the same time. Those in the sequential condition were told that the options would be presented one at a time and as each option is presented they would be asked to irrevocably choose or reject that option—thus they would not be able to select an option that they had previously passed up or one that was still to come. Participants were to choose one chocolate to taste. To make the choice more consequential, participants

TABLE 2  
EXPERIMENT 2: CHOICE COMMITMENT AND SATISFACTION BY CONDITION

	Control condition		Hope condition	
	Simultaneous	Sequential	Simultaneous	Sequential
Commitment:				
Stick	54% <sub>a</sub>	29% <sub>b</sub>	42% <sub>a,c</sub>	32% <sub>b,c</sub>
Switch to known	44% <sub>a</sub>	47% <sub>a</sub>	29% <sub>a</sub>	40% <sub>a</sub>
Switch to unknown	2% <sub>a</sub>	24% <sub>b</sub>	29% <sub>b</sub>	28% <sub>b</sub>
Satisfaction	6.18 <sub>a</sub> (.87)	5.63 <sub>b</sub> (1.58)	5.63 <sub>b</sub> (1.43)	5.85 <sub>b</sub> (1.23)

NOTE.—Numbers in parentheses represent standard deviations. Within each row, percentages and means with different subscripts are significantly different,  $p \leq .05$ .

were informed that they would be entered to win a 25-piece box of their chosen chocolate.

The names and descriptions of the chocolate options (e.g., “Paris—dark chocolate ganache made with our own black tea, with hints of citrus and vanilla”) were then presented either simultaneously or sequentially. The order of option presentation was randomized across participants. After participants indicated their choice, the experimenter gave each participant a piece of their chosen chocolate.

Having tasted their chocolate, participants completed a survey that asked them to rate (1 = not at all satisfied, 7 = very satisfied) their satisfaction with their chosen chocolate. A manipulation check asked participants to rate (1 = not at all, 7 = very much) the extent to which they experienced hope during the decision process. The study then followed the same procedure with the commitment measure as experiment 1 for the chocolate box lottery, where participants were given the opportunity to stick with their chosen chocolate, switch to one of the other options in the original choice set (the names and descriptions of the five options were again listed), or switch to an unknown chocolate that had been randomly selected from the same gourmet chocolate shop.

## Results and Discussion

To check whether the hope manipulation was effective, a 2 (hope)  $\times$  2 (option presentation) ANOVA was conducted on participants' reported feelings of hope during the decision task. The resulting interaction ( $F(1, 194) = 3.73$ ,  $p = .06$ ) is consistent with our theory that presenting options sequentially makes choosers feel hope, and it indicates that the prime had the intended effect. Specifically, contrasts showed that among participants in the control condition, sequential choosers ( $M = 4.82$ ) felt more hope than simultaneous choosers ( $M = 3.74$ ;  $F(1, 194) = 9.04$ ,  $p < .01$ ); however, among those induced to feel hope, simultaneous choosers ( $M = 4.52$ ) experienced an equally high level of hope as sequential choosers ( $M = 4.62$ ;  $F(1, 194) = .07$ ,  $p > .10$ ).

**Satisfaction.** Next, a 2 (hope)  $\times$  2 (option presentation) ANOVA was conducted on participants' reported satisfaction with their chosen chocolate. The results revealed the

predicted interaction ( $F(1, 194) = 4.23$ ,  $p < .05$ ). Planned contrasts showed that among those in the control condition, participants presented with their options sequentially ( $M = 5.63$ ) were less satisfied with their choice than those presented with their options simultaneously ( $M = 6.18$ ;  $F(1, 194) = 4.35$ ,  $p < .05$ ). Notably, however, among those induced to feel hope, simultaneous choosers ( $M = 5.63$ ) reported equally low levels of satisfaction as sequential choosers ( $M = 5.85$ ;  $F(1, 194) = .68$ ,  $p > .10$ ). Indeed, among those in the simultaneous conditions, those induced with hope ( $M = 5.63$ ) were less satisfied than those in the control condition ( $M = 6.18$ ;  $F(1, 194) = 4.45$ ,  $p < .05$ ). These results support our proposition that greater feelings of hope are responsible for sequential choosers' reduced satisfaction.

