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There Are Plenty of Fish in the Sea: The Effects of Choice Overload and Reversibility on Online Daters' Satisfaction With Selected Partners

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Online dating is often lauded for improving the dating experience by giving singles large pools of potential partners from whom to choose. This experiment investigates how the number of choices online daters are given, and whether these choices are reversible, affects romantic outcomes. Drawing on the choice overload and decision reversibility theoretical frameworks, we show that, a week after making their selection, online daters who chose from a large set of potential partners (i.e., 24) were less satisfied with their choice than those who selected from a small set (i.e., 6), and were more likely to change their selection. While choice reversibility did not affect daters' satisfaction, those who selected from a large pool and had the ability to reverse their choice were the least satisfied with their selected partner after one week. The results advance understanding of how media features related to choice affect interpersonal evaluations.

Online dating has revolutionized the relationship initiation process by providing singles with easy access to large pools of potential romantic partners—literally at the click of a button (Finkel, Eastwick, Karney, Reis, & Sprecher, 2012). The abundance of choice available to online daters is often touted as a considerable improvement on traditional dating, where getting just one date can be a time-consuming process (e.g., Heffez, Miller, & Riger, 2011). However, empirical research on how partner choice affects romantic outcomes in

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online dating is limited. At least one study, based on interviews with online daters, warns that having a great deal of choice may not be so beneficial after all, because it can make daters reluctant to commit to just one person (Ellison, Heino, & Gibbs, 2006).

The purpose of this study is to advance understanding of how partner choice affects online daters' romantic outcomes. We consider two aspects of partner choice: 1) quantity, or how many potential partners are presented as options to online daters; and 2) reversibility, or the extent to which online dating services allow users to change their mind about meeting a selected partner, and replace him/her with another. As a romantic outcome, we focus on pre-interaction impressions—specifically, daters' satisfaction with a selected partner, measured before any contact with that person took place. Pre-interaction impressions, or the perceptions communicators hold about their partners before interacting with them, powerfully shape subsequent meetings. For instance, when individuals were provided with positive information about their future online communication partner, they engaged in more positive behaviors when interacting with that partner online, and rated him/her as more socially attractive (Tong & Walther, 2012). Therefore, we argue that it is essential to understand pre-interaction impressions in online dating and, critically, how these impressions are shaped by media features.

Indeed, quantity and reversibility of choice can be construed as features of the online dating medium, born out of design decisions. Currently, the design of most online dating services enables users to access all potential partners in the system who meet their search criteria (i.e., matches). This tends to result in large numbers, reaching tens and even hundreds of individuals in densely populated areas. Similarly, to the best of our knowledge, all online dating companies currently allow users to reverse their choices (i.e., replace one potential partner with another as often as they wish). We label the design features that govern how many matches online daters are connected to, and whether they can replace them, the *choice architecture of online dating* (see also Thaler & Sustein, 2008). We argue that this choice architecture exercises subtle, but significant influence on online daters' pre-interaction impressions.

Theoretically, our examination is guided by the choice overload effect (Chernev, 2003; Iyengar & Lepper, 2000; Schwartz, 2002) and the decision reversibility effect (e.g., Bullens, van Harreveld, & Förster, 2011; Bullens, van Harreveld, Förster, & van der Pligt, 2013). These theoretical frameworks were originally developed in the field of behavioral economics, and have been applied widely to explain the effects of choice on consumer purchases such as jam (Iyengar & Lepper, 2000) and photography prints (Gilbert & Ebert, 2002). As we enter an age where partner selection via online dating sites presents an experience akin to shopping (i.e., "relationshopping"; see Heino, Ellison, & Gibbs 2010) and where choice is built into the very medium of communication, we argue that these theories are uniquely insightful. Moreover, applying

these theories to two new contexts (i.e., romantic relationships and mediated communication) can serve to push their boundaries, an important theoretical undertaking. For instance, do people use the same choice heuristics in complex, high-stake contexts, such as selecting romantic partners, as they do in simple, low-stake contexts, such as selecting chocolates?

Below, we derive hypotheses from the choice overload and decision reversibility frameworks. Then, we consider the joint operation of choice overload and decision reversibility in online dating—a possibly nefarious combination.

THE CHOICE OVERLOAD EFFECT

Americans like and want choice in most situations (see Patall, Cooper, & Robinson, 2008, for a review). Yet, they may be mistaken about the benefits of choice: Research shows convincingly that having more choices paradoxically makes people less satisfied with the selection they ultimately make (Schwartz, 2004). In a seminal study, consumers in a grocery store were significantly less satisfied with their purchase, and less likely to make one, if they were offered a selection of 24 rather than 6 flavors of jam (Iyengar & Lepper, 2000). This phenomenon, labeled the *choice overload effect*, has received support in numerous settings, such as selecting chocolates (Chernev, 2003), coffee (Mogilner, Rudnick, & Iyengar, 2008), pens (Shah & Wolford, 2007), and gift boxes (Reutskaja & Hogarth, 2009); supporting charities (Scheibehenne, Greifeneder, & Todd, 2009); and relying on movie recommendations (Bollen, Knijnenburg, Willemsen, & Graus, 2010). In these studies, choosing from a large pool of options, as compared to a small one, yielded decreased satisfaction with the item selected, decreased preference strength (i.e., how much individuals preferred their chosen item compared to the alternatives) and disappointment (Scheibehenne, Greifeneder, & Todd, 2010). These outcomes are considered the hallmark of the choice overload effect.

