Chapter 1

Introduction to Online Dating

Human and institutional intermediaries for centuries have connected couples for romantic relationships. Match-makers, video dating, newspaper personal advertisements, and speed dating vie for the faith and the money of their clients (Ahuvia & Adelman 1992).

These services have historically served only a small subset of the single population; the stigma of desperation and social awkwardness pervades popular accounts of their users (Ahuvia & Adelman 1992). Perhaps the stigma was not entirely incorrect: Goodwin (1990) found that although users of a dating service in Britain equalled a control group in socioeconomic status, they lagged behind in dating skills. It makes sense that the small, elective population of a dating service would be self-selected for having difficulty meeting a romantic partner through traditional channels.

ONLINE PERSONAL ADVERTISEMENTS

Online personal advertisements — lengthier, more detailed descendants of newspaper personal ads — have grown rapidly in recent years. In August 2003, personals Web sites in the United States drew 40 million unique visitors — half the number of single adults in the U.S. (Mulrine 2003). (Chances are that not all of the visitors were single, however.) With that many users, attributes tend to regress to the mean across the population: it is clear that the base of users no longer comprises only the lonely, socially stilted group that, according to the stereotype, populated traditional personal ads.

Thus, online personal ads have shed the stereotype as matchmakers for the awkward and now claim a prominent role in the social lives of millions of users. Millions more have friends and relatives who have used these systems, helping to personalize and destigmatize the public image of someone who would place a personal ad. From popular accounts, the base of users spans generations, breaking the 20- or 30-something age ceiling common in many online social environments.

Researchers have studied online friendships and romantic relationships from psychological and sociological perspectives (Van Gelder 1985, Lea & Spears 1995, Walther 1996, McKenna et al. 2002), and psychologists and sociologists have studied the personals ads that appear in print publications (Bolig et al. 1984, Ahuvia & Adelman 1992). To date, however, online personals have been considered only anecdotally. Their careful study is vital for two reasons.

First, as a suddenly popular way to meet partners for dates or relationships, online personals not only reflect but also have the potential to shape how people attract one another, date, and fall in love. The design of social systems influences the beliefs and behavior of their users; the features of a person that Match.com presents as salient to romance will begin to have some psychological and cultural influence if 40 million Americans view them every month. This influence exerts itself most strongly on the users themselves, but it also spreads into the general population. Because online personals systems affect such an important and intimate arena of their users' lives, designers have a particular obligation to work carefully.

Second, usage data from online personals Web sites provides an opportunity to perform rich analyses of the preferences and behavior of people seeking relationships. This information is intrinsically interesting as social science, but, more importantly, it will also inform future designs and matching algorithms to improve the experience of online dating.

AMERICAN SOCIETY AND THE RISE OF ONLINE DATING

The increasing ubiquity of Internet access in the United States has allowed a large number of users to reach online dating systems; the presence of this critical mass makes the systems increasingly attractive to even more users. However, a variety of other factors may have facilitated the sudden rise to prominence of online dating as a way to meet partners.

Attitudes Toward Marriage

The notion of a love marriage — in which a partner is selected to maximize emotional satisfaction rather than for socioeconomic or familial reasons — is an historically recent idea (Fisher 1992). It is also largely a Western one. Because romantic compatibility is difficult to predict and more fickle than practical compatibility (e.g., shared interests, socioeconomic status), those seeking a love marriage may be more selective than others and more willing to seek outside help (Ahuvia & Adelman 1992). The ability provided by online dating to sift quickly through tens of thousands of potential mates caters well to the desire of users to find a potentially elusive love match.

The ability to search almost endlessly may also support the cultural notion of the "one true love" — the idea that only one person will make you truly happy.

Delayed Marriage and Increased Mobility

Marriage tends to take place later in the life course than it did in the past; in just two decades, from 1975 to 1996, the median age of first marriage rose from 20.4 to 21.3 years for women and 22.9 to 23.5 years for men (U.S. Census Bureau 1975, 2002). Because more people are marrying after they leave natural dating pools like high school and college, they must employ other methods to meet potential partners. Finding partners outside of these institutional venues is a more difficult task, so formal intermediaries like online personals become a more valuable resource.

Furthermore, the American prioritization of career leads many people to move to distant cities for work or education, to places where they have no friends and no family. People who make moves like this must rebuild local social ties from nothing, a relatively rare situation for most people in most parts of the world.

Online personal ads, for finding dates or just friends, provide a mechanism for users to establish new connections even without an existing basis from which to expand their social circle.

Divorce Rate

The divorce rate in the U.S. is among the highest in the world, at 4.5 per 1,000 population; in most nations the rate is under 3.0 per 1,000 (United Nations 1999). Whatever its causes, the relatively high divorce rate in the U.S. creates a relatively large population of single people in mid-life, sometimes with children at home — certainly young enough to seek another life partner, but often too busy with children or career to spend much time broadening their social circles to find other single people. This population might represent a significant portion of

the boom in people using online dating systems who are older than typical computer-mediated communication users.

