

## Rapid Communication

# Extrapolating Psychological Insights from Facebook Profiles: A Study of Religion and Relationship Status

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### Abstract

Online social network users may leave creative, subtle cues on their public profiles to communicate their motivations and interests to other network participants. This paper explores whether psychological predictions can be made about the motivations of social network users by identifying and analyzing these cues. Focusing on the domain of relationship seeking, we predicted that people using social networks for dating would reveal that they have a single relationship status as a method of eliciting contact from potential romantic others. Based on results from a pilot study ( $n = 20$ ) supporting this hypothesis, we predicted that people attempting to attract users of the same religious background would report a religious affiliation along with a single relationship status. Using observational data from 150 Facebook profiles, results from a multivariate logistic regression suggest that people providing a religious affiliation were more likely to list themselves as single (a proxy for their interest in using the network to find romantic partners) than people who do not provide religious information. We discuss the implications for extracting psychological information from Facebook profiles. To our knowledge, this is the first study to suggest that information from publicly available online social networking profiles can be used to predict people's motivations for using social networks.

### Introduction

THE SOCIAL NETWORK Facebook.com has attracted more than 70 million active users worldwide and continues to gain enormous popularity throughout the world.<sup>1</sup> The growing popularity of Facebook may enable psychologists to use publicly available, self-disclosed information on people's profiles to understand people's decisions, behaviors, and motivations for using social networks.<sup>2-4</sup>

For example, people have increasingly turned to Facebook to search for potential romantic partners<sup>5</sup> in an environment where users can learn about each other through self-disclosed personal profiles. Facebook users interested in using the network for romantic relationships might be able to distinguish themselves from other users by leaving subtle profile cues to indicate their interest in finding romantic partners they would be interested in dating. Analyses of user-generated profile content might reveal information about users psy-

chology (such as his or her desire to seek a romantic other) that is not stated explicitly on their profiles.

This work attempts to extract psychologically meaningful data from online social networks profiles. Based on research in psychology, philosophy, and linguistics suggesting that methods of presenting information affect decisions and behaviors,<sup>3,6-10</sup> we predict that social network profiles can potentially be used to predict information about users that is not stated explicitly in their profiles. Specifically, we explore whether people's decision to disclose their religious affiliation on Facebook may suggest their desire for seeking romantic partners of the same religious affiliation.

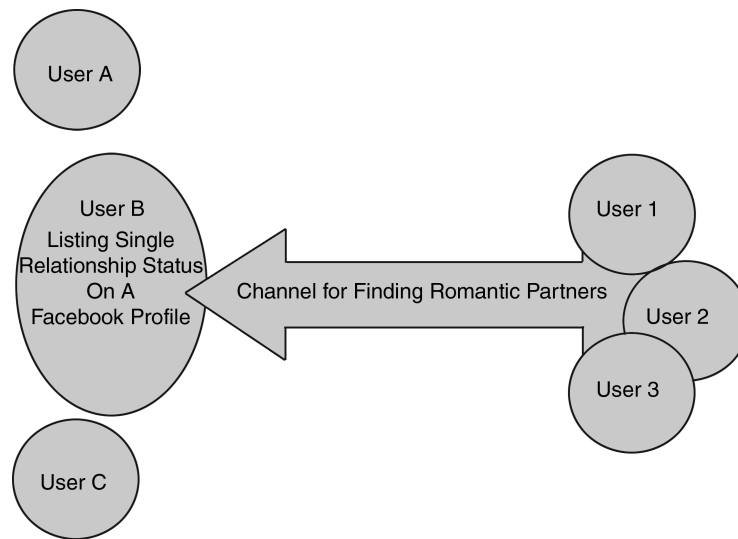
For instance, a user may present himself or herself as having a "single" relationship status in order to open a "channel"<sup>8,11</sup> to elicit contact from others seeking a person who is single and interested in romantic relationships (see Figure 1). Although listing relationship status as single may appear to merely describe one's current relationship status, the decision

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**FIG. 1.** Listing relationship status’ as a channel factor for finding potential romantic partners. User B can distinguish himself or herself from User’s A and C by listing relationship status (single). This small manipulation can have a profound effect on others by opening up a channel to increase communication with potential romantic partners.

of whether to release this information on a social network profile may be psycholinguistically meaningful<sup>6</sup> and may indicate information that is not stated explicitly on the profile (i.e., interest in using the network to search for relationships). Results from a pilot study we conducted support this hypothesis and suggest that listing relationship status as single may serve as a proxy to signal a user’s interest in using Facebook for dating. Twenty Stanford undergraduates were asked to rank the steps they would take to elicit contact from a romantic other on Facebook. Listing relationship status as single was the top-ranked method (mean ranking 1.71, *SD* = 1.0) that they would employ to seek contact from potential romantic others (see Table 1). Listing a single relationship status therefore appears to serve as a proxy measure for people’s interest in finding a relationship on Facebook.

