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Chapter XX

WHO'S IN *YOUR* SHOPPING CART? EXPECTED AND EXPERIENCED EFFECTS OF CHOICE ABUNDANCE IN THE ONLINE DATING CONTEXT

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Abstract: The advent of the Internet has led to a sizeable increase in the number of options from which humans can choose, in such evolutionarily important domains as housing, food and mates. The level of choice and amount of information seen on the Internet are well beyond that which would have been found in our ancestral choice environment, so how does it impact our decisions? We describe the results of two experiments in which we examine the influence of increasing online mate choice on expected *and* experienced choice-related affect and cognitions. In Study 1, participants merely expecting an increasing choice of mates believed they would enjoy choosing more from these sets, and would have greater satisfaction and less regret with their chosen

partner (versus when they expected to face limited choice), but only up to a point. On the other hand, participants in Study 2 who experienced a supposedly ideal number of potential mates from whom to choose did not have enhanced feelings about the choice process and person selected than participants experiencing a more limited number of options. Furthermore, the results indicated that having more choice may lead to memory confusion. Together, these studies suggest that while participants anticipate that increasing choice may ultimately yield more downsides than upsides, they underestimate how quickly increasing choice can become overwhelming. We propose that these results may be understood best within the context of an evolutionary-cognitive framework. The chapter concludes by discussing why the error in anticipation may be difficult to overcome and, further, how the design of dating websites could be improved given people's expectations.

Key words: affective forecasting; choice overload; evolutionary psychology; mate choice; online dating; too-much-choice; website design.

1. INTRODUCTION

Modern humans in wealthy parts of the globe face resource options of evolutionarily unprecedented magnitudes. For example, while our ancestors had limited food and habitat choices, we have a surfeit of foodstuffs to choose from, and the freedom to live in a variety of areas. The "problem" of too-much-choice is further magnified when one considers the number of options available on the Internet, which has no physical space limitations. For example, a consumer searching for a mountain bike on the Internet is likely to be presented with more than 3000 options from which to choose (Edwards & Fasolo, 2001). At the same time, however, our search psychology on the Internet may not be any different from that we employ in foraging for food or other resources in the physical world, as suggested by research on information foraging (Pirolli & Card, 1999), as well as by the framework of evolutionary consumer psychology more broadly (Saad, 2007; Saad & Gill, 2000; Stenstrom, Stenstrom, Saad, & Cheikhrouhou, 2007).. Thus, since the psychological mechanisms that we employ have not changed while our environment has, it may be useful to consider what kinds of information tools may help people deal with the associated decision-making challenges (Fasolo, McClelland, & Todd, 2007).

Perhaps more so than in any other evolutionarily important domain, the number of options facing us when choosing a mate has become potentially overwhelming. Not only are there simply more people to select among in our local environment than ever before, but modern methods of dating such as speed-dating or online dating also present us with more choice than humans have previously dealt with. And this expanding range of options is readily

available for inspection; that is, the inspection costs – in terms of option identification and time – are relatively minimal. For example, a typical "speed-dating" event may present singles with as many as 30 potential partners in less than 2 hours (Speeddater.co.uk), and one speed-dating event in China comprised as many as 5000 individuals (Haixa, 2005). As in consumer choice, the Internet has increased the mate-choice challenge even more: Match.com, the leading dating website, offers "millions of possibilities" (Match.com, 2004). At the same time, the lack of face-to-face cues (e.g. physical presence or ability to hear others' voices) makes dating websites a less "natural" and conceivably more cognitively demanding environment in which to acquire information about prospective mates (Kock, 2005). Of course, most people do not remain in a state of indecision concerning with whom to partner—95% of Americans have married by the time they reach age 55 (U.S Census Bureau)—but recent research in the consumer domain has indicated that all of this choice may have its downsides.

First, however, consider the benefits of having a great amount of choice: Both consumers and manufacturers believe an abundance of choice is desirable (Chernev, 2003; Schwartz, 2004). This presumption has long been underpinned by the idea that the more options there are, the more likely it is that the option chosen will closely match the chooser's preferences (Chernev, 2003); it also has been supported by research indicating that greater variety brings benefits including enhanced intrinsic motivation (Zuckerman, Porac, Lathin, Smith, & Deci, 1978), alertness, well-being (Langer & Rodin, 1976), and consumption (Kahn & Wansink, 2004).

Moreover, while it may seem as though it will be difficult for a decision-maker to wade through many options, large option sets do not necessarily pose a problem if choosers possess well-articulated preferences (Chernev, 2003). To have well-articulated preferences is to know what one likes (e.g., "I prefer black cars to green cars"), and which attributes are personally important (e.g., "Fuel efficiency is more important than color"). Chernev's research shows that when people with well-articulated preferences are faced with a large option set, they are more likely to "satisfice" (Simon, 1955), or choose the first option that is "good enough" along the various criteria that matter to them. As a result, cognitive demand is lowered (Simon), satisfaction is stabilized, and regret is attenuated (Schwartz, Ward, Monterosso, Lyubomirsky, White, & Lehman, 2002).

