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Conditional Strategies in Friend Selection

By

Jennifer Justine Arter

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## Abstract

### Conditional Strategies in Friend Selection

by

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Doctor of Philosophy in Psychology

University of California, Berkeley

Professor Lucia Jacobs, Chair

Many species employ conditional strategies for reproduction or survival. In other words, each individual “chooses” one of several possible phenotypes in order to maximize survival or reproductive advantage given the specific ecological niche (e.g., Moran, 1992). Humans seem to employ at least one conditional reproductive strategy; each individual chooses between a more short-term or a more long-term mating strategy (Gangestad & Simpson, 2000), and as with non-human animals, their choices relate in part to an assessment of their own traits (Belsky, 1997; Schmitt, 2005). However, the selection pressures that individuals of a species can exert on each other are not restricted to mate selection; they can arise from many forms of social interaction (West-Eberhard, 1983; Wolf, Brodie, & Moore, 1999). Evidence does suggest that individuals are sensitive to characteristics of the self, friend, and environmental conditions when choosing friends (Fehr, 1996; Rose, 1985; Verbrugge, 1977), and that a person’s economic, social, and environmental circumstances influence how they form and organize their friendships (Adams & Allan, 1998; Feld & Carter, 1998). Thus, in this dissertation I hypothesized that humans have evolved a coherent range of conditional friendship strategies: that we vary predictably in terms of the friendships we form, based on an assessment of our own traits, others’ traits, and our own current needs. I also hypothesized that individuals are able to perceive and detect reliable signals (Cronk, 2005; Searcy & Nowicki, 2005; Smith, 1994) of these strategies in others, enabling them to choose friends whose traits are most desirable to them.

In the Chapter 1, I proposed a continuum of individual differences in friendship strategy, anchored on one end by those who use friendships for exploration (e.g., skill-building and networking) and on the other end by those who use friendships for intimate exchange (e.g., emotional support and intimacy). I created and refined a measure assessing this continuum, and found that men tended to report a stronger exploration strategy than women. I also found that people who had a stronger exploration strategy also had a more short-term mating strategy and were more extroverted, and that people who had a stronger intimate exchange strategy reported themselves to be more kind and generous; these results remained when controlling for gender. However, friendship strategy did not relate to socioeconomic status,

age, attachment avoidance, relationship status, or presence of kin relationships. There was some evidence that friendship strategy was related to the number of friends an individual reported having and how close they felt to their friends.

The purpose of the study in Chapter 2 was to examine whether specific behaviors people displayed were related to their self-reported friendship strategy. I used videotapes of interactions between unacquainted participants, and hypothesized that people with a stronger exploration strategy would show behaviors that projected charisma, confidence, and social skills such as humorousness, whereas those with a stronger intimate exchange strategy would show behaviors that projected intimacy, compassion, warmth, and emotional availability. Results did not support this hypothesis; participants' friendship strategies generally did not relate to the behaviors that were assessed, which included gazing at the interaction partner, gesturing with the hands, laughing, and Duchenne smiles.

Further developing the ideas introduced in Chapter 2, the study described in Chapter 3 examined naïve viewers' reactions to the videotaped participants. I hypothesized that when asked to choose a hypothetical new friend from among the videotaped participants, viewers would detect signals of friendship strategy and would thereby choose someone whose self-reported friendship strategy more closely matched their own. Results did not generally support this hypothesis. However, findings did indicate that viewers might have been more uniformly influenced by signals of friendship strategy, as indicated by the finding that many viewers preferred videotaped participants with a stronger exploration strategy; this finding was stronger in men than in women.

Overall, the results of this series of studies suggest that people do characterize their friendship preferences along a continuum, and that these preferences do relate to personality and mating strategy, suggesting that this continuum may reflect a conditional strategy, with individuals "choosing" a friendship phenotype based on their own traits. However, there was not clear evidence of the reliable signals that might be necessary to help individuals use these conditional strategies effectively when actually choosing friends. It is possible that these signals were not detected because they do not arise in individuals' first interactions with each other.

This is the first research to study human friendship choice using the theoretical framework of conditional strategies, and it lays the foundation for new understandings of how humans form voluntary relationships. Future studies should attempt to discover whether reliable signals of friendship strategy emerge after repeated interpersonal interactions, or under different conditions of interaction, and they should include participants with a wider age range and more varied socioeconomic status. Despite their limitations, the studies in this dissertation propose and begin to test a novel theoretical framework for studying human friendship, and they suggest avenues for future work that should capitalize on the framework of evolutionary social psychology described here.

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## General Introduction

Many species show evidence of conditional reproductive or survival strategies. That is, there may be several possible phenotypes an individual could adopt, and the individual may “decide” upon a phenotype which is maximally advantageous given the conditions of the specific niche in which it finds itself (e.g., Moran, 1992). For this to work, the individual must be able to assess the niche, and their own traits relative to the niche (Gross, 1996; Stephens, 1987); importantly, this does not imply overt cognitive assessment or decisions by the individual. These conditional strategies can be “fixed,” meaning that the individual is shaped during ontogeny into a specific phenotype which is then stable in adulthood, or these strategies can be plastic, meaning that adults can move flexibly between alternative strategies as ecological conditions vary (Henson & Warner, 1997; Moore, 1991; Moran, 1992). For example, in many species of insects and fish, males choose between strategies of either fighting for and defending mates or sneaking matings, depending on their body size (Gross, 1996; Henson & Warner, 1997). In other species, the bigger, older, and/or otherwise preferred individuals can both secure mates and obtain extra-pair copulations (Gross, 1996; Henson & Warner, 1997).

Conditional strategies are sensitive to social and ecological context, including features such as population density and presence of predators (Gross, 1996). For example, male guppies are more likely to court females when predators are absent, but are more likely to attempt to coerce matings when predators are present; reciprocally, females will resist forced copulations in the former situation, but are more likely to accept them in the latter (Henson & Warner, 1997). Conditional strategies are often prominent in the context of mating and mate choice (Gross, 1996). Thus they are often the result of sexual selection pressure, which can result in extreme phenotypic traits as well as extreme phenotypic variation (Andersson, 1994; West-Eberhard, 2003). Such extreme variation is often seen, in particular, in social behaviors, which are often the most useful way to distinguish between two very similar species (Rice & Holland, 1997; West-Eberhard, 1983).

Humans appear to have developed conditional strategies with regard to choosing mates, in particular choosing between short-term and long-term mating strategies (Gangestad & Simpson, 2000). That is, individuals differ in the extent to which they seek out or will accept sexual activity in the absence of long-term commitment, as well as in their tendency to seek additional partners while in a committed relationship (Buss & Schmitt, 1993). Mating strategy choice seems to relate in part to characteristics of available partners, including their facial and body symmetry (an indicator of genetic quality), as well as indicators of partners’ caretaking ability and potential as a provider (Buss & Schmitt, 1993; Gangestad & Simpson, 2000). And as with non-human animals’ assessment of their own traits (e.g., body size), human mating strategy also appears to relate to individuals’ own somewhat stable preferences, as shaped in part via ontogenetic experiences and, likely, assessments of one’s own quality as a partner (Belsky, 1997; Schmitt, 2005). Indeed, there is evidence that the kinds of characteristics preferred in a mate are reliably related to one’s own characteristics. For example, those who prefer “kind and considerate” mates rate themselves higher on measures of emotional reliance and interpersonal dependency; and those who prefer “socially exciting” mates rate themselves higher on extroversion and public self-consciousness (Buss & Barnes, 1986). Thus humans appear to be evaluating both their own characteristics and the characteristics of their social



environment (e.g., partner quality) in deciding between conditional reproductive strategies. Again, this does not imply conscious decision-making with regard to reproduction, and appears to operate via mechanisms such as preferences for certain kinds of partners and greater or lesser willingness to engage in uncommitted sex with those partners (Gangestad & Simpson, 2000).

However, mating strategies are not the only arena of social interaction in which individuals can use conditional strategies. It has recently been recognized that sexual selection pressure on reproductive fitness is in fact a subset of a larger category of social selection pressures (West-Eberhard, 1983). In other words, the kinds of selection pressures that individuals of a species can exert upon each other are not restricted specifically to mate selection or mate competition; they may arise from any form of social interaction that has an effect on reproductive fitness (West-Eberhard, 1983; Wolf, Brodie, & Moore, 1999). Further, though social selection can result in increasingly competitive traits (e.g., resource competition), it can also result in increasingly cooperative traits, if those who are more cooperative gain some reproductive advantage over others (Frank, 2006; Trivers, 1971). It is likely that social selection pressure favoring cooperation has been a strong force during human evolution, and that such pressure has also resulted in humans' tendency to evaluate and choose relationship partners with whom cooperative interactions are likely to yield some kind of reproductive advantage (Alexander, 2006; Nesse, 2007; Trivers, 1971). (Note that "reproductive advantage" can be conferred in many ways, including for example protection or resource provision, and does not necessarily imply involvement in reproductive acts themselves. Nor does it imply any awareness by the individual of strategic decisions or the possibility that reproductive advantage could be gained on the basis of such decisions.)

If humans have evolved conditional mate-choice strategies as a result of sexual selection, then building upon the notion of social selection favoring the ability to choose helpful and cooperative partners, it is likely that we have also evolved conditional friendship strategies. In other words, we may vary predictably in terms of the kinds of friendships we form and the ways in which we use these friendships, as a function of some assessment of ecological conditions, including our own and others' traits as well as our own current needs.

Friendship appears to be a universal type of human social relationship (Fehr, 1996; Krappmann, 1996; Shackelford & Buss, 1996). As used here, friendship refers to bonds of affection and mutual liking formed between individuals who are not kin and not mating partners (Shackelford & Buss, 1996). However, beyond this, the definition of friendship can be a murky one. It is often defined via a number of characteristic attributes. Friendship is a specific bond between two (not more) individuals, in which no other can substitute (Buysse, Goldman, West, & Hollingsworth, 2008; Krappmann, 1996; Ladd, 2005), and in which there is a sense of equality between the friends (Allan, 1998). Friendships are voluntary and involve mutual affection, liking, and enjoyment (Buysse et al., 2008; Fehr, 1996; Hartup & Stevens, 1997). Friendships are also sometimes broken down into types, for example distinctions may be made between friends, good friends, and best friends (Buysse et al., 2008). Or friendships may be differentially characterized by their functions, for example specific things such as companionship, social comparison, affection, or instrumental assistance (Buysse et al., 2008), or more general distinctions such as informational assistance versus emotional support (e.g., Granovetter, 1982). The ability to reciprocate in providing benefits (of whatever kind is suitable

to a particular friendship) has been seen as a key feature in the maintenance of these relationships (Allan, 1998). Indeed, positive feelings about a friend are predicted both by the amounts of benefits one receives from a friend and by the amount one gives to that friend (Mendelson & Kay, 2003).

The fact that there are many different types of benefits that friends can exchange suggests that different kinds of friendships can serve different functions. This suggests that there may be conditional strategies involved in friend selection, and these should relate predictably to the needs of that individual. Little research has looked at friendships from an evolutionary perspective, exploring how they might fulfill fitness-related functions and whether evolution has favored a mechanism of conditional trade-offs between different, reliably discernible friendship selection strategies.

However, evidence does suggest that, as when choosing mating partners, individuals are sensitive to characteristics of the self, friend, and environmental conditions when choosing friends. People's friends tend to be similar to themselves in terms of characteristics such as age, gender, socioeconomic status, ethnicity, family background, and political or religious preferences, and these similarities tend to be strongest for one's closest friends (Fehr, 1996; Rose, 1985; Verbrugge, 1977). People are also more likely to form friendships with those with whom they are frequently in close proximity, for example those on the same floor of an apartment building, compared to those on other floors (Fehr, 1996). Proximity is especially important in predicting friendships between people who are otherwise dissimilar, for example in age or race (Fehr, 1996). Moreover, friends who live closer are more likely to consider each other best friends (Fehr, 1996). People also prefer to choose as friends those who have strong social skills such as nonverbal expressiveness, appropriate turn-taking in conversation, ability to initiate interactions effectively, and self-disclosure, as well as those who show interest in and responsiveness to oneself (Fehr, 1996). From an evolutionary perspective, both similarity and proximity could be considered signals of likely utility in reciprocal exchanges, and features such as social skills and responsiveness could be considered signals of the partner's intention and ability to reciprocate.

There is further evidence for individual differences in friendship choice. It has been demonstrated that an individual's circumstances, including economic, environmental, and social ones, influence the ways in which friendships are formed and organized (Adams & Allan, 1998; Feld & Carter, 1998). With regard to economic conditions, working-class men appear more likely to organize friendships around particular contexts or activities, whereas middle-class men tend to engage in broader ranges of activities with friends; this difference has historically been largest when the conditions of working-class life have been more difficult (Allan, 1998). Similarly, unemployed men tend to maintain less extensive friend networks (Allan, 1998). Allan (1998) argues that this is in part a consequence of the need to limit reciprocal commitments when individuals' resources are scarce. Economic context also influences the ways friendships are organized. People living in impoverished economic conditions, or who are unemployed, rely particularly strongly on resource exchange in friendships (Adams & Allan, 1998). And people in non-skilled jobs are more likely to maintain their closest friendships over time (Tampubolon, 2005).

Individuals also seem to choose friends who provide a good match to their social needs. For example, there is evidence that people vary with regard to how much they monitor others'

behavior and reactions to the self and mold themselves to these social circumstances, what has been termed self-monitoring (Gangestad & Snyder, 2000). People who are high self-monitors seem to prefer friends who are good at specific activities, and they seem to engage in specific activities mainly with those friends who are good at them. In contrast, those who are low self-monitors seem to prefer to choose friends based on overall liking of the person, and choose most-liked friends as activity partners, regardless of the friend's skill in that particular activity (Snyder, Gangestad, & Simpson, 1983). Though the concept of self-monitoring as a coherent personality trait has been debated (e.g., Briggs & Cheek, 1988; John, Cheek, & Klohnen, 1996), these findings are nevertheless an enticing example of the potential operation of conditional strategies in friendship choice.

