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Relationship Formation on the Internet: What's the Big Attraction?

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We hypothesized that people who can better disclose their "true" or inner self to others on the Internet than in face-to-face settings will be more likely to form close relationships on-line and will tend to bring those virtual relationships into their "real" lives. Study 1, a survey of randomly selected Internet newsgroup posters, showed that those who better express their true self over the Internet were more likely than others to have formed close on-line relationships and moved these friendships to a face-to-face basis. Study 2 revealed that the majority of these close Internet relationships were still intact 2 years later. Finally, a laboratory experiment found that undergraduates liked each other more following an Internet compared to a face-to-face initial meeting.

The Internet has become a prime venue for social interaction (D'Amico, 1998). Through e-mail, chat rooms, instant messaging, newsgroups, and other means, people are sharing aspects of their daily lives, talking about interests with like-minded others, and keeping in touch with family and friends. Social interaction has become the primary use of home computers (e.g., Moore, 2000). In the midst of all this social activity, people are forming relationships with those whom they meet on the Internet—especially those with whom they interact on a regular basis.

In many if not most ways, social interaction on the Internet resembles that in traditional, face-to-face venues (see Tyler, this issue). However, we will argue that there are some important differences. For example, there are qualities of Internet communication and interaction, such as its greater anonymity, that are known to produce greater intimacy and closeness. There are aspects of the Internet

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that enable partners to get past the usual obstacles or "gates" that in traditional interaction settings often prevent potentially rewarding relationships from getting off the ground. Still other features facilitate relationship development by providing meeting places for specialized interests, so that members have important features in common from the start.

Special Qualities of Internet Communication

The Intimate Internet

Considerable research on intimate relationships has shown that both self-disclosure and partner disclosure increase the experience of intimacy in interactions (e.g., Laurenceau, Barrett, & Pietromonaco, 1998; Reis & Shaver, 1988). However, disclosing quite intimate information about oneself normally occurs only after liking and trust have been established between relationship partners. As Derlega and Chaikin (1977) posited, individuals usually do not engage in self-disclosure with one another until they are confident that they have formed a "dyadic boundary," ensuring that information disclosed by one is not leaked by the other to mutual acquaintances. Even so, such a dyadic boundary may be violated or the other member may respond negatively to the disclosure. As Pennebaker (1989) and others (e.g., Derlega, Metts, Petronio, & Margulis, 1993) have noted, there are clear dangers in disclosing personal information, such as the risk of ridicule or outright rejection by one's friends and family.

The relative anonymity of Internet interactions greatly reduces the risks of such disclosure, especially about intimate aspects of the self, because one can share one's inner beliefs and emotional reactions with much less fear of disapproval and sanction (see McKenna & Bargh, 1999, 2000). In this way, self-disclosures with on-line acquaintances are similar to the "strangers on a train" phenomenon (e.g., Rubin, 1975), in which people sometimes share quite intimate information with their anonymous seatmates. Derlega and Chaikin (1977) note that people often engage in greater self-disclosure with strangers, because a stranger does not have access to a person's social circle, and thus the dyadic boundary cannot be violated. Unlike with the stranger on a train, however, people often have repeated interactions with those they get to know on-line, so that early self-disclosure lays the foundation for a continuing, close relationship.

Getting Past the Gates

A second reason for greater self-disclosure on-line is the lack of the usual "gating features" to the establishment of any close relationship—easily discernible features such as physical appearance (attractiveness), an apparent stigma such as stuttering (McKenna & Bargh, 1999), or visible shyness or social anxiety. These

gates often prevent people who are less physically attractive or socially skilled from developing relationships to the stage at which disclosure of intimate information could begin. Research has long shown the strong impact that these features have not only upon first impressions, but also in determining whether a friendship or romantic relationship will begin between two people (e.g., Hatfield & Sprecher, 1986). On the Internet such features are not initially in evidence and thus do not stop potential relationships from getting off the ground. We will return to this topic again in Study 3.

Finding Similar Others

The unique structure of the Internet allows individuals to easily find others who share specialized interests. We tend to be more attracted to others who are similar to ourselves and share our opinions (e.g., Byrne, 1971). Even within long-standing relationships, the more similar two people are, the more compatible they are, and the more likely married couples are to remain together (e.g., Byrne, 1997). However, it may be hard to find others who share one's interests in one's local area, and when people get to know one another in the traditional manner, it generally takes time to establish whether they have commonalities and to what extent. But when someone joins a newsgroup devoted to, for example, aging ferrets, he or she already knows that there is a shared base of interest with the others there. This allows the members to move quickly forward to find out what other key interests they might share and may provide a headstart to relationships.

Implications of the Distinct Qualities for Relationship Formation

It should be the case that relationships will develop closeness and intimacy significantly faster over the Internet than will relationships begun off-line, because of the greater ease of self-disclosure, as well as the founding of the relationship on more substantive bases, such as shared interests (as opposed to physical attractiveness alone). If it is the case that these relationships form on the basis of deeper and more substantive factors, one would expect not only that these relationships will become intimate quickly, but that they will be stable over time. Relationships formed on these grounds should also be able to better survive a face-to-face meeting, when gating features do come into operation.

What Is Disclosed in Self-Disclosure?

The self-relevant information that one shares with a relationship partner in the course of developing trust and intimacy is not the widely known features of one's public persona or "actual self" (Higgins, 1987), but the identity-important yet usually unexpressed aspects of oneself. What we refer to here as the "Real Me"

is that version of self that a person believes he or she actually is, but is unable to or prevented from (for any of a variety of reasons) presenting to others in most situations (see Bargh, McKenna, & Fitzsimons, this issue, for more on alternative versions of self). This concept is derived directly from Carl Rogers' (1951) therapeutic notion of the "true self"—that of the client feeling "he was not being his real self . . . and felt satisfaction when he had become more truly himself" (p. 136).