From an evolutionary standpoint, mate choice is a domain in which choosers possess well-articulated (evolved) preferences regarding the qualities that make for a desirable long-term mate (Buss, 1989; Buss & Schmitt, 1993). For example, men and women prefer partners who possess wealth and status, show family commitment, are attractive, and are likely to

be faithful (Buss & Barnes, 1986; Buston & Emlen, 2003). Importantly for the studies we describe in this chapter – which are situated in the online dating context – research suggests that the mate qualities that are important to people offline are the same as those that are important to people online (Fiore & Donath, 2005; Whitty & Gavin, 2001).

Despite the appeal of more options, the logic of diminishing returns (e.g., being presented with the 250th option does not add as much benefit as does being presented with the 12th) suggests that ever-increasing amounts of choice may not add much. Indeed, accumulating evidence suggests that the results of having extensive choice are not altogether positive, as it can also lead to decreased satisfaction with the option selected and increased regret towards options not chosen (Iyengar & Lepper, 2000), increased decision complexity, and cognitive load (for those with unarticulated preferences; Chernev, 2003). Thus, more choice may be worse. In a widely-cited set of studies, Iyengar and Lepper found evidence that "less is more" in some standard consumer decisions such as the purchase of chocolate. Despite the fact that people are consistently attracted to situations where they have more options, people choosing from among a couple dozen options found the experience more difficult, they were less confident about their choice, and they made fewer purchases than those choosing from a half dozen (though see Scheibehenne, Greifeneder, & Todd, 2009 for consideration of the limits of this effect).

2. FROM TOO MANY PRODUCTS TO TOO MANY MATES

Empirical investigations of the too-much-choice effect to date primarily have been focused on the consumer choice domain. Research on non-human animal mate choice offers reason to believe that there should be some continuity between the consumer choice findings and what we might find in human mate choice: Hutchinson (2005) reviewed research demonstrating the too-much-choice effect in the mating context for animals as diverse as frogs and grouse. While studies show that (female) animals initially prefer greater choice (e.g., they prefer leks—groups comprising numerous advertising males—to solitary males; Bradbury, 1981), they may be confused by it (e.g., as with acoustically advertising frogs; Gerhardt, 1987; Gerhardt & Klump, 1988), and their choice quality may diminish (as with grouse; Kokko, Sutherland, Lindström, Reynolds, & Mackenzie, 1998).

Dunbar (1992) suggests that primates' neocortex evolved during the environment of evolutionary adaptation (EEA), in part, to deal with the size of their respective social networks, which was itself determined by such

things as habitat. A consequence of this is that modern primates may not have the cognitive capacity to maintain social networks larger than that for which their neocortex was designed. Dunbar's regression modeling supports the proposed relationship between neocortex volume and average group size, with neocortex size accounting for approximately 76% of the variance in average group size across 36 primate species. Within a species, social networks greatly exceeding this optimal level tend to become unstable and eventually collapse, fissioning into smaller groups. Dunbar theorizes that the average human social network in the EEA may have contained approximately 148 individuals (with the 95% confidence limits between 100 and 231 individuals), a contention supported by a range of ethnographic, historical, and sociological evidence. Consequently, although too-much-choice may not have affective downsides (if the chooser possesses well-articulated preferences), there may still be practical costs (e.g., low quality choice).

How could two contradictory factors—desire for more choice, but detriments in decision making if too-much-choice is faced—coexist in our evolved minds? The desire for more options in mate choice is likely to have been adaptive in our evolutionary past. For example, motivation for increasing variety – even within a limited option set – facilitates the avoidance of incest (Grinde, 2002), as well as increases the chance of finding an option above a given threshold (Johnstone & Earn, 1999), so the wiser among us would have preferred to select a mate from as wide a sample as possible. (Males in particular have a preference for sexual variety; Peplau, 2003). Importantly for our purposes, however, in the EEA the desire for more choice could co-exist with our cognitive limitations for the simple reason that human social network sizes rarely exceeded our cognitive capacity. Our minds are adapted to dealing with few, sequentially-presented mate options (Miller & Todd, 1998). Given the strong upper limits on the number of options (whether mates, or habitats, or food) that might have been encountered at any one time, our ancestors rarely would have faced the **costs** associated with having “too many” options. But current developments in Internet and e-communication technology have jeopardized the co-existence of desire for choice and the potential to be overwhelmed by choice, by expanding the size of the mate choice environment well beyond our processing capacity. Thus, the two factors can come into conflict. Such theorizing is in accord with the mismatch hypothesis (Eaton, Konner, & Shostak, 1988; Nesse & Williams, 1994; Tooby & Cosmides, 1992), which proposes that our minds evolved in past natural environments that do **not** match the structure of modern environments in critical ways. As a result, people may come to experience “Darwinian unhappiness” (Grinde, 2002).