Gender is also a variable that influences friendship choice. Men more than women prefer opposite-sex friends who are more sexually attractive, and women more than men prefer opposite-sex friends who are stronger and provide protection (Bleske-Rechek & Buss, 2001). These findings suggest that individuals assess their own needs in a variety of ways, and shape their friendship preferences accordingly. These tendencies and preferences may well reflect underlying benefits to reproductive fitness that friendships can provide.

Though these findings indicate apparently strategic individual differences in friend selection, it is not clear whether there are overarching, coherent and reliably discernible conditional strategies in friendship choice, as there are with regard to mating strategies. In this dissertation, I hypothesize that there are such coherent, overarching conditional strategies, that these will relate in predictable ways to aspects of individuals' circumstances and traits, and that individuals will be able to perceive and detect reliable signals of these strategies in others, which help them to choose friends whose strategies match their own and therefore whose traits are most desirable to them.

In Chapter 1, I propose a model of individual differences in friendship strategy that falls along a continuum, anchored on one end by those who use friendships for exploration (e.g., skill-building and networking) and on the other end by those who use friendships for intimate exchange (e.g., emotional support and intimacy). I describe the creation of a new measure assessing where an individual falls on this continuum, and present self-report data relating this measure to features of the individual and of his or her circumstances that might be expected to influence the choice of strategy. In Chapters 2 and 3, I explore whether and how individuals might be signaling these strategies to unacquainted interaction partners in the course of social interactions. In the studies described in Chapter 2 I use videotapes of interactions between unacquainted participants to examine whether specific behaviors they display are related to their self-reported friendship strategy, hypothesizing that signals of an exploration strategy will tend to project charisma, confidence, and social skills such as humorousness, whereas signals of an exchange strategy will tend to project intimacy, compassion, warmth, and emotional availability. In Chapter 3 I examine naïve viewers' reactions to these videos, hypothesizing that when asked to choose a hypothetical new friend from among videotaped strangers, viewers will tend to choose someone whose self-reported friendship strategy more closely matches their own. Finally, I conclude by discussing the implications of these studies and how they fit into the theoretical framework of evolutionary theory as it applies to social phenomena.

## Chapter 1: Conditional Strategies in Friendship Choice

### Introduction

Among the categories of intimate human relationships, friendship is unique in that it is the only one in which reciprocity is the single avenue by which individuals can obtain fitness benefits; in kin and mating bonds, individuals additionally share genetic interests (or potential genetic interests, in the case of mates without children). Accordingly, friendships are considered the most voluntary kind of relationship (Feld & Carter, 1998). There are a wide variety of possible benefits that friendships can provide, which can be placed within the general categories of emotional support, instrumental and informational assistance, and evaluative feedback (Bleske & Buss, 2000; Tardy, 1985). Such benefits have the potential to contribute to reproductive fitness in various ways, including the provision of resources, facilitation of other beneficial social relationships including reproductive ones, physiological benefits such as stress reduction, and assistance in the development of skills (social or otherwise) which in turn facilitate better acquisition of other resources.

There is evidence that friendship can provide all of these benefits. For example, children who are friends are better able to cooperate in order to maximize each individual's access to a scarce resource (Hartup, 1996), and children produce better-quality schoolwork when working with friends compared to when working with non-friends (Hartup & Stevens, 1997; Newcomb & Bagwell, 1996). Children will also explore an unfamiliar room or toy more readily when in the presence of a friend (Hartup, 1996; Ladd, 2005), and will tend to form "alliances" with friends against non-friends (Ladd, 2005). Children with friends tend to develop better social skills over time, facilitating further fruitful social relationships (Hartup & Stevens, 1997; Ladd, 2005; Lindsey, 2002; Sebanc, 2003). In adults, friends can facilitate introductions to, and information about, new social contacts including potential mates (Bleske & Buss, 2000; Bleske & Shackelford, 2001) or the opposite sex in general (Bleske & Buss, 2000), and they can provide protection, companionship, social status, and of course concrete resources such as food (Bleske & Buss, 2000; Fehr, 1996). Friendship also contributes to physical and mental health; those who have more friends tend to live longer (Berkman & Syme, 1979; Fehr, 1996), have lower rates of hypertension (Uchino, Cacioppo, & Kiecolt-Glaser, 1996), lower rates of depression when assessed longitudinally (Hartup & Stevens, 1997), and higher levels of self-esteem and subjective well-being (Hartup & Stevens, 1997; Siebert, Mutran, & Reitzes, 1999).

Given this wide range of potential benefits, and the wide latitude an individual often has in choosing friends (Fehr, 1996; Feld & Carter, 1998; Krappmann, 1996), friend selection is a prime area in which conditional strategies might be operating. It seems likely that individuals would have a tendency to choose friends whose characteristics match their own needs, particularly their social needs. How these conditional strategies might operate, however, is a complicated question. As described in the literature on conditional strategies in other species, assessment of one's own needs is an important element of conditional strategies (e.g., Gross, 1996). Another is assessment of current environmental conditions (Moran, 1992; Stephens, 1987). In the case of human friendship, specific characteristics in each of these areas that are likely to influence a conditional friendship strategy include features of oneself such as one's own personality and age, as well as features of one's social and nonsocial environment, such as socioeconomic status, relationship status, and the availability of kin relationships. It is probable

that individuals' friendship choices, mate-selection choices, and kin availability are mutually influential: individuals may make choices in each domain contingent upon circumstances in the other two, including presence and quality of partners or potential partners in each domain.

In the current study, a specific set of hypotheses about conditional friendship strategies, and the traits and circumstances that should influence these strategies, was proposed. It was hypothesized that individuals would show evidence of conditional friendship strategies that would fall along a continuum. At one end of this continuum would be individuals who are using friendships primarily for exploration. That is, they are currently using friendships to build skills (social or otherwise), develop social networks, and find reproductive partners. These individuals would have greater numbers of friends, but feel less closeness with each friend, they would have a shorter average duration for each friendship, and they would spend less time with each friend. They would also tend to have friends who they see as good networking partners (i.e., see them as socially skilled, successful, and outgoing) and who tend to give them support with practical or social problems. This kind of social strategy is similar to Granovetter's (1973) concept of "the strength of weak ties" and Oishi and Kesebir's (2012) concept of a "broad, shallow" networking strategy. At the other end of the continuum would be individuals who are using friendships primarily for intimate exchange. That is, they are currently using friendships to provide stability, support, emotional intimacy, and reciprocal exchange. These individuals would have fewer, closer friendships of longer duration, and would spend more time on average with each friend. They would also tend to have friends who they see as kind and generous, and who tend to give them emotional support. This kind of social strategy is similar to Oishi and Kesebir's (2012) idea of a "narrow, deep" networking strategy. It was hypothesized that these would not be discrete categories; instead, individuals would fall along a continuous spectrum ranging between these two extremes.

It was further hypothesized that individuals are strategically "choosing" these friendship strategies to meet certain needs, and thus that these strategies would relate to a number of aspects of individuals' circumstances and personal characteristics. Regarding the exploration friendship strategy, there were a number of specific predictions. First, it was predicted that people engaging in an exploration-related friendship strategy would be more likely to be extroverted and describe themselves as socially exciting; individuals with such traits should seek out relationships with other socially exciting people, as a way of maximizing their social strengths. This is suggested in research on mate selection: individuals who are more extroverted tend to prefer mates who are more socially exciting (Buss & Barnes, 1986).

Second, it was predicted that individuals with a stronger exploration strategy would be more likely to be engaged in or more open to short-term mating strategies, as suggested by findings indicating that both a short-term mating strategy (Gangestad & Simpson, 2000) and extroversion (Pound, Penton-Voak, & Brown, 2007) relate to higher facial symmetry, suggesting that both preferences may be aspects of a conditional strategy that is influenced by an accurate assessment of one's own attractiveness or health. Engaging in an exploration friendship strategy would aid these individuals in meeting a larger number of potential romantic and sexual partners, as suggested by findings indicating that one of the functions of opposite-sex friendships is to gain sexual access to the friends themselves (Bleske & Buss, 2000; Bleske-Rechek & Buss, 2001).

Third, those with a stronger exploration strategy would be more likely to have a higher-socioeconomic-status (higher-SES) background; such individuals will have the resources to invest in numerous social contacts and frequent social activities (e.g., Harrison, 1998). Indeed, research suggests that when interacting with strangers, higher-SES individuals are more likely to dominate conversations and engage less intimately with partners, and they also tend to self-report higher levels of extroversion (Kraus & Keltner, 2009), traits that are hypothesized to be related to an exploration strategy.

Fourth, those with a stronger exploration strategy would be younger; younger people will have a greater need to develop skills, explore the social environment, and grow new relationships (e.g., Carstensen, 1992), all of which are functions that a large network of socially skilled and socially exciting individuals would be likely to provide.

Fifth, those with a stronger exploration strategy would be less likely to have a current exclusive romantic relationship, and would have more kin nearby, or would be more close with and spend more time with kin. From an evolutionary perspective, romantic, kin, and friend relationships can provide very similar sets of benefits (Bleske & Buss, 2000; Shackelford & Buss, 1996; Tardy, 1985); indeed, in some research traditions all three are lumped into the single category of “communal relationships” (Clark & Mills, 1993; Fiske, 1992). But because friendships are the most voluntary type of relationship (Feld & Carter, 1998), it is likely that individuals “fill in” needs not being met in other relationships by seeking out friends who can do so. There is evidence of this; for example, when romantic partners provide less emotional support, women seek it out from friends instead (e.g., Harrison, 1998). And individuals who are not in a romantic relationship, more so than those in relationships, report that providing protection is a more important function of friends (Bleske-Rechek & Buss, 2001). Friends are also perceived as providing indispensable support upon loss of a romantic relationship (Harrison, 1998). An exploration strategy would also aid non-partnered individuals in meeting potential new partners; findings suggest that individuals indeed use opposite-sex friendships to meet and gain information about potential mates (Bleske & Buss, 2000; Bleske-Rechek & Buss, 2001). There is also evidence of trade-offs between kin relationships and friendships: people who are more involved in kin relationships tend to participate less in non-kin friendships (Adams & Allan, 1998). It was thus hypothesized that individuals with more close kin would have less need to rely on friendships for support and intimacy, and would pursue friendships that fulfill more exploration-related functions.

Sixth, those with a stronger exploration strategy would have a more avoidant attachment style; such individuals are less comfortable with emotional closeness (Mikulincer & Shaver, 2007; Simpson, 1990) and thus may pursue this friendship strategy in order to avoid intimacy. Such a strategy would be in keeping with more avoidant individuals’ tendency to report feeling less closeness and less positive emotion in their romantic relationships (Feeney & Noller, 1990; Hazan & Shaver, 1987), and less distress upon losing a romantic relationship (Simpson, 1990). Research on attachment has focused primarily on romantic and parent-child relationships; if supported, the current hypothesis would add detail regarding how attachment style influences interactions within a third major category of relationships, friends.

On the opposite end of the spectrum, it was hypothesized that engaging in a strategy of intimate exchange friendships would be associated with essentially the opposite suite of situational variables and individual traits. First, it was hypothesized that individuals engaging in

intimate exchange friendships would be more likely to also be oriented toward long-term mating strategies, and would be more likely to be involved in long-term romantic relationships. These individuals would have less need to meet new mating partners. They might also be more oriented toward establishing lasting relationships which could aid in the rearing of offspring (as suggested in findings indicating that men who wanted children preferred wives who were more warm and nurturing, Buss & Barnes, 1986; a similar result with regard to friends would not be surprising). And they may be more oriented toward intimate friendships that could help them develop the kinds of social skills useful in rearing young, such as caretaking and successfully navigating intimate bonds.

Second, these individuals would be more likely to see themselves as kind, warm, and generous; individuals who tend to be more kind and generous are likely to seek out relationships with others who are similar to themselves on these traits, thereby maximizing the fitness benefits they can obtain by engaging in close reciprocal relationships with kind and generous others. This is suggested by the finding that individuals who rate themselves higher on traits such as interpersonal dependency prefer mates who are more kind and considerate (Buss & Barnes, 1986); again, a similar finding with regard to friendships seems likely.

Third, those with a stronger intimate exchange strategy would be more likely to have a lower-SES background; such individuals may tend to limit their numbers of reciprocal commitments because of a need to manage limited resources (Allan, 1998), especially given that low-SES individuals tend to rely on friends for resource exchange particularly strongly (Adam & Allan, 1998). Indeed, lower-SES individuals are more likely to display signs of engagement (e.g., laughing and nodding) when interacting with strangers (Kraus & Keltner, 2009); these signs of warmth and kindness are hypothesized to indicate a stronger intimate exchange strategy.

Fourth, those with a stronger intimate exchange strategy would be older; older people are likely to have less need for skill development and the meeting of new relationship partners. And as with individuals in long-term relationships, older individuals may similarly prefer more intimate friendships that may be more helpful in rearing young. Indeed, people do tend to desire more stable and intimate relationships as they get older (Carstensen, 1992).

Fifth, those with a stronger intimate exchange strategy would have fewer kin nearby, or would be less close with and spend less time with kin; these individuals would have more need to seek out intimate relationships with friends, as suggested by the findings of Adams and Allan (1998) that those who have fewer kin relationships tend to engage more in friendships.

Sixth, these individuals would have a less avoidant attachment style; they would be more comfortable with intimacy (Mikulincer & Shaver, 2007) and thus would not specifically avoid a friendship strategy that focuses on developing emotionally intimate friendships.

## Method

### Participants

Data were collected from two separate samples of participants; these two groups completed two somewhat different sets of surveys, as described below. The first consisted of 149 undergraduate students (75 women, 73 men, and 1 reported another gender identity). Reported ethnicity of these participants was as follows: 77 Asian/Pacific Islander, 42 White, 13 mixed ethnicity, 9 Latino/a, 2 African American, and 6 reported other ethnicities. Participants'

average age was 20.7 ( $SD = 2.7$ ), with a range of 18 to 36. The average family income was 4.32 ( $SD = 2.42$ ) on an 8-point scale; a score of 4 corresponds to an average income of between \$76,000 and \$100,000 a year. Reported highest level of education for either parent averaged 5.08 ( $SD = 2.15$ ) on a 7-point scale; a 5 indicated a Bachelor's degree.