The special qualities of Internet communication discussed above would be expected to have the general effect of facilitating disclosure and expression of the inner or true self, compared to face-to-face interaction, in which one's usual or "actual" self-qualities should predominate. Bargh et al. (this issue) provide evidence that Internet interaction settings do facilitate expression of the true self for the average person in an initial meeting with a stranger. Our focus here is on individual differences in the degree to which a person expresses his or her true-self concept over the Internet rather than in "real life" interaction settings. Those who do, we believe, will be more likely than others to form close and meaningful Internet relationships.

Who Will Form Strong Internet Relationships?

Logically, those individuals who are able to find similar others in traditional settings, who are able to get past the usual gating features by force of personality, attractiveness, charm, or wit, and who have the social skills needed to communicate themselves well and effectively have little need to express their true selves or "Real Me" over the Internet. The rest of us should be glad that the Internet exists. For to the extent one is commonly blocked from establishing relationships for any of the above reasons, one will have a stronger, unmet need to express his or her true self. Thus we would expect people who are lonely or are socially anxious in traditional, face-to-face interaction settings to be likely to feel better able to express their true self over the Internet and so to develop close and meaningful relationships there.

A second reason why Internet relationships should become important to the individual follows from social identity theory. Representations of external social entities, such as groups, through which the individual defines his or her identity tend to become incorporated into the self-concept (see Spears, Postmes, Lea, & Wolbert, this issue). Recent conceptualizations of the self as relational in nature (e.g., Chen & Andersen, 1999; Baldwin, 1997), in fact, also hold that one's self becomes "entangled" or defined in large part in terms of those important relationships.

Therefore, we would expect people who express and disclose their true self more over the Internet to consider the relationships they form there to be identity-important, whereas those who better express and disclose these aspects of self with those they meet off-line should tend to consider off-line, non-Internet relationships

more defining of their identity (and thus more important). That is, where the person locates his or her "Real Me," on- versus off-line, should mediate whether or not he or she forms close relationships on the Internet.

Turning Virtual Relationships Into Social Realities

What will the fate of these relationships be? Will they be confined forever to cyberspace? We do not believe so. From separate lines of research on social identity, it is known that people are highly motivated to make important aspects of identity a "social reality" (Gollwitzer, 1986), through making them known to their social circle of friends and family (see Deaux, 1996; McKenna & Bargh, 1998). When one combines the principles of the social identity and the relational-self theories, a novel and potentially important hypothesis emerges about the fate of relationships formed over the Internet. If, as these theories hold, people are motivated to make important new aspects of their identity a social reality, and if—as the recent conceptions of the relational self posit—important relationships also become aspects of one's identity, then people should be motivated to make their important new relationships a social reality, that is, to bring them into their "real lives," to make them public and face to face.

Being the Real Me: A Model of Relationship Formation on the Internet

We propose that those who feel that they can better express their true selves on the Internet than they can in their non-Internet areas of life will be more likely to form close relationships with those they meet on-line. We include as two determinants of who might be more likely to locate their true selves on-line those who (1) experience social anxiety in face-to-face settings and (2) are lonely. However, there are likely several other such determinants (e.g., single working parents with little time for a social life), and by no means is it just the anxious or lonely who will form close relationships over the Internet (as our results show). Those who locate their true selves on-line, as opposed to off-line, will feel that their on-line relationships develop much more quickly than do their non-Internet relationships, these relationships will be close and meaningful, and they will be motivated to move these relationships into their face-to-face lives through a series of stages. These close relationships should also be durable and stable over time.

In order to test these predictions, we conducted two surveys and a laboratory experiment. In Study 1 we examined whether those who do locate the true self more on-line are indeed more likely to form close virtual relationships and to then integrate these relationships into their off-line lives. Study 2 examined the stability of these relationships 2 years later. Our third study is an experimental test of the role that anonymity and gating features play in the development of feelings of liking for another in on-line versus face-to-face interactions.

Study 1: The On-Line Real Me and Internet Relationship Development

Method

Sampling of newsgroups. A set of 20 Usenet newsgroups was randomly selected for this study. At the time of the study, there were approximately 16,000 newsgroups in existence. We eliminated "personals" and "penpals" newsgroups because we were interested in relationships that formed naturally from Internet interactions per se, not because the individuals were deliberately using the Internet in order to find partners. The universe of potential newsgroups was further restricted to those in which there were at least 75 posts per week and in which at least half of the posts were targeted solely to that newsgroup. This left a final population of approximately 700 newsgroups. The sample of newsgroups was randomly selected from this set in proportion to the number of newsgroups available in each of the seven major Usenet hierarchies, in order that the final sample would be representative of all Internet newsgroups. Accordingly, newsgroups were selected from each of the hierarchies. (Examples of those included are talk.politics, rec.pets.cats, comp.unix.programmer, misc.kids.health, sci.astronomy, alt.gothic.fashion, and soc.history.)

Measures. The survey contained 36 items designed to assess the relation between (a) social anxiety, (b) loneliness**,** (c) expression of the real self, (d) the type of relationship formed, (e) the depth of the relationship formed, and (f) behavioral actions in on-line settings (e.g., exchanging electronic mail) as well as in "real life" settings (e.g., having an affair, meeting in person). To create the indices described below, scores on each item were first separately standardized and then the mean of the items taken. Six items from Leary's (1983) Interaction Anxiousness Scale measured the respondents' level of social anxiety in face-to-face situations, along with five items from the UCLA Loneliness Scale (Russell, 1996).

Four additional questions addressed the location of the respondent's *real self*—whether the respondent felt that he or she could more easily share central aspects of identity with Internet friends than with "real life" friends or vice versa. Two items, to which the respondent answered either "yes" or "no," were: "Do you think you reveal more about yourself to people you know from the Internet than to real life (non-'Net) friends?" and "Are there things your Internet friends know about you that you cannot share with real life (non-'Net) friends?" A further two questions assessed the extent to which the respondent expressed different facets of self on the Internet than he or she did to others in real life and the extent to which a respondent's family and friends would be surprised were they to read his or her Internet e-mail and newsgroup postings. These last 2 questions were rated on 7-point scales, ranging from 1 (*not at all*) to 7 (*a great deal*).