A Reciprocal Relationship with Culture

Social technologies are rarely neutral with respect to the interactions that take place through them. By their form and function, they affect the way their users communicate. Gay and Hembrooke (2004) propose an ecological extension of activity theory to "describe and account for the transformative power of seemingly ubiquitous artifacts such as language and pervasive computing devices":

> "Mutual accommodations among system elements shape the relationship among these components, which is interdependent. Changes in any part of a system or among contextual levels have the potential to affect any or all of the other related systems. … Activities such as technology construction should not be perceived as statically structured entities but rather as dynamic processes that are characterized by ambiguity and change."

> (Gay and Hembrooke 2004)

The designer of a personals system chooses to emphasize (both visually and algorithmically) some characteristics more than others. These decisions affect users' perceptions of what is important in others they see on the site. More broadly, I believe the choice of characteristics of people to emphasize in an online dating system has a reciprocal relationship with cultural notions of love and attraction (Figure 1.1).

As a suddenly popular way to meet partners for dates or relationships, online personals not only reflect but also have the potential to shape how people attract one another, date, and fall in love. The design of social systems influences the beliefs and behavior of their users; the features of a person that Match.com presents as salient to romance will begin to have some psychological and cultural influence if tens of millions of Americans view them every month. This influence would exert itself most strongly on the users themselves, but it could also spread into the general population.

Users will perceive a system as more efficacious if its design highlights the characteristics of others that are truly

Figure 1.1. The reciprocal relationship hypothesized between culture and online dating systems.

Cultural notions of love

users
users users
users
users

Online dating systems

salient to the user (rather than being salient to the technical architecture of the system, or just arbitrary).

DIFFERENT CULTURES, DIFFERENT VIEWS

Although online dating seems to enjoy the biggest boom in the North American market, it appears to be growing in other countries as well, though in one nation, the technology is more infamous than famous. This section highlights two particularly interesting interactions of culture with the technology — it does not comprehensively survey online dating around the world.

Online Dating in Japan

In Japan, usually a society quick to adopt new social technologies, online dating has been tainted nearly from its introduction by allegations of teenage prostitution through the services.

> "In a practice euphemistically known as *enjo kosai*, or 'compensated dating,' the victims offer sexual services in exchange for money or gifts. ... 'Awaiting messages from high school girls short of pocket money,' wrote a male visitor to a dating site."
>
> (Batty and McCurry 2004)

Police claim this practice leads to criminal assaults, mostly against teenage girls. According to Japanese police, nearly 800 crimes in the first half of 2002 were related to online dating (*Sydney Morning Herald* 2002). Teenagers' access to online dating services is made easier by the proliferation of Internet-capable mobile phones.

On the other hand, the Lovegety, a small, inexpensive wireless device that alerted its owner when another romantically compatible Lovegety owner was nearby, was briefly quite popular in Japan and made news around the world as the first device of its kind (Iwatani 1998). The Lovegety never developed a sufficiently dense user base to make Lovegety encounters common, however.

Online Dating in India

In India and abroad, some Indians have adopted online dating systems as a way to find not just relationships for themselves but partners for their sons and daughters. Parents, siblings, and other relatives are using Indian dating systems, many of which allow users to search for partners by social caste and skin tone as well as the typical demographic attributes common to most dating sites, to find suitable mates for their offspring (Priyanka 2004). Especially for Indians living abroad, where Indian communities can be small, the ability to search a large pool of prospects is particularly compelling.

In some ways, online dating is better-suited to brokering arranged marriages than love marriages. The characteristics used to pair people for an arranged marriage — e.g., family background, caste, socioeconomic status — are much easier to represent in a database and search than vaguely defined qualities like "chemistry," which people often cite as a major factor in love relationships.

HOW ONLINE PERSONALS WORK

Online personals systems usually include personal profiles of users, which document their location, gender, age, physical attributes, race, religion, smoking and drinking habits, self-description, and preferences for these characteristics in a potential mate or date; a private messaging system; and a mechanism for indicating interest without writing a substantial message, variously termed "winking," "eye contact," or a "collect call." In contrast to other systems that support online communities, personals systems usually lack a common forum, where everyone can read what anyone posts.

Profiles

User profiles include a title or pseudonym, constrained descriptors like age and hair color, free-response descriptors, and sometimes photographs. Constrained descriptors limit users to certain categories (e.g., the set of hair colors) or types of input (e.g., numeric for age). Free-response descriptors let the user answer questions with arbitrary text. Some sites give straightforward prompts for free-response descriptors, such as "Describe yourself" or "Describe who you're looking for." Others, such as Spring Street Networks (provider for Nerve.com and other sites), provide less direct prompts: "Best (or worst) lie I've ever told," "Song or album that puts me in the mood."

On Nerve.com, frequent users have become so familiar with common responses to the idiosyncratic free-response prompts that they sometimes make mocking reference to clichéd answers to a question in their own response.

Some new personals sites incorporate personality psychology into their profile-building process; Tickle, eHarmony, and PerfectMatch purport to match their members according to the results of personality tests.

Searching and Matching

Most systems provide both searching and matching functionality. In *searching*, users specify exactly what characteristics they are looking for. They can search the set of profiles based on constrained descriptors such as age, eye color, and religion, and sometimes by keywords in the free-response descriptors.

In *matching*, which is slightly less direct, systems pair users by comparing their profile descriptors to the descriptors of others — usually the constrained descriptors, because contemporary techniques for clustering or otherwise identifying similarity work better with clearly defined features than with free text. Different systems apply different weightings to the features of the profiles.

