

Online Communities and Dating apps: The effects of social presence, trust, and Covid-19

Completed Research

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Abstract

The Covid-19 pandemic changed the dynamics of socialization by restricting one of its main avenues: in-person gatherings. This pushed people towards digital technology to fulfill their socialization needs. In this paper, we take steps to explore whether features of online communities can contribute to innovative dating app designs, given how dating app business models currently focus on independent one-on-one interactions. We conducted an exploratory survey of 200 participants concerning dating app use habits, perceptions of dating apps, as well as degrees of trust, social presence, and perceived ease of finding dates using three dating methods. We found that social presence and trust consistently predicted the perceived ease of finding dates for each method, and that the perceived ease of finding dates influenced whether participants reported increased use of the method during Covid-19. Together with the growth in online community participation, these results suggest that dating app platforms might benefit from incorporating social features in their designs.

Keywords

Online dating, online communities, covid-19, social presence, trust, information technology use

Introduction

In recent years, it has become more common to use digital technology to intermediate the dating process and dating platforms have been at the forefront of this change. There have been numerous studies on this topic which largely come from the perspective of psychology, though some recent studies have taken a sociotechnical approach and focused on the design of digital dating platforms (Huang, 2020). A possible reason for this new interest is that online dating has become big business. According to Match Group, Tinder generated nearly \$1.4 billion in revenue in 2020 (Match Group, 2020). Jung et al., (2019) discusses strategic considerations around how these companies can drive revenue through advertisement and effective technology design.

Previous studies have identified that access to other potential romantic partners is a key advantage that these services offer versus the traditional dating process (Finkel et al., 2012). Yet, popular dating apps (e.g., Tinder, Bumble, etc.) focus on one-on-one interactions gated behind a two-way agreement between the parties involved. This process differs from the serendipitous way that many people find each other in group settings, whether those be online or in-person. A user's experience of social presence and trust are known to influence users' adoption of virtual world technologies (Srivastava & Chandra, 2018). Would features designed to facilitate a broader social experience also influence users' adoption of dating apps?

The question about how technology can best support romantic engagements is particularly relevant during the times of Covid-19. In response to the global pandemic, many countries have enforced social distancing practices, which limit peoples' ability to engage in-person. Dating has already seen a growing shift into digital environments (Jung et al., 2019), which might have helped fuel growth in online dating platforms during the pandemic. However, this trend was dwarfed by the surge in commitment to online communities. In an August 2020 survey conducted by Facebook, it was found that 77% of online community members reported that the most important group that they are part of operates online (Facebook, 2020).

There is consensus about the fact that the internet, in general, complements existing behavior patterns and that it has taken an important role in helping people meet others, which in turn connects potential partners (Rosenfeld & Thomas, 2012). However, the covid pandemic created a scenario where digital technology was the main, if not the only, means by which socialization could safely take place. With online communities being more closely aligned with in-person interactions, as offline and online groups seem to possess many similarities (McKenna & Green, 2002), it made us question how dating apps would fare in this vacuum.

We were thus inspired to study whether there are advantages to community-based experiences that are not currently incorporated in popular dating app designs, and whether Covid-19 has impacted how people meet dates. We were thus motivated to ask two research questions:

RQ 1: Are there differences among the factors that influence the perceived ease of finding dates when using dating apps, when meeting in person, or when participating in online communities?

RQ 2: Has COVID-19 affected the ways that people find dates online?

This paper describes an exploratory survey that was conducted to pursue these questions. The research questions were designed to extend some of the findings of Srivastava & Chandra (2018) about the role of social presence, defined as a sense of closeness through a digital medium, and trust, defined as the user's willingness to have faith in others, in influencing the adoption of virtual worlds, though instead in the context of online dating platforms. The study offers evidence that social presence and trust are relevant predictors of the perceived ease of finding dates, and that this, in turn, predicts whether users reported increased use of dating technologies or the participation in dating activities during Covid-19. Though there remain many questions, we discuss the implications of these findings and the relevance of social presence and trust as factors that could influence dating app effectiveness.