The second sample consisted of 158 undergraduate students (93 women and 65 men). There were significantly more women than men in this sample,  $X^2(1) = 4.96, p = .026$ . Reported ethnicity for this sample was as follows: 85 Asian/Pacific Islander, 36 White, 16 mixed ethnicity, 9 Latino/a, 2 African American, and 7 reported other ethnicities. Participants' average age was 20.2 ( $SD = 2.6$ ), with a range of 18 to 43. The average family income was 4.33 ( $SD = 2.28$ ) on an 8-point scale. Reported highest level of education for either parent averaged 5.10 ( $SD = 1.96$ ) on a 7-point scale. Because there were more women than men in the second sample, for all analyses in which gender was a predictor, statistics were run on both the sample as a whole and on a sample in which the last 10 female respondents had been removed. This removal resulted in a statistically equal number of male and female participants,  $X^2(1) = 2.19, p = .14$ . Unless otherwise noted, statistics are for the sample as a whole.

## Materials

To measure individuals' friendship strategy, a new measure was created: the Friendship Strategies Survey (FSS). The questions in this survey were designed to assess where an individual falls on a continuum between the exploration and the intimate exchange friendship strategies. The instructions ask participants to think about "the kind of person who would be an ideal friend for you," and each question asks the participant to decide between one exchange-related versus one exploration-related feature of an ideal friend, on a 6-point rating scale (participants are not allowed to rate the two features as equally important). Participants can indicate that they "greatly prefer," "somewhat prefer," or "prefer a little" each item in a pair, over the other. The 19 pairs of items originally included in this measure can be found in Table 1. (The final measure created as a result of analyses on these two samples, and used in the following two chapters, can be found in Table 8.) In the actual measure as seen by participants, half of the items are reversed, such that half of the exploration-related items appear as the left-side option, and half appear as the right-side option.

In the second sample, in order to refine the FSS, the items presented on each side of each question were presented to participants individually, and participants rated how important each one would be in a new "ideal friend," on a 7-point Likert scale ranging from "not at all important" to "extremely important." In this second sample, participants also used a rating scale in which they were able to allocate a limited budget (\$60) among all of the traits, with each trait being stronger or weaker depending on the amount money they spent on it (Li, Bailey, Kenrick, & Linsenmeier, 2002). This latter rating scale was not used in the current analyses, because it was included as an exploratory measure and did not prove helpful in refining the FSS. Participants in the second sample also completed the original, 19-question, paired-items version of the measure; they completed the paired-items version first, followed by the single-item ratings and then the budget-allocation measure.



Table 1

*Factor Loadings of the Friendship Strategy Survey Items Created for the First Sample*

	Factor loadings <sup>a</sup>			
	3-factor solution		2-factor solution	
Easygoing/adaptable OR Intellectually stimulating	.572			.552
Socially exciting OR Kind/considerate		.700		.696
Likes children OR Financially successful	.486		-.365	.450
Caring/warm OR Shares your interests	.456		-.437	.412
Quick-witted OR Thoughtful/wise		.447	-.304	.398
Relaxed/laid-back OR Socially poised	.399		.316	.401
Adventurous OR Responsible		.591		.607
Empathic OR Charismatic	.675			.675
Help you get things done OR Express concern for your well-being	.346	.351		.389
Be a good confidante OR Teach you how to do something	.727			.731
Introduce you to or help you meet people OR Give you physical affection or comfort		.625		.631
Spend time with you one-on-one OR Organize or invite you to parties/events		.498		.477
Be fun and engaging OR Keep your important matters private		.442	.570	.529
Understand your feelings OR Give you important information	.746			.748
Give you good advice OR Listen to you without judgment			.486	
Express their deep feelings OR Introduce you to new activities	.526	.314	.309	.563
Come to you for practical advice OR Tell you their secrets	.374		.543	.426
Rely on your kindness and empathy OR Rely on your knowledge and skill	.716			.700
Ask you for help getting things done OR Come to you for affection and comfort	.391	.505		.424
				.483

*Note.* Participants were asked to rate which of each pair they would prefer in an ideal friend, on a 6-point scale. Items were coded such that low scores indicated an exchange strategy.

<sup>a</sup>Loadings less than .30 are not shown.

To test the hypotheses regarding the traits and life circumstances that were hypothesized to relate to each friendship strategy, participants also completed a number of self-report measures. First, participants completed a set of measures assessing the features of their friendship networks that were predicted to relate to their friendship strategy, detailed in the following paragraphs.

Participants answered questions about their current friendships: how many friends they had, how many of these lived close enough to see regularly, how many years the participant had had each of the two oldest friendships, how emotionally close the participant felt to his or her friends in general, and how many hours per week the participant spent with his or her friends, in aggregate. Participants were asked to use the following definition: "Think of 'friends' as people with whom you have a current, mutual bond that you both consider to be a friendship. Do not include old friends you haven't talked to in a long time, relatives, current romantic partners, or people you consider to be acquaintances rather than friends."

Participants completed individual ratings of the importance of various traits in an "ideal friend" on a 7-point Likert scale ranging from "not at all important" to "extremely important." These traits included items that should describe individuals closer to each end of the friendship strategies continuum. Characteristics that were hypothesized to describe an intimate exchange friendship included kind/considerate, domestic/home-oriented, likes children, easygoing/adaptable, and sharing/generous. Characteristics that described an exploration friendship included socially exciting, intellectually stimulating/witty, and financially successful. Filler items included politically conservative and physically attractive. These characteristics were taken from those used in previous studies of friend and mate preferences (Bleske & Buss, 2000; Bleske-Rechek & Buss, 2001; Buss & Barnes, 1986; DeKay, Buss, & Stone, 1998, as cited in Bleske-Rechek & Buss, 2001).

Participants reported on the number of male and female acquaintances (i.e., "acquaintances: people you do not consider to be friends") they had on a 7-point Likert scale ranging from "0-50" to "more than 150." They reported on the number of Facebook friends (or other networking site contacts) they had on an 8-point Likert scale ranging from "0-100" to "more than 700," and they reported the amount of time per week they spent with acquaintances overall on a 7-point Likert scale ranging from "less than 1 hour" to "more than 30 hours."

Participants answered three brief open-ended questions regarding their favorite activities to do with friends; the things they most liked to talk about with friends; and how they judged whether a new person could be a friend, what interested them in a potential friend. These responses were not used in the current analyses, because they were exploratory in nature and were not direct tests of the hypotheses of the study, however results stemming from these measures can be found in Arter, Lee, Park, Partida, Vu, and Jacobs (2012).

Participants reported on the amount and types of emotional and instrumental support or assistance received from their friends as a group, on a 7-point Likert scale ranging from "never" to "very often." (These items were included only for the second sample.) These items were selected from the Inventory of Socially Supportive Behaviors (Barrera, Sandler, & Ramsay, 1981) and the Social Support Questionnaire (Sarason, Levine, Basham, & Sarason, 1983). Specifically, they rated how often their friends gave them the following types of support: "Gave you information on how to do something, or how to understand a situation you were in;"

“Keeps the things that you talk about private: just between the two of you;” “Comforted you by showing you some physical affection;” “Introduced you to, or helped you meet, other people you wanted to know;” “Expressed interest and concern in your well-being;” and “Pitched in to help you get something done.” Participants also had the opportunity to write in other kinds of support, but these open-ended responses were not used in the current analyses. This brief measure of social support was drawn from the social support literature, rather than from benefits questionnaires devised for other evolutionary psychology studies of human friendships (e.g., Bleske & Buss, 2000), because the former measures are backed by a large body of research indicating their predictive power for fitness-related outcomes such as physical health and longevity (e.g., Berkman & Syme, 1979; Cohen & Syme, 1985; Sarason & Sarason, 2001). Specific items were chosen that reflected benefits more likely to be valued by individuals at each end of the friendship strategies spectrum; items regarding physical comfort, privacy, and concern should be of more interest to those with an intimate exchange strategy, and items regarding information, introductions, and getting things done should be of more interest to those with an exploration strategy.

Second, participants completed a set of measures assessing the social conditions that could influence a participant’s friendship strategy, detailed in the following paragraphs.

Participants answered questions about their kin relationships, including open-ended responses of how many relatives they interacted with regularly and how many of these lived close enough to see regularly, as well as reporting on how emotionally close they felt to their relatives as a group, on a 7-point Likert scale ranging from “not close at all” to “extremely close,” and how many hours per week they spent interacting with relatives, on the same 7-point scale as that used for acquaintances.

Participants reported on their relationship status, specifically whether or not they were in a long-term romantic relationship or any short-term romantic/sexual relationships. If participants answered in the affirmative, they were asked to answer the following questions about each romantic or sexual partner: how much time they spent with the partner (on the same 7-point scale as that used for acquaintances), the length of the relationship in an open-ended response format, whether the partner lived close enough to see regularly, and how emotionally close they felt to the partner, on the same 7-point scale as that used for kin. They also reported on their partner’s age and gender, and whether they had had sex or had children with the partner.

Participants reported on the characteristics of their current romantic partner (if they had more than one, they reported on their primary partner); these were the same characteristics as those answered regarding the “ideal friend” (i.e., kind/considerate, etc.). If participants reported having no current romantic relationships, they answered these questions regarding their ideal romantic partner.

Participants reported on the amount and types of emotional and instrumental support or assistance received from their primary romantic partner, or if they did not have a current partner, the support they would receive from an ideal partner. These were the same social support items as those completed regarding support from friends.

Third, participants completed a set of measures assessing individual traits that could influence or be influenced by an individual's friendship strategy, as well as basic demographic information, detailed in the following paragraphs.

Participants reported on their own age in an open-ended response format, their gender (participants could choose male, female, neither, transgendered FTM, transgendered MTF, intersex, genderqueer, or other), their ethnicity (participants could choose as many as applied from the following categories: American Indian / Alaska native, Asian / Native Hawaiian / other Pacific Islander, Black / African American, Hispanic / Latino/a, White, or Other, and could fill in an open-ended response for Other), and their sexual orientation (participants could choose heterosexual/straight, homosexual/gay/lesbian, bisexual, asexual/nonsexual, non-heterosexual/queer, unsure/questioning, or other / prefer not to say).

Participants reported on their family of origin's socioeconomic status (SES), specifically, their family's income level on an 8-point Likert scale ranging from "\$25,000 or less" to "\$175,000 or more" and the highest level of education attained by either parent, on a 7-point Likert scale ranging from "less than high school" to "post-graduate degree."

Participants reported on their preference for a short- vs. long-term mating strategy, by completing the Revised Sociosexual Orientation Inventory (RSOI; Penke & Asendorpf, 2008). This scale contains nine items assessing three dimensions of sociosexual orientation: past behavior, attitude, and desire. Past behavior questions are answered in an open-ended format (e.g., "with how many different partners have you had sex in the past year?") and the remaining questions are answered on 7-point Likert scales (e.g., "sex without love is ok.")

Participants rated themselves on the same set of characteristics that they used to rate their ideal friend and current romantic partner (i.e., kind/considerate, etc.), using the same 7-point Likert scale.

Participants rated themselves on a 10-item measure of the Big Five personality dimensions (Gosling, Rentfrow, & Swann, 2003), rating how well each item described themselves on a 7-point Likert scale ranging from "not at all" to "extremely."

Participants rated their own attachment style, according to a 3-item measure in which they assessed their own similarity to descriptions of a secure style, an avoidant style, and an anxious style (Mikulincer, Florian, & Tolmacy, 1990), again on a 7-point Likert scale.

Finally, participants directly compared the importance in their lives of their friendships, romantic relationships, and kin relationships, by indicating what percentage of importance they would allocate to each of these categories. This measure was exploratory and was not used in current analyses.

## Procedure

Undergraduate participants were recruited from Psychology classes via a centralized, online recruiting system, and were given course credit in exchange for participation. Participants completed all surveys online.

## First Sample: Results

### Friendship Strategy Survey

First, the FSS was examined. Scores had been recorded such that responses on the far left received a score of 1, while those on the far right received a score of 6. Therefore all the

items for which the exchange-strategy option appeared on the right were reverse-coded, so that a low score would indicate an intimate exchange preference and a high score would indicate an exploration preference. Every item on the measure elicited scores ranging from 1 to 6, and average scores all tended to fall near the center of the range, with very similar standard deviations. The lowest mean score for a single item was 2.55 ( $SD = 1.51$ ) and the highest mean score was 3.93 ( $SD = 1.52$ ). Standard deviations ranged from 1.32 to 1.74.

Because good variability was found for every item, all items were included in a principal components factor analysis, to determine how the items related to each other. Direct oblimin rotation (with Delta set to the default value of 0) was used, because the survey was written with a single underlying dimension in mind and thus responses for all items were expected to be related rather than forming orthogonal dimensions (Field, 2005). The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy for this analysis was .72, indicating that interrelations between survey items were more than adequate for factor analysis (Kaiser, 1974, as cited in Field, 2005; values over .5 are considered adequate, while those over .7 are considered good). Bartlett's test of sphericity was highly significant ( $p < .001$ ), indicating that there were enough relationships between the items for factor analysis to be valid (Field, 2000). The determinant of the correlation matrix was .008, indicating that the data did not have excessive multicollinearity (values above .00001 are considered adequate; Field, 2000). The first factor analysis resulted in six factors with eigenvalues greater than 1. A scree plot indicated that a two-, three-, or four-factor solution might be appropriate; the first four factors accounted for 21.8%, 12.0%, 7.9%, and 6.5% of the variance, respectively. Thus factor analyses were run specifying each of these solutions, but the four-factor solution failed to converge in 25 iterations. Factor loadings for the two- and three-factor solutions can be found in Table 1.

An examination of the results of these two analyses led to the removal of four items that loaded fairly equally, and relatively weakly, on more than one factor in both the two- and three-factor solutions: "express deep feelings vs. introduce new activities," "help you get things done vs. express concern for your well-being," "give you good advice vs. listen without judgment," and "ask you for help getting things done vs. come to you for affection/comfort." The remaining items were subjected to another factor analysis, without constraining the number of factors. In this analysis, KMO was .725, Bartlett's test of sphericity was again at  $p < .001$ , and the determinant of the correlation matrix was .039. This analysis resulted in four factors with eigenvalues greater than 1, accounting for 22.8%, 14.4%, 9.2%, and 7.2% of the variance, respectively. The scree plot again suggested a three-factor solution, and the fourth factor consisted mainly of lower loadings of items that loaded more highly on one of the other three factors. The analysis was thus constrained to a three-factor solution, which again resulted in a third factor that consisted mainly of items that loaded more strongly on other factors. Therefore the final factor analysis was constrained to a two-factor solution. This analysis finally resulted in two clean factors, with each item loading more strongly on one factor or the other (Table 2). A component plot showed two clear groupings of items (Figure 1). Though each factor had one item with a factor loading of less than .40, these items fit into the factor conceptually, and removing them only marginally increased the percent of variance accounted for by each factor; thus both were retained in their respective factors. The items in the first factor describe an ideal friend who is either "warm, easygoing, and a confidante" or "successful, intelligent,

stimulating, and poised.” The items in the second factor describe an ideal friend who is either “kind, affectionate, and responsible” or “fun, exciting, outgoing, and adventurous.”