Why do people respond negatively to large choice sets? While no clear consensus has yet emerged in the literature (see Scheibehenne et al., 2010, for a review), several possible explanations have been advanced. One explanation focuses on *regret* (Iyengar & Lepper, 2000), arguing that having more discarded alternatives produces more opportunities for regret to emerge, which, in turn, dampens people's enthusiasm for their choice. Another explanation proposes that more choice generates more *cognitive burden*, which, in turn, creates frustration and diminishes satisfaction. For instance, individuals who could easily place their choices into categories (thus, reducing cognitive burden), experienced reduced choice overload effects (Mogilner et al., 2008). Similarly, choice complexity, operationalized as the number of choices in a set multiplied by the number of attributes of each choice, enhanced the choice overload effect, presumably because

choice complexity increased cognitive burden (Greifeneder, Scheibehenne, & Kleber, 2010; Reutskaja & Hogarth, 2009). Another explanation focuses on *choice justification*: Individuals experience reduced satisfaction because it is harder to justify a choice to other people when selecting out of a large array of good alternatives (Scheibehenne, Greifeneder, & Todd, 2009; Sela, Berger, & Liu, 2009). Finally, researchers point to the role of *counterfactual thinking*: Having more choices allows people to generate counterfactuals, or evaluative thoughts about the merits of the discarded alternatives (i.e., “what might have been”), which, in turn, lower satisfaction (Hafner, White, & Handley, 2012).

To summarize, the literature to date proposes that freeing a choice of constraints (i.e., by giving people lots of options to choose from) has pernicious effects in that it can set in motion a variety of psychological processes (e.g., regret, counterfactual thinking) that lower satisfaction. Conversely, constraining a choice (i.e., by limiting the number of options) inhibits these noxious processes, keeping satisfaction high. This inhibition has been attributed to the activation of ego-protective mechanisms, which serve to elevate individuals' sense of psychological wellbeing as they go through everyday life (Schwartz, 2002; Vaillant, 1993)

While the mechanism responsible for the choice overload effect is an important avenue for future research, so are the boundary conditions for the emergence of the effect. As this review shows, extant literature has focused on low-stake contexts, where the consequences of making a choice are relatively trivial. For instance, choosing a chocolate can at best result in an enjoyable treat, and at worst in wasting a few dollars. Here, we plan to investigate whether the choice overload effect can be extended to high-stakes contexts, such as online dating, where choosing a partner, even if only for a short involvement, can significantly affect emotional wellbeing (see Reis, Sheldon, Gable, Roscoe, & Ryan, 2000).

A series of cognate studies has already attempted this extension. Despite not using the choice overload effect as their theoretical framework, Wu and Chiou (2009) and Yang and Chiou (2010) found that online daters who were presented with more matches (30 vs. 60 vs. 90, and 40 vs. 80, respectively) engaged in more searching behaviors (i.e., examined more profiles) and selected partners who deviated more from their prespecified ideal list of qualities. The evidence for the choice overload effect is indirect in these studies. First, the choice sets in both studies were much larger than the choice sets theorized to produce choice overload effects. A meta-analysis shows that the interquartile range of small choice sets conditions is typically 5–6 items, with large choice sets conditions containing 24–30 items (Scheibehenne et al., 2010). Arguably, participants in these prior studies were overloaded by choice across experimental conditions. Second, the outcome variables (i.e., search strategies and the fit between characteristics of a selected potential partner and online daters' preexisting criteria for ideal potential partners) were inconsistent with

the choice overload framework, which makes predictions about people's *perceived satisfaction* with their choice.

One study to date has directly applied the choice overload framework to online daters' satisfaction with a selected partner, but it has not produced the predicted effect (Lenton & Stewart, 2008). Single women were asked to select a hypothetical match out of 4, 24, or 64 online dating profiles; however, their satisfaction with their selected partner was unaffected by the size of the choice set.

Despite this tepid evidence, we argue that the choice overload effect can be theoretically expected to emerge in the context of online dating. Recall that the effect is most likely to appear when choices are complex, in the sense that they contain an array of different attributes (e.g., Greifeneder et al., 2010), and when they require justification to others (e.g., Sela, Beger, & Liu, 2009). Choosing a potential romantic partner through online dating satisfies both these conditions—it is a complex choice, where a plurality of attributes need to be considered (e.g., attractiveness, education, job, religion, hobbies), and one that needs to be justified, not only to oneself, but to one's social network, whose approval is consequential for the success of romantic relationships (Sprecher & Felmlie, 1992). However, as an innovation adduced to prior studies, we argue that the choice complexity and public justification inherent to online dating require *processing time*, which is why the choice overload effect in this context should only be observable after some time has elapsed, and not immediately after the choice is made, as is the case in low-stake contexts.

As previously described, high-stake choices tend to be more complex, involving the consideration of a multitude of attributes. It should take individuals more time to ponder the ramifications of their complex choices, and certain ramifications may only emerge after the choice has been made. For instance, research shows that people tend to ignore their relationship deal breakers when meeting a potential romantic partner for the first time; however, over time, those who ignored deal breakers were less satisfied with their partners, presumably because they had time to ponder these deal breakers, and the initial excitement of identifying a potential romantic partner had waned (Eastwick, Finkel, & Eagly, 2011).

Additionally, social justification should be highly complex in online dating, as individuals typically introduce romantic partner to their family, friends, and acquaintances. While online daters seek a variety of romantic involvements, ranging from serious to casual, they should be concerned with social justification across these different types of relationships, because dating is a social endeavor that is typically the subject of conversation and question asking from one's social circle. However, predicting the reactions of these different audiences likely takes time. Individuals might not immediately anticipate problems that these audiences have with a selected partner, but, upon more careful reflection, these problems may become evident, resulting in decreased satisfaction.

Finally, it is worth noting that online dating is not only a high-stakes context, but also an *experiential* one. Unlike the objects investigated by prior research (e.g., chocolates, pens), online dating is an experience, and one that unfolds over time. With pens or chocolates, one gets to sample them immediately after selecting them. With online dating, it takes time to actually experience the date. This increased time lag between the act of choice and the act of “consumption” (see Loewenstein, 1987) should give daters ample opportunity to ponder the merits of their upcoming opportunity. Given the psychological importance of romance, we expect them to utilize this time to engage in mental processing.

The importance of time, while not yet considered by choice overload research, has been addressed in cognate areas of research. A large body of literature shows that, when confronted with psychologically challenging situations, people engage in mental processing that unfolds over time. For instance, cognitive dissonance, or the psychological discomfort created by an inconsistency between attitude and behavior, is resolved over time—usually a week after the discomfort arose in the first place (Menasco & Hawkins, 1978). In particular, the regret that sometimes accompanies dissonance has been shown to start out small or even nonexistent and grow over time (Koller & Salzberger, 2012). Finally, rumination, or intrusive thoughts caused by negative or stressful life situations, also unfolds over time; in fact, it has been shown to affect mental wellbeing several months after the distressing episode took place (see Smith & Alloy, 2009, for a review). Since making a decision among a plethora of options in the high-stakes context of online dating is also a psychologically challenging situation, this body of research offers further indication that online daters are likely to engage in mental processing over time.

