Reciprocal self-disclosure and rejection strategies on bumble

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Abstract
Dating apps are an increasingly common element of modern dating, yet little research describes users' experiences rejecting potential partners through these apps. This study examines how female Bumble users reject potential partners online in relation to self-disclosure, perceived partner disclosure, pre-rejection stress, and app usage. To investigate these issues, we conducted an online survey of 419 female Bumble users who had recently rejected someone through the app. Results revealed that women on Bumble employ ghosting strategies far more often than confrontational rejection and suggest that the degree to which women self-disclose, perceive a partner's self-disclosure, and experience pre-rejection stress may impact their rejection strategies. This study informs the hyperpersonal model by demonstrating that reciprocal disclosure may characterize online dating interactions—even in relationships that fail to reach the face-to-face stage. However, results also broach the possibility of communication burnout in online dating, in which some users may lessen self-disclosure after extensive app usage.

Keywords
Online dating, romantic rejection, self-disclosure, ghosting, interpersonal relationships

Dating apps are increasingly popular in the United States and cater to individuals seeking a variety of outcomes, including love, casual sex, self-worth validation, and excitement (Sumter et al., 2017). Bumble, the "feminist dating app" (Pruchniewska, 2020), subverts stereotypical dating norms by allowing only women to make the first

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move (Bivens & Hoque, 2018) and is the second-most popular dating app in the United States, with over five million users (Clement, 2019). Like other dating apps, Bumble allows users to create profiles, peruse the profiles of others in their geographical area, and "swipe right" to indicate interest in a potential partner. The difference between Bumble and other apps is that after two partners swipe right on each other and "match" on the app, only a woman can initiate messaging. This feature was created with the intent to empower women and reduce the likelihood of online harassment initiated by men (Pruchniewska, 2020; Stratmoen et al., 2020; Tanner & Tabo, 2018). While research has indicated that women do feel empowered using the app to choose or reject matches (Pruchniewska, 2020; Tanner & Tabo, 2018), little is known about how female users reject others and communicate on the app. Thus, this study fills a gap in the literature by investigating which strategies women most commonly use to reject partners on Bumble.

While some interactions on dating apps lead to in-person meetings and relationships (Vogels, 2020), the majority of interactions on these apps end before a face-to-face meet-up (Grøntvedt et al., 2020). The online-only nature of these interactions thus makes them appropriate to study through the lens of the hyperpersonal model, which argues that computer-mediated communication (CMC) breeds disclosure and intimacy. This research will assess the degree to which communication facilitated solely through Bumble reflects arguments of the hyperpersonal model. Further, while previous research indicates that people make intentional decisions about how to reject a partner (LeFebvre et al., 2019; Tong & Walther, 2010), little is known about what factors impact this decision-making process on dating apps. Therefore, the present research investigates the roles of self-disclosure, perceived partner disclosure, and pre-rejection stress in facilitating specific rejection strategies.

The Hyperpersonal Model in Computer-Mediated Communication

The hyperpersonal model (Walther, 2007) outlines the processes by which relationships are formed and developed in CMC contexts and argues that CMC facilitates higher levels of interpersonal intimacy than face-to-face communication. One of the main groups explored in this model is the "senders" of messages (Walther, 2011). Researchers have found that these senders engage in selective self-presentation, emphasize their desirable traits, and communicate in ways that elicit positive responses from others (Walther, 2007, 2011). Among online daters, some achieve these aims by using deception when describing personal goals, interests, or physical attributes (Hall et al., 2010), while others endeavor to portray an ideal yet authentic self in order to avoid being identified as a liar (Sharabi & Dykstra-DeVette, 2019).

Another critical behavior of senders in the hyperpersonal model is self-disclosure, or the act of communicating about oneself, which helps partners to develop intimacy (Jiang et al., 2011). The hyperpersonal model argues that mediated self-disclosures are greater in both depth and breadth than those in face-to-face environments (Walther, 2011). Meta-analyses of studies testing this theory have contested this claim (Nguyen et al., 2012; Ruppel et al., 2017), especially with regard to the *depth* of disclosure (Ruppel et al.,

2017). However, a number of studies do indicate that CMC can breed higher levels of self-disclosure (Jiang et al., 2013; Peter & Valkenburg, 2006). This phenomenon may be explained, in part, because people tend to ask personal and intimate questions much sooner than they would in face-to-face communication (Hance et al., 2018; Walther et al., 2015). Dyads, specifically, have been found to self-disclose more frequently and in greater amounts when they meet online, as opposed to a face-to-face meeting (Schouten et al., 2009; Tidwell & Walther, 2002). It is possible that these users feel more comfortable sharing personal information because they are able to edit their language and ponder what and how they will disclose to a partner prior to doing so (Tidwell & Walther, 2002).

Higher levels of computer-mediated self-disclosure can encourage more intimacy between partners (Jiang et al., 2011), enhance social attraction (Dai et al., 2016), and help partners form accurate perceptions of each other (Sharabi & Caughlin, 2017). As such, self-disclosure is a signifier of participants taking online dating seriously enough to move the interactions from online to in-person (Gibbs et al., 2006; Tanner & Tabo, 2018). Self-disclosure is also associated with higher online dating success (Gibbs et al., 2006), including an increased likelihood of a successful first date once a relationship is taken offline (Sharabi & Caughlin, 2017).