Another question addressed the *intimacy of relationship* formed. On a 4-point scale (1 = *acquaintance*, 2 = *friend*, 3 = *very close or "best" friend*, 4 = *romantic*

partner), respondents rated the closest Internet relationship they had formed to that point in time. To measure the *closeness* of the relationship formed via the Internet, 10 items were taken from Parks and Floyd's (1995) Levels of Development in On-Line Relationships Scale.

A question was included assessing the *pace* at which the respondents felt that their new on-line relationships generally develop as compared to new face-to-face relationships on a 3-point scale ranging from 1 (*typically slower*) to 3 (*typically faster*).

Relevant *behaviors* were measured in both the on-line and off-line domains. Respondents were asked to respond whether (yes or no) they had engaged in specific activities with the person they feel closest to on the Internet and the frequency of each of those activities in an average week. Items measuring on-line behaviors asked about exchanging e-mail and chatting on-line. Items measuring off-line activities concerned talking on the telephone, writing letters through the mail, and meeting one another in face-to-face situations. Additional behavioral measures included whether the respondent had ever had an affair with, or become engaged to, someone he or she had met via the Internet (yes or no).

Procedure. Over a 3-week period, questionnaires were e-mailed to every fifth poster in each newsgroup selected for the study, excluding advertisements ("spam" posts) and individuals who cross-posted to other newsgroups, until a total of 100 posters in each newsgroup had been sent a survey. In the event that the fifth poster had already been selected for the survey or that the poster did not fit the qualification for inclusion in the survey, the next (sixth) poster was selected.

Results and Discussion

Sample characteristics. Of the 2,000 surveys sent to posters, 568 were completed and returned. An additional 317 surveys were undeliverable. The response rate was thus 34%. The sample was composed of 333 females (59%) and 234 males (41%). The age of respondents ranged from 13 to 70, with the mean age being 32 years. Participants had been using the Internet for a mean of 34 months (ranging from 1 to 243 months).

Creation of indices. The items constituting the Social Anxiety index had an associated reliability coefficient (Cronbach's alpha) of .81, and the items related to the Loneliness index had a reliability coefficient for the index of .78. The associated reliability coefficient for the 4 items related to the expression of the Real Me was .83. Similarly, the 10 items involving the Closeness of the relationship possessed a reliability coefficient of .93.

In order to test the hypothesized mediational model, we conducted a structural equation modeling analysis of the relations between Social Anxiety,

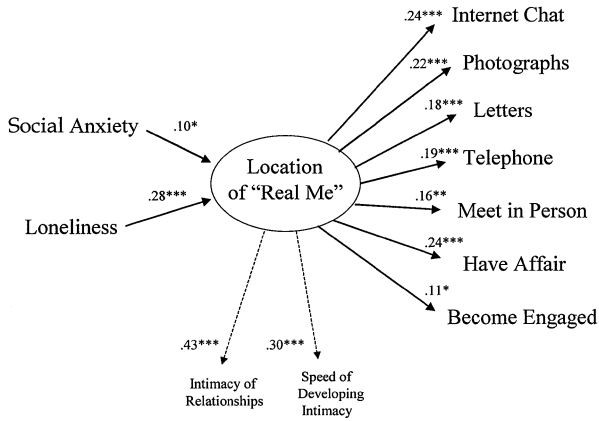

Fig. 1. Structural equation modeling analysis of the hypothesized determinants of Internet relationship formation and the transition of these relationships into real life, Study 1.
Note. Only statistically reliable paths shown. $^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

Loneliness, the Real Me, Relationship Intimacy, Closeness, On-Line Behaviors, and Off-Line Behaviors. As can be seen in Figure 1, the predicted model was argely confirmed.

Structural equation modeling analysis. First, as predicted, locating the Real Me on the Internet is significantly more likely for those who experienced higher levels of social anxiety and loneliness. Those who have a more difficult time with traditional social interactions and who feel more isolated and lonely turn to the Internet as a means of expressing facets of themselves that they are unable to express in their non-Internet lives.

The next step of the model calls for the location of the Real Me to mediate between social anxiety and loneliness, on the one hand, and the benefits of fuller self-expression and disclosure, on the other. In support of this prediction, it can be seen in Figure 1 that the more people express facets of the self on the Internet that they cannot or do not express in other areas of life, the more likely they are to form strong attachments to those they meet on the Internet. Indeed, their on-line relationships generally develop more quickly as compared to their non-Internet relationships. They also tend to eventually bring Internet friends into their real life, through phone conversations, exchanging letters and pictures, and meeting them in person. Finally, these Internet relationships can become quite intimate, as those who feel their real selves reside on the Internet, compared to those who don't, are significantly more likely to become engaged to, or have an affair with, someone they met on the Internet. In sum, Internet acquaintanceships can and do develop into close and even intimate relationships.

It is clear from these findings that those who participate in Internet newsgroups do tend to bring the friendships they form there into their everyday, non-Internet

lives. A full 63% of all respondents had spoken to someone they met via the Internet on the telephone, 56% had exchanged pictures of themselves, 54% had written a letter through the post, and 54% had met with an Internet friend in a face-to-face situation, tending to meet an individual an average of eight times.

Note that the lack of any reliable *direct* paths between social anxiety and loneliness, on the one hand, and relationship intimacy, closeness, and any of the off-line behaviors, on the other, further indicates the mediational role of the location of the true self. Believing that one is more one's real self on the Internet plays a crucial role in the formation of strong attachments to those one meets there and whether one brings that relationship into one's real life.

Absolute Real Me. The results just described are based upon the Real Me index as a continuous variable, with high or low scores *relative* to those of the other respondents. Thus, it is possible that all respondents had located their true self in the "real world" but simply to varying degrees, or it could be that all had located the true self on the Internet. To ensure that it is the *absolute* location of the true self—either on the Internet or in the "real world"—that matters, we recategorized respondents as locating their Real Me in an absolute sense either on-line or off-line.