**Commitment.** We then tested whether the method of option presentation affected individuals' commitment to their originally chosen option. See table 2 for participants' switching behavior. First, to assess participants' commitment, a logistic regression was conducted on participants' decision to stick with their original choice. The results revealed a main effect of decision task ( $\text{Wald}(1) = 6.41$ ,  $p = .01$ ), whereby sequential choosers were less likely to stick with their originally chosen option than simultaneous choosers. A closer examination revealed that in the control condition, sequential choosers (29%) were less likely to stick with their chosen option than were simultaneous choosers (54%;  $\chi^2(1) = 6.60$ ,  $p = .01$ ). However, among those induced to feel hope, there was not a significant difference between sequential choosers' (32%) and simultaneous choosers' (42%) likelihood to stick to their original choice ( $\chi^2(1) = 1.14$ ,  $p > .10$ ). These results are consistent with those from experiment 1, providing further support for the underlying role of hope in sequential choosers' reduced commitment.

Next, we assessed whether participants' decisions to switch away from their originally chosen option reflects hoping for a better option by conducting a logistic regression on participants' decisions to switch to the unknown option. The results revealed a significant interaction ( $\text{Wald}(1) = 5.99$ ,  $p = .01$ ) and a main effect of decision task ( $\text{Wald}(1) = 6.77$ ,  $p < .01$ ), whereby sequential choosers were more likely to switch to the unknown option than simultaneous choosers. A closer examination showed that only among



those in the control condition were sequential choosers (24%) more likely to switch to the unknown option than simultaneous choosers (2%;  $\chi^2(1) = 10.97, p = .001$ ). Among those induced to feel hope, simultaneous choosers (29%) were as likely to switch to the unknown option as sequential choosers (28%;  $\chi^2(1) = .02, p > .10$ ). We also examined the conditional probabilities, which similarly showed that of the switchers in the control condition, 34% of sequential choosers switched to the unknown option instead of to one of the known options, whereas only 4% of simultaneous choosers did. Among the switchers who were led to feel hope, 41% of sequential choosers switched to the unknown option and 50% of simultaneous choosers did. These results suggest that the low commitment exhibited among sequential choosers is driven by increased feelings of hope. Not only were simultaneous choosers as likely to switch as sequential choosers when they were made to feel hope, but the switching exhibited among these choosers tended to be toward an unknown future option. This limits the potential argument that the sequential choosers in this experiment were less committed to their choices because they simply got stuck with an objectively bad option; otherwise they would have been more likely than simultaneous choosers to switch to one of the other known options when given the opportunity.

Finally, a 2 (hope)  $\times$  2 (option presentation) ANOVA was conducted on participants' reported beliefs that the unknown option would be better than their originally chosen chocolate. The results revealed a marginal main effect of prime, whereby those induced to feel hope ( $M = .13$ ) believed that the unknown option would be better than their chosen chocolate, whereas those in the control condition ( $M = -.15$ ) believed the unknown option would be worse ( $F(1, 194) = 3.07, p = .08$ ). This was qualified by a significant interaction effect ( $F(1, 194) = 4.01, p < .05$ ). Among those in the control condition, sequential choosers ( $M = .08$ ) believed the unknown option would be more desirable than simultaneous choosers ( $M = -.38; F(1, 194) = 4.30, p < .05$ ); however, among those induced to feel hope, sequential choosers ( $M = .04$ ) and simultaneous choosers ( $M = .21$ ) did not differ in their beliefs about the unknown option ( $F(1, 194) = .57, p > .10$ ). This is consistent with the proposition that compared to presenting options simultaneously, presenting options sequentially tends to lead choosers to hope for a better option to become available.