Certain groups of people might be more focused in their approach for finding potential romantic partners. For example, people who identify with a religious background might be particularly interested in being contacted by potential romantic partners who have the same religious background. By informing users within the network of their religious background (and that they are single), they may increase the likelihood that others of the same religious background will contact them. Furthermore, this method of religious disclosure may serve to discourage people of a different (or without

any) religious background from contacting the user because they lack this shared identity.

This study attempts to test whether providing religious information on a Facebook profile may reveal information about the user’s desire to seek romantic others. We predict that people who provide information about their religious background should be more likely to list themselves as single (a proxy for their interest in finding romantic partners) than are people who do not provide religious information.

**Methods**

One hundred fifty Facebook users were selected from the experimenter’s “My Networks” section of Facebook (San Francisco, Stanford, NASA). Participants were not included in the sample if they reported being in a relationship, engaged, or married. Seven women (all under 22 years old) listed themselves as in a relationship with another woman. However, because they also provided information that they were interested in men, they were included in the sample and coded as single. (Removing these participants from the sample did not reduce the results to nonsignificant levels.)

To test our hypothesis, we randomly selected 120 participants (60 male, 60 female; ages 18–32) from the profiles displayed using the browse network search tool. Because only 20 participants in the random sample reported religious information, we collected data from an additional 30 participants who reported a religious affiliation (16 male, 14 female; ages 18–38). These additional data were randomly sampled within participants reporting being Christian (*n* = 15), Muslim (*n* = 8), and Jewish (*n* = 7). The total sample of 150 participants included 76 male and 74 female, ages 18 to 38, with 50 participants indicating a religious background and 100 participants who did not provide religious information. Participants were coded as having provided religious information if (a) they reported religion information, and (b) their religion was one of the default religions listed for use in a Facebook profile: if they wrote in their own religious information that

**TABLE 1.** MEAN RANKING (MOST IMPORTANT TO LEAST IMPORTANT) OF METHODS PEOPLE WOULD ATTEMPT TO RECEIVE CONTACT FROM A POTENTIAL ROMANTIC OTHER ON FACEBOOK

	<i>N</i>	<i>Mean (SD)</i>
Providing contact information	21	4.29 (1.5)
Providing educational information	21	4.86 (1.5)
Making a large number of wall posts	21	3.52 (1.4)
Listing “interested in men/women”	21	2.81 (1.8)
Listing a “single” relationship status	21	1.71 (1.0)
Having a lot of friends	21	3.81 (1.3)

TABLE 2. USER ATTRIBUTES ASSOCIATED WITH LISTING RELATIONSHIP STATUS (SINGLE) ON A FACEBOOK PROFILE

	$\beta$	SE	P	Odds ratio	-2 log likelihood	Cox & Snell R <sup>2</sup>	Nagelkerke R <sup>2</sup>
Age (18–22)	0.079	0.412	0.849	1.082			
Listed interested in men or women**	3.135	0.944	0.001	22.994			
Gender (male)*	-0.911	0.394	0.021	0.402			
Contact information	-0.008	0.132	0.953	0.992			
Religion (listed)**	1.718	0.595	0.004	5.572			
Overall model fit					154.215	0.181	0.242

\*Result is significant at the  $p < 0.05$  level.

\*\*Result is highly significant at the  $p < 0.01$  level.

was not listed as a choice by Facebook (e.g., I love all kinds of people), then they were coded as not identifying with a major religious belief system. We recorded participants' gender, age (continuous), age code (coded as college-age if 18–21; postcollege if 22 and up), religion (dichotomous variable to indicate whether they provided information about their religion), interest (a dichotomous variable to indicate whether they listed they are "interested in" men/women versus did not include this information), and contact information (1–5 depending on how much information they presented about themselves; 1 = one string of information such as e-mail, 2 = two strings of information such e-mail and phone number, etc.). Amount of contact information was included to control for the total amount of information listed (i.e., the possibility that participants might have listed both religious information and relationship status because they wanted to respond to every profile question).

**Statistical Analysis**

To test our hypothesis, we ran a logistic regression with relationship status as the dependent variable and age (coded), gender, interest, and religion as predictors, controlling for the amount of contact information users had listed. We then ran a separate logistic regression to test for interactions using the following predictors: age (coded), gender, interest, and religion, as well as age by gender, age by interest, age by religion, gender by interest, gender by religion, and age by gender by religion interactions, controlling for the amount of contact information users had listed.

**Results**

Table 2 shows the results of our analysis. In line with our pilot study results suggesting that listing single as a relationship status can be a proxy for interest in meeting potential romantic others, we found that people who listed an interest in men or women ( $M = 60.3\%$ ) were more likely to list themselves as single than were people who did not include this information ( $M = 35.7\%$ ), ( $\beta = 2.954$ ,  $p < 0.01$ ). More interestingly, results suggest that people who reported religious affiliation were significantly more likely to report being single than were those who did not include this information, ( $\beta = 1.964$ ,  $p < 0.01$ ). In fact, users listing religious information were almost 1.5 times as likely (49% of participants without religious information versus 72% of participants who listed religious information) to report a single relationship status (see Figure 2). Gender also predicted relationship status such that men ( $M = 35.7\%$ ) were less likely than women ( $M = 60.3\%$ ) to list themselves as single ( $\beta = -0.928$ ,  $p < 0.01$ ). There was no effect of age or contact information on likelihood of listing relationship status as single. There were no interaction effects. The best model included main effects interest, gender, and religion.