The presence of self-disclosure in online dating interactions that end in rejection has not yet been investigated. However, based on the hyperpersonal model claim that CMC facilitates self-disclosure (Tidwell & Walther, 2002), we predict that as time communicating on Bumble increases, so too does self-disclosure between partners, even though their communication ultimately ends.

H1: Self-disclosure will be positively associated with the number of messages exchanged (**H1a**) and the length of communication (**H1b**).

H2: Perceived partner disclosure will be positively associated with the number of messages exchanged (**H2a**) and the length of communication (**H2b**).

Based on persistent claims that self-disclosure is reciprocated in interpersonal interactions (Hill & Stull, 1982), we also seek to investigate the degree to which self-disclosure is reciprocated in online-only interactions facilitated through dating apps. Previous studies have discovered that people tend to like those who self-disclose to them during mediated communication (Jiang et al., 2011; Kashian et al., 2017). Self-disclosures in CMC are perceived to be more intimate than face-to-face disclosures and, as a result, people may be more likely to reciprocate disclosure in mediated environments (Jiang et al., 2013). Based on this finding, we propose the following hypothesis:

H3: Self-disclosure will be positively associated with perceived partner disclosure.

While some work shows that self-disclosure is encouraged through CMC (Tidwell & Walther, 2002), it is possible that rates of self-disclosure through Bumble may differ based on the frequency with which someone uses the app. Previous work has identified multiple motivations for using a dating app, including casual sex, love, and excitement (Sumter

et al., 2017), signifying that not all users use these apps to cultivate serious romantic relationships. It is possible that those who use Bumble infrequently are casual users who are less likely to self-disclose, while those who use the app more frequently may be more invested in finding a relationship and, thus, more willing to self-disclose. Based on this assumption, we will investigate the following hypothesis:

H4: Frequency of Bumble use will be positively associated with self-disclosure.

Because Bumble has not been specifically addressed in much existing literature, we will also investigate the relationship between frequency of Bumble use and previous dating app success. Existing work suggests that some who have had unpleasant experiences on the app or have failed to achieve success may reduce their app usage (De Wiele & Campbell, 2019). Conversely, then, it is possible that those who have found success on a dating app previously are more likely to return to dating apps in the future. Therefore, we propose the following hypothesis:

H5: Women who use Bumble more often will be more likely to have met a romantic partner through an online dating app.

Rejection on Dating Apps

Little research outlines online daters' experiences *rejecting* potential partners through an app, but dating apps facilitate this experience due to the physical distance that separates users (LeFebvre, 2017; Tong & Walther, 2010). Previous work suggests that users of these apps employ various online rejection strategies (LeFebvre, 2017). De Wiele and Campbell (2019) identified a number of these strategies by coding participant responses to open-ended questions about romantic rejection experiences on dating apps. Two of the strategies they identified (swiping left so that a "match" is not initiated and ignoring a match's initial message) were used to convey rejection prior to reciprocal communication with a partner. The remaining four strategies were used to reject a partner after reciprocal communication. These were a) ghosting (a partner stops replying to messages), b) unmatching, c) blocking, and d) rejection message (a partner states that they are not interested). The former three of these strategies all absolve the user of having to directly confront their partner and may be characterized as ghosting strategies.

Ghosting research is still somewhat sparse, as it is a newer phenomenon associated with dating (LeFebvre, 2017); however, it is an increasing area of interest among scholars studying both face-to-face and online dating. As research on ghosting has increased, there has been a lack of consensus in defining "ghosting." To address this issue, Koessler et al. (2019b) conducted a thematic analysis of responses to questions about ghosting and compared these results to themes identified by LeFebvre et al. (2019) in a separate qualitative study. Based on the evidence of these two teams, Koessler et al. (2019b) presented the following definition of ghosting:

"Ghosting is a strategy used to end a relationship with a partner with whom romantic interest once existed whereby the disengager unilaterally ceases technologically mediated communication with the recipient (suddenly or gradually) in lieu of providing a verbal explanation of disinterest."

Notably, this definition identifies two timelines in which ghosting may occur: suddenly or gradually, suggesting that scholars may want to investigate these two types of ghosting. It is also important to note that the precedent for ghosting described is "romantic interest." Both Koessler et al. (2019b) and others (LeFebvre & Fan, 2020) have argued that ghosting does not require the existence of an established relationship; rather, for ghosting to take place there only needs to be an expectation of continued communication. This suggests that online-only relationships are susceptible to ghosting (Koessler et al., 2019b). In fact, online-only relationships may be more likely to end in ghosting than offline relationships. First, as explained by Timmermans et al. (2020) various affordances of dating apps likely drive ghosting behavior. These include the ease and frequency with which users can delete dating apps (Fitzpatrick & Birnholtz, 2018), the incentive to treat potential partners as commodities on these apps (Banks et al., 2017), and user perceptions of dating apps as a source of entertainment. Further, previous research has shown that ghosting is most negatively perceived when it is employed in serious, long-term relationships as opposed to short-term ones (Freedman et al., 2019; Manning et al., 2019). As such, ghosting strategies may be commonly used to reject potential partners on Bumble, where relationships typically exist in an early stage. As rejection strategies on Bumble have not been previously studied, we will investigate the following research question:

RQ1: Which rejection strategies are most frequently employed by women who reject potential partners on Bumble?