### EXPERIMENT 3: FEELING HOPE AND REGRET TASTING WINE

This next study was a field experiment conducted as a wine tasting, which provided a test for the effect of presenting options sequentially versus simultaneously in another choice domain. More importantly, experiment 3 builds on the previous two studies by further exploring the underlying role of feeling hope in two ways. First, in this experiment, we measured (rather than manipulated) the extent to which participants felt hope during the decision pro-

cess, allowing for a test of mediation. Second, we honed in on the role of hope by (a) also measuring regret and (b) including both types of sequential conditions: one where passed-up options remained available throughout the decision task (flexible sequential, like in experiment 1) and one where passed-up options became unavailable (strict sequential, like in experiment 2). In experiment 2, since passed-up options became unavailable, it is possible that regret from passing up a good option contributed to sequential choosers' reduced commitment. Directly comparing this strict sequential condition with a more flexible sequential condition highlights the role of hope—showing that even when sequential choosers do not feel regret, they may still be less committed to their choices than simultaneous choosers because of hope. This experiment thus followed a 1 factor (option presentation), 3 level (simultaneous vs. strict sequential vs. flexible sequential), between-subjects design.

### Method

*Participants.* One hundred and twenty-nine members of Stanford's business school community (83% students and 17% staff) participated in a wine-tasting study in exchange for their choice of a free bottle of wine. The participants ranged in age from 21 to 65 ( $M = 29$ ); 57% were female.

*Procedure.* The experiment consisted of a wine-tasting event, during which participants tasted four Italian red wines and chose their favorite for their free bottle. The four wines had been selected by a wine expert to be comparable in quality and price. The wine samples were poured from bottles that were covered with paper bags to remove any influence of the labels, and the order in which the options were presented was counterbalanced.

Participants were randomly assigned to one of three option presentation conditions: simultaneous, strict-sequential (i.e., could not go back to passed-up options), or flexible-sequential (i.e., could go back to passed-up options). In the simultaneous condition, the four wine samples were poured and presented at the same time, allowing participants to sample across the wine options as they pleased before making their choice. In the strict-sequential condition, participants were poured one sample of wine to taste at a time, and after each taste they were asked to irrevocably choose or reject that option. Thus, they could not select a previously passed-up wine, and they could potentially choose a wine before tasting all four options. Regardless of which wine in the sequence they chose, they ultimately tasted all four wines before completing the survey. In the flexible-sequential condition, participants were poured one sample of wine to taste at a time, but they could pick any of the options (including previously tasted wines) when indicating their final choice.

Having chosen their free bottle of wine, participants completed a brief survey about their feelings during the decision process. Participants were asked to rate on a 7-point scale (1 = not at all, 7 = very much) the extent to which they had been "hoping for a better option" and the extent to which they "experienced regret."

**TABLE 3**  
EXPERIMENT 3: WINE COMMITMENT (%)

Decision	Simultaneous	Strict sequential	Flexible sequential
Stick	84 <sub>a</sub>	40 <sub>b</sub>	65 <sub>c</sub>
Switch to known	0 <sub>a</sub>	10 <sub>b</sub>	0 <sub>a</sub>
Switch to unknown	16 <sub>a</sub>	50 <sub>b</sub>	35 <sub>b</sub>

NOTE.—Within each row, percentages with different subscripts are significantly different,  $p \leq .05$ .

Choice commitment was measured at the very end of the study. Just as participants were about to leave, they were unexpectedly told that there was an additional wine that would not be available for tasting but which they could choose for their free bottle. Participants were then given three options: they could (a) stick with their originally chosen wine, (b) switch to any of the other previously tasted wines, or (c) switch to the unknown wine. Finally, participants were thanked and given a bottle of the wine they ultimately settled on.

## Results and Discussion

**Commitment.** Participants presented with options simultaneously were more committed to their chosen option than participants presented with options sequentially, irrespective of whether the sequential choosers could select a previously passed-up option. Specifically, choosers in the simultaneous condition were significantly more likely to stick to their chosen option (84%) than choosers in either the strict-sequential condition (40%;  $\chi^2 = 16.93$ ,  $p < .001$ ) or the flexible-sequential condition (65%;  $\chi^2 = 3.97$ ,  $p < .05$ ). Those in the strict-sequential condition were even less likely to stick to their chosen option than those in the flexible-sequential condition ( $\chi^2 = 5.47$ ,  $p < .05$ ). See table 3 for participants' switching behavior by condition.