Private Messaging

Online personals systems invariably provide a private channel through which members communicate without revealing their names or regular email addresses. Typically, it functions like a Web-based email client, providing a field to enter a subject for the message and a larger field for the message body, except that users can write only to others on the same site.

Users generally write each other with the private messaging system to find out whether they want to proceed to contact via email, phone, or face-to-face interaction. This provides privacy and safety until the users are comfortable with each other. A smaller group of users maintains contact for an extended period via the private messaging system, either uninterested in migrating the relationship to another medium or unwilling to do so.

Although sites often allow free browsing and searching in order to attract customers, most require users to pay for the ability to send private messages. Some sites allow non-paying users to reply to messages from paying users but not to initiate conversations on their own.

eHarmony restricts whom even paying customers can contact. In this system, users can contact a potential date only after the system has matched them with the person based on the results of their personality tests. That is, eHarmony provides only matching, not searching, and prevents communication between people who are not matched by the system.

Additionally, some personals systems offer a form of free contact without a substantial message, variously called an "eye contact," a "wink," or a "collect call." These mechanisms allow a user to express interest in another without formulating a message or, usually, paying for membership. On Nerve, some women are so deluged with collect calls that they indicate in their profiles that they will not respond to them, often criticizing the stinginess of those who do not pay for full privileges but still want a response.

THE CONSTRUCTION OF IDENTITY

Because text-based media provide only a limited communicative modality, it is possible to control what one conveys in such media more fully than in face-to-face interaction. In the language of Goffman (1959), users can tailor their self-presentation so completely that they accidentally "give off" nothing, communicating only what they intend to "give." This level of control allows users to construct and maintain one or more personae easily and convincingly:

> "In the physical world there is an inherent unity to the self, for the body provides a compelling and convenient definition of identity. The norm is: one body, one identity. Though the self may be complex and mutable over time and circumstance, the body provides a stabilizing anchor. [...] The virtual world is different. It is composed of information rather than matter. [...] One can have, some claim, as many electronic personas as one has time and energy to create."

> (Donath 1998)

Personal ads are clearly a venue in which favorable self-presentation is crucial. This makes the ability to craft one's identity particularly salient; many users expend great effort in perfecting their profiles, tweaking small bits of wording to achieve just the right effect. Because the medium is asynchronous, users can spend hours creating a profile that will be read in only a minute or two.

The Strategy of Self-Presentation

Online dating systems function as economies of attention. Users compete for the time and effort of others to read

their profiles and perhaps respond; this promotes what we might call strategic communication, in which people tailor their self-presentation to display what they believe will help them achieve their objectives. One could claim that all communication is strategic to some degree, and in dating situations most people want to put their best face forward. However, in online dating, the potential for exaggeration or fabrication is much greater. At 5'8", I cannot successfully claim to a person in my physical presence that I am 6'2" tall. But in my online personal ad, the deceit would be hard to detect.

Text-based online personals facilitate exaggeration. They make it easy to embellish or lie about characteristics that would be hard to misrepresent in face-to-face interaction, such as height, weight, age, attractiveness, and even facial appearance. (Even photographs are not unimpeachable: they might be favorable shots of a person who usually appears less attractive, or they might show someone else entirely.)

Once a significant number of users in a given personals system post profiles with exaggerated personal information, other users have an incentive to exaggerate to a similar degree or risk being overlooked in favor of others with more appealing — but not necessarily true — attributes (Ariely 2003). This incentive promotes strategic self-presentation, in which users attempt to present a profile, even enact a persona, which they think will optimize their desirability to others, regardless of whether it represents them accurately.

Strategic self-presentation is easier in text-based media than in face-to-face interaction because the user can strictly control what information she gives — that which she intentionally conveys — and can nearly eliminate what she "gives off" — that which she inadvertently indicates (Goffman 1959). Few people can avoid "giving off" their sex or height in face-to-face interaction.

Even if we accept that dating situations often involve some exaggeration in the service of self-promotion, the degree to which it is possible through informationally impoverished channels, combined with the incentive to exaggerate in an environment of exaggerators, makes online dating users likely to exaggerate more often and to a greater degree than offline daters.

Perception of Others

With such care devoted to production of profiles, their consumption requires interpretation beyond literal comprehension. Users of online dating systems must learn through experience — or perhaps from the advice of those more experienced — how to read between the lines in the local culture, which varies from site to site.

The Culture of a Personals Site

On Nerve.com, which shares content with other affiliates of Spring Street Networks' personals system, users self-consciously style hip identities. Certain bands, artists, and writers become points of reference, examples of various identities. Nerve's free-text profile questions seem designed to provoke this kind of expression: "Best (or worst) lie I've ever told," "Song or album that puts me in the mood." The prompt, "Most humbling moment," provokes a common response, "Posting this ad," but also commentary on it. (A paraphrased example: If posting this ad is your most humbling moment, you need to get out more.) This kind of explicit meta-commentary is rare, but users

commonly demonstrate familiarity with the norms, if only through their invocation of the familiar examples.