Literature Review

Digital technology & dating

The internet, as a whole, has drastically impacted how personal communities (e.g. in relation to where one grows up) and workplace communities connect people and enable discovery of romantic partners (Rosenfeld & Thomas, 2012). Online dating services, for their part, seem to have built their business model focusing on specializing on the efficiencies provided by the internet to achieve this particular goal. Mobile dating apps take this even further by offering an avenue that extends the capabilities of web-based online dating services by taking advantage of the exponential growth of mobile technology and the capabilities incorporated into these devices, such as GPS. As discussed by Jung et al. (2019), the penetration of mobile technology across the globe in conjunction with the expansion of Android and iOS ecosystems has enticed companies to make sizable investments into the industry.

The way dating app companies earn revenue is through advertisement (Jung et al., 2019) or a subscription that provides premium features (Yu et al., 2018). Both of these revenue streams depend on user engagement. An active user base means that more time is spent on the platform, which in turn allows for more advertisement to be shown to each user (Jung et al., 2019). On the other hand, engaged users seem to be more likely to subscribe for premium features, which in turn makes them (and, consequently, others) more engaged with the platform in a virtuous circle (Yu et al., 2018).

The COVID-19 pandemic had drastic implications in the way people socialize. Many countries have enforced different restrictions to in-person social interactions, which hinders the possibility of pursuing romantic relationships in the traditional way. As discussed by Bapna et al. (2016), the success of online dating despite the existence of its in-person counterpart reflects inefficiencies in the latter. Thus, it is interesting to consider how the restriction of one of these may have on the other. Furthermore, literature is scarce in relation to the impact on behavior that online dating users have when faced with influential events, but there is indication that this impact can be meaningful (Yoon et al., 2020). Therefore, it is important to understand factors that drive engagement and the impact of the coronavirus pandemic may have on users.

Social presence and trust in online communities

Online dating services mediate communication between technology users, providing key differences between this medium and traditional dating (Finkel et al., 2012). These differences can be either positive or negative in nature, such as the aforementioned benefit the access these services provide. Yet, there is a lot of information that is lost without the in-person component. Finkel et al. (2012) explain that “experiential attributes” which can be better captured in-person, such as rapport, are not easily communicated through these services because they rely more on “searchable attributes” such as income or physical appearances (Finkel et al., 2012). It has been found that despite the importance of certain traits to liking a potential match (e.g. physical appearance, a “searchable attribute”), removing these allows bonds to be made based on more substantive traits, like values and conversational style (McKenna & Green, 2002).

These findings echo studies in online communities, where the lack of in-person contact along with social cues hinder the development of trust, which is a key component in communicating effectively (Ridings et al., 2002). Nevertheless, online communities more closely mimic the way that people interact in offline environments, where people gather in groups to meet others serendipitously, compared to the one-on-one interactions preferred by popular dating apps. Previous studies have compared online versus offline groups and found that there are many similarities between the two methods, such as the social influence exerted on participants, though there might be small differentiating factors between specific online platforms (McKenna & Green, 2002). It is thus desirable to compare these approaches with contemporary dating platforms and online communities.

It has been established that a user’s experience in relation to social presence and trust influence users’ adoption of virtual world technologies and online communities broadly (Srivastava & Chandra, 2018), which might affect users’ intention to use social dating platforms. Other literature has found that trust affects the perceived benefits of dating platforms, which in-turn plays a role in the intention to adopt the technology (Chen et al., 2018). Social presence, by contrast, describes the degree by which a system’s interface can connect us to another’s mind (Nowak & Biocca, 2003). This is important, since communication requires trust for its effectiveness, especially when visible cues are not available. With a high degree of social presence, the connection with another should be more fluid, further providing the social connection that computer mediated platforms require to be successful.