**Discussion**

Results from our studies suggest that content on Facebook profiles may reveal information about users that is not stated explicitly on their profiles. Specifically, results suggest that the decision to list single as a relationship status can serve as a proxy for people's interest in using the network to elicit contact from

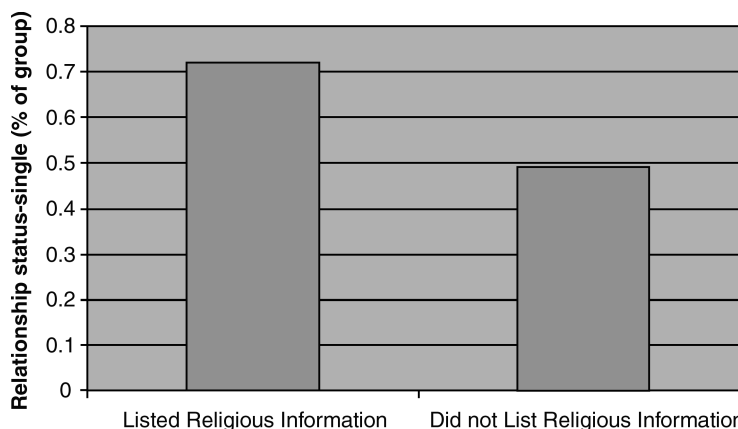


FIG. 2. Percentage of people listing relationship status (single) by self-reported religious affiliation.

potential romantic partners. Study 1 data confirms this result: users who listed that they were interested in men or women were significantly more likely to list themselves as single. More interestingly, results suggest that users who provided religious information were more likely to list relationship status as single, a signal of their attempt to meet people from a similar religious background. Taken together, our results suggest that demographic content on Facebook profiles may reveal psychological information about users such as their motivations for using the network. Psychologists may therefore be able to extract public demographic data from social network profiles in order to better understand the psychology of network users.

Research on the meaning of user-generated profile content may have implications for psychology and technology communities. With the rapid development of virtual social networks and the immense amount of data becoming publicly available, understanding the meaning of online user behavior could lead to potential breakthroughs in the future of technology. Advances might be made in computer science (by building applications that make use of social network profile information), marketing (through improving behavioral targeting of advertisements), health (by learning about whether people are at risk for various diseases and mental disorders), and other areas at the intersection of psychology and computer science. Access to this immense pool of data on user characteristics can lead to rapid advances in the public sector as well, and organizations such as the CIA and the police are already starting to use this information for advancing their fields.<sup>12</sup>

There are several limitations associated with this study, most of them stemming from the observational design of the study. First, the participants were a sample of Facebook users allowing publicly viewed profile information and belonging to the San Francisco, Stanford, or NASA networks. Although our results may therefore not generalize outside of this participant population, this study has been a first attempt at suggesting that psychologically meaningful information can be extracted from user profiles on virtual social networks. While this study does not look at a nationally representative sample of users, psychological methods often use introductory psychology students (ages 18–21) as their participant sample. The participant sample in this study includes a broad range of participants ages 18 to 38 from a wide geographical area (any locations of users who belong to the San Francisco, Stanford, or NASA networks). Second, we did not test this hypothesis experimentally but rather through an observational design. However, we feel that broad observational methods are well suited for the interdisciplinary nature of this analysis. Future work in this area can be conducted using controlled experiments. Finally, although this study suggests that information from a user's profile potentially carries psychologically meaningful information, we realize that this study looks at only one application of a broad hypothesis.

Future work in this area can therefore test for generalization and mediators of the effects seen in this work. For example, it is possible that the association between religion and relationship status would be mediated by one's difficulty in finding romantic partners with shared values or hobbies. In that light, we might expect that people who belong to a group with low membership rates (e.g., vegetarians, activists of a political viewpoint) might list that they are single and part of that group. Additional research might test whether this effect generalizes such that other ostensibly unrelated profile vari-

ables may be associated with each other. For instance, user preferences for books might predict variables unrelated to this preference (e.g., political orientation).

## Conclusion

This study suggests that psychological inferences can be made about social network users by extracting profile data. By analyzing a user's decision of whether or not to disclose information on a publicly viewed profile, we may be able to gain insight into the user's intent on the network. As social networks continue to grow and publicly available user information increases, we will be able to gain a better understanding of human behavior within virtual social networks. Future work in this area contest for generalization and mediators of the effects seen in this paper.

## Disclosure Statement

The authors have no conflict of interest.

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