Furthermore, those who switched away from their original choice tended to switch to the unknown future option rather than to one of the other three options in the original choice set. Compared to participants in the simultaneous condition (16%), both those in the strict-sequential condition (50%;  $\chi^2 = 10.74$ ,  $p = .001$ ) and those in the flexible-sequential condition (35%;  $\chi^2 = 3.97$ ,  $p < .05$ ) were more likely to switch to the unknown option. Participants in the two sequential conditions did not differ in their likelihood to switch to the unknown option ( $\chi^2 = 2.04$ ,  $p > .10$ ). In fact, 100% of the switchers in the flexible sequential condition switched to the unknown option, as did 83% of switchers in the strict sequential condition. These results support our proposal that sequential choosers' lower commitment level stems from hope for a better future option.

**Hope and Regret.** To further explore the reason for sequential choosers' reduced commitment, we examined the emotions participants reported to have felt during the decision process. The method of option presentation had an effect on participants' hope for a better option ( $F(2, 128) =$

18.03,  $p < .001$ ). Contrasts showed that compared to participants in the simultaneous condition ( $M = 3.60$ ), participants in both the strict-sequential condition ( $M = 5.50$ ;  $t(126) = 5.68$ ,  $p < .001$ ) and the flexible-sequential condition ( $M = 5.07$ ;  $t(126) = 4.53$ ,  $p < .001$ ) felt more hope. Participants in the two sequential conditions felt equally high levels of hope ( $t(126) = 1.32$ ,  $p > .10$ ).

Method of option presentation also had an effect on participants' experienced regret during the decision process ( $F(2, 128) = 10.20$ ,  $p < .001$ ). Participants in the strict-sequential condition ( $M = 3.20$ ) experienced more regret than participants in either the flexible-sequential condition ( $M = 2.02$ ;  $t(126) = 3.98$ ,  $p < .001$ ) or the simultaneous condition ( $M = 2.02$ ;  $t(126) = 3.91$ ,  $p < .001$ ). Participants in the flexible-sequential and the simultaneous conditions did not differ in their levels of regret ( $t(126) = .01$ ,  $p > .10$ ). To summarize, whereas higher levels of hope were reported among participants in both sequential conditions, regret was only higher among those in the strict-sequential condition (see table 4).

To test whether the emotions of hope and regret caused sequential choosers' reduced commitment, we next conducted a mediation analysis (Preacher and Hayes 2008). In the model, we focused on the effect of presenting options simultaneously versus sequentially on participants' likelihood of switching away from their original choice, with hope and regret as mediators. The bootstrap results showed the mean indirect effects through each mediator to be significant: the coefficient of the indirect path through hope was .55, with a 95% confidence interval excluding zero (.14 to 1.30), and the coefficient of the indirect path through regret was .30, with a 95% confidence interval excluding zero (.02 to .75). The direct effect of option presentation on likelihood to switch was mar-

**TABLE 4**  
EXPERIMENT 3: EMOTIONS FELT DURING  
THE CHOOSING PROCESS

Emotion	Simultaneous	Strict sequential	Flexible sequential
Hope	3.60 <sub>a</sub> (1.84)	5.50 <sub>b</sub> (1.24)	5.07 <sub>b</sub> (1.40)
Regret	2.02 <sub>a</sub> (1.21)	3.20 <sub>b</sub> (1.88)	2.02 <sub>a</sub> (.91)

NOTE.—Numbers in parentheses represent standard deviations. Within each row, means with different subscripts are significantly different,  $p \leq .05$ .