More than 600 million people across the world now have Internet access (Manasian, 2003), with the vast majority using it to communicate with other people, and doing so to maintain interpersonal relationships (Bargh & McKenna, 2004). Brym and Lenton (2004) argue that the Internet constitutes a society, with only China and India exceeding it in size. As in any society, mating is a goal possessed by many of the Internet's members: nearly 10 out of every 1000 Internet users log onto dating websites (Lenton & Hobaiter, 2007). Brym and Lenton suggest that there are four main factors underlying the expansion of Internet dating (vs. "traditional") dating, including (1) an increasing number of singles; (2) increasing career and time pressures; (3) the increasing mobility of individuals; and (4) a decrease in workplace romance (because of fears surrounding sexual harassment complaints). As we suggested already, however, dating websites present people with many more options than they would typically encounter in their local communities. And the average dating website user appears to appreciate this variety, as one estimate suggests that they scan as many as 200 profiles each time they log in (Lenton & Hobaiter).

Recently, psychologists have begun to investigate mate choice in dating websites, although most of this research concentrates on the decisions that people make (e.g., who people tend to choose and why), rather than focusing – as we do – on subjective perceptions regarding the choice process. The latter is much more likely to differ between online and “real world” dating situations, because, again, what people look for in mates online and offline does not change (Whitty & Gavin, 2001), whereas the online choice context is unique. For example, Bargh and McKenna (2004) argue that the increased anonymity afforded by the Internet leads people to develop closer relationships more quickly, as it facilitates self-expression based on shared interests and values and reduces the potential for physical and non-verbal attraction cues to impede connection. Bargh and McKenna do not consider, however, the effect of one of the most striking features of the Internet social environment: The sheer number of options one encounters.

In this chapter we describe two studies in which we examined the degree to which the number of mate options available online influences people's expectations about (see Study 1) and experience of (see Study 2) the choice situation and option selected. Do people want a multitude of potential partners to choose from and, if they get it, are they as satisfied as expected when they encounter such wealth of choice? We expected that the preference for ever more choice would be found in the online mating context, given the similarity in people's behavior between the online and offline worlds in terms of their desired mate preferences (as already described), and in terms of their psychological mechanisms for searching and foraging (DiClemente & Hantula, 2003; Pirolli & Card, 1999). Based on

Chernev's (2003) findings regarding the moderating role of well-articulated preferences, we further expected to find that choosers faced with a relatively large set of potential mates to be at least as content (if not more so) with their selection than choosers faced with a relatively small set of potential mates. In other words, less may not necessarily be more, at least in terms of choosers' affective experience of selecting a potential mate. At the same time, however, abundant choice may test humans' cognitive capacity, in which case the downsides of "too much choice" may be evident in the choice strategies choosers employ and the quality of the choices they make.

3. EMPIRICAL EVIDENCE: IS THERE SUCH A THING AS TOO MANY MATES?

3.1 Expectations

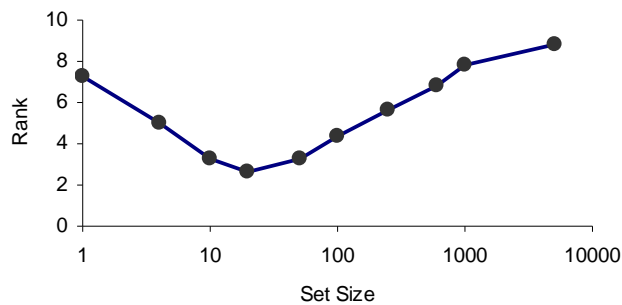
Based on the evolutionary theorizing described above, we anticipated that people would have positive expectations about a larger set of mate options, and that the relationship between set-size and positive expectations would be monotonic. To examine this proposal, 88 participants (average age = 22.5, 58% female) were given a survey containing questions concerning the role of mate choice set-size in preferences and expected choice-related affect and demographic items (including sex, age). Specifically, participants were asked to imagine that they had signed up to a dating website with the goal of selecting the one individual with whom they would most prefer to make contact. They were further asked to imagine being presented with a list of potential mates. For each of 10 option set-sizes (1, 4, 10, 20, 50, 100, 250, 600, 1000, 5000), participants were asked to rank the sets according to their preferred set-size for selection (no ties permitted) and to rate the sets, using 7-pt. Likert-type scales, along several dimensions: the expected difficulty of making a selection from the set; their anticipated satisfaction with the choice (i.e., the person selected from the set); their anticipated regret concerning their selection from the set; and their expected enjoyment of the selection process in each set. The final page of the survey asked participants to report demographics (e.g., gender, age, sexual orientation).