The Real Me variable was redefined in terms of (1) those who locate the real self purely in the off-line domain, (2) those who locate the self equally in both the off-line and on-line domains, and (3) those for whom the real self resides purely in the on-line domain. Specifically, the Absolute Real Me variable was scored as follows: "Pure Off-Line" was defined as those who responded (a) that they did not reveal more about themselves to Internet friends than to off-line ("real-life") friends, (b) that their Internet friends did not know things about them that the respondent's off-line friends did not know, and (c) on the "not at all" side of the scale (i.e., less than 4) for *both* of the questions assessing the extent to which different facets of self were expressed mainly on the Internet. Those whom we termed "'Tweeners" were those whose responses were mixed (i.e., with a 4, with greater than 4 to some questions and less than 4 to others, with a yes to one question and a no to the other), and "Pure On-Line" was defined as the flip side of the off-liners (greater than 4s and yes to both dichotomous questions). In support of the proposed model, the results of the analyses were unchanged.

Our model also holds that whoever locates the true self on-line, regardless of anxiety and loneliness levels, will be more likely to form on-line relationships. Computing the same mediational model but including only those respondents who were *low* on both social anxiety (scoring less than 3 on 1–5 scale) and loneliness (2 or less on a 1–4 scale) yielded results consistent with that prediction. All of the significant paths in Figure 1 remained significant when the model was recomputed only for the nonanxious and nonlonely respondents, with one exception: The expression of the true self on the Internet did not lead to a significantly greater tendency to meet with Internet friends face to face or to become engaged to an

Internet partner (*p*s > .20). One reason for this may be that, with the understandable exception of those who met in order to conduct an affair, people who are not lonely in their regular lives do not feel a need to meet in real life with Internet friends. They are presumably satisfied with the relationships they have formed and the closeness they have achieved in them.

Gender differences. Although analyses controlling for gender show that the model held for members of both genders, not surprisingly there were differences in the ways that males and females assessed their Internet relationships. Previous research has shown that women more than men tend to self-disclose to others, even in casual encounters (e.g., Cozby, 1973; Jourard, 1964). Caldwell and Peplau (1982) found that women's friendships tend to be more deeply intimate than men's. Women place greater emphasis on talking and sharing emotions, whereas men tend to focus on shared activities. In terms of romantic relationships, women and men do not differ in how much they are willing to reveal to one another, but they do differ in the types of things they reveal (Rubin, Hill, Peplau & Dunkel-Schetter, 1980). These differences in the way men and women perceive and experience relationships were borne out in the present study.

Males and females equally engaged in such activities as e-mailing, meeting, exchanging pictures, writing letters, and getting together in Internet Relay Chat (IRC). Following Caldwell and Peplau's findings, females characterized the relationships they formed over the Internet as more intimate than did males (see Figure 2). Ancillary analyses showed that females described the relationships they formed as being significantly closer and deeper than did males across each of the 10 items comprising the relationship closeness index (all *p*s < .01). However,

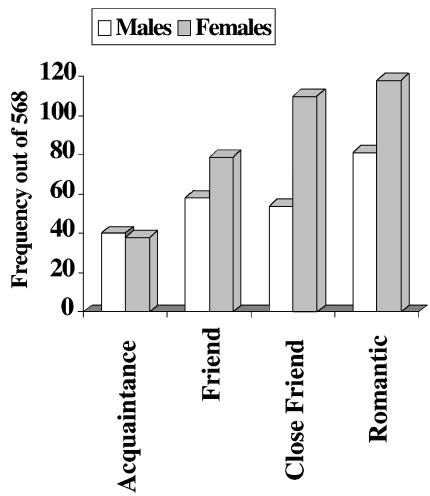

Fig. 2. The closest Internet relationships formed by males and females.

males and females involved in romantic relationships did not significantly differ across these 10 items (all *p*s > .15).

The presence-control exchange. We conducted a path analysis in order to test the sequence that an individual follows in moving a relationship from the on-line realm into that of the real world. We hypothesized that people would gradually, through a series of stages, give up the safety and control over the interaction afforded by the Internet for the greater physical reality and intimacy—but greater risk and lower personal control—of the real world. It is useful here to treat intimacy and control as commodities of a sort, in that one can trade or exchange some of one for some of the other. On e-mail, for instance, one can choose if or when to respond and do so without the pressures of real-time conversational demands; yet this greater control comes at the cost of psychological distance from the other person. In chat rooms, one gives up some control over the interaction for the greater richness of interacting in real time. Likewise, exchanging letters or telephoning requires one to give up control over details of one's identity, but one gains the greater trust and intimacy of those communication modes, as well as some degree of physical reality. Finally, interacting in person gives up all of the control advantages of the Internet in exchange for physical and psychological closeness.

Because all of the respondents reported that they had exchanged e-mail with their Internet acquaintances, the analysis was conducted beginning (as the exogenous variable) with the second most popular on-line activity, that of talking via IRC. As predicted, individuals start Internet relationships with relatively high control over the encounter and gradually relinquish that control in a series of stages (see Figure 3). It is noteworthy that there are no significant direct paths between talking via IRC (or exchanging letters) and meeting in person. The *only* significant path to meeting in person is from talking on the telephone. Thus, unless an Internet relationship progresses to the point at which the participants are talking with one another via the telephone, it is unlikely that the participants will take the final step of meeting face to face.

In summary, Study 1 strongly supported the central prediction that close and meaningful relationships do form on the Internet, as well as the proposed model of who will tend to form them and why. When people locate their true self on

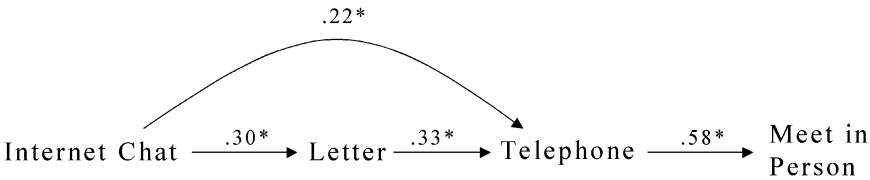

Fig. 3. Sequence of stages in exchanging control over interaction for greater intimacy in the relationship, Study 1.
* $p < .0001$. For all paths not shown, $p > .25$.

the Internet, they presumably integrate their strong Internet relationships into their identity and self-structure and so want to make them a social reality, bringing these relationships into their real lives. Moreover, Internet relationships tend to develop closeness and intimacy more quickly than do real-life relationships. But do they last? In Study 2 we returned to these same respondents 2 years later and asked them how their Internet relationships had fared over time.