Previous literature has suggested that individuals make intentional decisions about how to reject partners. LeFebvre et al. (2019), for example, found that people chose ghosting as a rejection technique for specific reasons, including convenience, lack of attraction, negative interactions, changes in relationship status, and safety concerns. The strength and context of a relationship can also influence the way someone rejects a potential partner. In Tong & Walther (2010) study of computer-mediated rejection, they found that strangers are more likely to apologize when rejecting potential partners, while acquaintances communicate rejection by suggesting future non-romantic contact. While this indicates that relationship differences may also impact how people choose to reject a partner through a dating app, little is known about what factors may impact how individuals terminate these online-only relationships.

LeFebvre et al. (2019) called for future research on relationship dissolution to investigate relationship factors, such as commitment, length, and intensity, which may be antecedents of ghosting behavior. In this study, we investigate three factors that may impact the manner in which an individual chooses to dissolve a relationship facilitated through Bumble: self-disclosure, perceived partner disclosure, and pre-rejection stress.

Self-disclosure, perceived partner disclosure, and rejection

Existing literature has identified a number of antecedents that may impact how someone chooses to end a relationship, including overlap between the couple's social networks, relationship intimacy, compassionate love, and the rejector's intentions to maintain a friendship after ending the romantic relationship (Sprecher et al., 2010). However, these factors may be less applicable to relationships dissolved through dating apps, as these relationships end so early in the dating process. One factor that is present in these relationships is the degree to which the partners have self-disclosed. While the relationship between self-disclosure and relationship dissolution strategies on dating apps has not been addressed directly, there is some evidence to suggest that ghosting may occur more often in relationships with low levels of self-disclosure. Koessler et al. (2019a) found that ghosting was more likely to be used in relationships that were shorter and less committed. Because self-disclosure breeds relational closeness (Sprecher & Hendrick, 2004), women may be more likely to ghost their partners if self-disclosure between the partners is low. In a follow-up study, Koessler et al. (2019b) similarly found that some people chose to dissolve relationships through ghosting because the relationship was not long or serious enough to require a direct confrontation. Therefore, women who have shared little with a partner on Bumble may feel it unnecessary to initiate a breakup conversation, while women who have both self-disclosed and received high levels of disclosure may be more inclined to feel they owe the partner an explanation before they cease communication.

Some existing literature on growth versus fixed mindsets also suggests that those who self-disclose more on dating apps may be less likely to employ ghosting strategies. People with a growth mindset, as opposed to those with a fixed mindset, are more likely to use social media for social interaction and identity expression (Song et al., 2019). Research has also found strong growth beliefs to be negatively associated with ghosting intentions and behaviors (Freedman et al., 2019). Taking these findings together, it is possible that users who socialize and self-disclose at high rates on dating apps are less likely to ghost a dating app match. However, this possibility is uncertain as the above research was not focused on dating app usage.

In contrast to the evidence above, it is also possible that higher self-disclosures may be related to ghosting. After sharing disclosures with a dating app match, women may feel guilty about choosing to reject the partner and may wish to cease communication without providing an explanation. Rejecting romantic partners can cause feelings of guilt (Baumeister et al., 1993), and ghosting has been portrayed as an "easy way out" of ending romantic contact (Abad-Santos, 2017). Further, previous work has shown that dating app users may experience stress and insecurity when they are rejected through these apps (De Wiele & Campbell, 2019). Because women preparing to reject a partner have likely experienced dating app rejection themselves (Musan, 2020), it is possible they may wish to avoid directly confronting the partner in order to spare the partner's feelings (Koessler et al., 2019a), especially if they have established a stronger bond through reciprocal self-disclosure. Of course, ghosting itself may also cause frustration, hurt feelings, or damaged self-esteem in the rejected partner (Manning et al., 2019; Timmermans et al., 2020);

however, previous work shows that ghosting performed through dating apps is typically not done with malicious intent (Timmermans et al., 2020).

Because existing literature has not yet observed the connection between self-disclosure, perceived partner disclosure, and rejection strategies, we will investigate the following research questions:

RQ2: Will self-disclosure be associated with the type of rejection employed?

RQ3: Will perceived partner disclosure be associated with the type of rejection employed?

Stress and Rejection

Because romantic rejection can cause rejectees to feel excluded and hurt (Deri & Zitek, 2017), rejecting a romantic partner or prospect is often a stressful endeavor for the rejector (Hancock et al., 2017; Stratmoen et al., 2020). Existing literature suggests that rejectors often try to balance the preservation of their own self-image with a desire to mitigate their partner's embarrassment (Tong & Walther, 2010), which can be difficult to navigate. There is some evidence to suggest that a rejector's stress level may impact the manner in which they dissolve a relationship (LeFebvre, 2017); however, little is known about which strategies may be employed by dating app users experiencing pre-rejection stress.