We examined the effects of participant sex (male vs. female) and set-size (vs. 4 vs. 10 vs. 20 vs. 50 vs. 100 vs. 250 vs. 600 vs. 1000 vs. 5000) on the ranks of preference and for the ratings of difficulty, regret, satisfaction, and enjoyment. For each of these five variables we tested linear and quadratic effects (expecting the former, but open to the latter). We explored whether

participant sex moderates these effects, as some evolutionary-based theories suggest that men and women may have different set-size preferences (e.g., Sexual Strategies Theory; Buss & Schmitt, 1993), with men supposedly preferring more mating opportunities than women.

Analysis of stated preferences regarding ideal option set-size revealed evidence for reliable and quadratic effects. Neither effect depended on participant sex. Because the quadratic function yielded the largest effect size, this is the result we interpret. As Fig. 1 illustrates, option set-size preference is U-shaped, with both men and women expressing strongest preference (lowest rank) for a set-size of 20, and decreasing preference for both smaller and larger set-sizes.

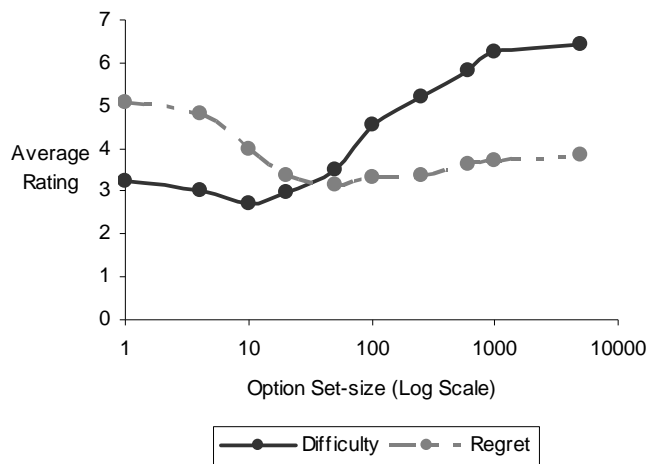
Figure 1. Study 1: Preferred Number of Options (lower ranks, higher preference)



Analysis of expectations regarding the difficulty of selecting a potential mate from the sets of varying sizes also revealed evidence for reliable linear and quadratic effects, neither of which were moderated by participant sex. We interpret the linear effect, which was stronger. As Fig. 2 illustrates, increasing set-size is associated with expectations of greater choice difficulty. That is, as the number of potential mates increases, so too does the expected difficulty of making a selection.

Analysis of expectations regarding anticipated regret with their selection revealed evidence for reliable linear and quadratic effects, neither of which depended upon participant sex. We interpret the stronger quadratic effect. As Fig. 2 also illustrates, increasing set-size is associated with expectations of experiencing less regret up until the set-size reaches approximately 50. After this, regret about one's choice is expected to increase a bit.

Figure 2. Study 1: Expected Difficulty and Regret by Option Set Size



Analysis of expectations regarding anticipated satisfaction with their selection revealed evidence for reliable linear and quadratic effects of option set-size. Neither effect depended upon participant sex. We interpret the stronger quadratic effect. As Fig. 3 shows, increasing set-size is associated with expectations of greater satisfaction – but again, only up to a point. After the size of the option set reaches 20-50, expected satisfaction flattens out and may even decrease as the set-size reaches 250-600. Both men and women anticipate achieving highest satisfaction if they have had to search through a few dozen options, with diminishing returns obtained thereafter.

Finally, analysis of expectations regarding anticipated enjoyment of selecting a potential mate amongst sets of varying sizes revealed evidence for reliable linear and quadratic effects, neither of which were moderated by participant sex. We interpret the stronger quadratic effect. As Fig. 3 illustrates, increasing set-size is initially associated with expectations of enjoying the choice process more. After the set-size reaches 20-50, however, enjoyment is expected to decrease again. Men and women alike anticipate enjoying making a choice in the presence of some modicum of choice more than very little or very wide choice.

Figure 3. Study 1: Expected Satisfaction and Enjoyment by Option Set Size



3.2 Experience

Study 1 demonstrated that both men and women expect they will be more satisfied with their choice, experience less regret over their choice, enjoy the selection process more, and generally prefer to select a mate out of more rather than fewer options – at least up to a point. That point appears to be between 20 and 50. But are these expectations sound—that is, are people well-calibrated to the potential challenges of choice in this domain? The primary purpose of our subsequent study was to examine affective responses to the experience of selecting a mate amongst a small versus a larger option set. To create a strong comparison, we chose the smallest of our set sizes (4 options) along with a set size approximating the presumed “ideal” on the dimensions explored in Study 1 (20 options).

A secondary purpose of this study was to explore the effects of set size on mate search memory in order to assess the presence of potential ‘cognitive downsides’ of greater choice (Jacoby, Speller, & Kohn, 1974). Information overload is believed to occur when decision quality initially increases with incoming information, but then decreases when the incoming information exceeds a point beyond the decision-maker’s cognitive capacity. Later research confirms the idea that there is a point beyond which information becomes “too much,” but indicated that problems may only arise if the decision maker is under time pressure (Hahn, Lawson, & Young, 1992) or, again, if the decision maker does not have well-articulated preferences (Chernev, 2003). Evidence for information overload in our study would be revealed by poorer memory for the option selected (‘mate search

memory') among those participants presented with the supposedly 'ideal' set size of 20 (vs. those presented with a less-than-ideal set size of 4).