Vaisman (2001) offers a send-up of the stereotypical Nerve user:

> "You have a dog-eared copy of Stendhal, in French, next to the iMac and the Dutch lube you picked up in Amsterdam. You dream of your next trip to Iceland. You try your hand at pathetic fallacies: *your fingers itch, the trees shudder*. Belle & Sebastian are pretty awesome. You work for a website, but you know *what's up*."

> (Vaisman 2001)

The identities of the various online dating sites arise from a combination of their marketing with the real attributes of their populations. eHarmony.com, which claims to match users based on personality compatibility, focuses more on marriage than most sites; it sometimes bills itself as a Christian match-making service. Nerve Personals (and Spring Street Networks) arose from an eponymous online magazine about sex. As such, its marketing evokes dating and sex more than marriage. Some sites, like Match.com and Yahoo! Personals, seem less targeted, with marketing that presents nonspecific images of romance.

Social Affinity, Real and Imagined

Walther et al. postulate that the tendency in computer-mediated communication to fill in the blanks about a conversational partner more optimistically than one would in face-to-face interaction give the media a "hyperpersonal" effect, in which participants project desirable qualities onto their conversational partners in lieu of complete information about them (Walther 1996; Walther et al. 2001). The feeling of social affinity is quickened, but this sense comes more from wishful thinking than from accurate perception of the other, so it can lead to disappointment later, when a fuller picture of the other has emerged.

Walther's early development of hyperpersonal theory (1996) found that text-based media can facilitate social affinity, but the affinity takes longer to bloom than it would via face-to-face interaction, because conversation is less rapid and extraverbal cues are largely absent. Thus, computer-mediated interaction allows the formation of intimacy but slows the process as compared to face-to-face communication because the conveyance of salient information is slower.

His later work with collaborators (Walther et al. 2001) delineated a more nuanced model, with some empirical validation, to explain the perception of others in a variety of online scenarios, including short-term and long-term interaction with and without photographs of the participants.

The Role of Photographs

The conventional wisdom in online dating holds that you must attach a photograph of yourself if you want to succeed in meeting someone. In the analysis in Chapter 3, I will explore the effects of photographs on one online dating system. Here, I review prior research on their impact.

Walther et al. (2001) studied online workgroups in a 2x2 design, varying short- or long-term interaction and the presence of photographs. They found that users experienced affection and social attraction:

1. Most of all in *long-term* online groups *without* photographs.

2. Less so in *long-term* online groups *with* photographs and *short-term* online groups *with* photographs.

3. Least of all in *short-term* online groups *without* photographs.

Photographs had opposite effects in short-term and long-term groups. In short-term groups, the presence of photos yielded greater affinity. Walther et al. suggest that photos in this context provide a feeling of social presence that mitigates the asocial tendencies that arise in pseudonymous groups without an expectation of future interaction. The photo's "dose of reality" makes users behave more like they would in a short-term face-to-face interaction (Walther et al. 2001).

In long-term groups, however, the presence of photos reduced affinity. Walther et al. (2001) explain this finding as a result of the hyperpersonal effect — in long-term interaction, users have the opportunity to construct idealized perceptions of others, but photographs thwart the process by injecting a reality opposed to the ideal image.

Similarly, Farnham and Riegelsberger (2004) found that online gaming profiles with photos were preferred less than those without photos; they also found, however, that users formed "more complete impressions" of others when photos were included. Farnham and Riegelsberger (2004) note that we must consider as social engineers whether we want to facilitate idealized perception without photos or promote accurate perception, and perhaps ultimately more successful matching, with photos. Although users might say they are more satisfied with the former, they might be better served by the latter.

TRAJECTORIES OF DISCLOSURE

Progressive self-disclosure constitutes a major part of the development of a romantic relationship. The mystery presented by a new friend or lover enhances their appeal, and gradual disclosure builds intimacy even as the rush of novelty diminishes.

Online personals systems provide a wealth of information at the outset, perhaps eliminating the opportunity for delight at discovering shared musical tastes or favorite books. On the other hand, much of the information, as we have seen, might be exaggerated or falsified, so perhaps users do not have as much information as they think they do.

After users identify someone they like, they can contact the person through a private messaging system. Typically, these systems function like simple Web-based email clients. This is the venue in which much of the initial self-disclosure occurs in online dating. Popular advice columns and books about online dating often suggest

Some newer systems, such as eHarmony, deliberately foster self-disclosure that the site's architects think will facilitate interpersonal affinity. In the initial stages of private messaging, the system does not allow users to send arbitrary text messages, instead asking them to select pre-written questions to that seem intended to encourage

mutual self-revelation, such as:

> If you were taken by your date to a party where you knew no one, how would you respond?
>
>> a) stay close to my date, letting him/her introduce me
>>
>> b) find a spot at the back bar and relax alone, letting him/her work the room
>>
>> c) strike out on my own, introducing myself and making friends
>>
>> d) I would ask my partner if I could skip this particular event
>
> How often do you lose your temper?
>
>> a) practically never
>>
>> b) once in a while
>>
>> c) on occasion during the week
>>
>> d) probably once a day on average
>
> *(eHarmony.com)*

AMBIGUITY AND IMAGINATION

We always contend with incomplete information about others. In many cases, a dearth of information can lead to greater interpersonal affinity than would complete information. Norton et al. (2004) argue that ambiguous characterization allows others to project the attributes they prefer onto a person, leading to a more favorable perception of them. Consider common statements in personals advertisements, such as:

> — I really enjoy good music.