Table 2

*Factor Loadings of the Friendship Strategy Survey Items in the Second Analysis, with Four Items Removed*

	Factor loadings <sup>a</sup>		
	3-factor solution		2-factor solution
Easygoing/adaptable OR Intellectually stimulating	.561	.371	.593
Socially exciting OR Kind/considerate	.782		.766
Likes children OR Financially successful	.578	-.373	.504
Caring/warm OR Shares your interests	.530	-.399	.449
Quick-witted OR Thoughtful/wise		-.503	.389
Relaxed/laid-back OR Socially poised	.366	.562	.444
Adventurous OR Responsible	.660		.644
Empathic OR Charismatic	.640		.654
Be a good confidante OR Teach you how to do something	.720		.733
Introduce you to or help you meet people OR Give you physical affection or comfort	.568		.595
Spend time with you one-on-one OR Organize or invite you to parties/events	.519		.522
Be fun and engaging OR Keep your important matters private	.602	.305	.505
Understand your feelings OR Give you important information	.725		.736
Come to you for practical advice OR Tell you their secrets		.525	.383
Rely on your kindness and empathy OR Rely on your knowledge and skill	.730		.722

*Note.* Participants were asked to rate which of each pair they would prefer in an ideal friend, on a 6-point scale. Items were coded such that low scores indicated an exchange strategy.

<sup>a</sup>Loadings less than .30 are not shown.

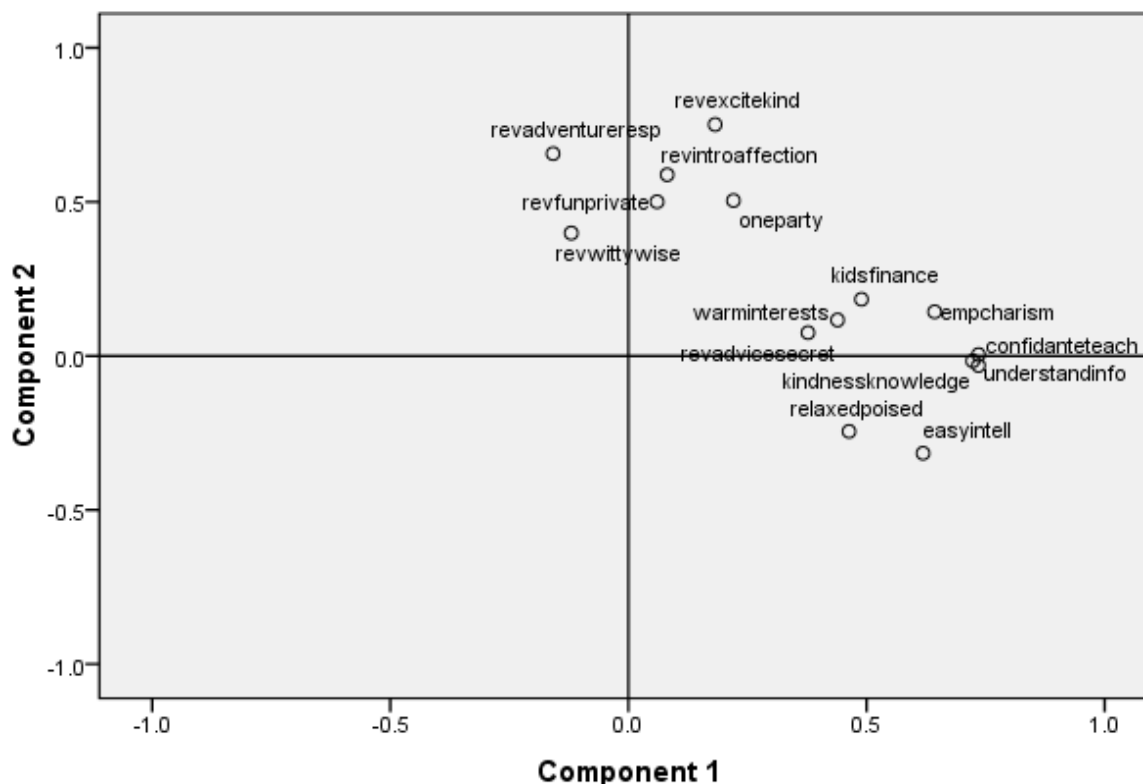


Figure 1. Forced two-factor solution for the Friendship Strategy Survey, after removing four items based on previous factor analyses. Principal components analysis, with Direct oblimin rotation ( $\Delta = 0$ ).

Two subscale scores were created by taking the mean score on the subset of items loading on each factor. Cronbach's alpha for the first factor was .761, and for the second factor was .610. The mean score for the first factor was 3.16 ( $SD = .88$ ), and for the second factor was 3.36 ( $SD = .92$ ). The distributions of both sets of scores approximated a normal distribution (Figures 2 and 3). However, because the two factors remain conceptually similar, remain relatively close in space in a component plot (see Figure 1), and were all created with a single underlying dimension in mind, a single score was also calculated, using all 19 of the items in the questionnaire, including those ultimately left out of the final two-factor solution. Cronbach's alpha for this composite scale was .773. The mean score for this overall scale was 3.24 ( $SD = .69$ ), and the distribution of scores also approximated a normal distribution, though it was somewhat more leptokurtic than the two factor scores (Figure 4). Because one of the main goals of the current study was to create a valid measure of individual preferences for exploration or exchange relationships, the hypotheses of the study were tested using both versions of this measure, as a way of comparing them.

Scores on the FSS differed by gender, for both factor scores as well as the overall mean score: men reported higher scores on each of the three scales. (Factor 1: mean for men: 3.33,  $SD = .89$ ; mean for women: 3.00,  $SD = .86$ ;  $t[145] = 2.28$ ,  $p = .024$ . Factor 2: mean for men: 3.58,  $SD = .90$ ; mean for women: 3.14,  $SD = .90$ ;  $t[146] = 2.98$ ,  $p = .003$ . Total score: mean for men: 3.44,  $SD = .69$ ; mean for women: 3.05,  $SD = .63$ ;  $t[144] = 3.63$ ,  $p < .001$ .) Therefore, in subsequent analyses, gender was controlled for when necessary.

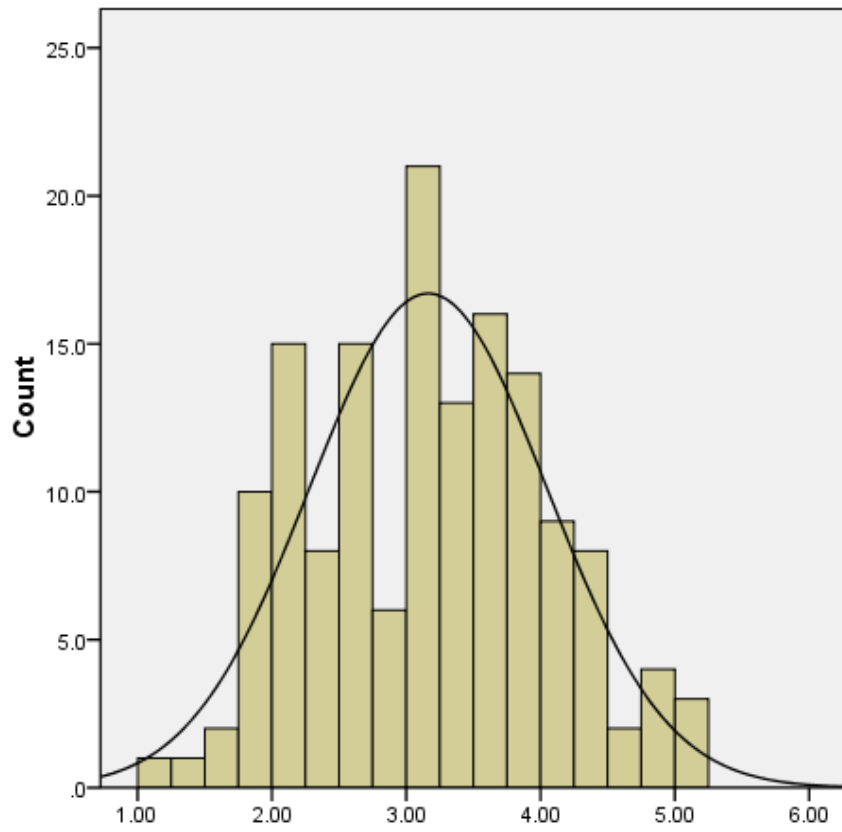


Figure 2. Distribution of mean scores for the first factor of the Friendship Strategy Survey.



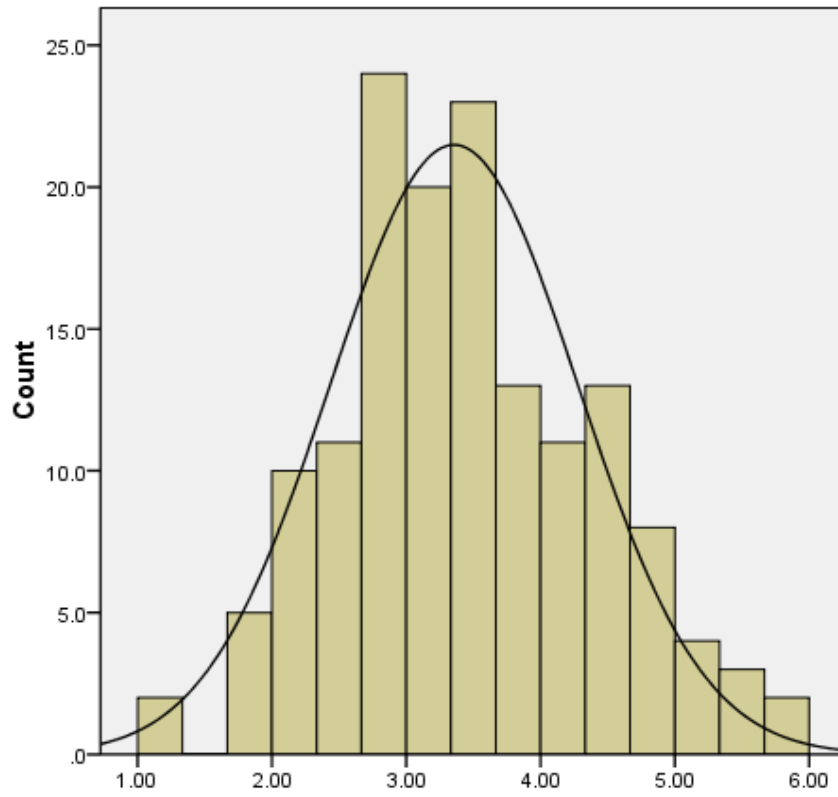


Figure 3. Distribution of mean scores for the second factor of the Friendship Strategy Survey.

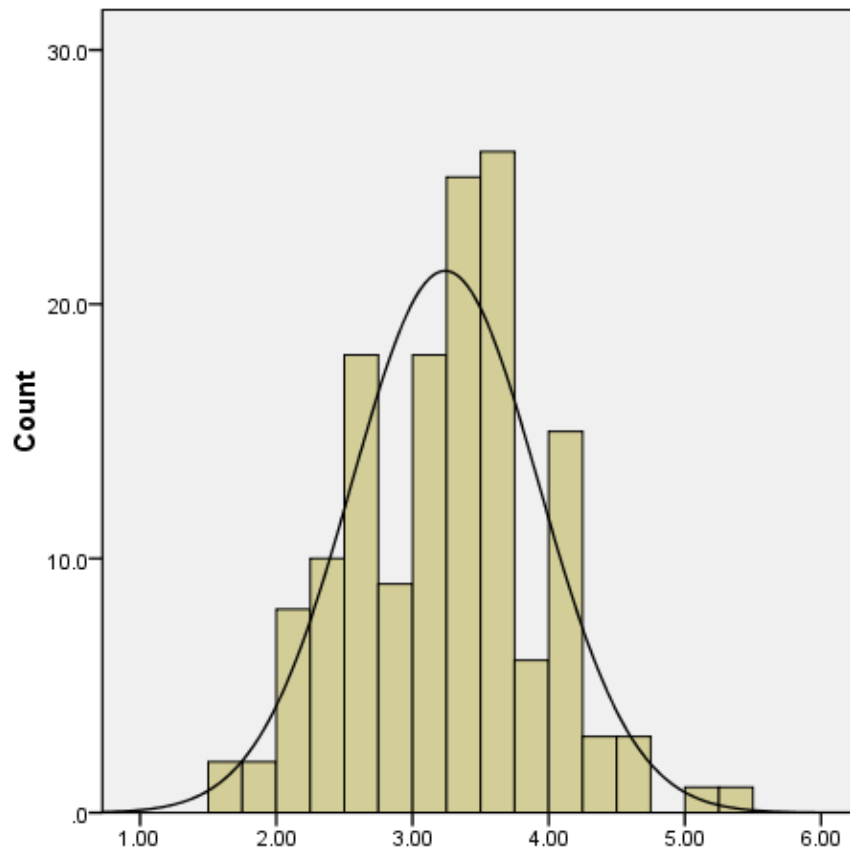


Figure 4. Distribution of mean scores for all items on the Friendship Strategy Survey.

#### Features of the Friendship Network

The hypotheses for the first set of variables, features of the friendship network, included the idea that an exploration strategy would be related to characteristics of having more friends, less closeness with friends, shorter friendships, and less time spent with friends, while an intimate exchange strategy would be related to characteristics of having fewer friends, more closeness with friends, longer friendships, and more time spent with friends. Results for each of these hypotheses are presented individually below.