To test these ideas, we recruited 96 individuals (average age = 21.77, 60% female) from the University of Cambridge (UK) community. Approximately 89% self-reported being exclusively heterosexual, 6% reported being bisexual, 3% reported being exclusively homosexual, and 2% did not respond (n=2). In this study, because the methodology assumed attraction to the opposite sex, the results reported below exclude the homosexual and non-reporting participants. The conclusions drawn from these results are generally the same if we do not restrict the sample to exclusively heterosexual participants.

Participants in this study were assigned to one of four conditions: one set of 20 online dating profiles or one of three sets of 4 online dating profiles (sets a, b, and c, which were randomly selected subsets of 20 men or 20 women). The sets of 4 versus 20 profiles were equivalent, on average, with respect to a separate group of participants' (n = 88) ratings of the individuals' physical attractiveness and overall "mate value" (e.g., average of perceived physical attractiveness, physical fitness, socio-economic background, financial power, parental fitness, extroversion, openness, neuroticism, conscientiousness, and agreeableness).

The participants were presented with a mock dating website called "DateOnline.com," which was composed of a series of Microsoft® PowerPoint® (2002) slides designed to simulate a website (adapted from Lenton, Bryan, Hastie & Fischer, 2007). Prior to viewing this mock dating website, participants were informed that they would view profiles of people who were hoping to meet a potential romantic partner. Their given goal was to 'select the one individual you would most prefer to contact for further communication and, possibly, a meeting.'

Each profile provided a variety of information, including the target's age, location, hair color, and 12 other criteria typically mentioned by dating websites. The profiles also contained a unique free response text in which, like most dating websites, the person had supposedly described him- or herself. All of the information provided was controlled across the male and female stimulus sets (save sex-related information such as stated sex, height, and pronouns) in order to maintain consistency across these sets and, thus, participant sex. Each profile also contained a black and white photograph of the target individual's head and shoulders.

The first page of DateOnline.com resembled a standard entry page of a dating website and asked participants to click on their own sex (man vs. woman). This action directed participants to the first of 4 or 20 profiles of opposite-sex individuals. Participants were instructed to view all of the profiles — one profile per page — in the order presented before making a

decision, at which point they could spend as much time as desired looking at any or all the profiles again. When they had decided upon an individual, they wrote his/her screen-name on a slip of paper.

Following their choice, participants reported – via 7-pt. Likert-type scales – their difficulty, regret, enjoyment, and satisfaction with the choice or choice process. This time, of course, they reported choice-related affect based on experience. Additionally, participants were asked to report on the degree to which they desired to choose from more vs. from fewer profiles.

Finally, we presented participants with a cued recall test to assess their recollection of the characteristics possessed by the person they selected. We reminded participants of the fifteen criteria comprising a profile (age, location, hair color, height, etc.) and, for each criterion, asked that they recall the relevant characteristic of the selected individual (e.g., ‘brown’). We also asked that they recall and write down as much as possible from this person’s text-based self-description. After completing this task, participants responded to the same demographic items as described previously.

A research assistant (RA) coded the two parts of the recall test separately. For the criteria recollection part, for each criterion the coder distinguished among wholly incorrect responses (0), partially (in)correct responses (.5), and wholly correct responses (1). The values were summed to obtain an overall criteria memory score (minimum=0, maximum=15). For the self-description recall part, the RA counted the number of traits/interests/activities recalled that was contained in the selected profile. The RA also counted the number of confabulations within each self-description recall; i.e., traits/interests/activities recalled, but were not contained in the selected profile.

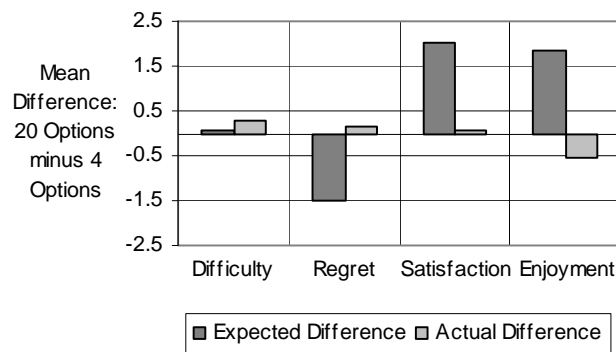
In the previous study, participants reported a preference to select a mate among 20 rather than 4 profiles. Corroborating this expectation, this study revealed that participants in the 20-profile condition were less likely to want more profiles from which to select than those in the 4-profile condition. This finding depended, however, on participant sex, such that while both men and women wanted more profiles in the 4-profile condition than in the 20-profile condition, the condition difference was smaller for men than for women. Women were more likely than men to perceive a set of 20 as being nearer their ideal option set size, whereas men perceived this same set-size as being still somewhat too small.