> — I like going to movies.

> — I enjoy spending time with my friends.

These statements are true about so many people that they provide little or no information, yet they allow the reader to imagine that the movies and music that the writer enjoys match the reader's preferences in those domains. This sort of optimistic interpretation of others relates to the human tendencies to assume that in-group others are like one's self (social projection [Clement & Krueger 2002]) and generally to like people (person-positivity [Sears 1983]).

As evidence for their hypothesis, Norton et al. (2004) conducted a series of studies. First, they found that people *thought* they would like someone better given more information about them. Second, they showed that, contrary to the intuition demonstrated in the first study, having more information was associated with less liking. Third, they found that with repeated trials, the trend reversed, and in the final of four trials, participants liked people better given more information about them.

Intimate Perception

Imagination facilitates the intimate perception of another person, posits Armstrong (2002):

> It's not necessarily the case that the imaginative person can see elements other people are unaware of, it's that they think up less expected — and perhaps more revealing — ways of putting together the elements which anyone can observe. This matters when it comes to love, especially falling in love, in a crucial way. Most people are not startlingly beautiful or magically attractive. But someone who seems just moderately nice — to most people — can flower under the imaginative attention of a lover's eye. Not … because the lover is somehow gilding the other with fictitious charms; but because the kind of attention the lover brings allows less obvious qualities to be seen and appreciated. Just as a muted work of art … would quickly be passed over by someone alert to only the most obvious signs of artistic bravura, so a muted person (an ordinary person) has attractive qualities which will probably not be evident to a casual observer. In other words, imagination can be allied to acuteness of perception, rather than to distortion.
>
> (Armstrong 2002)

What is the role of imagination in online dating? Can people perceive others with sufficient acuity to appreciate nuances of personality? When it comes to the imaginative perception of real qualities, the limitations of multiple choice, short answer, and static photographs would seem to obscure the kind of detail that would "not be evident to a casual observer," which Armstrong suggests that lovers embrace.

Even richer media, like video personals, do not convey the subtleties of personality and mannerism that five minutes of face-to-face conversation would provide. It would seem that most mediated communication provides insufficient detail for the imaginative perception of a romantic prospect to occur in the sense that Armstrong describes.

SELLING YOURSELF (OR BUYING A MATE)

Becker (1992) conceptualizes people's search for mates in terms of a marriage market, in which the participants seek partners to maximize their own happiness or welfare by exchanging what they have for what they want (in Becker's words: to "maximize their expected well-being"). Each person carries a certain value on the market, which we can consider to be a weighted average of characteristics like beauty, intelligence, social status, wealth, and fertility. Logically, people should seek the best partner they can afford; we would all like to have someone who is a "10," but a "7" can realistically expect only another "7." Not all 7's possess the same mix of qualities. One might make up for lower attractiveness with a greater intellect; one "shops" for the preferred combination of qualities. Indeed, single people who use "formal marriage market intermediaries," such as personal ads or human match-makers, sometimes refer to the process of "buy[ing]-a-boy" or selling oneself as "the right product" (Ahuvia & Adelman 1992).

Market models often assume that actors have complete or nearly complete information about the world. Usually, in social environments where one might find a date, this is not true. But online personals systems would seem to provide an ideal example of a marriage market, because they offer so much information about so many choices. (As

we noted above, though, it's unclear whether a computer-based profile can capture enough salient information to gauge attraction or compatibility.) As such, online personals provide a powerful empirical test-bed for market theories, and the theories themselves provide a framework within which we can consider personals systems. (Marriage markets give us little insight into the actions of individuals, who likely are not calculating the marginal benefit of one mate over another, but they are more useful for describing trends across thousands of users of online personals.)

Catalogs of People

In mid-20th century America, the Sears Roebuck catalog provided almost every non-perishable good a person could want, all shipped to your doorstep. Online dating provides such a catalog of potential mates — or dates, or sex partners. From the perspective of the individual, the prospectives seem bountiful; this surplus surpasses the scale of a singles bar by several orders of magnitude.

However, such a bounty demands a different cognitive approach than one would employ at a dinner party, for example. An intimate gathering allows one to discover others gradually, through social and environmental context and through conversation. Of course, we cannot help forming initial impressions based on superficial characteristics, but the organization and scale of such an event allow us to look past them. In online dating, users typically search and sort by relatively superficial characteristics, precluding interaction with anyone who does not meet the criteria the searcher specifies. Browsing a large catalog requires exclusion of entire categories, snap judgments, and quick dismissal of the vast majority of the items. It is unclear to what degree this mentality might affect decisions in online dating.

The Tyranny of Choice

Iyengar and Lepper (2000) studied consumer behavior by varying the number of gourmet jams available at a supermarket tasting table. They found that customers were more likely to buy jam when they were presented with fewer choices at the tasting table; they also liked the jam better. The authors suggest that customers might have enjoyed their choices more when the options seemed more special. Furthermore, they indicate that it might not be dissatisfaction with what they choose but rather the increased uncertainty that comes with choosing among many similar items that causes stress in decision-making, an effect which would be exacerbated if the decision were important and if some of the options were clearly not as good as others.