Hence, ours is the first study to consider the possibility that, in online dating, choice overload effects do not emerge immediately after the choice is made (consistent with the findings of Lenton & Stewart, 2008), but rather after some time has elapsed. We choose to investigate this effect one week after online daters make their choice, for two reasons: 1) This time frame is consistent with prior studies in the related domain of cognitive dissonance, which have allowed one week to pass between initial and secondary measures of satisfaction with a chosen item (Bem & McConnell, 1970; Brehm & Cohen, 1959). 2) One week is a realistic amount of time that online daters take between identifying a desirable potential partner and face-to-face meetings (Mapes, 2014). In sum, we advance the following hypothesis:

H1: One week after selecting a potential partner, online daters who chose from a large pool of matches will be less satisfied with their choice than those who chose from a small pool.

THE DECISION REVERSIBILITY EFFECT

Just as individuals like having more choices, they also enjoy the added choice that comes from being able to reverse a choice, and pick something else instead. For example, consumers appreciate being able to return purchases to such an extent that return policies are now recognized as a critical aspect of marketing (Autry, 2005). However, this desire may be psychologically ill advised: The ability to change one's mind about a choice produces less satisfaction toward that choice and more regret for discarded alternatives. For instance, one study shows that individuals who had the option to change their minds about their selection of a photography print liked the chosen print less than those who were not allowed to exchange it (Gilbert & Ebert, 2002). Likewise, individuals who evaluated the attractiveness of a selected book rated the alternatives as more attractive when they had the ability to switch (Frey, Kumpf, Irle, & Gniech, 1984). This phenomenon has been labeled *the decision reversibility effect* (Bullens et al., 2011; Bullens, et al., 2013; Frey, 1981).

This effect has been described as a manifestation of the "psychological immune system," or the notion that individuals seek, interpret, and remember information in a self-protective manner (Antonovsky, 1987; Gilbert & Ebert, 2002; Gilbert et al. 1998). According to this notion, people "subjectively optimize" their perceptions of an outcome when they can't optimize the outcome itself (Gilbert & Ebert, 2002, p. 504). In the case of irreversible choice, it is only possible to optimize perceptions, which is why people tend to extol the virtues of their chosen item or person. Conversely, in the case of reversible choice, it is possible to optimize outcomes by choosing an alternative, and no shift in perception is necessary to achieve a sense of satisfaction. Put simply, if one cannot change something, one learns to like it. The example provided by Gilbert and Ebert (2002) is uniquely appropriate here: "when conversation with a blind date proves uninteresting, people normally change partners ('I'll never go out with him again'), but when conversation with a spouse proves uninteresting, people normally change their attitudes ('Dull yes, but with a heart of gold')" (p. 504).

To summarize, a lack of reversibility can be conceptualized as a constraint to choice, similarly to having a small choice set. As such, it activates ego-protective mechanisms—in this case, the psychological immune system—that keep satisfaction with a choice high (Vaillant, 1993).

Importantly, ego-protective mechanisms can be expected to affect choice satisfaction, because everyday choices are the very substance of our psychological wellbeing. Whether the choice be of clothes, hobby, or career or the purchase of goods, it is likely to reflect who we are and how we feel about ourselves (Akerlof & Kranton, 2000; Suler, 2002). Therefore, people's responses to these choices are likely to be governed by ego-protective mechanisms that modulate psychological wellbeing (Gilbert et al., 1998; Vaillant, 1993). This

should be especially true of romantic choices, as these choices are exceptionally consequential for people's happiness and wellbeing (Reis, Collins, & Berscheid, 2000) and even reflects their own sense of identity (Buston & Emlen, 2003). Thus, if choosing a romantic partner is deeply tied to ego and reflective of a sense of self, it likely falls under the purview of ego-protective mechanisms.

No research has yet investigated the decision reversibility effect in the high-stake and experiential context of online dating. In fact, most previous studies involved fairly trivial choices (e.g., choose between two 15-minute tasks [Bullens et al., 2013]; choose between books [Frey et al., 1984]). However, this effect has been brought up repeatedly in the popular press. For example, Ludlow (2013) writes that online dating simply "makes it too easy to find people [and] to ditch people." Theoretically, there is reason to expect decision reversibility effects to emerge in this context as much as in the previously investigated ones. An online dater who makes a selection, but knows that there are other options, should be prone to seek to maximize her outcomes by considering these other options. However, an online dater who makes a selection which she cannot change, should be likely to psychologically affirm her choice. Moreover, the effects may be even more salient in a high-stake context, where the motivation to make a good decision is high, leading to a stronger activation of the psychological immune system (Gilbert, Lieberman, Morewedge, & Wilson, 2004; Wilson & Gilbert, 2005).

Similarly to the choice overload effect, the decision reversibility effect is likely to take time to emerge in an online dating setting, as the ramifications of the choice need time to psychologically percolate. As before, we investigate the effect one week after online daters have made their selection. Notably, there is precedent for the need for time to elapse before the decision reversibility effect emerges in higher-stake choices. When examining individuals' selection of one of their own photographs for printing—arguably a meaningful decision, because individuals might feel ownership over their own photographs and perceive the decorations of their apartment, visible every day, to be important—the decision reversibility effect emerged two days after individuals made their choice (Gilbert & Ebert, 2002). Thus, we hypothesize:

H2: One week after making their partner selection, online daters who had the ability to change their selection will be less satisfied with the person they chose than those who did not have the ability to change.

THE JOINT EFFECT OF CHOICE OVERLOAD AND REVERSIBILITY

Individually, choice overload and decision reversibility should affect online daters' satisfaction with their choice of a potential partner. However, in online dating environments, it is typical for both abundant choice and convenient reversibility to coexist—you can always go online and find someone else. This

raises the question of how choice overload and decision reversibility work in tandem to affect online daters' satisfaction with a selected partner. From a theoretical standpoint, it is noteworthy that no research has yet investigated, in any context, how these two effects work jointly, despite the fact that both make predictions about individuals' satisfaction with their choices. We undertake this important theoretical task.