*Number of friends.* The mean number of friends reported was 36.2 ( $SD = 64.7$ ; some individuals reported a very large number of friends). Male and female participants did not differ in the number of friends reported. The correlation between the first friendship style factor and number of friends approached significance:  $r(148) = .15, p = .07$ . Correlations for the second factor and the total friendship strategy score were not significant, indicating that overall, those with a stronger exploration strategy did not report having more actual friends.

*Closeness to friends.* Participants reported on how close they felt to all of their friends, considered as a group, on a 1-7 scale. The average score on this scale was 5.26 ( $SD = 1.15$ ). There was a trend for female participants to report somewhat higher closeness (mean = 5.43,  $SD = 1.15$ ) than male participants (mean = 5.04,  $SD = 1.13$ ),  $t(146) = 1.91, p = .059$ . Scores on this scale did not correlate significantly with FSS scores; this is perhaps not surprising given the high mean score on this scale.

*Length of friendships.* Participants reported on the length in years of their two longest friendships. These were averaged into a single score, with a mean of 10.4 years ( $SD = 4.36$ ). Men reported having longer friendships (mean = 11.2,  $SD = 4.4$ ) than women (mean = 9.7,  $SD = 4.3$ ),  $t(145) = 2.10, p = .038$ . The length of friendships did not correlate significantly with any of the FSS scores.

*Time spent with friends.* Participants reported on the number of hours per week spent with friends, on a 1-7 scale. The average score on this scale was 3.70 ( $SD = 1.60$ ); scale point 4 corresponded to 13-18 hours per week. Men and women didn't differ on this variable. This score was not significantly correlated with any of the FSS scores.

*Intercorrelations among friend variables.* The intercorrelations of the above variables were also examined. Three of the six correlations were significant: Mean length of friendships correlated positively with the number of friends,  $r(148) = .29, p < .001$ ; mean length of friendships correlated positively with emotional closeness,  $r(148) = .17, p = .038$ ; and time spent with friends correlated positively with emotional closeness,  $r(149) = .33, p < .001$ . Most of these correlations were consistent with the hypotheses regarding friendship strategy; however the positive correlation between number of friends and length of friendships was counter to hypotheses: those with an exploration strategy had been hypothesized to have more friends and shorter friendships.

#### Conditions and Characteristics Related to Friendship Strategy

Hypotheses regarding the social conditions and individual characteristics expected to relate to friendship strategy included the following: that an exploration strategy would relate to a short-term mating strategy, a lack of an exclusive long-term relationship, higher extroversion, lower kindness/generosity, higher SES, lower age, more close kin nearby, more closeness with kin, and higher attachment avoidance. An intimate exchange strategy was hypothesized to relate to the opposite of these. Each of these hypotheses was tested using both the two factor scores and the overall mean score of the FSS.

*Mating strategy.* The Revised Sociosexual Orientation Inventory (RSOI) assesses short-versus long-term mating strategy via three subscale scores (Penke & Asendorpf, 2008): sexual behavior, sexual attitudes, and sexual desire. For all scales, higher scores indicate a more short-term mating strategy; lower scores indicate a more long-term strategy. Because higher scores on the FSS indicate a stronger exploration strategy, a positive correlation between RSOI scores and FSS scores was hypothesized. Of the nine possible correlations between the three RSOI scores and the three FSS scores, eight were significant at the .05 level; applying a Bonferroni correction for multiple comparisons with a significance criterion of  $p < .0056$ , five of the correlations still reached significance (Table 3). However, men and women differed in their scores for two of the subscales. For the RSOI attitude scale, men reported higher scores (mean = 3.66,  $SD = 1.85$ ) than women (mean = 2.89,  $SD = 1.60$ ),  $t(146) = 2.71, p = .008$ . For RSOI desire, men again reported higher scores (mean = 3.29,  $SD = 1.51$ ) than women (mean = 2.35,  $SD = 1.22$ ),  $t(146) = 4.20, p < .001$ . (Men and women did not differ significantly on the RSOI behavior subscale.)

Table 3

*Correlations Between Friendship Strategy and Revised Sociosexual Orientation Inventory scores, for the First Sample*

	2	3	4	5	6
1. RSOI attitude	.401***	.486***	.125	.304***	.259**
2. RSOI desire		.318***	.168*	.294***	.256**
3. RSOI behavior			.181*	.212*	.240**
4: Friendship strategy factor 1				.110	.805***
5: Friendship strategy factor 2					.626***
6: Friendship strategy total score					

\* $p < .05$ . \*\* $p < .005$ . \*\*\* $p < .001$ . All tests 2-tailed.

Multiple regressions were used to examine whether RSOI scores would still predict friendship strategy after controlling for gender. The first regression predicted scores on the first FSS factor score, with gender entered as a predictor on the first step and RSOI desire entered on the second step. In this regression, the first step, with only gender entered, did not reach significance,  $\Delta R^2 = .02$ ,  $\Delta F(1, 146) = 2.97$ ,  $p = .087$ , and RSOI desire also did not result in a significant increase in variance accounted for,  $\Delta R^2 = .023$ ,  $\Delta F(1, 145) = 3.56$ ,  $p = .061$ . Reversing the order of the predictors, with RSOI desire entered on the first step, the result was significant,  $\Delta R^2 = .028$ ,  $\Delta F(1, 146) = 4.23$ ,  $p = .042$ , and though gender in the second step did not result in a significant increase in variance accounted for, it did reduce the variance accounted for by RSOI desire back to trend level,  $Beta = 1.89$ ,  $p = .061$ . The second regression predicted scores on the second FSS factor, with gender entered on the first step and all three RSOI scores entered stepwise on the second step. Both RSOI attitude and RSOI desire remained significant predictors when controlling for gender, and the coefficient for gender was no longer significant on the second step (Table 4). The third regression predicted the FSS overall score, with gender entered on the first step and the three RSOI subscale scores entered stepwise on the second step. In this regression, RSOI attitude remained significant after controlling for gender, but behavior and desire were excluded from the model (Table 5). Thus, overall, though gender related significantly to both FSS scores and RSOI scores, it did not account for the association between the latter two measures.

*Long-term relationship.* Each participant was assessed as being involved in a long-term relationship if he or she reported having a romantic partner and described this relationship as marriage, engagement, domestic partnership, long-term relationship, or “could become” a long-term relationship. Relationships reported as short-term or casual were not counted. Participants were allowed to report on up to five romantic partners. Four participants reported having more than one romantic partner; for these participants, only data for the first partner were used. The hypothesis that those in a long-term relationship would have a stronger intimate exchange friendship strategy was tested using independent-samples t-tests. Results were not significant for any of the three FSS scores; the difference in scores on the first factor of the FSS was at trend-level in the direction opposite of that predicted,  $t(146) = -1.73$ ,  $p = .086$ . Those who didn’t have a long-term relationship ( $n = 96$ ) had a mean first-factor FSS score of 3.07 ( $SD = .84$ ), whereas those who did had a mean score of 3.33 ( $SD = .94$ ).

Table 4

*Hierarchical Regression Predicting Friendship Strategy Factor 2 from RSOI Scores, Controlling for Gender, for the First Sample*

Variable	$\beta$	$R^2$	$\Delta R^2$	$\Delta F$
Step 1				
Gender	-.186*	.035		
Step 2				
Gender	-.151			
RSOI attitude	.290***	.117	.083	13.40***
Step 3				
Gender	-.141			
RSOI attitude	.214*	.143	.026	4.27*
RSOI desire	.178*			

Note.  $n = 145$ .

\* $p < .05$ . \*\*\* $p < .001$ .

Table 5

*Hierarchical Regression Predicting Friendship Strategy Total Score from RSOI Scores, Controlling for Gender, for the First Sample*

Variable	$\beta$	$R^2$	$\Delta R^2$	$\Delta F$
Step 1				
Gender	-.251**	.063		
Step 2				
Gender	-.222**			
RSOI attitude	.234**	.117	.054	8.65**

Note.  $n = 144$ .

\*\* $p < .01$ .

*Personality.* Participants reported on their own personality features on a 7-point scale. Two personality-related variables were hypothesized to be related to friendship strategy: higher extroversion was predicted to be associated with a stronger exploration strategy, and higher levels of a trait composed of kindness, warmth, and generosity was predicted to be associated with a stronger intimate exchange strategy. To assess extroversion, a single score was created from the mean of participants' ratings of themselves as "extroverted/enthusiastic," "socially exciting," and "reserved/quiet," reverse-coded. Cronbach's alpha for these items was .844. The mean extroversion score was 3.93 ( $SD = 1.41$ ). To assess participants' kindness/generosity, a single score was created from the mean of participants' ratings of themselves as "kind/considerate," "sharing/generous," and "sympathetic/warm." Cronbach's alpha for these items was .813. The mean kindness/generosity score was 5.35 ( $SD = .98$ ). FSS scores were hypothesized to correlate positively with extroversion, and negatively with kindness/generosity. The first FSS factor and the overall FSS score both correlated negatively

with kindness/generosity,  $r(148) = -.204, p = .013$ , and  $r(147) = -.188, p = .023$ , respectively. The second FSS factor correlated positively with extroversion,  $r(149) = .202, p = .013$ . However, men reported lower extroversion (mean = 3.64,  $SD = 1.41$ ) than women (mean = 4.20,  $SD = 1.36$ ),  $t(146) = 2.49, p = .014$ . A multiple regression was run, with the second FSS factor as the dependent variable, and gender and then extroversion entered on the first and second steps, respectively. Even with gender controlled, extroversion still explained significant variance in FSS second factor scores:  $\Delta R^2 = .061, \Delta F(1, 146) = 9.99, p = .002$ . Beta coefficients were  $-.251$  for gender and  $.253$  for extroversion; both were significant at  $p = .002$ , and thus appeared to account for non-overlapping variance in FSS scores.

*Socioeconomic status (SES) and age.* Participants answered questions about their family-of-origin's income (1 – 8 Likert scale; mean = 4.32 [4 = \$76-100,000],  $SD = 2.42$ ) and either parent's highest level of education (1 – 7 Likert scale; mean = 5.08 [5 = BA],  $SD = 2.15$ ). The distribution of parent's education scores was highly skewed (most parents had above a Bachelor's degree), whereas family income had a wider distribution, and thus the latter was used as the index of SES. Men and women did not differ in SES. This measure of SES did not relate to any of the FSS scores. Participants reported their age in years. Mean age was 20.7 ( $SD = 2.7$ ). Higher FSS scores were predicted to correspond with higher SES and lower age; however, again, age did not correlate significantly with any FSS scores.

*Kin variables.* Participants gave open-ended reports of the number of relatives with whom they were in regular contact (mean = 5.82,  $SD = 6.23$ ) and the number who lived close enough to see regularly (mean = 2.81,  $SD = 3.80$ ). They also rated their emotional closeness with relatives overall on a 1 – 7 scale (mean = 5.15,  $SD = 1.74$ ), and reported on the number of hours per week spent with relatives on a 1 – 7 scale (mean = 2.38,  $SD = 1.44$ ; 2 = 1-6 hours). Men and women did not differ on this variable, except that men reported spending slightly less time with relatives (mean = 2.08,  $SD = 1.21$ ) than women did (mean = 2.68,  $SD = 1.60$ ),  $t(146) = 2.56, p = .011$ . FSS scores were hypothesized to correlate positively with scores on all of these variables. None of these correlations were significant, though FSS second-factor scores were positively correlated at trend level with number of relatives who live close,  $r(145) = .158, p = .058$ , and with emotional closeness with relatives,  $r(149) = .150, p = .067$ .

*Attachment avoidance.* Participants rated their attachment avoidance on a 7-point Likert scale, with higher scores indicating greater avoidance. The average score on this scale was 3.38 ( $SD = 1.84$ ). Men and women did not differ in avoidance scores. FSS scores were hypothesized to correlate positively with avoidance, but these scores were not significantly correlated, and in fact were almost perfectly orthogonal. There was however a trend for those who reported higher avoidance to report lower levels of closeness to romantic partners,  $r(57) = .216, p = .107$ . Scores for attachment security and attachment anxiety also did not relate to FSS scores.

#### First Sample: Discussion

Overall, findings of this study included the following. Individuals do report a range of preferences for their ideal friendships, as indicated via the distribution of responses to the FSS. However, responses on this measure did not relate as expected to characteristics of individuals' actual friendship networks, their life circumstances (including SES, age, relationship status, and kin relationships), or their level of avoidant attachment. In contrast, friendship strategy was

related as predicted to individual differences in mating strategy, extroversion, and kindness/generosity. It was also related to gender, with men scoring significantly higher (i.e., a stronger exploration strategy) than women. Each of these findings is discussed in more detail below.

Findings suggested that people do report a range of preferences with regard to their ideal friend, as reflected in the relatively normally distributed scores obtained on the FSS. At one extreme, some individuals had a strong preference for a friend who is kind, affectionate, responsive, and emotionally supportive; at the other extreme, others had a strong preference for a friend who is exciting, outgoing, fun, and knowledgeable. As predicted, most participants reported preferences which fell somewhere between these two extremes. However, characteristics of individuals' actual friendship networks did not relate as predicted to this measure of friendship strategy. The number of friends a person reported having, emotional closeness to these friends, length of these friendships, and time spent with these friends were not significantly related to friendship strategy. Characteristics of individuals' life circumstances (i.e., SES, age, presence of a long-term relationship, and presence of close kin) also did not relate as predicted to friendship strategy.

One possible explanation for the lack of relationships between friendship strategy and features of actual friendship networks is that the relatively basic questions used to measure aspects of participants' friendship networks were not adequate to capture this relationship. Due to constraints on the length of the survey overall, each of these variables was measured using only one or two general questions. For example, participants reported on the length of their longest two friendships only, and the average of these was taken as an index of friendship length. But it is likely that even individuals with a very strong exploration strategy have at least some long friendships. The shorter friendships hypothesized for individuals with a strong exploration strategy may emerge only when averaged across all friendships, as it is hypothesized that these individuals will have a large network of relatively recent, less-close friendships. Similarly, the lack of correlation between time spent with friends and friendship strategy scores may be due to the fact that participants were asked how much time they spent with friends as a group, rather than how much time was spent with each friend individually. An individual with a strong intimate exchange strategy might be expected to spend relatively large amounts of time with a small number of friends, and a person with a strong exploration strategy might be expected to spend smaller amounts of time with a larger number of friends. These two patterns could result in an overall equal number of hours spent with all friends.