In a subsequent study, Botti and Iyengar (2003) found that, contrary to popular wisdom about the pleasure of making one's own decisions, those who were permitted to choose were more satisfied than those whose choices were made for them only when selecting from "more preferred alternatives." When the options included "less preferred alternatives," non-choosers were more satisfied (Botti and Iyengar 2003).

It is possible that similar effects color the perceptions of users of online dating systems when they face choices between thousands of potential partners — in the offline world, people never have so many simultaneous dating options. Studies like these also have implications for understanding arranged marriages, in which partners often maintain higher levels of satisfaction than in freely chosen love marriages (Brehm et al. 2002).

The Lure of Guaranteed Replacement

Additionally, the perpetual availability of a catalog of others lowers the cost of leaving an existing relationship. Usually, the prospect of being alone for a period of time and the uncertainty of finding another partner serve as disincentives to the termination of a present relationship. With a catalog of single others readily available, people who are advertising their availability to people like you, it should be easier to dismiss the current relationship with confidence that one can find another person at will.

Similarly, online personals make the opportunity cost of entering a relationship — or staying in one — readily apparent. Instead of a vague knowledge that you might be missing out on someone better, you have detailed profiles of all the possibilities.

SOCIAL CONTEXT

In the offline world, we meet friends and lovers in the context of existing social structures. The grocery store, the bar, church, or the neighborhood are common venues for meeting people. More abstractly, one's social network serves as the backdrop for introductions to friends of friends. Interactions which emerge from these contexts remain socially *situated* or *embedded* (Edmonds 1998) within them, such that the involved people are accountable not just to each other but to the wider circle of friends and acquaintances. The sanctions for misbehavior therefore extend beyond the immediate dyad. In terms of dating, this provides incentive for individuals to treat their dating partners well; additionally, it offers some assurance that others are unlikely to behave badly.

Online personals, on the other hand, eliminate most social context. We might consider the online dating site itself a social context, but most such sites have no provision for social interaction outside the goal-directed search and communication activities intended for meeting potential partners. Other kinds of interaction, which might lead to the formation of broader-purpose bonds, are not facilitated. Without a social context in which interactions might be embedded, users can misbehave with fewer consequences than in an offline dating milieu; word of their misbehavior will likely never reach their offline friends, and the unfortunate dating partner can be wiped from the email record and blocked from future communication with a few clicks.

It is also true, however, that online personals cut across offline social contexts. These systems introduce users who would never meet through face-to-face channels because their social contexts do not overlap; indeed, online dating bridges social contexts between which there was no previous connection. In this capability lies the promise of online personals, the real advantage they can offer over face-to-face meetings — a tremendous pool of potential dates, not only large but also distinct from those you would meet any other way.

For certain marginalized populations, the circumnavigation of one's offline social contexts provides the additional benefit of privacy. Gays and lesbians who do not disclose their sexual orientation, for example, might be unable to seek a partner through offline channels without revealing their orientation to friends, family, or co-workers.

Social networking systems like Orkut and Friendster, on the other hand, exploit existing offline social contexts to allow users to meet, e.g., friends of friends. These tools mimic real-world mechanisms for meeting others, with

many of the same advantages and disadvantages. Friendster and Orkut indicate others to whom you are connected by a chain of friends (i.e., "friend of a friend of a friend of a friend"), but distant connections — more than approximately three degrees from you — are effectively strangers.

Narrow-Purpose and Broad-Purpose Communities

Most traditional online dating sites facilitate narrow-purpose community. They offer tools for finding people to date and communicating with them, but they tend not to provide tools for communicating in a broader context or establishing ties outside of a dating context. In addition, their marketing and on-site presentation of communication tools strongly suggest that the purpose of these sites is dating only, even if its tools could be used for other forms of interaction. In particular, the positioning of the private messaging system as a mechanism for contacting potential romantic partners likely discourages same-sex communication on heterosexual systems, even where it might facilitate friendship or prove otherwise beneficial.

By contrast, social network systems like Friendster.com facilitate romantic interaction, but they situate it in a broader context communication — on Friendster, users can message friends of friends for dating purposes, but they can also announce a party to first- and second-degree members of their social network, or locate old friends from high school. Although Friendster has a "suggest a match" function, with which users can introduce two friends who might like each other, it has no dating-specific message features. Because romantic messages travel through the same channels as non-romantic messages, we might consider Friendster a broad-purpose system. Other broad-purpose systems include "portal" sites like Yahoo!.

By providing incentive to interact on the site even when one is not seeking romance, broad-purpose sites may be able to retain their users even while they are off the dating market.

DIFFERENCES IN ONLINE DATING SYSTEMS

Online dating systems take a variety of approaches to the goal of enabling compatible users to meet and date. In this section, I attempt to provide a summary of the different ways these systems handle the key tasks in online dating. These classifications come from several years of observation of dozens of online dating systems, but they are not based on any formal method of taxonomy.