Recall that having a small choice set and lacking reversibility can be conceptualized as choice constraints—that is, factors that limit people's choices (Schwartz, 2002). Earlier we argued that the presence of either of these constraints activates ego-protective mechanisms, such as the inhibition of regret and counterfactual thinking (in the case of small choice sets) and the launching of the psychological immune system (in the case of a lack of reversibility). These mechanisms serve to keep satisfaction high and as such are adaptive, despite the fact that they operate through different routes (Gilbert et al., 1998).

In fact, ego-protective mechanisms are described as *functionally equivalent*, because they all serve the higher purpose of maintaining a sense of psychological wellbeing, and yielding similar effects on wellbeing (Gilbert, Pinel, Wilson, Blumberg, & Wheatley, 1998; Tesser, Crepaz, Collins, Cornell, & Beach, 2000; Vaillant, 1993). Therefore, we expect that the presence of either choice constraint (i.e., small set or lack of reversibility) will operate similarly in increasing satisfaction with a chosen person, because they each activate one type of ego-protective mechanism.

Further, ego-protective mechanisms are theorized to be *mutually redundant*, in that having multiple mechanisms activated at the same time does not supply more wellbeing than having just one activated (Gilbert et al., 1998; Tesser et al., 2000; Vaillant, 1993). This is the case because people do not take any opportunity available to feel good about themselves and their choices, but rather are content to feel “good enough” (Tesser et al., 2000). Supporting this notion, research in the area of consumer choice shows that there is a ceiling effect in satisfaction with a chosen item: Once people like something “well enough,” it is hard to get them to like it more (Cadotte, Woodruff, & Jenkins, 1987; Oshikawa, 1971). Therefore, in our case, the presence of both constraints (i.e., small choice set and lack of reversibility) should not increase satisfaction more than the presence of either one of the two.

However, the complete absence of choice constraints (as is the case in the large choice set and reversibility condition) should be the most antithetic to satisfaction, because it does not activate any ego-protective mechanisms. Online daters whose options remain wide open should paradoxically experience a substantial decrease in satisfaction.

In sum, we predict that when at least one choice constraint is present (i.e., small choice set, lack of reversibility, or both), satisfaction should be fairly high due to the activation of self-protective mechanisms. However, the absence of choice constraints (i.e., large choice set and reversibility) should cause satisfaction to dip because no ego-protective mechanisms are activated. This effect

should emerge one week after online daters have made their selection, as both choice overload and decision reversibility need maturation time:

H3: One week after making their selection, the online daters who had selected from a large pool of matches and were able to change their choice will be the least satisfied with their chosen partner.

Given the need for maturation time, online daters whose choices are unconstrained (due to choice overload and decision reversibility) should experience the greatest drop in satisfaction as time elapses. We test this notion directly:

H4: The online daters who selected from a large pool of matches and were able to reverse their choice will experience the greatest drop in satisfaction with their selected partner during the week following their initial selection.

Finally, actual exchange behavior must also be considered: To what extent will online daters act on their ability to change their selected partner when given an opportunity to do so? In previous studies, researchers found that, in addition to the perceptual outcomes described earlier (e.g., decreased satisfaction), choice overload and decision reversibility also impacted behavior, such as whether or not individuals purchased the item under consideration, or exchanged it when given the opportunity to do so (Gilbert & Ebert, 2002, Iyengar & Lepper, 2000). We expect similar effects in online dating. Since having a large pool of matches is predicted to generate less satisfaction with the selected partner than having a small pool of matches, daters in the former condition should be more likely to exercise their ability to change their selection (and thus to attempt to rectify their dissatisfaction) than daters in the latter condition:

H5: One week after selection, daters who were given the opportunity to reverse their choice will be more likely to do so if they choose from a large pool than a small pool of matches.

METHOD

Participants and Recruitment

Participants ($N= 152$; 74% female, 80% Caucasian, 10% Asian, 1% African American; age $M = 20.1$, $SD = 1.46$) were undergraduate students at a large Midwestern university who were single, heterosexual,¹ and interested in meeting a potential romantic partner through online dating. Participants were recruited through online advertisements placed on the department's research participation website and were compensated with extra-credit in their Communication courses.

Participants were given the following cover story: X² university was developing an in-house online dating system designed specifically for their large student population, and was recruiting single students to pilot the beta version of the website. Participants in this pilot study would be matched with potential dates and compensated with extra credit in exchange for their feedback on the effectiveness of the dating system. This feedback would then be used to improve the website before launching it to the entire university.

The time taken by participants to complete the survey was recorded. Seventeen participants were eliminated because they failed the manipulation check (see Procedure and Design section), and an additional 12 participants were eliminated because they completed the online survey in an unreasonably short amount of time, indicating inattention. Last, 24 participants were excluded because they did not return for the second phase of the study. This attrition rate is consistent with similar longitudinal research, in which more than 25% of participants failed to complete the experiment or responded inconsistently (Gilbert & Ebert, 2002). After removing all these participants, the effective sample size was $N = 99$. Eliminated participants were randomly distributed across experimental conditions, and did not differ in age, gender, or any of the covariate measures (see Procedure and Design section) from participants who were retained in the study. It is unlikely that the eliminated participants threatened the validity of the study. Rather, they were eliminated because of behaviors that demonstrated a lack of motivation to pay attention to the experimental procedure or to connect with a potential partner through online dating.

Procedure and Design

The study used a 2 (quantity of choice: 6 vs. 24) \times 2 (choice reversibility: reversible vs. irreversible) experimental design. Participants were assigned to condition through randomization software.

Participants were required to come to the lab during two separate appointments (Time 1 and Time 2), spaced exactly one week apart. At Time 1, participants filled out a short survey with demographic and personality measures. This information was ostensibly used to match them with suitable partners. Then, participants were presented with a selection of either 6 (i.e., small choice set) or 24 matches (i.e., large choice set), and were prompted to examine them and select one person with whom they would like to go on a date. Additionally, participants were told that they could either change their selection the following week (reversible condition) or not (irreversible condition). After making their selection, participants completed an additional survey about their satisfaction with their choice.