**TABLE 5**  
 OPTIONS CHOSEN ACROSS EXPERIMENTS

	Experiment 1: Chocolate study				Pilot: Manicure study		
	Low cognitive load		High cognitive load		Simultaneous	Sequential	
	Simultaneous	Sequential	Simultaneous	Sequential			
St. Malo	20%	26%	33%	19%	Red	0%	14%
Waikiki	25%	16%	19%	19%	Burgundy	33%	14%
Queen Elizabeth	25%	11%	5%	22%	Pink	6%	10%
Naranjito	10%	26%	10%	15%	Sheer pink	22%	33%
The Georgian	20%	21%	33%	26%	Sheer beige	39%	29%
	$\chi^2(4) = 3.16, p > .10$		$\chi^2(4) = 4.00, p > .10$		$\chi^2(4) = 5.03, p > .10$		
	Experiment 2: Chocolate study				Experiment 3: Wine tasting study		
	Control		Hope		Simultaneous	Sequential	
	Simultaneous	Sequential	Simultaneous	Sequential			
Orinoco	20%	16%	21%	32%	Wine 1	19%	22%
Figaro	18%	25%	25%	11%	Wine 2	21%	17%
Bangkok	14%	10%	15%	13%	Wine 3	21%	33%
Marquise	24%	33%	15%	28%	Wine 4	39%	28%
Paris	24%	16%	23%	17%			
	$\chi^2(4) = 2.35, p < .10$		$\chi^2(4) = 6.20, p > .10$		$\chi^2(3) = 2.93, p > .10$		

ginal ( $p = .06$ ), suggestive of indirect-only mediation, which is the form of mediation consistent with full mediation in Baron and Kenny's (1986) procedure. Thus, hope and regret each appeared to play a role in sequential choosers' reduced commitment, with the driving role of hope being slightly stronger.

Together these results suggest that presenting options sequentially (irrespective of whether passed-up options remain available) leads to lower choice commitment than presenting options simultaneously. Furthermore, as evidenced by their tendency to switch to an option outside of the original choice set, sequential choosers hoped that the future option might be better. Indeed, a mediation analysis provided additional support for the driving role of hope, distinct from regret, in reducing sequential choosers' reduced commitment.

**GENERAL DISCUSSION**

Presenting options sequentially, rather than simultaneously, can detrimentally affect how consumers experience the products they choose. The results of two field experiments and two laboratory experiments showed that whether choosing a piece of gourmet chocolate, a nail polish color, or a bottle of Italian red wine, individuals presented with their options one at a time ended up less satisfied with, and ultimately less committed to, their chosen option than individuals presented with their options all at once. This negative effect persisted regardless of whether passed-up options remained available and even when sequential and simultaneous choosers had the same option information available to them when making their selection. Feeling hope proved a key driver of this effect. That is, presenting options one at a time led choosers to imagine a better option, hoping for it to become available. In contrast, when options were

presented all at once, choosers compared the presented options against each other, neither imagining nor hoping for a better option. Therefore, consistent with the old saying "a bird in the hand is worth two in the bush," choosers should give up hoping for what is to come and remain focused on that which they currently have to enjoy greatest satisfaction.

In sum, our results show that presenting options sequentially hurts how choosers subjectively experience whatever option they select. But do sequential choosers also end up with different (and objectively worse) options than simultaneous choosers? The observation that sequential choosers were not more likely than simultaneous choosers to switch to one of the other options in the original choice set indicates that sequential choosers did not think they got stuck with an objectively worse option from that assortment. Moreover, participants chose among experiential items, such that each option's quality was ambiguous and subjectively determined. Nonetheless, to assess whether sequential choosers ended up with different (or worse) options than simultaneous choosers, we looked across the studies at whether the method of option presentation influenced which options participants selected. Table 5 delineates for each study how frequently the various options were chosen within each condition. The nonsignificant chi-square results (all  $p > .10$ ) suggest that the method of option presentation did not influence the objective outcome of participants' choices. That is, sequential choosers did not end up with different outcomes than simultaneous choosers; they just experienced them as less desirable. Future research should examine contexts in which the options do vary in objective quality. For instance, would hope for a better option still resign sequential choosers to lower satisfaction when choosing among utilitarian items?