Stages of Online Dating

We can divide the steps that users take as they use online dating systems into three major tasks: describing themselves, discovering other people, and communicating with selected others. Because dating systems differ within these tasks, but almost universally have the three tasks in common, I will describe approaches to the tasks separately rather than trying to categorize sites holistically. I will also give examples of sites that employ each approach; some sites offer more than one approach for the same task. These lists are meant to be representative, using well-known sites, not exhaustive. As with the Web in general, there are too many online dating sites opening and closing every day to craft a comprehensive list.

Self-description

■ *DIRECT*

Most online dating systems construct personal profiles by asking users to describe themselves directly. They request demographic and personal information, including age, sex, sexual orientation, location, marital status, children at present, child-bearing aspirations, race, religion, height, weight, body type, attractiveness, smoking habits, drinking habits, drug habits, and (on at least one system) self-deprecation habits. Even sites like eHarmony that focus on indirect self-description include at least basic demographic and personal questions.

It is in the multiple-choice or short-answer personal and demographic questions that sites for various sub-populations tend to display their specialization. For example, Manhunt.net, a site aimed at gay men, allows users to specify their body type with terms like "bear," which is unique to gay male culture. JDate, a site for Jewish singles, allows them to specify their particular sect of Judaism. Kissykat.com, for pet lovers, gives users the ability to list their pets (and search for others based on the pets they own).

Sites that employ primarily direct description also prompt users in direct language to describe themselves and what kind of person they want to meet (e.g., "The most important thing in my life is...").

Examples: Match.com, Yahoo! Personals, Spring Street Networks (provider for Nerve.com, Salon.com, etc.), many others

■ *INDIRECT*

Social psychologists routinely find that people are unable to describe themselves accurately on a variety of dimensions, even when they believe they can. Perhaps because of this, some sites have begun to provide indirect ways to prompt users to describe themselves. Nerve.com includes profile questions that allow users to self-disclose
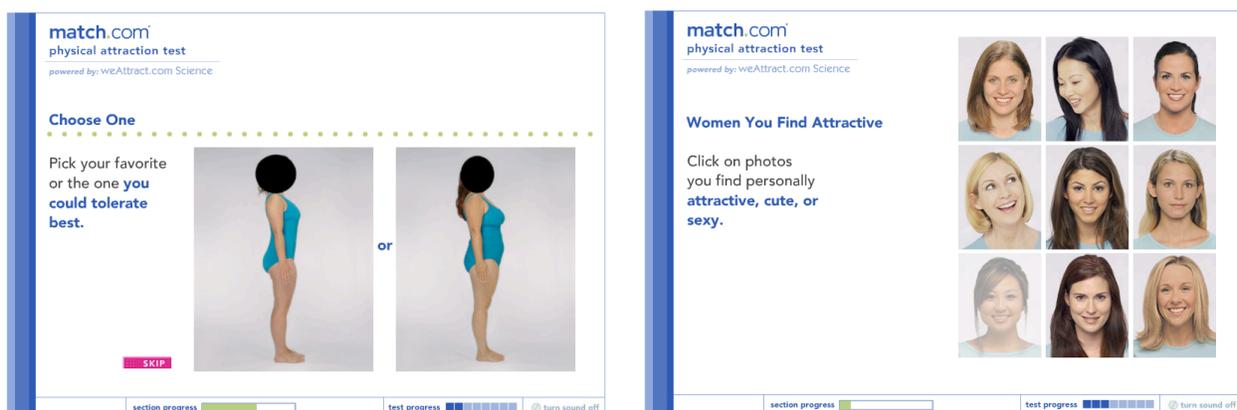

Figure 1.2. Physical attractiveness test from Match.com. The screen on the left asks the user, "Pick your favorite or the one **you could tolerate best.**" At right, the screen instructs, "Click on photos you find personally **attractive, cute, or sexy.**" (Highlights theirs.)

without having to make explicit statements about themselves. Questions like this on Nerve include "Song or album that gets you in the mood," which brings out musical preferences as well as providing an opportunity for innuendo; "Five things you'll find in your bedroom," which gives users a chance to mention personal details and, again, allude to sex; and "Celebrity you resemble most," which allows users to provide a reference point for appearance, sometimes ironic, and to demonstrate affinity (if any) for pop culture.

More recently, sites like eHarmony.com and Tickle.com administer personality tests as a major part of the self-description process. These tests purport to gauge how users behave in social situations, how they handle conflict, and what is important to them in romance — but the sites provide no particular evidence of what their tests measure, so it is unclear how well they correspond with the personality psychology literature. However, research has shown that personality factors like communicative style and conflict management as well as emotional disposition are important to successful relationships (Brehm et al. 2002).

Match.com developed a physical attraction test (Figure 1.2) in conjunction with weAttract.com. As the eHarmony and Tickle tests assess personality without asking the user to report it explicitly, so the Match.com test allows users to express their preferences in physical characteristics by demonstrating them in a series of simple choices. The test presents a series of rating and comparison tasks. In the rating tasks, users indicates on a Likert-type scale how much he or she likes an image of a person's face or body. (The images show models, but they are not all model-beautiful.) In the comparison tasks, users are presented with two or more images of faces or bodies and must choose the one they like best (or dislike least). Using these responses, the system constructs a model of the user's preferences for various physical attributes.