It is also likely that individuals' actual friendship networks are influenced by many real-world circumstances that interact with individuals' ideal preferences; the FSS assesses only the latter, in asking what the respondent's "ideal friend" would be like. Various real-world considerations likely interfere with an individual's ability to find friends who match their "perfect" ideal, including availability of potential friends, skill in social interaction that would be required to make friends effectively, and the presence in the friendship network of previously existing friendships, some of which might be of quite long duration and therefore formed when one's "ideal" preferences were different. Such considerations may interact with ideal friendship strategy preferences in ways that would require more detailed measures to assess. Thus, a study that includes more detailed questions regarding participants' friendship networks is needed to determine whether and how friendship strategy relates to features of actual friendship networks.

In contrast to the null results regarding features of the friendship network, one clear finding that did emerge was that friendship strategy was related to individual differences in three relatively stable traits: mating strategy, extroversion, and kindness/generosity. Friendship strategy was also related to gender, with men having a tendency toward a more exploration-related strategy compared to women. With regard to mating strategy, people who reported having a more short-term mating strategy also tended to have a more exploration-related friendship strategy. Although there were some gender differences in scores on each of these scales, in general the relationship between mating strategy and friendship strategy remained when gender was controlled for.

With regard to personality, those with a stronger exploration strategy also reported being more extroverted (and this association again remained when controlling for gender), and those with a stronger intimate exchange strategy also reported being more kind/generous. These results are consistent with the theory that one's ideal friendship preferences, as assessed via the FSS, represent a conditional strategy aimed at maximizing the value of friendships, based on an individual's assessment of his or her own traits and the kinds of friends who will be most rewarding to interact with, given those traits. The picture that emerges is that extroverted people who are more interested in a short-term mating strategy are more likely to prefer friends who are charismatic, successful, outgoing, witty—in short, friends who will maximize their ability to meet new people and interact in socially exciting ways. In contrast, people who see themselves as more kind and generous and who are more interested in a long-term mating strategy are more likely to prefer friends who are thoughtful, caring, affectionate, empathic—friends who will maximize their ability to engage in deeply reciprocal intimate bonds. These findings suggest that it would be fruitful in a future study to determine the kinds of benefits that pairs of friends are actually exchanging, and whether different kinds of benefits are exchanged at different frequencies between pairs of friends with strong exploration strategies versus those with strong intimate exchange strategies.

Combined with the lack of significant relationships between friendship strategy and characteristics of individuals' life circumstances (i.e., SES, age, long-term relationship status, and kin relationships), results indicating that friendship strategy relates to mating strategy and personality may suggest that friendship strategy is relatively stable across fluctuating life circumstances, and stems from other stable, "internal" traits, rather than fluctuating as the individual's life circumstances change. Conditional strategies, across species, can either fluctuate as conditions change, or can be chosen once and remain relatively stable (Henson & Warner, 1997; Moore, 1991; Moran, 1992); thus the current findings are in line with one way that conditional strategies can operate. However, the conclusion that conditional friendship strategies do not fluctuate according to changing life circumstances should be considered tentative at best, because it is very possible that characteristics of the current sample account for the lack of relationship between FSS scores and life circumstances. The current sample was composed of college students, and therefore was very restricted in age range. Most of this sample of young adults did not have children, and although there was variability in terms of family of origin's SES, college students are almost by definition upwardly mobile and therefore may not be representative of SES-related differences that might be present in a more diverse population. With this sample, it is not possible to detect a more long-term tendency for friendship strategy to shift with age and as life circumstances change in major ways. Similarly,



because these participants were all relatively young, their romantic relationships might inherently be less “serious,” or even if serious, they have not had the chance to become truly “long-term,” and therefore relationship status might not have as much influence on friendship strategy among college students as it might among older people. And, of course, the very restricted age range would make it very difficult to reveal any correlation between friendship strategy and age itself. These considerations suggest, of course, that the current study should be replicated using a sample that varies more in terms of age and SES.

Characteristics of the current sample are not however a possible explanation for why attachment avoidance was unrelated to friendship strategy. This association should not be influenced in particular by age, as attachment style is a relatively stable trait that is associated with a wide variety of outcomes among college-age individuals (Mikulincer & Shaver, 2007). It may be that attachment is more closely related to behavior with romantic partners than it is to behavior with friends. Indeed, there was a trend for those who reported higher avoidance to report lower levels of closeness to romantic partners, which may have reached significance with a larger sample size of individuals who had romantic partners.

Overall, results of the current study do suggest that individuals’ ideal friendship preferences are associated with other stable individual traits, including general features of personality as well as preferences regarding romantic relationships, and therefore that friendship strategy may be a relatively deeply held preference. For this reason, it seems likely that friendship strategy will relate to differences in the kinds of people that an individual will tend to choose as a friend, when given an ideal choice situation. This possibility will be examined in Chapter 3. (It is also possible that friendship preferences would relate to the things that a person values most about his or her current friends, including those friends’ personality features and the kinds of support and interaction enjoyed with those friends. This possibility is one that must await a future study, in which individuals could be asked to report on their current friends’ characteristics in more detailed ways.)

However, before undertaking the study of friendship strategies in relation to choice of friends and the signals that individuals may be using to choose their friends, a major issue that emerged in these findings needed to be resolved: the factor structure of the FSS proved difficult to interpret, and thus the measure required a revision. Specifically, it was unclear whether the FSS contained one underlying factor or two. An examination of the two subscales that resulted from a factor analysis of the FSS (Table 2) shows that conceptually, the two scales seem to differ more in terms of the exploration strategy items; the first factor seems to describe a more skillful, intelligent, poised friend whereas the second seems to describe a more fun, spontaneous, gregarious friend. In contrast, the intimate exchange items seem to be more conceptually similar across the two factors. This suggests that the results of the factor analysis may have been driven by a distinction between two sub-categories of features related to an exploration strategy, and that the features of an intimate exchange strategy might have been “brought along for the ride” because the pairs of items in each question could not be analyzed separately. To make the FSS more robust, therefore, it was necessary to examine participants’ preferences for each item individually, in order to create paired choices that would either reflect a single underlying dimension of exploration versus intimate exchange preferences, or would allow subscales within each strategy to emerge without being influenced by relations

between items on the other strategy. This was undertaken in the second sample, and all hypotheses were tested again with this new sample.

### Second Sample: Results

#### Friendship Strategy Survey

In this sample, participants rated the importance in an ideal friend of each of the 38 FSS items individually, on a 1-7 scale. The range of responses for most items was either 1-7 or 2-7, though one item, “fun and engaging,” had a range of 3-7. Mean responses ranged from 3.14 ( $SD = 1.63$ ) for “financially successful” to 5.97 ( $SD = 1.07$ ) for “kind/considerate.” Most items had means between 4.0 and 6.0; only three items had means below 4.0. Standard deviations ranged from 0.97 to 1.78. The average rating for most items was somewhat higher than the middle of the scale, not surprising given that all the friend descriptors described generally desirable traits. (This is not a problem for the FSS when items are paired, because the aim in asking questions in the paired format is to determine, for each item, whether the participant will choose an exploration-related item over an exchange-related item, or vice versa, when forced to do so.) Distributions of most items appeared reasonably normal. Three items obtained kurtosis statistics greater than 1, indicating a “flattened” distribution (“gives good advice,” “understands your feelings,” and “relaxed/laid-back”); these statistics were all less than 2, which is generally considered acceptable (Cutting, 2012). Four items obtained skewness statistics less than -1, indicating somewhat more scores above the mean than below the mean (“kind/considerate,” “expresses concern for your well-being,” “understands your feelings,” and “spends time one-on-one”); again, all values were above -2, which is generally considered acceptable (Cutting).

Because all items appeared to have acceptable distributions, all were included in an initial principal components factor analysis with Varimax rotation. The KMO measure of sampling adequacy was .834, a value considered very good (Field, 2005), and Bartlett’s test of sphericity was highly significant ( $p < .001$ ), indicating enough relationships among the items for factor analysis. However, the determinant of the correlation matrix was very small ( $4.67 \times 10^{-11}$ ), suggesting multicollinearity. A scree plot indicated two strong primary factors (with eigenvalues of 10.13 and 4.66 for these two factors, accounting for 26.65% and 12.27% of the variance, respectively). However, the rotated solution failed to converge in 25 iterations, perhaps because of the large number of factors (10) with eigenvalues greater than 1 and the apparent multicollinearity among the variables. Because the items were expected to cluster around two factors (i.e., exploration versus exchange strategies), the analysis was constrained to a two-factor solution, which did converge. Results of this analysis showed that almost all items loaded as expected on two factors which mirrored the exploration-exchange continuum; no item loaded strongly on the factor opposite to that predicted (Table 6). Six items, however, had low and roughly equal loadings on both factors, and therefore do not appear to differentiate well between the two strategies. These six items were: “likes children,” “easygoing/adaptable,” “relaxed/laid-back,” “fun/engaging,” “gives good advice,” and “comes to you for practical advice.” Two subsequent factor analyses specifying 3- and 4-factor solutions verified that these six items either loaded strongly on a third or fourth factor or continued to load equally across more than one factor.

Table 6

*Factor Loadings of Single-Item Ratings for All Items in the Friendship Strategy Survey, Second Sample*

	Factor loadings <sup>a</sup>			
	3-factor solution		2-factor solution	
Kind/considerate	.703		.720	
Likes children	.292	.409	.344	.261
Easygoing/adaptable	.283	.260	.276	.244
Caring/warm	.773		.780	
Relaxed/laid-back	.265	.252	.251	.223
Thoughtful/wise	.604		.609	
Empathic	.734		.745	
Responsible	.374	.478	.438	
Give you physical affection or comfort	.484		.496	.217
Be a good confidante	.744		.719	
Express concern for your well-being	.783		.785	
Understand your feelings	.768		.758	
Spend time with you one-on-one	.631		.644	
Listen to you without judgment	.706		.711	
Express their deep feelings	.838		.830	
Keep your important matters private	.611		.599	
Come to you for affection and comfort	.765		.771	
Tell you their secrets	.530	.259	.558	
Rely on your kindness and empathy	.657	.219	.682	
Socially exciting		.726		.690
Intellectually stimulating	.465			.491
Shares your interests	.452			.454
Financially successful	.464	.333		.545
Quick-witted	.559			.588
Charismatic	.614			.577
Adventurous	.590			.521
Socially poised	.576			.603
Introduce you to new activities	.676			.649
Help you get things done	.552	.268		.605
Organize or invite you to parties/events				.575
Be fun and engaging	.365	.460	-.454	.286
Teach you how to do something	.648	.354		.722
Introduce you to or help you meet people		.750		.750
Give you good advice	.413	.407		.416
Give you important information	.262	.513	.277	.286
Rely on your knowledge and skill		.291	.712	.227
Come to you for practical advice			.720	.269
Ask you for help getting things done		.339	.670	.204

*Note.* Participants rated how important each item was in an ideal friend, on a 7-point scale.

<sup>a</sup>Loadings less than .20 are not shown.

These six items were removed and the factor analysis was repeated with the remaining items, again specifying a two-factor solution. The KMO measure was .838 and Bartlett's test of sphericity was again highly significant ( $p < .001$ ). Again the determinant of the correlation matrix was very small ( $5.36 \times 10^{-9}$ ), though slightly larger than it had been with all items included. In this analysis, the first two factors had eigenvalues of 9.05 and 4.63, respectively, accounting for 28.28% and 14.46% of the variance. In this analysis, each item loaded onto the expected factor and no items showed strong double-loadings (Table 7). Sixteen items remained for the exploration subscale; Cronbach's alpha for these items was .88. Sixteen items also remained for the exchange subscale; Cronbach's alpha for these items was .92. Mean scores were created for each of these sets of items.

Next, the relationship between these two mean scores and scores on the original FSS was examined. For the original FSS, as in the results for the previous sample, an examination of the means for each item showed that most were near the center of the scale, ranging from 2.61 to 4.32, with standard deviations ranging from 1.37 to 1.72, and with estimates of skewness all falling between -1 and 1 and estimates of kurtosis ranging from -1.40 to -.58, indicating a slightly peaked distribution for all items. The overall mean score for this scale was, again, coded such that a low score indicated an intimate exchange strategy and a high score indicated an exploration strategy. Cronbach's alpha for the scale was .737. This mean score should correlate positively with the mean score for single-item exploration ratings, and should correlate negatively with the mean score for single-item exchange ratings. Correlations were as predicted; the paired-item FSS score correlated positively with single-item exploration ratings,  $r(157) = .303, p < .001$ , and negatively with single-item exchange ratings,  $r(157) = -.596, p < .001$ . The single-item ratings for exploration and exchange strategies also correlated positively with each other,  $r(157) = .351, p < .001$ . This may be an artifact of the fact that all items described positive traits in an ideal friend; when rated separately, an individual is not forced to choose between them and thus may decide he or she prefers them all.

After having determined which single items were appropriate to retain in a revised version of the FSS, and having verified that mean scores for these items related as expected to the original FSS, the next goal was to determine whether there were subscale factors evident within the items meant to measure each friendship strategy, so that individual items could be paired appropriately in the new version of the scale.

For these analyses, principal components factor analysis with Direct oblimin rotation (Delta = 0) was used, with separate analyses for exploration and exchange items. For the exchange items, KMO was .908, and Bartlett's test of sphericity was significant,  $p < .001$ . The determinant of the correlation matrix was .000, indicating strong multicollinearity, perhaps not surprising given that the scale was written to capture a single dimension of preference. Results revealed two factors with eigenvalues greater than 1. These had eigenvalues of 7.60 and 1.40, respectively, and accounted for 47.49% and 8.77% of the variance. However, the scree plot suggested a one-factor solution. An examination of the factor loadings showed that only two items loaded strongly only on the second factor, four loaded strongly on both, and the rest loaded strongly only on the first. Items loading on the second factor or double-loading included those describing giving and receiving physical affection, being a confidante, expressing deep feelings and telling secrets. Items loading on the first factor included those describing a friend's personality features, spending time one-on-one, expressing concern, listening and keeping

things private, and understanding feelings. These clusters of items were not clearly distinguishable conceptually, though some related themes seemed to be clustering together.