Methodology

Methodological approach

Recognizing that online communities may play an increasingly important role in online dating during the pandemic, we sought to investigate factors that could influence the perceived ease of finding dates. Srivastava & Chandra (2018) conducted a mixed-methods study that investigated factors that lead to the emergent intention to use virtual worlds as collaboration tools. They identified the importance of institutional trust-building factors and social presence in building a disposition to trust such technologies, and subsequently the role of this trust in influencing intention to use them, albeit in an institutional context. Though relevant, this context is fundamentally different from dating apps; it cannot be assumed that the conditions will generalize to the dating app context. We instead sought to explore whether social presence and trust would similarly influence factors that are associated with known antecedents to online communities and sought to explore whether differences would appear when participants responded about the three dating settings.

Srivastava & Chandra (2018) described a survey which established social presence and trust as factors in online community use, we opted to draw from these to create a simple survey which could compare three dating contexts. Given that we needed to investigate these in three contexts, we opted to limit the number of measures, and introduce new measures related to Covid-19 which were not well-grounded in the literature. We also believed that there could be differences among dating app use history and dating app affordances (e.g. interested primarily in long-term relationships) and whether they would be more likely to explore dating in online communities. We thus interpreted this as an exploratory survey designed to address research questions, which could be complemented with other methods (e.g. social media analysis, qualitative research), to eventually contribute to eventual hypothesis-driven research in this novel context.

We developed a simple 6-question instrument to measure social presence, trust and perceived ease of finding dates based on items described by Srivastava & Chandra (2018) and opted to recruit participants for the study on Amazon's Mechanical Turk platform, which is a recruitment pool for simple labor tasks commonly used for social science surveys (Steelman et al., 2014). The instrument was designed to be very short in an effort to improve Mechanical Turk's response quality by reducing user fatigue and limiting the length of the overall survey (Fleischer et al., 2015; Keith et al. 2017). By applying such a small instrument, we can learn about the influence of these factors in three different dating contexts: 1) finding dates using dating apps, 2) finding dates when interacting with others in a physical group setting (e.g. parties, bars, restaurants), and 3) finding dates when interacting with others in online communities, as well as perceived changes in behavior during Covid-19. This gave us the flexibility to

Participants and data collection

All procedures were reviewed by the Dalhousie University research ethics board, according to the Canadian Tri-Council Policy Statement on Ethical Conduct for Research Involving Humans. We recruited 200 participants from the United States and Canada using Amazon Mechanical Turk (Steelman et al., 2014). Participants were recruited on a first-come, first-serve basis, and the only restriction on the population was that they needed to be over 18 years of age and have a 90% success rate or higher on previous Mechanical Turk tasks. Participants were compensated CAD \$2 for their time. We excluded data from respondents who did not respond to at least one of the questions, leaving a total of 194 responses. The median age of the respondents was reported to be between 25 and 35 years and 59.3% identified their gender as man (40.7% woman). 8 (4.1%) of the 194 participants reported having never used a dating app. All participants reported being single when they completed the survey.

Measurements

We designed a questionnaire that administered the 6-question instrument about the three dating contexts, and also asked questions about demographics, participants' perceptions of the amount of time spent engaging with the dating method, their whether dating app use resulted in conversations with dates, and their perceptions of the impact of COVID-19 on their dating behaviors. This resulted in a 29-item questionnaire consisting of 21 Likert scale questions plus 8 multiple choice or multi-select questions, as described in the Appendix. The questionnaire was administered in August 2020 using the Qualtrics platform. Data was analyzed with paired t-tests, ANOVA, and simple linear regression using the Pandas (McKinney, 2011), statsmodel (Seabold & Perktold, 2010) and scikit-learn (Pedregosa et al., 2011) modules of the Python programming language. Visualization was conducted using the matplotlib (Hunter, 2007) and seaborn libraries (Waskom et al., 2012). We conducted minimum residual factor analysis and calculated Cronbach's alpha for each of the construct-context pairs in order to determine instrument validity.