Study 2: The Temporal Stability of Internet Relationships

If, as we have argued, the bases for the formation of Internet friendships and relationships are not so much the traditional ones, such as physical attraction, but are more substantively grounded in mutual expression of true selves and discovery of common interests, then it follows that these relationships should be relatively durable and stable over time.

Method

Two years after the initial data collection, participants in Study 1 were re-contacted. A follow-up survey was e-mailed to each participant. Of the original 568 participants, 214 could no longer be reached at the original e-mail addresses. Of the 354 participants whose addresses remained valid, 145 completed and returned the survey, for a response rate of 41%.

Measures. The follow-up survey included the same measures taken 2 years earlier: social anxiety, loneliness, expression of the real self, and frequencies of on-line and off-line behaviors with the relationship partner (see Study 1). In order to reduce the time burden on the entirely volunteer participants (and so increase response rate), the questionnaire was shortened to a total of 30 items in the following manner: First, the 10 items assessing relationship closeness were omitted (these had correlated strongly with the single item assessing the intimacy of the relationship in Study 1); second, we included only the single question "I wish I had more confidence in social situations" to assess social anxiety (it had explained 81% of the variance in the social anxiety index in Study 1); thirdly and similarly, the single question, "How often do you feel that you are no longer close to anyone?" was used to assess loneliness, as it was found to explain 83% of the variance in the Study 1 loneliness index.

Measures of off-line loneliness and social anxiety were again included in the follow-up because, if socially anxious and lonely individuals are expanding their social circles through forming important relationships on the Internet and then successfully integrating them into their non-Internet lives (as Study 1 found), one would expect that this would lead to a reduction in feelings of loneliness and, perhaps, of social anxiety. It is possible that the positive reinforcement and successful formation of these on-line relationships might lead to feelings of greater

self-efficacy in the traditional social domain for those with interaction anxiety (e.g., Bandura, 1977).

Therefore, several new items were added to the follow-up survey, asking respondents *directly* whether they felt that using the Internet had made them become more lonely, had made them become less lonely, or had not affected them in this way, and whether they felt that they had fewer, more, or the same number of friends since they began using the Internet. Respondents were also asked to report whether they felt that using the Internet had affected feelings of depression.

In order to discover the fate of the relationship that participants had reported to us in 1997, we included a question asking about the present status (i.e., in 1999) of that relationship. We also included a question asking whether (yes or no) the participant considered his or her Internet relationships to be as real, as important, and as close as his or her off-line relationships. We also asked participants about the number of virtual friendships they had developed in which they were able to share very personal and intimate aspects of their lives. Finally, respondents were specifically asked whether they believe they are more their true selves on the Internet or off-line on a 7-point scale from 1 (*not at all*) to 7 (*very much*); this item was included in the Real Me index.

Results and Discussion

Sample characteristics. The sample was composed of 33% male and 67% female respondents. The age of respondents ranged from 16 to 72, with the mean age being 34.5 years. Participants had been using the Internet for a mean of 63 months (with a range from 25 to 204 months).

Relationship stability. In line with our prediction, our respondents' on-line relationships remained relatively stable and durable over the 2-year period (see Table 1). Indeed, the stability of these Internet relationships compares quite favorably to that of relationships that form and endure solely in the traditional face-to-face world (see Figure 4). For example, Attridge, Berscheid, and Simpson (1995) followed 120 dating couples for 6 months and, according to the self-reports of their participants, 32% of the relationships had dissolved before the 6-month period ended. Kirkpatrick and Davis (1994) followed 354 couples in "steady or serious" dating relationships over a 3-year period; 7 months into the study 36% of the

Table 1. Fate of Relationships After Two Years

Relationship	Relationship dissolved	Became less close	Became closer and stronger	Total continuing (Columns 2 + 3)
All relationships	25%	18%	54%	75%
Acquaintanceships	33%	0%	67%	67%
Friendships	21%	21%	58%	79%
Romantic partnerships	29%	19%	52%	71%

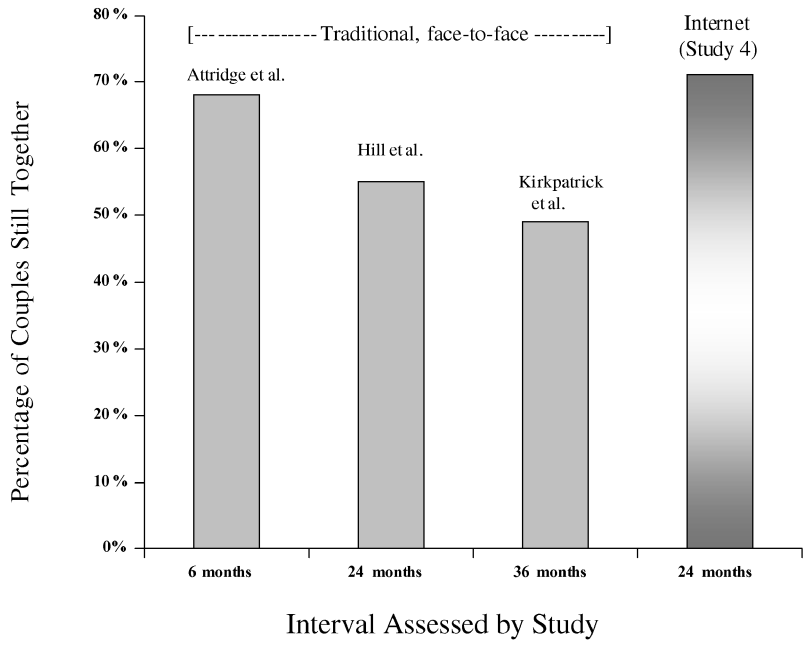

Fig. 4. Comparison of relationship stability for those relationships formed in real life versus on the Internet, by time interval of duration measured in study.
Note. Full citation and description of the three comparable real-life studies in text.

couples had broken up, and at the end of the 3 years, only 49% of the couples were still together. In the classic study by Hill, Rubin, and Peplau (1976), 45% of their dating couples had ended their romantic relationships prior to the conclusion of the 2-year study.