Previous research has found that women who worried that rejecting a male partner would insult the partner or incur retaliation were more likely to use an evasive rejection strategy over a confrontational one (Stratmoen et al., 2020). Similarly, then, it is possible that women experiencing general stress prior to rejecting someone may be more likely to use a ghosting strategy—especially one that allows the user to avoid the situation entirely like unmatching or deleting their account. Because little is known about how pre-rejection stress may impact dissolution strategies through Bumble, we will investigate the following research question:

RQ4: Will pre-rejection stress be associated with the type of rejection employed?

Method

To address the research questions and hypotheses, we distributed an online survey. The majority of participants were recruited through Amazon Mechanical Turk, and these participants were compensated for their time. In addition, the survey was posted to five subreddit pages related to online dating or general research: r/Bumble, r/SampleSize, r/dating_advice, r/dating, and r/OnlineDating. These participants were not compensated and participated voluntarily. This study was approved by the Institutional Review Board, and all subjects consented to participate. Only female Bumble users were invited to participate in the study. Because we sought to understand rejection strategies and their antecedents in online-only relationships, participants were required to have rejected someone through Bumble whom they had matched and exchanged messages with but had

not met in-person. In order to minimize memory bias, participants were required to have rejected this person within the two weeks prior to taking the survey. Participants were asked to answer survey questions based on this one interaction only.

All data were collected between January 27, 2020, and February 11, 2020. A minimum sample size of 384 was calculated using a confidence level of 95% and a confidence interval of 5.0. A total of 462 individuals participated in the study; however, those who did not fully complete the survey were removed from the sample, resulting in a sample of 419 Bumble users. Participants were between the ages of 18 and 68 ($M = 29.83$, $SD = 7.97$) and identified as "female" ($N = 390$), "male to female trans" ($N = 21$), and "other (female)" ($N = 8$). A variety of races and ethnicities were represented in the sample, including White (56.3%), Asian (23.4%), Black or African American (11%), Hispanic or Latino (4.1%), American Indian or Alaskan Native (2.4%), Hawaiian Native or Pacific Islander (0.2%), and multiracial (2.4%).

Measures

The following measures were assessed using the survey instrument.

Frequency of Bumble use

Using an established scale (Rosen et al., 2013), we asked participants to respond to the following item: "How often do you go on Bumble?" Participants responded on a 10-point scale (1 = "never," 2 = "once a month," 3 = "2–3 times per month," 4 = "once a week," 5 = "2–3 times per week," 6 = "4–5 times per week," 7 = "daily, 2–3 times per day," 8 = "4–6 times per day," 9 = "once an hour," 10 = "2 or more times per hour").

Length of communication

Participants were also asked to report the length of their communication with their potential partner. After being prompted to think about the person they had most recently rejected through Bumble, participants responded to the following item on an 8-point scale: "How long did you communicate with that person for?" (1 = "less than a day," 2 = "a couple days," 3 = "a week," 4 = "two weeks," 5 = "three weeks," 6 = "one month," 7 = "two months," 8 = "more than two months").

Number of messages exchanged

In order to assess the number of messages exchanged between the participant and their potential partner, participants were asked to respond to the following item: "Approximately how many messages did you exchange with the person you rejected?" Participants responded on a 4-point scale (1 = "5 or less," 2 = "6 to 15," 3 = "16 to 30," 4 = "31+").

Type of rejection

Participants were also asked to disclose the method by which they rejected the potential partner. After being prompted to think of their interaction with the partner they rejected, participants were asked how they rejected that partner. Five potential responses were listed based on previous work. Research has indicated that individuals may reject a partner through sudden or gradual ghosting (Koessler et al., 2019b; LeFebvre & Fan, 2020). To distinguish between these two methods, we included the following two possible responses: a) "ghosting without unmatching (the act of sudden disappearance of a potential romantic partner)" and b) "slow fading without unmatching (someone becomes less and less available to the other)." A third response ("ghosting by unmatching") and a fourth response ("confrontation, or, giving an explanation to the other person for the rejection/ why not interested") were included based on previous evidence that these methods are used in online dating (Koessler et al., 2019b). Finally, due to the frequency with which some users delete dating apps from their phone (Fitzpatrick & Birnholtz, 2018; LeFebvre et al., 2019), a fifth rejection strategy was added ("ghosting by deleting account").

Self-disclosure

Self-disclosure was measured using the 10-item Self-Disclosure Index (Miller et al., 1983), which assesses both the breadth and depth of disclosure by measuring how much information an individual has disclosed to a new acquaintance about a variety of topics, such as "my personal habits," "what makes me the person I am," "what is important to me in life," and "my deepest feelings." Participants responded to items on a 7-point Likert scale (1 = "nothing," 7 = "a lot"). Scale items were summed, with higher scores indicating a higher level of self-disclosure. Cronbach's alpha reliability was 0.95.