Data processing

To ensure the validity of our model, we investigated the reliability of the social presence, trust and constructs for our three models. We calculated the Kaiser-Meyer-Olkin test which revealed no values below 0.77, suggesting suitability for analysis. We then conducted exploratory factor analysis similar to that described by Gefen et al. (2000). Minimum residual factor analysis consistently revealed loadings that were characteristic of two factors, rather than the three expected, with all loadings except that for the perceived ease of finding dates measure exhibiting values over 0.6. We nonetheless opted to investigate the social presence and trust constructs as distinct in this work, while recognizing that the models and findings might instead reflect a latent factor.

Results

What influences the perceived ease of finding dates?

Dating app use frequencies and affordance frequencies are described in Figure 1. We did not find significant relationships between dating app use or affordances and the other measures. A one-way ANOVA test of the responses to the perceived ease of finding dates item was conducted and revealed that participants were

statistically more likely to disagree that it is easy to find dates in an online community than when using dating apps or in physical group settings ($F = 22.807$; $p < 0.001$). Figure 2 illustrates the mean response values and their 95% confidence intervals. Figure 2 also illustrates mean response values and 95% confidence intervals to the questions concerning increased use or activity during Covid-19.

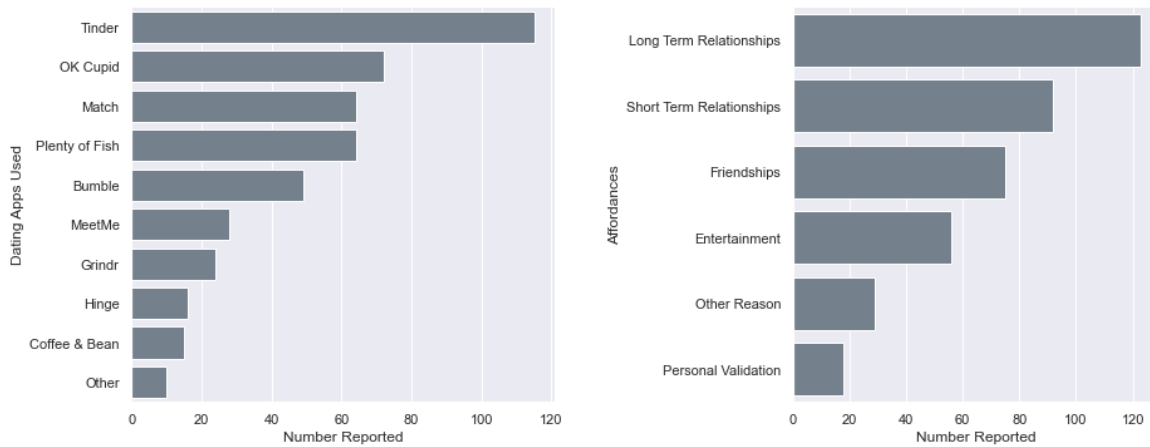


Figure 1 – Frequencies of reported dating apps used and affordances of dating apps.

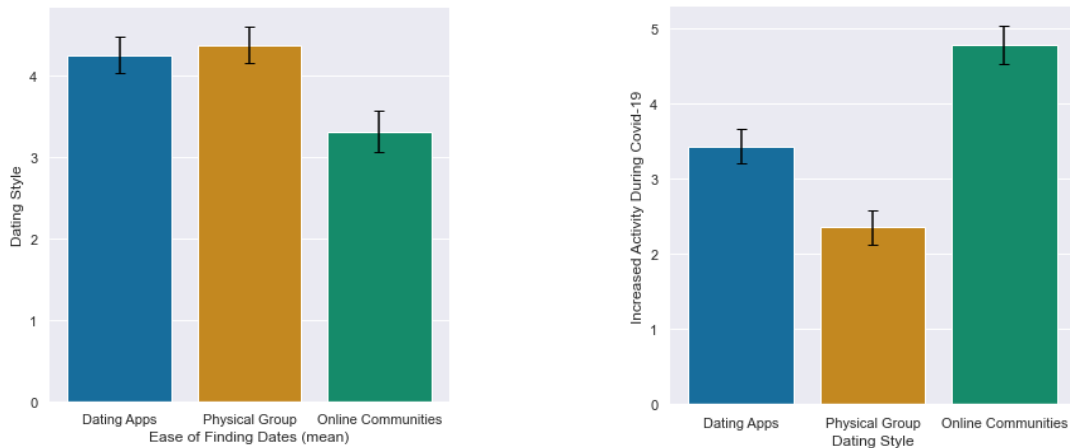


Figure 2 - Mean response and 95% confidence interval for perceived ease of finding dates and increase in use or activity during Covid-19 items for each investigated dating method.