Feelings of hope keep choosers from settling into the decisions they have made because they continue to hope for a better option to become available. This mechanism is related

to one identified by Gilbert and Ebert (2002), which was also shown to diminish choosers' satisfaction. They found that among photography students who were instructed to choose which of their two personally meaningful photographs to donate, those who were told that they would later be able to change their minds ended up less satisfied with the photograph they decided to keep than those who were told that their decisions were irreversible. The researchers argued that when choosers do not perceive their decisions to be complete, the processes that typically help choosers subjectively optimize their outcomes do not kick in, thus leaving them less satisfied with that outcome (Gilbert and Ebert 2002). Even though none of the participants in our studies knew they would subsequently be allowed to switch away from their chosen option, merely presenting options sequentially seems to have led participants to wonder about and idealistically imagine what might still be out there. Thus, our participants were similarly kept from mentally concluding the decision process upon selecting an option. Future research should examine whether there are other contextual factors or individual difference variables (e.g., being a maximizer or satisficer) that, like the sequential presentation of options, would increase choosers' tendencies to wonder about future possibilities, hoping for a better option to become available (Schwartz et al. 2002). Our findings suggest that hope can have undesirable effects in the context of decision making, even though decades of research have highlighted the beneficial motivating consequences of this emotion in such domains as academics, athletics, physical health, and overall happiness (Averill, Catlin, and Chon 1990; Curry et al. 1997; Lazarus 1999; Mogilner, Aaker, and Pennington 2008; Rossiter and Percy 1991; Seligman 1975, 2003; Snyder 2000; Taylor et al. 2000).

If having options presented one at a time engenders reduced choice satisfaction and commitment, can one circumvent these detrimental effects? Experiment 1 suggests one potential remedy by showing that swamping choosers' cognitive resources keeps them from hoping for better possibilities, thereby allowing them to enjoy more satisfaction from the decisions they make. Here it is interesting to note that although we found that cognitive load reduced choosers' feelings of hope, such manipulations have typically been used to increase choosers' reliance on emotions (Shiv and Fedorikhin 1999). The pattern of results in experiment 1 therefore highlights that thinking (about what could be in the future) is a component of this particular emotion: hope. Indeed, recent research has more precisely shown that although cognitive load increases reliance on primary emotions, it can reduce choosers' access to secondary (more cognitive) emotions, of which hope is one (Becker-Asano and Wachsmuth 2010; Shiv and Fedorikhin 2002).

Another strategy might be for choosers to think of a sequentially presented choice set as a quasi-simultaneous presentation of options. The core aspect of sequential presentation is that it is almost impossible to assess where the current option falls in a typically normal distribution of all potential future and previously experienced options. The trick for making such an assessment might be to draw the decision maker's

attention to options from his/her past within the domain in question that he or she (1) chose and is now extremely satisfied with and/or (2) rejected and now regrets having done so. If the decision maker is able to identify such an option, then the next step would be to assess the current option against the previous option, thereby converting the sequential presentation to a quasi-simultaneous presentation of options. The decision maker's task now is to assess if the current option is as good, or better, than the option from the past and choose accordingly.

## CONCLUSION

Retailers are fortunate in that they can decide how best to present their assortment so as to maximize consumers' satisfaction and commitment to the products they choose. The findings from this investigation are unambiguous in terms of their recommendation for retailers: consumers are more satisfied with what they select when the options are presented simultaneously than when the options are presented sequentially.

Of course, there are circumstances in which the decision of how options will be presented is out of anyone's hands, such as choosing a job, house, or spouse, as well as for business leaders as they decide whom to hire or whether to acquire a promising startup. In these circumstances, individuals can benefit from the recognition that sequentially presented options have the inherent limitation of making choosers focus on options that may never exist, and even if they did, would not necessarily be better than what choosers already have. Thus, getting the most from choice might require being willing to give up the eternal quest for the best.

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