Each participant was given a username and password to the online dating system. During the week between Time 1 and Time 2, participants were

allowed to access the system at their discretion, including reviewing their choice and the partners they discarded. If they were in the reversible condition, participants were reminded through a notice on the website that they could change their selection during their second lab appointment.

At Time 2, participants came to the lab and were asked to log into the online dating system and review the profile of the person they selected. Afterward, they reported their satisfaction with their choice using the same questionnaire they filled out at Time 1, along with some decoy questions. Additionally, participants were asked to recall whether they could change their choice or not. This question was intended as a manipulation check. Participants who answered incorrectly were eliminated from the analyses.

Stimuli

The online dating system was created specifically for this experiment. Visually, it was closely modeled after popular online dating systems, such as Match.com. Upon login, participants were shown a thumbnail display of their matches (either 6 or 24) and were able to view each profile by clicking on the respective thumbnail. The profiles were also modeled after popular dating systems, and contained one to three photographs, and a series of short-answer (e.g., height, age, ethnicity) and open-ended questions (e.g., about me, last book read). The dating website contained a visibly prominent banner reminding participants whether or not they could change their choice of a potential partner (i.e., the reversibility condition). Participants were told that their matches were other students from the same university, who were single and interested in finding a romantic partner through online dating. In reality, they were undergraduate students from a different institution who filled out online dating profiles using a template developed by the research team, as part of a different, unrelated study. The students who filled out the profiles were in fact single and interested in meeting potential partners through online dating. All of them gave permission to use their profiles in the current study.

Because attractiveness is a main criterion for selecting dating partners (Eastwick & Finkel, 2008), it was important that quantity of choice is not confounded with dating attractiveness (e.g., profiles in the small choice set are more attractive than profiles in the large choice set, or vice versa). All profiles were rated for dating attractiveness by a group of unacquainted observers using a 2-item questionnaire (i.e. "How attractive is this online dater?", "How willing would you be to date this online dater?"; $\alpha = .96$), measured on a scale from 1 (*not at all*) to 7 (*extremely*). We ensured that the average dating attractiveness of the profiles in each condition was equal (condition means were 3.94 and 3.97, with standard deviations of .48 and .55). The six profiles in the small choice set condition were a subset of the large

choice set condition of 24. In other words, the large choice set subsumed the small choice set.

Measures

The dependent variable was satisfaction with the choice of a dating partner and was measured using a 7-item satisfaction scale ($\alpha = .94$) adapted from previous research on choice overload and reversibility (Gilbert & Ebert, 2002; Iyengar & Lepper, 2000). The scale contained items such as: “How much do you like the individual whose profile you selected?”, “How satisfied are you with the dater you chose?”, and “How much are you looking forward to contacting this individual?” Each item was measured using a 7-point Likert scale, from 1 (*not at all*) to 7 (*extremely*).

A series of covariates that might affect choice satisfaction were collected:

- a. gender, because research shows that women can be pickier when it comes to potential mates (Grammer, Kruck, Juette, & Fink, 2000);
- b. tendency for romantic idealization (e.g., “Do you believe in soul mates?”), which has been shown to lead to more positive illusions and, hence, more satisfaction, with romantic partners (Murray, Holmes, & Griffin, 1996);
- c. previous relationship experience (“How many committed romantic relationships have you had to date?”), as this can affect perceptions of new partners (Furman, Brown, & Feiring, 1999);
- d. online dating experience (“Have you ever dated someone you met through online dating?”), as experienced users may be more comfortable with online dating tools (Sautter, Tippett, Morgan, 2010);
- e. attitudes toward online dating (“Would you be willing to use online dating in the future?”), in order to control for any existing stigma felt towards online dating (Cali, Coleman, & Campbell, 2013); and
- f. online dating efficacy (“I can use online dating to get what I want”), or the extent to which participants believed themselves capable of navigating the online dating environment, because online daters who are not comfortable using dating sites might not properly attend to the manipulation.

RESULTS

All hypotheses make predictions about satisfaction ratings measured at Time 2. Prior to attending to these hypotheses, we probed for any effects of the manipulations at Time 1 to ensure that, as predicted, no such effects emerged. An analysis of covariance (ANCOVA) with choice satisfaction ratings at Time 1 as the dependent variable, quantity of choice and reversibility as between-subject factors, and the covariates mentioned earlier was run. The omnibus

test did not reach significance, $F(9, 91) = 1.26, p = .27$. There was no main effect of quantity of choice, $F(1, 89) = 1.66, p = .20$, with daters who selected from a pool of 6 ($M = 4.78, SD = .72$) being equally satisfied with their selection as daters who selected from a pool of 24 ($M = 4.57, SD = .85$). Similarly, there was no significant main effect of reversibility, $F(1, 89) = 1.13, p = .30$, with daters in the reversible condition ($M = 4.59, SD = .76$) being equally satisfied with their selection as daters in the condition where choice reversibility was not available ($M = 4.76, SD = .81$). None of the covariates were significant. Therefore, at Time 1, there was no evidence of a choice overload effect, which replicates the findings of Lenton and Stewart (2008), or of reversibility.

We hypothesized that, one week after selection, daters in the large choice set condition would be less satisfied with their choice than those in the small choice set condition (Hypothesis 1), and that daters who had the ability to change their selection would be less satisfied than those who were not allowed to change it (Hypothesis 2). These predictions were tested through an ANCOVA with choice satisfaction at Time 2 as the dependent variable, quantity of choice and reversibility as the between-subjects factors, and all the covariates mentioned earlier. The omnibus test was marginally significant, $F(9, 89) = 1.69, p = .10$, partial $\eta^2 = .15$. However, the main effect of quantity of choice was significant, $F(1, 89) = 3.80, p < .05$, partial $\eta^2 = .04$. Simple-effects tests show that participants in the large choice set condition were less satisfied with their selection than those in the small choice set condition, $t(97) = 2.04, p < .05$, Cohen's $d = .41$, providing support for Hypothesis 1. The main effect for reversibility was not significant $F(1, 89) = .001, p = .74$, as there was no difference in choice satisfaction between the participants who could and could not change their selection, failing to support Hypothesis 2. None of the covariates reached significance, all F 's < 3.02 , all p 's $> .05$. See Table 1 for means and standard deviations.