In the present survey, 71% of the romantic relationships that had begun on the Internet in the present survey (and 75% of all reported Internet relationships) were still intact 2 years later—with the majority being reported as closer and stronger. Thus, applying the identical criterion as was used in the previous studies of dating couples (i.e., "Is the relationship continuing, yes or no?") we find that the stability of relationships initially developed on-line compares favorably to that found in studies of relationships that had initially developed face to face. Using the stricter criterion for our participants of comparing only those romantic relationships that were reported to have become closer and stronger, we find a comparable endurance rate (52%) to that found in the 2-year study of Hill et al. (1976; 55%). Also notably, 84% of our respondents reported that their on-line relationships were as real, as important, and as close as their non-Internet relationships.

Stability of Real Me index. Our 2-year follow-up survey also enabled us to assess the temporal stability of the Real Me as a personality characteristic: whether

or not responses to the Real Me measure reflect a stable and reliable personality characteristic regarding an individual's ability to express his or her true self over the Internet versus face to face. Of the 34 participants who were categorized in 1997 as locating the real self absolutely on-line, none of them located the real self off-line in 1999. Of the 30 participants locating the real self solely off-line in 1997, only 3 had transferred their location of the real self to the purely on-line realm. Of the 60 "tweeners" in 1997, 50 continued to locate the self in between the two domains. Paired samples *t*-tests were also conducted between the individual items comprising the Real Me index at Times 1 and 2, and again no significant differences emerged (all *p*s > .20).

Social anxiety, loneliness, and depression. Relevant to the proposed model, a within-participants *t*-test was conducted comparing the amount of social anxiety reported in 1997 to that reported 2 years later. Results demonstrate a significant reduction in the level of social anxiety experienced by participants, $t(141) = -2.55$, $p < .01$. That is, our random sample of Internet newsgroup users were significantly less socially anxious in 1999 than they were in 1997 (i.e., after two additional years of Internet use). When asked directly to assess what effect using the Internet had on feelings of depression, only 2% of the respondents reported that it had caused them increased feelings of depression, compared to 25% for whom it had reduced feelings of depression (73% reported no effect).

A within-participants *t*-test also showed participants to be less lonely in 1999 than they had been in 1997, $t(141) = -5.30$, $p < .001$, and this reduction in loneliness was not qualified by differences in initial levels of loneliness. That is, both those who originally reported the lowest levels of loneliness and those who reported the highest levels of loneliness in 1997 reported equivalent reductions in loneliness in 1999. Of course, there may have been other factors besides Internet use producing such a reduction. However, when participants were also *explicitly* asked to assess the effect that using the Internet had on their feelings of loneliness, 47% reported being unaffected, 47% felt their Internet use had reduced feelings of loneliness, and only 6% reported that they felt more lonely as a result of using the Internet. The majority (68%) of participants also reported that using the Internet had increased their social circle, whereas only 3% reported having fewer friends as a result of Internet use (28% reported no change). Indeed, the average participant reported having a mean of six virtual friends with whom he or she shared intimate, personal details.

Becoming Friends on the Internet: Faster, Stronger, Deeper, Longer

We've suggested that the anonymity and lack of traditional gating features in Internet interactions are what facilitate the rapid formation of on-line friendships, as they facilitate the expression of the Real Me. We proposed that forming a friendship based initially upon mutual self-disclosure and common interests,

rather than superficial features such as physical attractiveness, provides a more stable and durable basis for the relationship and enables it to survive and flourish once those "gates" do come into operation when the partners meet in person.

In support of this line of thinking, Gergen, Gergen, and Barton (1973) found that when individuals interacted in a darkened room where they could not see one another, they not only engaged in greater self-disclosure but also left the encounter liking one another more so than did those who interacted in a room that was brightly lit. Research in interpersonal attraction has shown that people like better others who are more disclosing and that, conversely, personal disclosure breeds liking by others. Collins and Miller (1994) found that not only do we like those who disclose to us and tend to like those to whom we ourselves make disclosures, but we also tend to like those who like us in return.

Interacting on the Internet is similar in some respects to interacting in a darkened room, in that one cannot see one's interaction partner, nor can one be seen. First impressions thus are formed based upon the information provided by the other person and perhaps by the positive effect of our own acts of self-disclosure, rather than upon physical features. Research has shown that it is difficult to overcome first impressions (e.g., Fiske & Taylor, 1991); one reason being that in subsequent interactions, people selectively focus upon information that is confirmatory rather than disconfirmatory of their original judgements (see Higgins & Bargh, 1987).

Whereas our first two studies confirmed our predictions that people (1) do form close, lasting relationships with those whom they meet on the Internet, (2) develop intimacy at a faster rate than in real life, and (3) successfully bring these relationships into their real lives, they do not directly test our model's assumptions about the *process* by which this happens—that is, *why* all of this occurs. Thus, we conducted a laboratory experiment to provide such a test.

Study 3: Friendship Formation in the Absence of Traditional "Gating Features"

Study 3 was designed to assess the effect that the presence (as in face-to-face interactions) versus absence (as in Internet interactions) of traditional relationship gating features (e.g., physical appearance) has on how much strangers like each other after their initial interaction. We predicted that those who met for the first time on the Internet would show greater liking for partners than would those who met face to face (Time 1). Further, it was predicted that liking for the partner would be greater for those in the Internet condition than for those in the control condition even after the final meeting (Time 2), in which participants in both conditions had met face to face and physical appearance was now operating for all pairs as a gating feature.

Method

Participants. Thirty-one male and 31 female New York University undergraduate students were recruited from the introductory psychology participant pool.