Multivariate linear regression was conducted on exogenous factors including gender, age, social presence and trust, on the endogenous perceived ease of finding dates item. We found that gender and age were not significant predictors of reported perceived ease of finding dates. However, analysis revealed that both social presence ($\beta = 0.918$; $t = 39.335$; $p < 0.001$) and trust ($\beta = 0.990$; $t = 36.528$; $p < 0.001$) were significant predictors of the perceived ease of finding dates with dating apps. Analysis also revealed that social presence ($\beta = 0.736$; $t = 37.353$; $p < 0.001$) and trust ($\beta = 0.872$; $t = 41.588$; $p < 0.001$) were significant predictors of the perceived ease of finding dates in physical group settings. Social presence ($\beta = 0.704$; $t = 30.008$; $p < 0.001$) and trust ($\beta = 0.763$; $t = 27.843$; $p < 0.001$) were also significant predictors of perceived ease of finding dates in online communities. Results were analyzed for collinearity by observing variance inflation factors (VIF) between the social presence and trust constructs, as well as each of these and the ease of finding dates item. Results found a high degree of collinearity between social presence and trust in the dating apps context (VIF = 12.90), physical group settings context (VIF = 18.23) and online communities context (VIF = 16.81). VIF analysis of the exogenous and endogenous factors only found a high degree of

collinearity between trust and ease of finding dates in physical group settings (VIF = 9.96). Figures 3 and 4 summarize the results of these regressions.

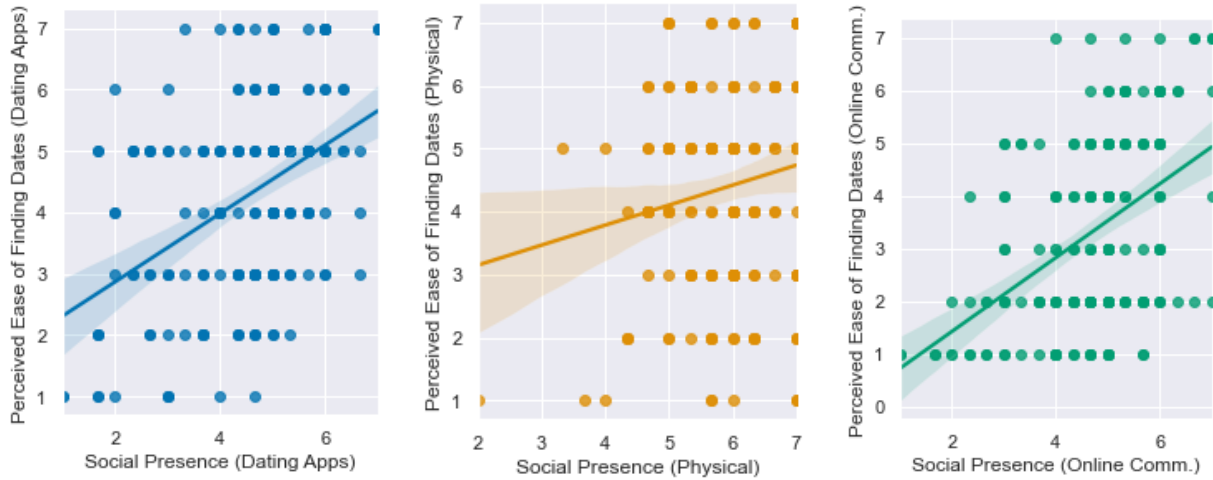


Figure 3 – Univariate regression of the social presence construct on perceived ease of finding dates for each investigated dating method.