In Study 1, participants expected that while choosing among 4 versus 20 would be equally difficult, they also expected to be more satisfied, experience less regret, and better enjoy choosing a potential mate from a set of 20 than a set of 4 options.¹ In accord with this, participants in this study did not find selecting among 20 options to be any more difficult than

¹ As determined by individual t-tests, not included here; details available upon request.

selecting among 4. And this was equally true among the male and female participants. But contrary to the previously gathered expectations, participants in this study did not find selecting among 20 to be any more satisfying than selecting among 4, nor did they experience any less regret when choosing from a set of 20 than from a set of 4 options. Participant sex did not qualify either of these results. And finally, participants' enjoyment was not influenced by whether they chose a potential mate from a set of 4 or a set of 20. Again, this effect was the same for both men and women. See Figure 4 for a direct comparison of expected and experience-based choice-related affect.

Figure 4. Expected (Study 1) vs. Experienced (Study 2) Choice-related Affect as a Function of Choice Set Size



Set-size had an interesting impact on participants' recollection of their chosen mate's characteristics. On average, participants choosing among 4 profiles obtained a significantly higher 'criteria memory score' than those choosing among 20 profiles, but the effect was not equally true of men and women. Set size had no effect on women's recall for the profile criteria, whereas men in the 4-profile condition accurately recalled more criteria than men in the 20-profile condition.

Both male and female participants in the 20-profile condition were more likely than those in the 4-profile condition to evince memory intrusions (i.e., confabulations) in free recall of the self-descriptions. There were no condition differences, however, with respect to the accurate recall of the self-descriptions' content. Overall, it would appear that having more choice may not necessarily lead to less accurate memory, but it may bring about memory intrusions, which may be an indication of choice overload.

3.3 Summary

Study 1 showed that participants of both sexes *expected* to experience more difficulty in choosing from a set of mates the larger that set becomes, matching our hypothesized monotonic relationship. However, for all of the other aspects of the choice process—regret, satisfaction, and enjoyment—as well as for what set size they would most prefer, male and female participants' expectations were better fit by quadratic functions. In each of these cases, the *expected* “ideal” or most preferred mate set size was in the range of 20-50 potential mates. Notably, these expectations did not depend on participant sex. But does this match what men and women end up preferring when they actually face such a choice? This is what we tested in Study 2, where we found that, while small (4 options) and larger (20 options) set sizes were experienced as equally difficult to choose from, the expected preference for the larger set size in terms of more enjoyment and satisfaction and less regret did not materialize: An ostensibly “too-small” option set produced the same affective experience as an ostensibly “ideal” option set. Thus, although people **think** they would be more satisfied, less regretful, experience greater enjoyment and, thus, prefer selecting a potential long-term mate from 20 options, their choice experience does not generally confirm these expectations. Instead, the supposedly ideal set size yields no differential affect, and some indication of poorer overall memory, compared to the smaller set of 4 options.

3.4 Limitations

Of course, as is standard in studies investigating the effects of option set size on consumers' choice-related affect (e.g., Iyengar & Lepper, 2000), we employed single-item measures of expected and experienced affect. As such, our ability to say something about discrete emotions is limited. Furthermore, our first study presented the 10 option set sizes in an increasing (versus decreasing or even random) manner, while the second study employed only two of these 10 set sizes, and in a between-subjects design—it would be interesting to relax all of these limitations (cf. Shah & Wolford, 2007). The experimental instruction of selecting only one person out of the choice set to pursue further allowed our results to be compared with those from other consumer choice studies that similarly imply selection of a single item (e.g., one flavor of jam to purchase), but it may not match what most people are doing when they search for mates online; whether this is the case, and what impact there would be from allowing people to select as many potential mates as they wanted, should be investigated further. Finally, our use of a college population of participants, who may not have been motivated to

search for a mate, could have reduced the effects we found; studies using people actually seeking mates, preferably via online sites that could be experimentally manipulated, would provide even more convincing data.

4. IMPLICATIONS

4.1 Theoretical

Our findings contribute to the long-standing body of evidence showing a mismatch between what people think they will feel and what they actually feel (Gilbert & Wilson, 2000), as well as adding to more recent research showing that this mismatch holds true in mate choice behavior more specifically (Penke, Todd, Lenton, & Fasolo, 2007). Because the intention to repeat an experience may depend more on a person's *expectations* of that experience, rather than on the experience itself (Klaaren, Hodges, & Wilson, 1994), however, it is still useful to understand people's expectations. For example, the popularity of websites that advertise "millions of opportunities" (e.g. Match.com) may be based more on people's expectations that more choice is better than on their experience with abundant choice.