Perceived partner disclosure

After responding to the self-disclosure items, participants were prompted to reflect on the degree to which their partner had self-disclosed to them. Perceived partner disclosure was measured using the 10-item Self-Disclosure Index (Miller et al., 1983). Participants were asked to indicate how much information the rejected partner had shared with them about the same topics described above. Responses were rated on a 7-point Likert scale (1 = "nothing," 2 = "a lot"). Scale items were summed, with higher scores indicating a higher level of perceived partner disclosure. Cronbach's alpha reliability was 0.95.

Pre-rejection stress

The participants were also asked to respond to items gauging the level of stress they were experiencing prior to rejecting their partner. After being prompted to think about how they felt before rejecting the partner, participants responded to a modified 7-item version of (Cohen et al., 1983) Perceived Stress Scale (e.g., "I felt stressed," "I felt nervous," "I felt I was unable to control the situation"). Responses were rated on a 7-point Likert scale

(1 = "strongly disagree," 7 = "strongly agree"). Cronbach's alpha reliability was low (α = 0.69); therefore, one item ("I felt that things were going my way") was removed from the scale, resulting in a 6-item scale. Cronbach's alpha for this scale was 0.80.

Finally, participants responded to a series of demographic questions and were asked to indicate whether they had or had not ever met a romantic partner through the use of an online dating app.

Results

We used IBM SPSS software version 27 to perform statistical analyses. See Table 1 for bivariate correlations and descriptive data.

The rejection strategies employed by women (RQ1) from most to least common were ghosting by unmatching (41.1%), ghosting without unmatching (19.8%), slow fading (17.4%), ghosting by account deletion (11.5%), and confrontation (10%).

To address RQ2–RQ4, a series of one-way ANOVA tests were conducted to investigate whether the type of rejection used is associated with self-disclosure (RQ2), perceived partner disclosure (RQ3), or pre-rejection stress (RQ4). The descriptive statistics for self-disclosure, perceived partner disclosure, and pre-rejection stress for each rejection strategy are reported in Table 2.

To address RQ2 (i.e., if self-disclosure is associated with the type of rejection used), a one-way ANOVA was run. Self-disclosure was significantly different for different types of rejection, Welch's $F(4, 149.30) = 2.99$, $p < .001$. Self-disclosure was significantly higher for those who ghosted by deleting their account ($M = 4.37$, $SD = 1.18$) than for those who suddenly ghosted without unmatching ($M = 3.39$, $SD = 1.66$). The assumption of homogeneity of variances was violated, as assessed by Levene's test for equality of variances ($p < .001$). Therefore, we used Games-Howell post hoc analysis; this revealed a mean increase of 1.0, 95% CI [0.3, 1.7], which was statistically significant ($p < .001$). All other relationships were statistically insignificant.

RQ3 (i.e., if perceived partner disclosure is associated with the type of rejection used) was also assessed using a one-way ANOVA. Perceived partner disclosure was significantly different for different types of rejection, Welch's $F(4, 147.75) = 3.13$, $p = .017$. Perceived partner disclosure was significantly higher for those who ghosted by deleting

Table 1. Bivariate Correlations and Descriptive Statistics.

	1	2	3	4	5	6	M (SD)
1. Number of messages exchanged	–						1.70 (0.79)
2. Length of communication	.354***	–					2.2 (1.36)
3. Frequency of Bumble use	.346***	.128**	–				4.02 (2.02)
4. Self-disclosure	.114*	.310***	.167***	–			3.70 (1.55)
5. Perceived partner disclosure	.079	.283***	.161***	.866***	–		3.77 (1.57)
6. Pre-rejection stress	.045	.205**	−.170**	.660***	.671***	–	3.71 (1.32)

*$p < .05$, **$p <.01$, ***$p < .001$.

Table 2. One-way ANOVA Means.

Type of rejection	Self-disclosure		Perceived partner disclosure		Pre-rejection stress		Age	
	M	SD	M	SD	M	SD	M	SD
Suddenly ghosting without unmatching	3.39	1.66	3.60	1.71	3.59	1.32	27.92	8.24
Gradually ghosting without unmatching (i.e., "slow fade)	3.59	1.39	3.50	1.34	3.42	1.24	29.08	7.47
Ghosting by unmatching	3.75	1.64	3.81	1.65	3.76	1.39	30.39	8.38
Direct confrontation	3.55	1.47	3.70	1.51	3.45	1.42	32.07	8.04
Ghosting by deleting account	4.37	1.18	4.34	1.32	4.35	0.95	30.10	5.87

their account ($M = 4.34$, $SD = 1.32$) than for those who gradually ghosted without unmatching (i.e., "slow fade") ($M = 3.50$, $SD = 1.34$). The assumption of homogeneity of variances was violated, as assessed by Levene's test for equality of variances ($p = .005$). Therefore, we used Games-Howell post hoc analysis; this revealed a mean increase of 0.84, 95% CI [0.1, 1.5], which was statistically significant ($p = .009$). All other relationships were statistically insignificant.