Procedure. Participants engaged in two 20-min meetings. Participants in the study were randomly assigned to one of three conditions. In the control condition, each participant interacted with his or her partner in person for both meetings. In the "IRC" condition, participants interacted first in an Internet chat room and then met face to face for the second meeting. For both the control and the IRC conditions, participants knew that they were interacting with the same person both times.

In the final, "trading places" condition, the participant interacted with one partner in person and also with a person he or she believed was a different partner over the Internet. In reality, it was the same person both times, though neither partner was aware of this. Prior to the second interaction with the ostensibly different partner, participants were instructed not to talk about their previous partner, in order to protect confidentiality. The order of meeting (Internet vs. face to face) was counterbalanced for the trading places participants. Each participant was paired with an opposite-sex partner, for a total of 10 cross-sex pairs in each of the conditions.

All participants were instructed to get acquainted with one another. After 20 min, the interaction was ended. Participants in all conditions completed a set of measures assessing the interaction and their partner and then engaged in the second interaction, following which they again assessed their partners using the same set of measures. Special care was taken during the debriefing to discover whether any participants in the trading places group suspected that they had interacted with the same person in both conditions. Data from one participant were excluded from the analyses as he suspected that he had spoken with the same partner on both occasions. No other participants in the trading places condition showed any such suspicion.

Measures. Participants rated the extent to which they liked their partner on a 14-point scale, ranging from -7 (strong dislike) to $+7$ (strong liking). Next, eight items taken from the Relationship Development Scale (Parks & Floyd, 1995) assessed the participants' perceptions about the quality of the interaction and the level of intimacy that had been established.

Results and Discussion

Liking for partner. An analysis of variance was conducted on partner liking scores with Communication Mode (IRC vs. face to face) as the between-participants factor and Time of Measurement (Times 1 and 2) as the

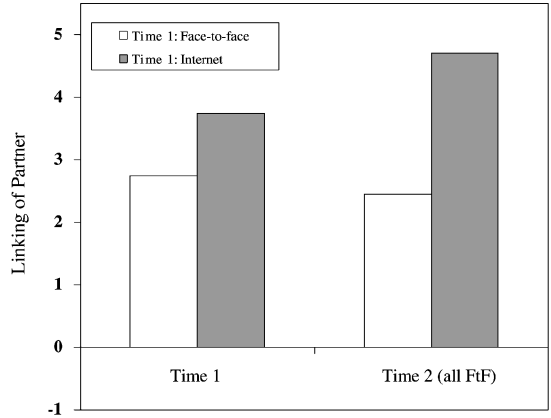

Fig. 5. Degree of liking for partner for those who met first on the Internet versus face to face, after initial meeting and also after second (face-to-face) meeting, Study 3.

within-participants factor. The main effect of Communication Mode was not reliable, $F(1, 40) = 2.27$, $p = .12$, nor was the main effect of Time, $F(1, 40) = 1.35$, $p = .25$. However, as predicted, the Communication Mode × Time interaction was reliable, $F(1, 40) = 4.98$, $p < .05$. In the IRC condition, liking for partner increased after meeting face to face, whereas liking nonsignificantly decreased for those who met continuously in person (see Figure 5).

Although the amount of liking for one's partner after 20 min of interaction (at Time 1) did not yet differ between the Internet ($M = 3.75$) and the control condition ($M = 2.75$, $t < 1$), these differences did emerge by the end of the interaction at Time 2, such that those in the Internet condition ($M = 4.70$) liked their partners significantly more than did those who met consistently face to face ($M = 2.45$), $t(38) = -2.18$, $p < .05$. Bargh et al. (this issue, Study 3) also found that significant differences in partner liking emerged, after a 40-min interaction, with those who interacted solely on-line liking each other more than did those who interacted solely in person.

A within-participants *t*-test was conducted for those in the IRC condition, comparing amount of liking at Time 1 (after interaction on IRC only) and at Time 2 (after meeting face to face). Liking increased significantly from Time 1 to Time 2, $t(20) = 1.83$, $p = .04$, one-tailed. A within-participants *t*-test for the control condition yielded nonsignificant results, $t(20) = 1.45$, $p > .10$. In other words, further face-to-face communication enhanced partner liking in the IRC condition, but not in the control group.

Also as predicted, a within-participants *t*-test revealed that the same person was liked substantially more when he or she interacted with a partner via the Internet ($M = 4.95$) than when the interaction took place in person, $M = 3.11$, $t(20) = 3.33$, $p < .001$. This within-participants comparison, in which the same

participant provides liking ratings for both a face-to-face and an Internet interaction partner, is a more powerful and sensitive test of our hypothesis than the between-participants comparison of the face-to-face versus IRC condition. Unlike comparisons between the face-to-face-only group and the IRC group, where liking for different partners was being compared, the trading places group provides insight into how the *same pair* would like one another if they were to initially meet in one condition versus the other.

Quality of conversation. In the two experimental conditions in which participants knowingly interacted with the same partner twice, the ratings of the quality of the conversation taken after the first meeting were nearly identical to those after the second meeting—that is, partners did not much alter their initial assessment after further interaction—and analyses of these ratings at Time 1 and at Time 2 produced the identical patterns of significant effects. Thus for the sake of brevity we will describe only Time 2 findings for these two conditions.

The main effect of Initial Communication Mode (first meeting face to face vs. on IRC) was not reliable ($F < 1$) but it did reliably interact with the repeated measure of Conversation Quality Rating (i.e., the different items of the questionnaire), $F(5, 190) = 2.63$, $p < .02$. Inspection of the mean ratings by the two conditions revealed only one reliable difference: those participants who had met first on IRC were more likely to have told their partners what they specifically liked about them, compared to participants who met first face to face.

In the trading places condition, we compared conversation quality ratings of the "IRC partner" vs. the "face-to-face partner" (again, in reality the same person both times) using within-participants *t*-tests for the various questionnaire items. Two reliable differences were revealed: Participants felt they knew their IRC partner better than they did their face-to-face partner, $t(18) = 3.64$, $p < .001$, and they were more likely to have told their IRC than their face-to-face partner specifically what they liked about him or her, $t(18) = 2.80$, $p < .01$.