Examples: eHarmony.com, Tickle.com, Match.com, Spring Street Networks

■ *FREEFORM*

A few online dating systems, rather than creating elaborate profile systems, simply extend the concept behind newspaper personal ads, which are usually a few short lines of text printed as classified ads. These systems give users a name or headline and a space for whatever text the user wishes to include. Of course, these ads can be much longer than newspaper personals, for which people typically pay by the word or line, but in the same spirit, they permit unstructured text.

Examples: MakeOutClub.com, CraigsList.org

Discovery of Others

■ *SEARCHING*

The most basic way to discover other people in an online dating system is searching. At the basic level, this allows users to specify the sex, age, and location they seek; most sites provide more powerful capabilities as well, so users can search for, e.g., all the brown-haired, blue-eyed men between 5'11" and 6'3" who don't drink within a five-mile radius of zip code 90210.

Searching gives users a great deal of control, but sifting through so many options can be overwhelming. Advanced searches also give users the ability to overspecify, so that searches return only a few people who meet very specific criteria. This is problematic if people poorly understand who might be compatible with them; in offline interactions, one is not able to filter the people one encounters so precisely.

Notably, eHarmony.com, which relies heavily on personality-based matching, described below, does *not* include search functionality. That is, users cannot conduct searches for people who match arbitrary sets of characteristics; they can see only the users with whom the system deems them compatible.

Examples: Match.com, Yahoo! Personals, Spring Street Networks, many others

■ *MATCHING*

Many online dating systems will automatically match users with others whom the system deems compatible by comparing their profiles. Companies keep their matching algorithms private, but some provide limited information about them to users.

Some matching algorithms simply look for similarity. One common method for computing a similarity score involves representing a profile with n features as a vector in n-space whose similarity to another profile can be conceptualized as the degree to which the vectors point in the same direction. Others also check for mutual satisfaction of requirements — is person A's age in the range person B seeks, and vice versa?

Sites that employ personality tests, like eHarmony and Tickle, focus on complementarity more than similarity. Although their algorithms are carefully kept secret, they claim to pair people with personality traits known to complement each other in successful relationships. Without knowing the details of their matching processes, it is difficult to assess how accurately they do this.

Typically, sites present users with a list of their matches along with, in some cases, a "compatibility score" that indicates the relative strength of each match. As mentioned above, eHarmony.com is apparently unique in revealing to users only those people with whom the system considers them compatible — users cannot view any other profiles.

■ *SERENDIPITY*

Finally, some systems include mechanisms for exposing users to randomly selected others, or allowing them to stumble across profiles without having to search for them or be matched with them. Usually, this takes the form of a "user of the day" profile, featured on the home page, or a different randomly selected profile every time the home page is loaded.

Examples: Spring Street Networks, MakeOutClub.com

Communication

■ *PRIVATE MESSAGING*

Most online dating systems provide private messaging systems, essentially Web-based email that uses pseudonymous handles instead of real names and email addresses in order to protect the privacy of users until they choose to reveal it to their correspondents on the site. Commercial systems often focus their business models around the private messaging system, charging either a monthly fee or a per-message fee to send mail. Many allow users to receive messages for free.

Match.com also lets users send private voice messages.

Examples: Match.com, Yahoo! Personals, Spring Street Networks, many others

■ *ATTENTIONAL TOKENS*

Some sites offer a way to express interest in someone without sending a full message. The names of these tools sometimes evoke physical metaphors — "eye contact" or "wink." One site refers to them as "collect calls." They have in common that the action is free and notifies the recipient that the sender has expressed interest in him or her, but they typically include either no textual content or one of a few prewritten statements from which the user can choose.

Examples: Spring Street Networks, Match.com

ANALYSIS OF BEHAVIOR ON ONE DATING SYSTEM

This introduction has provided a survey of diverse perspectives on attraction and online dating. In the second chapter, I present a quantitative analysis of the behavior of users on one online personals Web site. The analysis seeks to reveal the preferences of the users with respect to potential dating partners by examining whom they contact and with whom they converse from a set of 57,000 active users.

The findings highlight the importance of a variety of characteristics to users of the site under study, as revealed by the communicative patterns of the users. In particular, the examination of "bounding" characteristics shows that life course attributes, including marital status, whether one wants children, and how many children one has already, are much more likely than chance to be the same across the two users in a dyadic interaction. Regression models built to predict how many messages a user with specific attributes will receive reveal somewhat different preferences for men and women. For both sexes, the strongest predictor by far of messages received is the number of messages sent. For men, age, educational level, and self-rated physical attractiveness are the next most important qualities. For women, however, they are not being overweight, self-rated physical attractiveness, and having a photo.

In the third chapter, I consider the implications of these findings for the design of online dating systems. Specifically, I suggest elevating the importance of life course attributes in both search interfaces and matching algorithms to better reflect their great importance to users. Additionally, I note that many subsets of the population

— by sex, ethnicity, religion — might benefit from interfaces tailored to their unique preferences; a generalized tool that serves all subpopulations likely serves all of them suboptimally.

Finally, I propose new directions both for the design of online dating systems and for their further study. New designs might include mobile, in-context systems; experiential tools for learning more about others; and the incorporation of physiological signals of attraction. My research agenda suggests further analytic work, but also experimental, ethnographic, and comparative approaches.