Table 7  
*Factor Loadings of the Friendship Strategy Survey Single-Item Ratings for the Second Sample: Final Version, with 6 Items Removed*

	Factor loadings <sup>a</sup> : 2-factor solution	
Kind/considerate	.720	
Caring/warm	.764	
Thoughtful/wise	.607	
Empathic	.750	
Responsible	.451	
Give you physical affection or comfort	.505	.227
Be a good confidante	.706	
Express concern for your well-being	.764	
Understand your feelings	.766	
Spend time with you one-on-one	.648	
Listen to you without judgment	.702	
Express their deep feelings	.827	
Keep your important matters private	.599	
Come to you for affection and comfort	.783	
Tell you their secrets	.565	
Rely on your kindness and empathy	.676	
Socially exciting		.708
Intellectually stimulating		.472
Shares your interests		.431
Financially successful		.564
Quick-witted		.556
Charismatic		.577
Adventurous		.514
Socially poised		.604
Introduce you to new activities		.676
Help you get things done		.616
Organize or invite you to parties/events		.570
Teach you how to do something		.742
Introduce you to or help you meet people		.760
Give you important information	.291	.566
Rely on your knowledge and skill	.227	.471
Ask you for help getting things done	.205	.523

*Note.* Participants were asked to rate how important each item was in an ideal friend, on a 7-point scale.

<sup>a</sup>Loadings less than .20 are not shown.

For the exploration items, KMO was .863, Bartlett's test of sphericity was significant,  $p < .001$ , and the determinant of the correlation matrix was .002. The analysis resulted in four factors with eigenvalues greater than 1; these had values of 5.94, 1.44, 1.27, and 1.01, and accounted for 37.12%, 8.99%, 7.98%, and 6.33% of the variance, respectively. However, the scree plot again suggested a single factor. Examination of the factor loadings did not reveal conceptually coherent factors; the fourth consisted of apparently random items, all items loaded negatively on the third, and few items loaded only on the second. The analysis was repeated, specifying a two-factor solution. In this analysis, many items loaded moderately on both factors. Those loading only on the first factor included financially successful, gives help getting things done, invites to parties, and introduces new people. Those loading only on the second factor included intellectually stimulating, adventurous, relies on your knowledge and asks for help getting things done. Those loading on both factors included items describing adventurousness, excitement, skill, and charisma. A three-factor solution improved the conceptual fit somewhat, with items loading on the first factor describing a friend who is successful, plans parties and introduces new people, and helps get things done; items on the second factor describing a friend who is stimulating, witty, charismatic, and adventurous; and two items on the third factor describing a friend who asks for help.

To construct the revised, paired-items FSS, the factor clusters for each of the two factor analyses above were used. Items that loaded most strongly onto the first factors of their respective analyses were paired together, and then the remaining items were paired (those which loaded onto their second factors or loaded moderately on both). This rule was violated for two pairings which worked well together conceptually and did not have other readily apparent items to pair with; for both of these, at least one of the items had loaded somewhat ambiguously and thus changing its category did not seem problematic. These pairings were "thoughtful/wise" with "quick-witted" and "give you physical affection and comfort" with "teach you how to do something." The final version of the FSS can be found in Table 8.

#### Features of the Friendship Network

All the hypotheses of the study were tested in the second sample using the two mean scores obtained from the ratings participants made of each friendship strategy separately, as well as using scores from the original FSS.

*Gender differences.* Men and women did not differ in their mean scores for exploration,  $t(155) = .156, p = .877$ , but women had higher mean scores for exchange,  $t(155) = 4.36, p < .001$ . The mean exploration score for men was 4.62 ( $SD = .81$ ) and for women was 4.60 ( $SD = .80$ ); the mean exchange score for men was 5.05 ( $SD = .96$ ) and for women was 5.65 ( $SD = .76$ ). Men and women also differed in their mean scores on the original FSS,  $t(155) = 3.33, p = .001$ . The mean score for men was 3.36 ( $SD = .63$ ) and for women was 3.02 ( $SD = .65$ ). These results were essentially the same when run on the reduced sample with equal numbers of men and women. Thus, gender was controlled for where necessary in all subsequent analyses.

*Number of friends.* It was hypothesized that preference for an exploration strategy would correlate positively with how many friends a person had. Thus, number of friends should correlate positively with exploration and paired-items scores, and negatively with exchange scores. Mean number of friends was 34.75 ( $SD = 57.27$ ). (Participants gave open-ended numerical responses to the question regarding number of friends; for one participant who gave

a range [i.e., 25-30], the higher number in the range was used as the actual data point.) Only the correlation with exchange scores was significant, and it was in the expected direction,  $r(156) = -.195, p = .015$ .

Table 8

*Pairings of Items in the Final Version of the Friendship Strategy Survey*

Intimate exchange items		Exploration items
Kind/considerate	OR	Socially exciting
Good confidante	OR	Adventurous
Thoughtful/wise	OR	Quick-witted
Expresses their deep feelings	OR	Charismatic
Caring/warm	OR	Shares your interests
Responsible	OR	Financially successful
Empathic	OR	Socially poised
Express concern for your well-being	OR	Help you get things done
Spend time with you one-on-one	OR	Organize or invite you to parties/events
Understand your feelings	OR	Give you important information
Keep your important matters private	OR	Introduce you to or help you meet people
Listen to you without judgment	OR	Introduce you to new activities
Give you physical affection or comfort	OR	Teach you how to do something
Tell you their secrets	OR	Be intellectually stimulating
Come to you for affection and comfort	OR	Ask you for help getting things done
Rely on your kindness and empathy	OR	Rely on your knowledge and skill

*Note.* When presented to participants, every other item is reversed in order, such that half of the exchange items appear on the left and half appear on the right.

*Closeness with friends.* It was hypothesized that an exploration strategy would be negatively related to emotional closeness with friends. The mean score for closeness to friends was 5.42 ( $SD = 1.14$ ). Emotional closeness correlated negatively with the score on the original FSS,  $r(157) = -.180, p = .024$  and positively with the intimate exchange strategy score,  $r(157) = .451, p < .001$ , but it did not correlate significantly with the exploration strategy score; these correlations were consistent with hypotheses.

*Length of friendships.* It was hypothesized that the length of friendships would be negatively related to an exploration strategy and positively related to an exchange strategy. Participants reported on the length of their longest and second-longest friendships; these mean lengths were 11.33 years ( $SD = 4.84$ ) and 8.40 years ( $SD = 4.40$ ), respectively. These two responses were not significantly related to any of the friendship strategy scores.

*Time spent with friends.* It was hypothesized that the amount of time spent with friends would relate negatively to an exploration strategy and positively to an exchange strategy. Participants reported on the number of hours per week they spent with their friends as a

group. The average score was 4.17 ( $SD = 1.76$ ); a score of 4 corresponds to 13-18 hours per week. This measure was not related to friendship strategy scores.

#### Conditions and Characteristics Related to Friendship Strategy

*Mating strategy.* Short- versus long-term mating strategy was assessed via the RSOI, with three subscale scores for sexual behavior, sexual attitudes, and sexual desire; higher scores indicated a more short-term strategy. It was hypothesized that these scales would correlate positively with the original FSS score and the exploration strategy score, and negatively with the exchange strategy score. As in the previous sample, men scored higher than women on RSOI attitudes and desire,  $t(153) = 4.32, p < .001$ , and  $t(152) = 5.79, p < .001$ , respectively. Scores were not significantly different for RSOI behavior. Mean scores for behavior, attitudes, and desire for men were 1.21 ( $SD = 3.61$ ), 3.99 ( $SD = 1.78$ ), and 3.75 ( $SD = 1.73$ ), respectively, and mean scores for women were .69 ( $SD = 1.56$ ), 2.82 ( $SD = 1.60$ ), and 2.37 ( $SD = 1.23$ ), respectively. Of the nine possible correlations between friendship strategy and RSOI scores, six were significant at the .05 level or higher, and two more showed trends in the expected direction (Table 9). Applying a Bonferroni correction for multiple comparisons, with a significance criterion of  $p < .0056$ , three of the correlations still reached significance; these were original FSS scores' correlations with RSOI attitude and behavior, and exchange strategy scores' correlations with RSOI attitude.

Table 9

*Correlations Between Friendship Strategy and Revised Sociosexual Orientation Inventory Scores, for the Second Sample*

	2	3	4	5	6
1. RSOI attitude	.599****	.382****	.050	-.294****	.290****
2. RSOI desire		.222**	.185*	-.139†	.205*
3. RSOI behavior			.140†	-.207*	.257****
4: Exploration strategy score				.351****	.303****
5: Exchange strategy score					.596****
6: Original FSS score					

† $p < .10$ . \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .005$ . \*\*\*\* $p < .001$ . All tests 2-tailed.

Because men and women differed in some friendship strategy scores and in some RSOI scores, multiple regressions were used to examine whether RSOI scores would predict friendship strategy scores with gender controlled. First, a regression was run in which the original FSS score was the dependent variable, gender was entered on the first step, and the three RSOI variables were entered stepwise on the second step. In the first step, gender was a significant predictor,  $\Delta R^2 = .063, \Delta F(1, 150) = 10.12, p = .002$ . On the second step, only RSOI behavior was added to the model, and resulted in a significant increase in the variance accounted for,  $\Delta R^2 = .054, \Delta F(1, 149) = 9.16, p = .003$ . Gender remained a significant predictor in this model,  $Beta = .229, p = .004$ . RSOI attitude narrowly missed being included as a predictor ( $p = .055$ ). A regression with exchange strategy score as the dependent variable was run next, entering predictors as before. In the first step, gender was a significant predictor, and in the



second and third steps, RSOI attitude and then RSOI desire were added to the model (Table 10). In the final model, all three were significant predictors. Regression was not used to examine the exploration strategy scores, because these did not differ significantly by gender and only one of the RSOI scores was significantly correlated with exploration.

Table 10

*Hierarchical Regression Predicting Intimate Exchange Strategy from RSOI Scores, Controlling for Gender, for the Second Sample*

Variable	$\beta$	$R^2$	$\Delta R^2$	$\Delta F$
Step 1				
Gender	.337***	.114		
Step 2				
Gender	.273**	.151	.037	6.51*
RSOI attitude	-.203**			
Step 3				
Gender	.330***	.175	.025	4.40*
RSOI attitude	-.312**			
RSOI desire	.209*			

Note.  $n = 145$ .

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

*Long-term relationship.* Participants were invited to report on up to five romantic partners; only seven participants reported having more than one romantic partner, and thus data were used only for the first partner. However, of these seven participants, one reported that the first relationship was short-term and the second relationship was long-term (the other six reported either that both were short-term or that the first was long-term). Because presence of a long-term relationship was the variable of interest, for this participant, data for the second relationship were used instead of data for the first relationship. Men and women were equally likely to report being in a romantic relationship ( $\chi^2(1) = .099$ ,  $p = .75$  for the full sample;  $\chi^2(1) = .053$ ,  $p = .82$  for the equal-genders subsample). It was hypothesized that people who were currently in a long-term relationship would have higher exchange-strategy scores, lower exploration-strategy scores, and higher scores on the original FSS. No significant differences were found in any of these scores,  $t(155) = .32$ ,  $ns$  for the original FSS score,  $t(155) = .09$ ,  $ns$ , for exchange scores, and  $t(155) = 1.48$ ,  $ns$ , for exploration scores.

*Personality.* As in the first sample, a score for extroversion was created using the mean score of participants' self-ratings of "extroverted/enthusiastic," "socially exciting," and "reserved/quiet," reverse-coded. The mean score for this scale was 4.38 ( $SD = 1.25$ ), and Cronbach's alpha for these items was .721. Kindness/generosity scores were again created using the mean score of participants' self-ratings of "kind/considerate," "sharing/generous," and "sympathetic/warm." The mean score for this scale was 5.41 ( $SD = 1.08$ ), and Cronbach's alpha for these items was .841. As predicted, extroversion correlated positively with the exploration strategy score,  $r(157) = .381$ ,  $p < .001$ , and with the original FSS score,  $r(157) = .162$ ,  $p = .043$ , but it was not significantly correlated with the exchange strategy score. Similarly,

kindness/generosity correlated positively with the exchange strategy score,  $r(157) = .547, p < .001$  and negatively with the original FSS score,  $r(157) = -.335, p < .001$ ; however, counter to predictions, it also correlated positively with the exploration strategy score,  $r(157) = .195, p = .014$ . Women scored higher than men on exchange strategy scores and lower than men on the original FSS score, and they also scored higher than men on kindness/generosity,  $t(155) = 2.15, p = .033$  (scores for extroversion were not significantly different between men and women). Therefore, multiple regressions were run, in which gender was controlled for in the relationships between kindness/generosity and exchange strategy, and between kindness/generosity and the original FSS score. After entering gender in the first step of the regression, kindness/generosity remained a significant predictor of exchange strategy scores when added on the second step:  $\Delta R^2 = .248, \Delta F(1, 154) = 59.26, p < .001$ . Similarly, after entering gender in the first step, kindness/generosity remained a significant predictor of the original FSS score when added on the second step:  $\Delta R^2 = .087, \Delta F(1, 154) = 15.83, p < .001$ .

*Socioeconomic status and age.* It was hypothesized that SES would correlate positively with exploration strategy scores and original FSS scores, and negatively with exchange strategy scores. As in the previous sample, SES was assessed via participants' family income (mean = 4.33 on an 8-point Likert scale [4 = \$76-100,000],  $SD = 2.28$ ) and parents' highest level of education (mean = 5.10 on a 7-point Likert scale [5 = BA],  $SD = 1.96$ ). Again, scores for level of education were skewed, with most parents having high levels of formal education. Thus family income was used as the measure of SES. SES did not correlate significantly with the original FSS score,  $r(152) = .08, ns$ , or with exchange strategy score,  $r(152) = -.14, ns$ , but there was a negative correlation between income and exploration strategy scores,  $r(152) = -.184, p = .023$ . This finding was the opposite of that predicted: those who came from higher-SES families reported a lower preference for an exploration strategy.