Relation between liking and conversation quality ratings. For each condition, we examined the degree to which the participant's liking of the partner was correlated with ratings of the quality of the conversation and how well the participant felt he or she knew the partner at the end of the meeting. According to our model, people who meet face to face base their initial liking on more superficial gating features such as physical attractiveness, and so ratings of partner liking in the control condition should be relatively unrelated to ratings of the quality of the interaction. Conversely, people who meet on the Internet, in the absence of these gating features, should show a stronger relation between the quality of the conversation and how well they feel they know the other person, and their overall liking ratings for that person.

In support of this prediction, there were no reliable correlations between liking for partner and any of the Conversation Quality ratings for participants in the

control condition (all rs < .16, all ps > .5). In the IRC condition, however, degree of liking for the partner was significantly related to several of the items assessing the interaction experience. The more that participants in the IRC condition (a) felt certain they knew their partners, (b) felt that they could accurately predict what their partner's attitudes would be, (c) felt they had discussed a wide range of topics with their partner and moved easily from one topic to another, and (d) felt that they had been able to share intimate or personal things about themselves with the partner, the more they reported liking their partner (all rs > .59, ps < .01).

Within the trading places condition, none of the correlations between liking and the various conversation quality items was significant when the partners met face to face (all ps > .08). However, when these same people interacted on the Internet, there were significant correlations between degree of liking and three of the items. The more participants felt able to share intimate or personal things about themselves with the partner, the more certain they were that they knew their partner, and the more confident they were that they could accurately predict what their partner's attitudes would be, the more they liked their partner (all rs > .47, ps < .05).

In other words, when people interacted on the Internet—but not when they interacted in person—the quality of the interaction, especially the intimacy and closeness attained, determined liking. In the face-to-face meetings, the quality of the interaction did not matter to liking judgments, consistent with the notion that in face-to-face interactions it is the more superficial gating features that dominate liking and overwhelm other interpersonally important factors.

General Discussion

The three studies presented here tested the model that greater expression of one's true self on the Internet results in the rapid formation of close relationships that endure over time. Those who are socially anxious and lonely are somewhat more likely to feel that they can better express their real selves with others on the Internet than they can with those they know off-line. The close relationships that are formed on-line tend to become integrated into one's non-Internet social life in a series of stages. With each step of the process, individuals exchange more of the control they hold over their side of the interaction in return for greater intimacy.

Study 1 showed that real, deep, and meaningful relationships do form on the Internet, and Study 2 found these relationships to be stable over time. Study 3 demonstrated that when people meet on the Internet, in the absence of the gating features that are present in face-to-face situations, they like one another better than they would if they had initially met face to face. Further, this liking tends to survive a subsequent face-to-face encounter. The absence of gating features we believe to be an important reason, along with the greater self-disclosure fostered by the anonymous environment of the Internet (see also Bargh et al., this issue), for the fast development of close, stable relationships on-line documented by Studies 1

and 2. The tendency for people in general, independently of their levels of social anxiety or loneliness, to be better able to express and effectively convey important aspects of their real selves over the Internet also plays an important role in fostering on-line relationships.

A study by Kraut et al. (this issue) reports that those individuals who are gregarious and friend-rich in their off-line lives and who use the Internet more also tend to become more involved in their communities than do those who are introverted. Although introverts and extraverts alike benefited from increased Internet use, with increases in their local and distant social circles and increased face-to-face communication with family and friends, introverts who used the Internet more reported increased loneliness. The authors suggest that it may be the case that the Internet allows the friend-rich to get richer. Our studies suggest that although the friend-rich indeed appear to become richer through their on-line interactions, the friend-poor also become richer than they had been. The socially anxious and the lonely individuals who expressed their true selves on-line formed close on-line relationships and integrated them into their off-line lives, increasing their social circles and becoming less socially anxious and lonely in the process.

Our findings of decreases in loneliness and depression and increases in the size of one's social circle after 2 years of Internet use appear to conflict with the conclusions of two studies widely reported in the media. In a press release, Nie and Erbring (2000) reported results from a survey of Internet users and concluded that Internet use causes people to spend less time with family and friends. However, the full report of the study showed that this conclusion was based upon only 4.3% of the total sample. That is, over 95% of Nie and Erbring's total sample did not report spending any less time with family and friends because of use of the Internet. Moreover, even among the heaviest Internet users, 88% reported no change in amount of time spent with family and friends. It is noteworthy that Kraut et al. (this issue) report that greater levels of Internet use are associated with the average respondent's spending more, not less, time in face-to-face interactions with family and friends.

Secondly, in the original HomeNet study tracking new Internet users, Kraut et al. (1998) reported small but significant correlations between the number of hours spent on-line per week and self-reported depression and loneliness scores. From this they concluded that Internet use causes people to become more lonely and more depressed. They also found that Internet use was associated with a reduction in the size of participants' social networks. However, a 3-year follow-up survey of the same participants (Kraut et al., this issue) showed that the originally reported negative effects had disappeared, and findings from a new sample showed overall positive effects of using the Internet on social involvement and psychological well-being. Thus the overall conclusion from the complete HomeNet study is that Internet use has no harmful effects on psychological well-being and that the size of one's social circle tends to increase as one makes friends on-line—findings entirely in harmony with our own.

It is evident from all of these findings that, rather than turning to the Internet as a way of hiding from real life and from forming real relationships, individuals use it as a means not only of maintaining ties with existing family and friends but also of forming close and meaningful new relationships in a relatively nonthreatening environment. The Internet may also be helpful for those who have difficulty forging relationships in face-to-face situations because of shyness, social anxiety, or a lack of social skills. What is more, to the extent that these virtual relationships become incorporated into and thus a part of the individual's identity and "true self," they tend to be brought into the person's traditional, face-to-face, real-life circle of friends and intimates. People, it would seem, want very much to make a reality out of the important aspects of their virtual lives.

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