A final one-way ANOVA was run in order to assess RQ4 (i.e., if pre-rejection stress is associated with the type of rejection used). Pre-rejection stress was significantly different for different types of rejection, Welch's $F(4, 148.37) = 6.79$, $p < .001$. Pre-rejection stress was significantly higher for those who ghosted by deleting their account ($M = 4.35$, $SD = 0.95$) than for all other groups, namely those who suddenly ghosted without unmatching ($M = 3.59$, $SD = 1.32$), those who gradually ghosted without unmatching (i.e., "slow fading") ($M = 3.42$, $SD = 1.24$), those who ghosted by unmatching ($M = 3.76$, $SD = 1.39$), and those who confronted the partner/gave an explanation ($M = 3.45$, $SD = 1.42$). The assumption of homogeneity of variances was violated, as assessed by Levene's test for equality of variances ($p < .005$). Therefore, we used Games-Howell post hoc analysis; this indicated statistically significant mean differences between those who ghosted by deleting their account and those who suddenly ghosted without unmatching ($MD = 0.76$, CI [0.21, 1.32], $p = .002$), those who gradually ghosted without unmatching (i.e., "slow fading") ($MD = 0.93$, CI [0.38, 1.49], $p < .001$), those who ghosted by unmatching ($MD = 0.59$, CI [0.11, 1.07], $p = .008$), and those who confronted the partner/gave an explanation ($MD = 0.89$, CI [0.17, 1.62], $p = .008$). All other relationships were statistically insignificant.

A series of Spearman's rank-order correlations were run in order to address **H1** and **H4**, which predicted that the number of messages exchanged (**H1a**), length of communication (**H1b**), and frequency of Bumble use (**H4**) would be positively associated with self-disclosure. The results showed statistically significant positive correlations between the number of messages exchanged and self-disclosure [$r_s(418) = .11$, $p = .020$.] and between length of communication and self-disclosure [$r_s(419) = .31$, $p < .001$]. There was a statistically significant negative correlation between frequency of Bumble use and

self-disclosure, $r_s(419) = -.17, p < .001$. Thus, **H1a** and **H1b** were supported, and **H4** was not supported.

Two additional Spearman's rank-order correlations were run in order to address **H2**, which predicted that the number of messages exchanged (**H2a**) and length of communication (**H2b**) would be positively associated with perceived partner disclosure. The results showed that the relationship between the number of messages exchanged and perceived partner disclosure was not significant $r_s(418) = .08, p = .108$. There was a statistically significant positive correlation between length of communication and perceived partner disclosure, $r_s(419) = .28, p < .001$. Thus, **H2a** was not supported, while **H2b** was supported.

To address **H3** (i.e., that self-disclosure would be positively related to perceived partner disclosure), a Pearson correlation was run. The result showed a statistically significant positive correlation between self-disclosure and perceived partner disclosure, $r(419) = .87, p < .001$, supporting **H3**.

To address **H5**, which predicted that women who use Bumble more often would be more likely to have met a romantic partner through an online dating app, a Mann–Whitney U test was conducted. The distributional assumption was met. Self-disclosure was significantly higher in those who had met a romantic partner through an online data app ($Mdn = 4.00$) than those who had not ($Mdn = 3.60$), $U = 16,980, z = -2.87, p = .004$. Therefore, H5 was supported.

We also ran a number of tests to check for potential impacts of age. Spearman's rank-order correlations revealed that age was not related to the number of messages exchanged [$r_s(418) = .003, p = .950$] and that the relationship between age and frequency of Bumble use was not significant [$r_s(419) = -.092, p = .06$]; however, age was positively associated with length of communication [$r_s(419) = .174, p = .001$]. To determine if age was associated with the type of rejection used, a one-way ANOVA was run. There was homogeneity of variances, as assessed by Levene's test for equality of variances ($p = .199$). Age was significantly different for different types of rejection, $F(4, 413) = 2.45, p = .046$. Age was significantly higher for those who used direct confrontation ($M = 32.07, SD = 8.04$) than for those who rejected by suddenly ghosting without unmatching ($M = 27.92, SD = 8.24$). Tukey post hoc analysis revealed a mean difference of 4.16, 95% CI [0.05, 8.28], which was statistically significant ($p = .046$).

Discussion

This study examined women's rejecting behaviors on Bumble in relation to self-disclosure, perceived partner disclosure, pre-rejection stress, and app usage. The first finding of interest (**RQ1**) was that 90% of the sample utilized various ghosting methods to reject a partner, while only 10% provided the partner with an explanation for ceasing contact. This suggests that female Bumble users generally prefer to reject potential partners using non-confrontational strategies (LeFebvre, 2017; LeFebvre et al., 2019) and supports research indicating that it may be considered more socially acceptable to ghost people early on in the dating process, as opposed to a serious relationship (Manning et al., 2019).

Two of the rejection strategies investigated (i.e., ghosting by unmatching and ghosting by account deletion) clearly convey rejection without direct confrontation. However, these two rejection strategies may be perceived differently due to app function. When a woman unmatches a potential partner by selecting "unmatch," her profile disappears from the rejectee's list of conversations, sending the signal that the rejector is still online dating, but is no longer interested in the rejectee as a potential partner. Conversely, when a woman ghosts a partner by deleting her profile, their conversation is still visible to the rejected partner but is labeled "Deleted Account," signifying to the rejectee that the rejector has left the app entirely. This rejection strategy may indicate that the rejector is no longer pursuing potential partners online or uses dating apps because of social pressure rather than to find relationships (Richardson et al., 2020). Interestingly, ghosting by unmatching was utilized roughly four times more frequently than ghosting by account deletion, suggesting that many users unmatch potential partners but continue to use the app to find potential romantic connections. Though this unmatching is non-confrontational, it may leave the rejectee without a sense of closure (LeFebvre, 2017).