Hypothesis 3 predicted a joint effect: One week after selection, online daters who chose from the pool of 24 potential matches and had the ability to change their choice would be the least satisfied compared to those in the other three conditions. This hypothesis was tested through a planned contrast analysis performed on the satisfaction ratings at Time 2, while controlling for all the covariates indicated earlier (see the upper panel of Table 1 for contrast weights, means, and standard deviations). We used planned contrasts, rather than interaction effects, because they allow us to ask more precise questions (i.e., if there is a difference between only one group and all of the others) and have more power in detecting differences (Abdi & Williams, 2010; Ruxton & Beauchamp, 2008; Thompson, 1990). The planned contrast analysis was significant, $t(95) = 1.72, p < .05, \eta^2 = .24$. Following the suggestion of Keppel and Wickens (2004), an analysis of the residual explained variance was conducted in order to determine if this set of contrast weights adequately described the effect of the study manipulations on the dependent variable.

TABLE 1 Planned Contrast Coefficients, Means, and Standard Deviations.

	Large choice set, reversible decision	Large choice set, nonreversible decision	Small choice set, reversible decision	Small choice set, nonreversible decision
Planned contrast weights	-3	1	1	1
Satisfaction ratings at Time 2 (Hypothesis 3).	$M = 4.45,$ $SD = 0.88$	$M = 4.59,$ $SD = 0.75$	$M = 5.02,$ $SD = 0.74$	$M = 4.75,$ $SD = 1.14$
Planned contrast weights	-3	1	1	1
Difference in satisfaction ratings from Time 1 to Time 2 (Hypothesis 4)	$M = -0.19,$ $SD = .78$	$M = 0.09,$ $SD = 0.55$	$M = 0.14,$ $SD = 0.50$	$M = 0.07,$ $SD = 0.84$

This analysis showed that after accounting for the variance described by the hypothesized effect, a nonsignificant amount variance in the dependent variable remained, $F(3, 95) = .88, p = .45$, indicating that the proposed contrast weights adequately explained the patterns in the data. Thus, Hypothesis 3 received strong support.

Hypothesis 4 predicted that the joint effect of choice overload and reversibility would unfold over time: During the week from Time 1 selection to Time 2 reevaluation, those who selected from the large choice set and had the ability to change their choice would experience the greatest decrease in satisfaction compared to the other three conditions. To test this hypothesis, a difference score between satisfaction at Time 2 and satisfaction at Time 1 was first computed. Then, a planned contrast analysis was performed on this difference score, while controlling for all the covariates indicated earlier (see the lower panel of Table 1 for contrast weights, means, and standard deviations). The planned contrast analysis was significant, $t(95) = 1.85, p < .05, \eta^2 = .31$. As before, an analysis of the residual explained variance was conducted in order to determine if this set of contrast weights adequately describe the hypothesized effect. This analysis showed that after accounting for the variance described by the hypothesized effect, a nonsignificant amount variance in the dependent variable remained, $F(3, 95) = .04, p = .99$, supporting Hypothesis 4.

While the results of Hypothesis 3 suggest that at Time 2 the excessive choice-can exchange group is least satisfied, and the results of Hypothesis 4 suggest a particular trend over time in which the excessive choice-can exchange group sees a drastic and negative change over the course of the week but the other groups do not, the significance of this change over time must also be addressed. In order to conduct this analysis, we first combined the three theoretically similar conditions as discussed above (see Zhao, Hoefler, & Zauberger, 2007, for a similar procedure). In addition to being considered theoretically similar, there exists no statistical difference in

satisfaction level changes between the excessive choice-no exchange and limited choice-no exchange condition $t(38) = -.308, p = .76$, the limited choice-can exchange and limited choice-no exchange condition $t(49) = .314, p = .75$, and the excessive choice-no exchange and limited choice-no exchange condition, $t(45) = .60, p = .95$. Thus, these groups were combined in order to run a repeated measures factorial ANCOVA with Time as the within-subjects factor and condition (choice overload-can exchange condition vs. other conditions) as the between-subjects factor. As expected, this analysis shows an interaction between time and condition $F(1,91) = 3.37, p < .05$, such the passage of time had a statistically significant effect on satisfaction level, and this effect depended on whether participants were in the excessive choice-can exchange condition, or the other conditions. As indicated above, the excessive choice-can exchange condition saw a drop in the level of satisfaction over time, whereas all others did not.

Hypothesis 5 predicted that of those offered the ability to reverse their decision, more daters in the large choice set condition would take advantage of this option than daters in the small choice set condition. While no daters in the small choice set condition chose to change their selected partner at Time 2, 13% of the daters in the large choice set condition did. This difference was statistically significant, $\chi^2(1) = 2.93, p < .05$, providing support for Hypothesis 5.

DISCUSSION

Romantic relationships are key to personal happiness (Diener & Seligman, 2002), and nowadays online dating has become a prevalent modality for initiating these relationships: 35% of the long-term relationships established between 2005 and 2012 were the result of individuals meeting online, with half of those individuals meeting specifically through dating websites (Cacioppo, Cacioppo, Gonzaga, Ogburn, & VanderWeele, 2013). The technological features of dating websites can play an important role in individuals' ability to establish romantic connections. This role may be obvious, as in the case of algorithms that identify matches for users, or rather subtle, as in the case of information presentation and packaging on the site. The latter is the focus of this paper. Specifically, we argue that how partner choice is presented on the website (i.e., how many potential partners are given to online daters, and whether these partners can be exchanged) exercises significant influence on daters' evaluation of potential partners. The results support this assertion. Online daters who were presented with large (i.e., 24) as opposed to small (i.e., 6) pools of potential partners registered decreased satisfaction with their choice. Moreover, daters who had a large pool of partners and were given the option to reverse their selection were the least satisfied with their choice, and more likely to act on their ability to reverse their selection than daters who were given a small pool of partners.