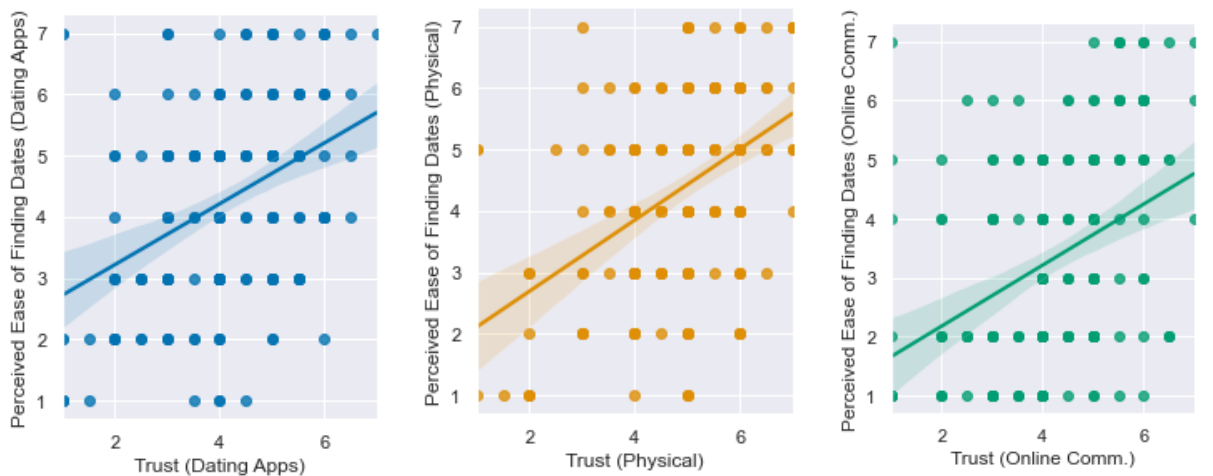


Figure 4 – Univariate regression of the trust construct on perceived ease of finding dates for each investigated dating method.

Has Covid-19 impacted how people find dates?

Similarly, an ANOVA test was conducted to investigate whether participants were significantly more likely to report increased social activity in the three contexts, which revealed significant differences in the response to these three questions ($F = 92.167; p < 0.001$). Further analysis using paired t-tests revealed that participants were more likely to disagree with the statement that they are meeting in person more during Covid-19 than they are using dating apps more during the pandemic ($t = 6.01; p < 0.001$). They are also significantly more likely to agree that they are using online communities more during than the pandemic than agree that they are using dating apps more ($t = 7.326; p < 0.001$). Figure 2 illustrates the mean response values to these three questions and their 95% confidence intervals.