Other forms of rejection used were suddenly ghosting without unmatching and gradually ghosting without unmatching (i.e., "slow fading"). In both scenarios, the rejector's profile remains in the rejectee's conversation list, suggesting the possibility of a future encounter. Some users may also use these strategies to minimize rejectee suffering, thus minimizing their own rejection guilt (Tong & Walther, 2010).

The least common rejection strategy employed by participants was confrontation, or, giving a direct explanation for ceasing contact. Dating apps such as Bumble afford people the ability to easily avoid confrontation with the touch of a button. Due to the frequency with which participants in this sample employed ghosting strategies, it appears that female Bumble users take advantage of this affordance with some regularity. According to the hyperpersonal model, senders of messages in CMC prefer to communicate "in a manner that invites preferential reactions" (Walther, 2011, p. 461). Confronting a potential partner often elicits a negative response from the rejectee (Lawson & Leck, 2006), and some women may fear that directly confronting a partner before ceasing communication may elicit retaliation (Stratmoen et al., 2020). Further, previous research has found that feeling guilty about hurting a partner has motivated some to use ghosting as a disengagement strategy (Koessler et al., 2019b). These findings provide some context for why female Bumble users prefer less direct rejection methods. In addition, the hyperpersonal model suggests that CMC users tend to present a positive image of themselves and engage in selective self-exposure, often to maintain a positive sense of self (Tong & Walther, 2010; Walther, 2011). Therefore, it is also possible that female Bumble users avoid direct confrontation in order to avoid presenting a more negative self-image online. Finally, one finding of note was that female users who rejected their partner using direct confrontation were older than those who suddenly ghosted their partner without unmatching. According to previous work, older online daters tend to prioritize honest self-representation and avoid playing dating "games" (Watson & Stelle, 2011), which may explain why older women in this study were more likely to reject a partner using direct confrontation.

Because ghosting has been shown to have negative short-term impacts on rejectees, including decreased self-esteem and mental well-being (Timmermans et al., 2020), this

study's finding that female users commonly use ghosting strategies to dissolve communication with potential partners may be cause for some concern. However, other research has shown that long-term negative effects of ghosting seem to be nonexistent (Navarro et al., 2020) and that many dating app users have accepted ghosting as a convention of modern dating (Koessler et al., 2019a). These findings temper concerns about potential increases in ghosting practices on dating apps.

The second finding of interest was that even in interactions that ultimately ended in rejection, potential partners on Bumble showed mirrored levels of self-disclosure (**H3**). As women perceived that their partner was disclosing personal information over the app, they appear to have reciprocated with their own self-disclosure. Further, this study showed that women self-disclosed at higher rates when they exchanged higher numbers of messages with a partner and communicated over a longer period of time (**H1**). Similarly, perceived partner disclosure increased in tandem with communication length (**H2b**), though it was not associated with the number of messages exchanged (**H2a**), indicating that communication length may be a better indicator of reciprocal disclosure.

While this study does not compare CMC to in-person communication, these findings do support the hyperpersonal model by suggesting that reciprocal self-disclosure may permeate online dating interactions—occurring even in communications that ultimately fail to make it to the face-to-face stage. These findings corroborate existing literature on self-disclosure and rejection and demonstrate that the principles of the hyperpersonal model apply to even non-serious relationships on Bumble (Hance et al., 2018; Jiang et al., 2011; Tanner & Tabo, 2018). As potential partners communicate over a longer period of time, there are greater opportunities for self-disclosure to naturally increase as these partners become more comfortable with one another (Hance et al., 2018; Walther et al., 2015).

The third finding of interest was that rejection strategies used by women on Bumble may vary based on the level of self-disclosure shown prior to rejection. Those who ghosted by account deletion self-disclosed more before they rejected a partner than those who suddenly ghosted without unmatching (**RQ2**). Similarly, those who ghosted by account deletion perceived higher partner disclosure than those who rejected through slow fading (**RQ3**). The high levels of self- and partner disclosure that preceded a rejector deleting her account could indicate that, after creating a stronger bond through reciprocal disclosure (Jiang et al., 2011), these users wanted to avoid inciting a negative reaction (Stratmoen et al., 2020) and felt that deleting their account would leave the rejectee feeling less personally offended than if they were to simply cease replying to messages (Walther, 2011). In contrast to ghosting by account deletion, those who suddenly ghosted without unmatching had self-disclosed less. In these cases, low levels of self-disclosure may have resulted in neither a strong reason to continue the relationship nor a strong reason to more directly end the conversation through unmatching or deleting one's account. Future research should explore more thoroughly the motivations behind specific rejection strategies.