In other words, the mediated platform of online dating structured the partner selection process in ways that had significant interpersonal consequences.

These results offer a series of theoretical contributions. First, they introduce theories about people's perception of choice (i.e., choice overload and decision reversibility) from behavioral economics to the new contexts of mediated communication and romantic relationships, thus, expanding the theories' boundaries. Second, they illuminate the joint operations of these theories, a previously unexamined topic. Third, they advance understanding of how media features affect relational processes. We detail these contributions below.

Extending Choice Theories to New Contexts

The choice overload effect, or the notion that having more choices decreases satisfaction with the item selected, has received robust empirical support for a multitude of low-stake choices, such as inexpensive consumer purchases. In applying this framework to online dating, we pushed its boundaries from choices among objects to choices among people, and from low-stake to high-stake choices. The predicted effects emerged in online dating, underscoring the robustness of the choice overload framework across a variety of different types of choices.

However, choice overload effects in the high-stake context of online dating did not replicate low-stake contexts identically. Whereas in the latter contexts dissatisfaction with a selection made from a large set tends to set in immediately after the choice is made, in the former context the passage of time was a necessary condition for choice overload effects to emerge. We theorized that time is a key variable in high-stake contexts, because such contexts tend to be complex, involving ramifications that may be difficult to predict immediately (such as how family and friends will respond to a selected romantic partner). This argument is consistent with research in the related area of cognitive dissonance, which finds that dissonance, the uncomfortable mental state experienced by individuals after choosing between similarly attractive options, can start out small and grow over time (Koller & Salzberger, 2012). Together, our findings and dissonance research suggest that decisions that require thoughtfulness, either because they are high stakes or close calls, may elicit psychological processes that unfold over time, as individuals evaluate and reevaluate the merits of their choices.

Ours is the first study to identify the passage of time as a key ingredient in the emergence of choice overload effects in online dating, and thus explains why previous, nonlongitudinal research failed to find this effect (Lenton & Stewart, 2008). Given these encouraging findings, we invite future research to pursue a deeper understanding of how time affects the evaluation of choices. For instance, do online daters ruminate over time, and does this rumination

decrease their satisfaction with a selected partner? Do they consider the qualities of the discarded options in greater depth? Similarly, future research should establish the minimum amount of time necessary for the emergence of the effect.

While the choice overload effect received strong empirical support, the main effect of reversibility effect did not emerge, either immediately after daters made their selections, or a week later. One explanation for this null finding is that our reversibility manipulation may not have been sufficiently strong; that is, the college students who took part in this experiment may not have felt entirely bound to the person they selected online, due to the availability of potential partners in their natural environment. It is possible that this effect will emerge more clearly in a setting where online daters perceive a greater scarcity of dates, such as among middle-aged or elderly adults, because these groups are more likely to believe that their choices are difficult to replace. We invite future research to examine this possibility.

Similarly, an unexpected finding was that excessive choice reduced choice satisfaction on its own, but that reversibility only did so in conjunction with choice satisfaction (i.e., there was no main effect of reversibility). Recall that we had theorized that excessive choice and reversibility were functionally equivalent in that they both deactivated ego-protective mechanisms. This unexpected pattern indicates that these two phenomena, while still functionally equivalent in the sense that they deactivate ego-protective mechanisms, might not operate in an identical way. At least in our online dating context, reversibility appears to have a different threshold for deactivating ego-protection—that is, the presence of an abundance of choice. Ego-protection mechanisms might kick in as predicted when daters cannot reverse a choice made out of a small pool (i.e.), but when the pool is large (i.e., 24), it may simply become impossible for individuals to protect themselves.

For illustrative purposes, consider one potential ego-protective mechanism: the reduction of regret. According to our findings, it appears that selecting from a pool of six potential daters triggers ego-protective mechanisms that allow individuals to defend their decision: Our participants actually saw a small rise in satisfaction over the course of a week, likely feeling the effects of reduced regret for any options passed over. However, when selecting from a pool of 24 daters, individuals simply couldn't protect themselves from the noxious experience of regret: There simply were too many options to reduce regret for.

The threshold for reversibility is not as clear. It appears that selecting from 6 potential mates and being able to reverse the decision left daters no less satisfied than if they selected from 6 dates and were not able to reverse the decision. It is possible that there was no regret to reduce when the pool of choices was small: There may simply be one best choice for a date. Thus, we see no drop in the reversible condition, and no difference between conditions. However, when selecting from 24 potential daters there is much room for regret. Instead of having only 5 options that represent a potential path

untaken, there are 23. In this context, reversibility likely matters more. Those who were unable to reverse their decision in this situation felt the beneficial effects of the ego-protective mechanism: Even when faced with choice overload, they saw a rise in satisfaction with their selection to a level consistent with those who selected from a pool of 6 options. However, those who had the option to reverse their decision and were selecting from the larger pool had no ego-protective mechanisms activated and, thus, experienced the drop in satisfaction. We invite future research to more directly test the conditions necessary for reversibility to deactivate ego-protective mechanisms.

Despite the lack of a main effect of reversibility, reversibility and choice overload worked in tandem to reduce online daters' satisfaction with their choice. Ours is the first study to show that choice overload and decision reversibility, two frameworks that make predictions about choice satisfaction, work in a joint manner, such that reversible choices made of large sets result in the least amount of satisfaction with one's selection. We theorized that this pattern can be explained via the lens of choice constraints, or factors that limit people's choices (i.e., having a small choice set, or lacking reversibility). Because choice constraints activate ego-protective mechanisms that make people feel good about themselves and their choices, their removal has pernicious effects on choice satisfaction, causing it to dip over time. Interestingly, we found that these constraints do not have an additive effect—having both available at the same time does not raise satisfaction more than having just one, because the ego-protective mechanisms they activate are mutually redundant. While our results point to the value of adding at least one constraint to a choice, future research is necessary to directly test the relationship between choice constraints and the activation of ego-protective mechanisms (i.e., reduction of rumination, regret, or counterfactual thinking).