Our results also suggest that theorizing about the supposed downsides of too much choice ought to make a distinction between choice-related affect versus choice process and outcome. We proposed that mate choice is a domain in which people possess well-articulated preferences, in which case extensive choice is dealt with by simpler choice strategies, such as satisficing (Chernev, 2003). Satisficing is low in cognitive demand (Simon, 1955), thus the chooser with well-articulated preferences *feels* just as good choosing from a large selection as others do choosing from a small selection. The results of Study 2 support this line of reasoning. At the same time that more choice yields similar affective outcomes to less choice, the former may lead to worse actual outcomes. Lenton and Stewart (2008) presented female participants with a small (4) and ideal-sized (24) set of online dating options, and included a large option set as well (64), which should have been outside the range of both expected preferences (per Study 1) and humans' natural upper limit on available mates. This study also showed that set-size had *no* impact on choice-related affect. The results also revealed, however, that as the option set size increased, participants were more likely to report having used search strategies (e.g., elimination-by-aspects or lexicographic) that are likely to miss options that are "best all around." (Lenton, Fasolo, & Todd, 2009, provide further evidence for this change in choice strategy as number of options increase across speed-dating sessions.) As a consequence, people

choosing from extensive online mate options may be less likely to identify partners for whom they are most suited. Notably, the results of our second study were observed with a rather conservative operationalization of ‘more choice’ (i.e., 20 options), suggesting that the potential cognitive-based downsides of abundant choice may be greater in the modern mating game, where it is not uncommon for singles to be confronted with 30 options (Speed-dating) or even 1000 (Web-dating).

It is important to emphasize that our findings indicate that people’s expectations concerning the effects of option set size on choice-related affect are not wholly linear (monotonic), as originally hypothesized: people expect increasing choice to result in greater enjoyment, less regret, and enhanced satisfaction, **but only up to a point**. Thereafter, they anticipate that the benefits will decrease. This fits with recent research showing that purchase behavior first increases, then decreases as the set size increases (Shah & Wolford, 2007). Our subsequent study indicates, however, that people may misjudge the point at which the costs associated with greater choice outweigh the benefits. Thus, while on the one hand expectations about the subjective consequences of having too much choice are to some extent ‘calibrated’ (i.e., people accurately anticipate that there is such a thing as too much choice), on the other hand people mispredict their subjective experience of greater choice at given points in the distribution of choice. In other words, people overestimate the point at which more choice satiates.

Why do men and women **think** they will prefer a relatively large option set in the first place? Such a conundrum could be explained by the mismatch hypothesis (Eaton, Konner, & Shostak, 1988; Nesse & Williams, 1994; Tooby & Cosmides, 1992), as described earlier. Extrapolating Dunbar’s (1992) theorizing, if the average human group size consisted of approximately 150 people, and we assume that half of these were women and half men and, further, that fewer than half of each sex were fit for reproduction (e.g., age limits, health limits, etc), then the rough size of the set of local options from which our ancestors could choose (assuming choice) was around 35. Of course, the option set would have been even further constrained because of pre-existing pair-bonds between some members of the group. According to this logic, while we are built to be attracted to more options, we are not adapted to deal with the excessive number we see today. This possibility also seems to hold in some domains for other species, such as mating grouse: As option set size increases within a naturally occurring range, mate choice quality is enhanced, but beyond this natural upper limit, choice quality diminishes (Kokko et al., 1998).

We are thus left to wonder if people can be persuaded that having fewer options than they would prefer is a good thing – a view that would be particularly beneficial in online choice domains, where one can spend a great

deal of time comparing and contrasting options, only to end up being equally (dis)satisfied or, perhaps worse, less likely to identify someone who is truly suited to them. We believe that it would be difficult to persuade people of such a notion. First, if there are no (affectively) experiential differences between choosing from a smaller versus a larger set of options (as we found), how could choosers begin to associate the latter situation with negative consequences? Second, if affective downsides of relatively greater choice do exist, but are not immediate (e.g., choosers may not realize their regret unless they have the time and motivation to reflect upon their post-choice feelings) nor significant (e.g., the chooser selected a jam that was not optimal from a large choice set, as in the studies of Iyengar & Lepper, 2000), learning about these disadvantages might only happen after considerable delay and repeated exposure to the choice situation. Third, if decision environments in general are evolving in the direction of offering ever more choice, choosers are unlikely to have a point of comparison whereby they can experience the benefits of less choice. Finally, even though expectations of the utility of an event often do not match the actual experience of it (e.g., Kahneman, 1994), again, research shows that it is the **expectation** that predicts the likelihood of participating in the same event in the future (Klaaren et al., 1994). Thus, even if people were to eventually recognize lesser enjoyment in having made a selection from a larger option set, their expectation that a larger option set should yield something better might lead them to prefer the large option set again. Future research ought to investigate the impediments to learning that more choice comes with costs, particularly in the online choice context, where the downsides could be as disastrous as divorce or forever being a “lonely heart” as a result of choice deferral or paralysis.