The fourth finding of interest was that rejection strategies used by women on Bumble may vary based on the level of stress they experienced prior to the rejection (**RQ4**). This study showed that female Bumble users who ghosted by deleting their accounts had higher levels of pre-rejection stress than all other users. Because these users also had higher levels of self-disclosure, it is possible that these users, after disclosing at higher

rates to their partner, experienced stress related to the prospect of rejecting them (Hancock et al., 2017) and believed that deleting their account would be the best way to reject the partner without embarrassing or hurting them (Tong & Walther, 2010). Choosing to delete one's account rather than unmatch or stop responding to a partner may signal that a user has given up on online dating altogether, rather than on the partner specifically, thus alleviating the partner's rejection pain.

The fifth finding of interest was that women who used Bumble more often self-disclosed at lower rates prior to rejecting someone (**H4**) but were more likely to have successfully met a romantic partner through a dating app (**H5**). The former finding contradicts our prediction that frequent Bumble users would disclose *more* to a partner before rejecting them. It is possible that, contrary to our assumption, women who are active Bumble users may be casual daters who prioritize meeting many people over expressing in-depth self-disclosures. However, taking the findings of **H4** and **H5** together, it seems more likely that active Bumble users are interested in developing a relationship but may experience exhaustion related to high levels of romantic opportunities (Pronk & Denissen, 2020), leading them to be more selective about the interactions they invest in, while dedicating little self-disclosure to partners they are likely to reject. Meanwhile, those who spend less time on Bumble may be more willing to self-disclose, even with partners whom they ultimately reject. It is also possible that frequent app users are less likely to self-disclose to a partner they ultimately reject due to stronger destiny beliefs. Individuals with stronger destiny beliefs (e.g., belief in soulmates) have reported higher ghosting behaviors and intentions than others (Freedman et al., 2019), and it is possible that these individuals use Bumble more often and quickly ghost partners that do not immediately spark a connection.

The finding that self-disclosure was negatively associated with app usage has implications for the hyperpersonal model. While the hyperpersonal model posits that CMC invites more self-disclosure than face-to-face interactions, this finding suggests that this may become less true for highly active users of dating apps.

The findings reported in this study should be considered in light of a few limitations. The results concerning how female users reject potential partners through Bumble may be limited by the reporting methods employed in this paper. In this survey, four of the five potential responses for how participants rejected a partner were related to ghosting; further, the employment of the term "confrontation" in the fifth response may have registered as a severe or negative word for some participants, prompting them to choose another response. Rather than employing a multiple-choice item to assess rejection type, future studies may be able to shed further light on how women reject partners through dating apps by asking participants to describe how they ended the interaction and then coding those responses. This study is also limited by its reliance on self-report and potential memory bias in respondents, though we attempted to diminish possible memory bias by limiting experiences to two weeks prior. In this study, participants reported their own self-disclosure, followed by their partner's self-disclosure, and this order was not counterbalanced. Future studies may benefit from doing so. Finally, this study is limited by its use of the crowdsourcing platform, Mechanical Turk. It is possible that users of this platform have higher familiarity with technology and may be more likely to employ

ghosting strategies. Future research may benefit from using alternative methods of sampling to investigate how users reject others through dating apps. While the current study provides preliminary evidence that self-disclosure, perceived partner disclosure, and pre-rejection stress may impact women's rejection strategies on dating apps, future research should further investigate why these connections may exist, as well as the consequences of using various methods to reject others through dating apps. Future research may also benefit from measuring the depth and breadth of disclosure in online dating separately. Finally, as the following variables were not assessed in this paper, future research should investigate how other factors, such as sexual orientation, socioeconomic status, or disability, may impact rejection experiences on dating apps.

Conclusion

Overall, this study found that women frequently use ghosting strategies to terminate early-stage relationships on Bumble. The results also suggest that female users may be more likely to reject a partner by deleting their account if self-disclosure, perceived partner disclosure, and pre-rejection stress were high. Finally, this study provides preliminary evidence that continued communication over Bumble promotes reciprocal disclosure even when that communication eventually ends in rejection.

The findings of this study inform the hyperpersonal model in three distinct ways. First, this study found preliminary evidence that female Bumble users tend to avoid communicating rejection in a confrontational manner that may prompt a negative reaction (Stratmoen et al., 2020) or hurt the rejectee (Koessler et al., 2019a). This finding supports the argument that CMC communicators attempt to behave in ways that invite more preferential reactions (Walther, 2011) and seek to mitigate their partner's embarrassment when rejecting them (Tong & Walther, 2010). Second, this study found that Bumble, like other CMC platforms, appears to stimulate reciprocal self-disclosure between users. Most notably, this study showed reciprocal self-disclosure may characterize mediated discussion even when that discussion ultimately ends in rejection. This indicates that the prevalence of ghosting reported in this study may not necessarily signify that users are having less meaningful interactions prior to rejection. Finally, this study broaches the possibility of communication burnout in CMC, specifically in the context of online dating, and suggests that there may be circumstances in which frequent CMC users do not self-disclose to a higher level than they would in face-to-face communication. Future research into the hyperpersonal model should further investigate this possibility.

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Supplemental Material

Supplemental material for this article is available online.

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