All in all, the data suggest that theories from behavioral economics retain their explanatory power in online dating. Additionally, they are consistent with theories of intimate relationships. Specifically, the investment model of developing relationships (Impett, Beals, & Peplau, 2001, Rusbult, 1980, 1983) argues that individuals' satisfaction with long-term romantic partners is contingent on their perceptions of the availability of alternative romantic partners: The more and higher quality alternatives individuals believe they have, the less likely they are to be satisfied with their existing romantic partner. Similarly, we find that even before long-term relationships commence, individuals' perceptions of their alternatives diminish their satisfaction with a selected potential partners. Thus, although they originate in different fields, these theories complement each other in showing that having a multitude of choices dampens satisfaction with a romantic partner both in the incipient stages of relationships (as was the case in our study) and in established, long-term relationships (which are the purview of the investment model).

Additionally, our findings are consistent with recent research concerning real-world online dating outcomes. One study shows that couples who met

through online dating had higher break-up rates than those who met in face-to-face settings (Paul, 2014). This may be an upshot of the effect identified in this research: Online daters may believe they have more choice than face-to-face daters, due to the sheer number of potential partners easily available online, and as a result they may be more apt to be dissatisfied with their chosen partner.

Interpersonal Effects of Media Features

In this article, we have conceptualized quantity and reversibility of partner choice as media features of dating websites, in the sense that dating websites can make design decisions about how to structure users' ability to choose romantic partners. Specifically, dating websites can vary the number of matches users are presented with, and can enable or disable their ability to reverse their choices, once made. We find that these media features are psychologically meaningful, in that they affect daters' interpersonal evaluations of potential partners. This pattern is consistent with a growing body of research that demonstrates the influential role of the media in shaping interpersonal impressions. For instance, the presence or absence of a personal photograph has been shown to affect the perceived social attractiveness (Walther, Slovacek, & Tidwell, 2001) and trustworthiness (Toma, 2010) of online communication partners. Similarly, the number of Friends users have on social network sites, a website-generated cue, affects how attractive and extraverted they are perceived (Tong, Van Der Heide, Langwell, & Walther, 2008; Utz, 2010). In all, this body of research highlights the importance of mediated presentations of information in the establishment of interpersonal connections.

As noted earlier, our study imported theories from behavioral economics to the realm of online dating. We believe that these theories may become especially useful in understanding interpersonal interactions in a multitude of online communication contexts, beyond online dating. Indeed, choice is increasingly embedded in online platforms, with social network sites such as LinkedIn, Facebook, and Twitter accruing millions of members and presenting users, every time they log in, with generous options about whom to initiate contact with. These websites also visibly quantify choice, displaying clear numbers of how many Friends, followers, or contacts one has, or are online and available for interaction. These displays of choice may not be without interpersonal consequence. We argue that examining how the presentation of choice in mediated platforms is a rich avenue for future research and theorizing.

Practical Implications

Existing online dating websites treat amount of choice and decision reversibility quite differently in their virtual architecture. When it comes to choice, websites can range from default views of only four potential matches

(eHarmony) to as many as 40 or more matches (Plenty of Fish) on a single page. When it comes to decision reversibility, there are tacit cues that might influence users' perceptions. A website such as Plenty of Fish or Datehookup may convey notions of reversibility by its very nomenclature, implicitly suggesting to users that potential partners are replaceable, and their decisions about whom to date reversible. Conversely, Chemistry.com and EHarmony.com advertise themselves as tools to help users find their "soulmates," implying that potential partners found on the site may not be easily replaced. These design decisions and packaging of information may alter users' perceptions of romantic connections made through the site, dampening their enthusiasm for a potential partner if choice appears plentiful and decisions easily reversible. Indeed, the fact that EHarmony, whose design emphasizes both limited choice and limited reversibility, generates the greatest number of long-term partnerships and marriages (Cacioppo et al., 2013) is consistent with our findings.

Limitations and Future Research

This study used an undergraduate sample and a contrived online dating system. Although the use of dating sites is on the rise among college students, our convenience sample is younger than typical online daters, who are aged 25–45 (Smith & Duggan, 2013). We recommend that future research replicate our findings with older daters. Additionally, while participants believed they were using a real online dating website, were single, and were interested in finding dates, they may differ from actual subscribers of online dating services. Older subscribers of online dating websites may be more motivated to find relationship partners, more interested in serious relationships, and may perceive less availability of partners in their everyday environments. As such, they may be even more liable to choice overload and decision reversibility effects than our sample. We recommend that future research replicate this study with online dating subscribers of more varied demographics.

From a theoretical standpoint, it is important that future research examine the mechanism behind the combined effect of choice overload and reversibility. As previously noted, it is possible that online daters who have more choices experience more regret, cognitive burden, and need for justification, and they may ruminate about their choices over time. Future studies should directly assess these variables. For example, we noted earlier that the need for justification may arise out of relational goals. Future research should address whether relational goals impact need for justification, and this consequently predicts the presence of choice overload effects. Additionally, a particularly exciting avenue for future research is to follow up on how the pre-interaction impressions identified here affect subsequent interactions between daters. Do daters whose satisfaction with selected partners is dampened by choice

overload and reversibility effects interact more negatively with these partners in subsequent meetings, leading to self-fulfilling prophecies?

Conclusion

John Durham Peters (1999) writes that “the meaning of communicative connections, large and small, is an ongoing conundrum” (p. 224). The naturally enigmatic nature of connection is only amplified when considering the realm of mediated communication, where there is more possibility for connection than ever before. To that end, we hope to have taken a small step forward by identifying that, when it comes to finding a romantic partner online, more is not always better. Our study proposes that the framing and presentation of romantic choices in a dating website may systematically alter interpersonal evaluations, and may even affect the future trajectory of relationship development. We offer theoretical perspective for explaining these effects, and open up several promising avenues for future research.

NOTES

1. The study was restricted to heterosexual participants in order to avoid the potential confounding effect of sexual orientation on perceptions of partner availability. Research shows that the pool of romantic partners is more restricted for same-sex than for heterosexual individuals (Mustanski, Lyons, & Garcia, 2011), which is why the former may have different reactions to our experimental manipulation. We invite future research to replicate our findings with a same-sex sample.

2. Anonymized for peer review.

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