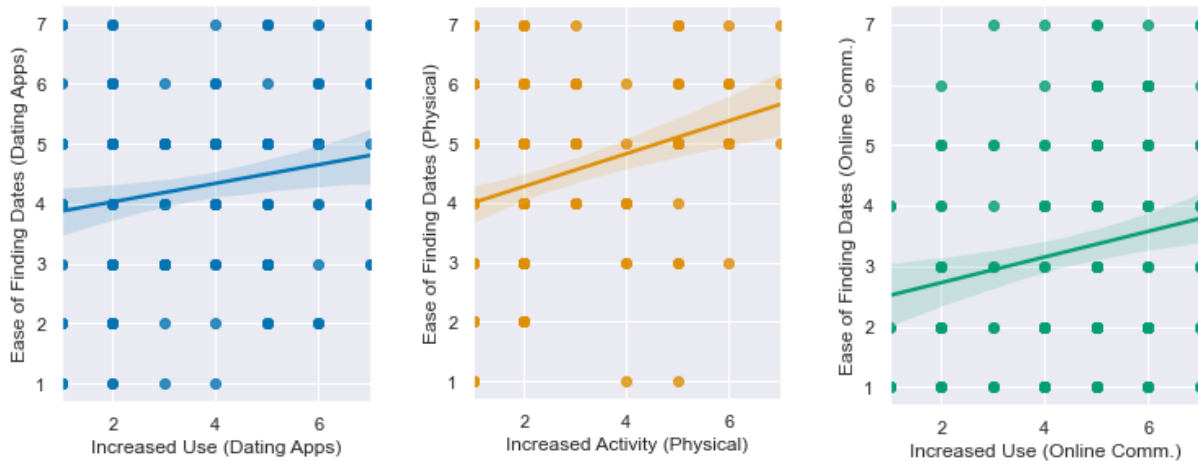


Figure 5 - Univariate regression of the ease of finding dates measure on increased use or activity during Covid-19 measures for each investigated dating method.

Similarly, simple linear regression was conducted on the influence of the exogenous ease of finding dates measure on the endogenous increased activity measures. Analysis revealed that ease of finding dates was a significant predictor on increased dating app use ($\beta = 0.740$; $t = 23.14$; $p < 0.001$), increased physical group interaction ($\beta = 0.519$; $t = 20.203$; $p < 0.001$) and in increased online community participation ($\beta = 1.161$; $t = 23.602$; $p < 0.001$). These results were analyzed for collinearity by observing VIF which revealed low collinearity for the dating apps (VIF = 3.75), physical group settings (VIF = 3.10) and online communities (VIF = 3.88). Figure 5 summarizes the results of these regressions.

Discussion

Descriptive analysis of the most frequently cited dating apps and affordances were not surprising, with more than half of participants reporting having used Tinder at some point in their lives. More than half of respondents reported interest in using dating apps to form long-term relationships, while 92 of the participants identified short-term relationships as a motivation. With such levels of usage, it is clear that dating apps are an important business with implications for broader society.

Typically, companies in the digital dating business have to contend with the alternative of the traditional method of finding dates in person, using the distinct advantages brought by their digital technology to differentiate themselves. The Covid-19 pandemic not only showcased the importance of social interaction for society at large, but it also removed this “competitor” for the aforementioned companies, for the most part; yet, interestingly, users did not appear to flock to their services as would be expected. The fact that participants were led to report a significantly higher degree of use of online communities, which offer another avenue for socializing, lead us to recognize an opportunity for dating app companies.

As previously discussed, engagement is one of the main components that drives revenue and platform adoption for online dating services. Users appear to feel far more engaged with online communities, and while more research should be done to determine the specific factors that create this difference. This finding is particularly interesting to executives in the dating app industry, since this has the potential of uncovering a competitive advantage.

Social presence and trust, it should be noted, appear to be key factors in the ease of finding dates across the three settings studied: dating apps, physical group settings, and online communities. Though this study is insufficient to be conclusive, it nonetheless provides evidence to support the notion that dating app designs could further focus on fostering social trust in order to improve the user experience. For their part, age and gender appeared to be not significant predictors in this perception, and thus this should stay true across different demographic segments.

Limitations

There are limitations with this study. First, the 6-item construct described was minimalistic, and was adapted from a virtual world community context described by Srivastava & Chandra (2018); this context is quite different from online dating. Though the study reveals interesting results around the consistency among social presence and trust factors in different dating contexts, it is also possible that these findings reflect an extraneous factor. Future work would thus benefit by replicating these findings, while also incorporating a range of other possible factors that could influence ease of task and subsequently actual use changes.

Second, there is a high degree of collinearity between the social presence and trust constructs. These results suggest that there might be a mediating effect or antecedent factor that influenced participants to respond similarly towards these constructs. Srivastava & Chandra (2018) reported that social presence positively influenced institutional trust, a potentially related trust model. We also found collinearity between trust and the ease of finding dates item in the contexts of dating apps and physical group settings. The “ease of finding dates” item was adapted from an item used in the Technology Acceptance Model (Davis, 1989), though is designed to be applied in contexts of technology use. In the case of physical group settings, there is no particular IT artifact mentioned, so it is possible that this item does not accurately represent a propensity to use an item but instead approval of their social experiences. Similarly, to in-person dating methods, it is also possible that participants simply expressed approval of online communities, rather than the antecedents of IT use. These results should thus be re-investigated together with evidence from other studies, which employ qualitative methods, or a second study which includes a more rigorous exploration of specific dating apps and technology acceptance, ideally with a larger instrument.