Future research might also examine the role of attribute-overload, rather than option-overload, in online mate choice. An abundance of attributes may be more disconcerting to choosers than an abundance of options (Fasolo et al., 2007), in part, because humans may not be able to effectively process more than 3-4 variables simultaneously (Halford, Baker, McCredden, & Bain, 2005). The average online dating profile contains over 100 items of information available for consideration by the chooser, with one online dating company’s profiles containing nearly 500 items of such information (Lenton & Hobaiter, 2007). How do online daters deal with this?

Simultaneous presentation of multiple attributes is likely to be especially problematic in a domain (such as mate choice) in which attributes were – until very recently – typically encountered and evaluated sequentially (Miller, 1997). Another direction researchers might pursue is investigation of the role of option similarity on choice-related affect and cognitions. For example, research suggests that choice deferral is not due so much to the

avoidance of trade-offs but is, instead, the result of small (rather than large) differences between the options in terms of their overall attractiveness (Dhar, 1997). Given that larger set sizes necessarily possess smaller average differences amongst the options, it could be that eventual dissatisfaction in larger sets is not due to the set size per se but to decreasing option differences and the concomitant difficulty in justifying one's choice. In the online dating environment in which choosers are likely to first winnow down to a set of potential mates they already find themselves attracted to, which are likely therefore to be even more similar to each other, this problem may well be exacerbated.

4.2 Practical

Our findings have practical implications for the design of online mate selection aids. Web designers are savvy to the notion that decision makers need help weeding through the multitude of options with which they are presented on the Internet and, to this end, they have developed technology to assist online decision making (Edwards & Fasolo, 2001). Decision technology has also been implemented in dating websites (e.g., one-way or two-way matching between members based on their profile characteristics and selection criteria; Lenton & Hobaiter, 2007). However, dating sites appear to have been designed with the implicit philosophy that the more profiles a user's search yields, the more satisfied the user will be. For instance, dating websites do not encourage users to be selective. An example is Yahoo.com, which alerted users to be less selective in their search criteria whenever their search yields fewer than 51-60 profiles. The results of our first study suggest that this alert may backfire, as 50 is about the maximum amount of choice users expect to desire. Similarly, websites implement very generous upper limits to users' search results. For instance, users who search for mates on Match.com and Yahoo.com are presented with a non-sortable list of 500 profiles. Our results lead us to expect that on sites with so much choice, users will likely find themselves browsing ever more profiles in an increasingly superficial way. Hence, online decision aids that can put reasonable limits on choice seem desirable. Such choice-limiting aids have become available (e.g. Chemistry.com – the “frugal” version of Match.com – sends subscribers 5 new matches a day), but they have not caught on: For instance, the first version of SpeedMatching.com allowed only 4-8 profiles to be ‘visited’, but this website was subsequently replaced by a page (<http://www.speedmatching.com>) that directs users to Match.com's extensive choice universe.

We also note that this ever-expanding list of profiles could be linked to the growing practice of dating sites to compute and display overall “match

scores.” These scores indicate how well a given mate fits the user’s wishes, all criteria considered. This practice implies that websites allow users to be ‘compensatory’ (i.e., to trade-off a good value on one criterion with a bad value on another), but in so doing they leave users with very long lists of options (Edwards & Fasolo, 2001). It then becomes particularly important to let users ‘delete’ profiles from search lists, as FriendFinder.com allows. Lastly, our results lend psychological support to a design feature that a growing number of dating sites implement: the possibility of ‘saving’ or bookmarking profiles that the user deems interesting during the process of search. This possibility is desirable as it can counteract memory confusions due to information overload and too large sets of profiles. In short, we urge designers of dating websites to keep in mind that there is a balance to be maintained between, on the one hand, people’s desire for a large number of options (up to a point) and, on the other hand, the fact that more choice will increase use of simplifying heuristics which may have potentially negative consequences on choice outcome (e.g., a significant mismatch between the chooser’s desires and the qualities of the individual or individuals chosen).

Finally, the degree to which a user experiences satisfaction with a dating website and the features it possesses may depend on their cultural background, as well as their individual traits (Zahedi, Van Pelt, & Song, 2001). There may even be differences in women’s experience of a mate search web site dependent on their current position in their menstrual cycle (Saad & Gill, 2000). Thus, research into the impact of cross-cultural, personality-based, and even temporal differences on the effectiveness of online mate search tools is also needed.

5. CONCLUSIONS

Even though decision makers understand that the increasing choice so often available in online settings may come at a cost, they overestimate the point at which these costs are likely to be experienced and satiation is likely to occur. A plausible culprit for this effect is the mismatch between the quantity of options available to choose among in our evolutionary past and the far greater numbers made available to us today through our communications technology. Because correction of this misperception is likely to be difficult for the ‘unaided’ decision maker, web-designers and e-communication experts should provide some assistance. We highlight some ways in which this correction can take place on dating websites, and welcome more research into this important domain.

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