Finally, it is important to acknowledge that the survey was conducted on a random sample of single American and Canadian adults who use the Amazon Mechanical Turk platform. Though this platform is used in information systems research (Steelman et al., 2014), it is important to recognize that Mechanical Turk users represent a subset of the population who might not represent a random selection. Given these limitations, the results described in this paper might be best interpreted as the first steps into a wider exploration of dating apps and online communities, rather than proof of a wider evidence of a new social trust construct.

Conclusion

In this paper, we have provided evidence that social presence and trust are factors that influence the perceived ease of finding dates, whether when using dating apps or in online communities, and that this in turn influences whether they are more likely to identify that method as easy to find dates. We also provide evidence that people are increasingly turning towards online communities during the Covid-19 pandemic. Taken together, this is an opportunity for innovation.

The Covid-19 pandemic revealed that there is an ongoing need for improved online social experiences, including in romantic contexts. We challenge academics and dating app companies to explore these factors further and for companies in general to consider new application designs and business models that incorporate traits of online communities and focus on increasing social presence and trust in their designs. Dating apps are becoming increasingly important to our society. By investing in improved social experiences, companies can improve engagement, improving their users’ experience while simultaneously increasing their bottom line.

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Appendix – Survey Instrument

Item	Description	Item
Age	What is your age?	Input
Gender	Which of the following best describes your gender?	Multi-choice
Apps	Which of the following dating apps have you used?	Multi-select
Purpose	What are the main purposes that motivate you to use dating apps currently or in the past?	Multi-select
Convo	Of the matches with other people generated by the dating apps that you have used, which percentage of matches result in a conversation?	Multi-choice
Date	Of the matches with other people that resulted in conversations, how often did the match result in an in-person date?	Multi-choice
ASoc1	I believe there is a sense of human contact when using dating apps.	Likert (7)
ASoc2	I believe there is a sense of personalness ...	Likert (7)
ASoc3	I believe there is a sense of human warmth ...	Likert (7)
ATru1	I generally trust people who use ...	Likert (7)
ATru2	I generally have faith in others who use ...	Likert (7)
AEase	It is easy to meet new dates using a ...	Likert (7)
PTime	In a given week how many hours do you spend meeting with friends, colleagues or strangers in person or in group settings?	Multi-choice
PSoc1	I believe there is a sense of human contact when interacting with others (friends, colleagues or strangers) in physical group settings (e.g. parties, bars, restaurants)	Likert (7)
PSoc2	I believe there is a sense of personalness when ...	Likert (7)
PSoc3	I believe there is a sense of human warmth when ...	Likert (7)
PTru1	I generally trust people in ...	Likert (7)
PTru2	I generally have faith in ...	Likert (7)
PEase	It is easy to meet new dates in ...	Likert (7)
OTime	In a given week how many hours do you spend meeting with friends, colleagues or strangers in online group settings (e.g. Reddit, Discord or interactive video games)?	Multi-choice
OSoc1	I believe there is a sense of human contact when interacting with others (friends, colleagues or strangers) in online communities.	Likert (7)
OSoc2	I believe there is a sense of personalness when ...	Likert (7)
OSoc3	I believe there is a sense of human warmth when ...	Likert (7)
OTru1	I generally trust people in ...	Likert (7)
OTru2	I generally have faith in ...	Likert (7)
OEase	It is easy to meet new dates in ...	Likert (7)
Cov1	Due to Covid-19 I am using dating apps more than before Covid-19.	Likert (7)
Cov2	Due to Covid-19 I am interacting in physical group settings more than before Covid-19.	Likert (7)
Cov3	Due to Covid-19 I am participating in online communities more than before Covid-19.	Likert (7)