It was hypothesized that age would correlate positively with exploration strategy scores and original FSS scores, and negatively with exchange strategy scores. These correlations were not significant,  $r(157) = -.72, ns$ , for paired-items scores,  $r(157) = .069, ns$ , for exploration strategy scores, and  $r(157) = .078, ns$ , for exchange strategy scores.

*Kin variables.* It was hypothesized that having more kin living nearby and feeling closer to kin would correlate positively with exploration strategy scores and original FSS scores, and negatively with exchange strategy scores. None of these correlations were significant, except that exchange strategy score correlated positively with feelings of emotional closeness with kin,  $r(157) = .259, p = .001$ . This was the opposite of the predicted correlation.

*Attachment.* It was hypothesized that attachment avoidance would correlate positively with exploration, negatively with exchange, and positively with original FSS scores. There were no significant correlations between avoidance and friendship strategy scores. However, attachment security scores were positively correlated with exploration strategy scores,  $r(157) = .19, p = .017$ , and attachment anxiety scores were positively correlated with exchange strategy scores,  $r(157) = .195, p = .014$ .

### Second Sample: Discussion

In this second sample, a revised version of the FSS was created which had a more satisfactory factor structure. The previous version of the FSS, as well as friendship strategy scales composed of the individual items assessing an intimate exchange strategy and the

individual items assessing an exploration strategy, were all used to test all of the original hypotheses. Overall, findings mirrored those in the first sample, with a few additional results. As in the first sample, friendship strategy was related as predicted to individual differences in mating strategy, extroversion, and kindness/generosity. Again men reported a significantly stronger exploration strategy than women, and again friendship strategy was not related as predicted to life circumstances (i.e., SES, age, relationship status, and kin relationships) or to attachment avoidance. Indeed, two findings regarding SES and closeness to kin ran counter to hypotheses. However, unlike in the first sample, some features of individuals' actual friendship networks were related to friendship strategy, including the number of friends individuals had and their closeness to their friends. And unlike in the first sample, attachment security and anxiety were both related to some friendship strategy scores. Use of the separate mean scores for exploration and exchange preferences in the second sample uncovered some of these new findings. Each of these findings is discussed in more detail below.

The problems with the factor structure of the original FSS were corrected in the current sample, by asking participants to rate each individual item separately and then eliminating individual items that did not relate strongly to either an exploration or an exchange strategy. Then, the remaining individual items describing each strategy were factor analyzed, to determine their relationships to each other. These results were used to create new pairs of items that were related both statistically and conceptually. The final version of the FSS, with 16 pairs of items, will be used in the studies described in Chapters 2 and 3.

Regarding features of individuals' actual friendship networks, the number of friends participants reported having, and their emotional closeness with their friends, did relate in expected ways to some of the three friendship strategy scores, results which were not obtained for the first sample. Specifically, those who reported a stronger preference for an exploration strategy also reported that they had more friends, and those who reported a stronger preference for an exchange strategy reported that they felt more emotionally close to their friends. Emotional closeness also related as predicted to the original FSS score in this sample. The reason for the discrepancy in findings between the first and second samples is unclear; a replication of the study, using more detailed measures of these variables, is needed before firm conclusions can be drawn. However, mirroring the results of the first sample, length of friendships and time spent with friends did not relate to any of the friendship strategy measures, results which again point to the need for further study which includes more detailed measures of individuals' actual friendship networks.

Also mirroring findings for the first sample, presence of a long-term relationship and participants' age did not relate to any of the friendship strategies scores. SES and kin variables similarly did not relate to friendship strategy as hypothesized. However, two findings for SES and kin variables were obtained that ran counter to hypotheses. First, those who more strongly preferred an exploration strategy reported a lower SES. This correlation was significant though not very large. However, it suggests that higher-SES individuals are less interested in exciting, outgoing, skillful friends than are lower-SES individuals, and that this association may be obscured when using the FSS, because SES does not appear to relate to any preference for kind, empathic, warm friends. Similarly, although most aspects of kin relationships were not associated with friendship strategy, those who more strongly preferred an intimate exchange strategy reported feeling more emotionally close to kin. The hypothesis was that people with a

weaker kin network would compensate by seeking out more intimate exchange in their friendships. Obtaining a finding counter to this suggests that individuals who feel close with kin also value intimate exchange with friends; thus, rather than a compensation, this result points to the possibility of a preference for intimate exchange which may be applied in similar ways within both kin relationships and friendships. As with SES, if true, this finding suggests that a relation between an exchange preference and closeness to kin might be obscured when using the FSS, because there does not appear to be a relationship between exploration strategy and closeness to kin. Thus, when exploring these particular relationships, it may be advisable to include the opportunity for participants to rate exploration and exchange items individually.

With regard to mating strategy and personality, results from the second sample replicated those from the first sample. It was again found that those with a short-term mating strategy tended to have a stronger preference for an exploration friendship strategy, and this relationship remained when controlling for gender. It was also again found that those who rated themselves as more kind/generous had a stronger preference for an intimate exchange strategy, and those who rated themselves as more extroverted had a stronger preference for an exploration strategy. One finding ran counter to hypotheses: those who rated themselves as more kind/generous also had a stronger preference for an exploration strategy, when these items were rated separately. However, the fact that the original FSS scores were correlated in the expected direction with kindness/generosity, and the fact that the correlation between kindness/generosity and exchange strategy scores was much larger than that between kindness/generosity and exploration strategy scores, suggests that this finding does not undermine the general hypotheses of the study. Indeed, it can be expected that most people would generally prefer kind and empathic friends; the assertion of the current study is that the preference for kind and generous friends will be a central concern for those pursuing an intimate exchange strategy, whereas the desire for exciting and outgoing friends will be a more central concern for those pursuing an exploration strategy. This is the reason why these items are pitted against each other in the FSS: forcing participants to choose between them will reveal which set of preferences takes precedence.

Finally, regarding attachment, again avoidance did not relate to any of the friendship strategy measures. However, interestingly, attachment security and attachment anxiety did relate to exploration scores and exchange scores, respectively. Specifically, the more strongly participants indicated that a description of a secure attachment style described themselves, the more strongly they preferred an exploration strategy, and the more strongly they indicated that a description of an anxious attachment style described themselves, the more strongly they preferred an intimate exchange strategy. Again, because scores on the FSS itself did not relate to attachment in either sample, it appears that some relationships between friendship strategy and other constructs appear only when ratings for each strategy can be made separately. The meaning behind these specific findings is not entirely clear, although a relationship between attachment anxiety and a desire for warm, empathic friends who express their deep feelings does make intuitive sense; attachment anxiety is inherently characterized by an exaggerated desire for reassurance, comfort, and care from others (Mikulincer & Shaver, 2007).

With the final version of the FSS established, the next chapters turn to the question of whether friendship strategy will relate to differences in the kinds of people that an individual will tend to choose as a friend, when given an ideal choice situation.

## Chapter 2: Reliable Signals of Friendship Strategy in Signal Senders

### Introduction

If humans have conditional strategies with regard to friendship choice, preferring friends who have specific characteristics that will best meet their needs, then there also should be a way for people to assess possible new friends with regard to how well each might fit their strategy. From an evolutionary perspective, the ability to send and receive signals regarding another's state or characteristics has been investigated under the umbrella of signaling theory (Searcy & Nowicki, 2005). Of interest in the current investigation is the concept of *reliable* signals: those that accurately convey information regarding the physical or behavioral state of the signaler (Cronk, 2005; Searcy & Nowicki; Smith, 1994). Though there is much room for dishonest signaling, particularly in the realm of human communication, signals are likely to remain honest when they are very costly (energetically or otherwise) to fake, when they are essentially impossible to fake (as in the case of group membership markers such as dialect), or when both signaler and receiver benefit from the honesty of the signal or from repeated interactions with each other (Bliege Bird & Smith, 2005; Cronk, 2005; van Baalen & Jansen, 2003; Silk, Kaldor, & Boyd, 2000). A classic example of a costly, reliable signal is that of stotting: some ungulates (e.g., gazelles) will stot or "hop" upon seeing a predator, which appears to function as an honest signal of alertness and physical health and thus high probability of escape (Cronk, 2005). The stot is both difficult to fake in a sick or weak animal, and serves the interest of both predator and prey, saving them both the energy expenditure of a fruitless pursuit (Cronk, 2005).

Good evidence has been found for the existence of reliable signals in human morphology and behavior, though this literature has focused perhaps too much upon the costs of signaling and examples of costly signals, as opposed to the benefits to both signaler and recipient that can also make honest signals evolutionarily advantageous (Cronk, 2005). Reliable signals can take many forms. They can be morphological, as in the case of facial dominance: features such as strong jaws and broad cheekbones are judged by others to denote individuals who are likely to be dominant and take charge (Mueller & Mazur, 1997). Naïve observers' ratings of facial dominance in military recruits predicted the recruits' eventual rank attainment, which in turn predicted their reproductive fitness as measured via the number of children the recruit eventually had (Mueller & Mazur, 1997). Reliable signals can also be communicated via relatively automatic behavior, as in the case of infant crying. Different kinds of cries reliably signal different infant needs, for example hunger versus pain, and mothers' differing responses to these different cries indicate the communication value of these signals (Zeifman, 2001). Further, reliable signals can be conveyed via much more complex and even learned behaviors, as in the case of religious rituals, which may signal commitment to the religious group and which can be very difficult to fake (Irons, 2001; Sosis, 2003). Indeed, religious communes with more costly rituals and taboos tend to last longer (Sosis & Bressler, 2003).

There is evidence that humans rely on both morphological and behavioral reliable signals when choosing mates (Gangestad & Simpson, 2000). Morphological features notably include fluctuating asymmetry: individual variations in body symmetry that may result from genetic or environmental abnormalities (Gangestad & Simpson, 2000). Men with more symmetry have more sexual partners and more extra-pair partners, suggesting that women use

symmetry as an indicator of good genetic fitness (Gangestad & Simpson, 2000). Indeed, women prefer the smell of more symmetrical men, but only when they are in the fertile phase of their menstrual cycle (Gangestad & Simpson, 2000).

There are also behavioral signals used in mate choice. For example, men who are pursuing a short-term mating strategy rate female promiscuity as somewhat desirable, whereas men pursuing a long-term mating strategy find it undesirable (Buss & Schmitt, 1993). In this case, women's behavioral signals of traits such as sex drive could be reliable signals of their potential as short-term or long-term mating partners. Similarly, women who are pursuing a long-term mating strategy value male signals of ambition and social status (Buss & Schmitt, 1993). In these cases, the reliable signals have different consequences depending on the conditional strategy of the signal receiver. That is, people who want short-term mates and those who do not will have very different reactions to the same signals. In this way, reliable signals can be a powerful component of conditional strategies, functioning to efficiently bring together individuals whose strategies are compatible.

It is hypothesized in the current study that reliable signals are similarly at work in the context of conditional strategies of friend selection. If humans have an ability to choose friends based on conditional strategies, they should also have evolved signals by which to evaluate potential new friends, and these signals should vary depending on the conditional strategy the signaler is pursuing, in order to attract the kind of friendships that will be most advantageous. These signals will have benefited both sender and receiver: reciprocal exchange is fundamental to the reproductive fitness benefits of friendship (Alexander, 2006). Thus they should be reliable signals: they should relate predictably to the signaler's conditional strategy, and others should be able to use the signals to reliably match the signaler's strategy to their own.

This study examined whether individuals give reliable signals of their friendship strategy, in other words, whether their behaviors when interacting with a stranger relate to their self-reported friendship strategy (the next chapter will address whether receivers select friends on the basis of such signals). It should be remembered that neither the exploration nor the intimate exchange strategy is hypothesized to be associated with a lower drive toward affiliation; individuals with both strategies may be equally desirous of affiliation, but will differ in terms of the qualities and activities that are most desired in affiliation partners. With this in mind, it was hypothesized that signals of an exploration strategy would include signals of gregariousness and charisma, confidence and social dominance, and social skills such as playfulness and humorousness, and that signals of an intimate exchange strategy would include signals of intimacy, compassion, helpfulness, warmth, and emotional availability. Possible specific behaviors that could be signals of these characteristics were drawn from related research in social psychology; ultimately, eight specific behaviors were chosen and it was hypothesized that these behaviors could be used to signal friendship strategy between interacting individuals. Predictions regarding these specific behaviors include the following.

#### Behaviors Signaling a Stronger Exploration Strategy

*Gazing toward interaction partner.* Gazing at an interaction partner appears to communicate a variety of information to the partner, ranging from interest and attraction to potential threat (Frischen, Bayliss, & Tipper, 2007). Those who gaze more at a partner during interactions tend to be seen by the partner as more open, receptive, and affectionate (Burgoon,

Coker, & Coker, 1986), and tend to rate themselves higher on nurturance (Libby & Yaklevich, 1973). These traits should be characteristic of those with a stronger intimate exchange strategy. On the other hand, Arya, Jefferies, Enns, and DiPaola (2006) found that participants tended to rate faces that engaged in greater amounts of rapid gaze *aversion* as lower in dominance, although slower gaze aversion was not strongly related to dominance ratings. And viewers perceive greater levels of strength and leadership, and assume a higher GPA, in those who engage in more eye contact (Brooks, Church, & Fraser, 1986). Dominance and competence cues should be a characteristic of those with a stronger exploration strategy. Moreover, Fromme and Beam (1974) found that high levels of eye contact in an interaction partner were associated with greater physical approach (i.e., moving closer to the partner) for more dominant individuals, but less approach for those with lower dominance, suggesting that more dominant individuals prefer to approach those who give more signals of dominance themselves. Thus, in the current study, participants' overall duration of gazing at the partner was used, and it was hypothesized that a longer overall duration of gazing would be associated with a stronger exploration strategy.

*Laughter.* Laughter appears to be a positive social signal; listeners have more positive reactions to the sound of the voiced laugh, including rating the laughter as friendlier, compared to the sound of unvoiced laughter (Bachorowski & Owren, 2001). In a dating context, people tend to assume that laughter is a sign of interest (Fichten, Tagalakis, Judd, Wright, & Amsel, 2001). Laughing is also associated with extroversion; those who rate themselves as higher on extroversion also rate themselves as more likely to laugh in a variety of daily contexts (Ruch & Deckers, 1993; Vernon, Martin, Schermer, & Mackie, 2008). Thus it was hypothesized that laughing would be a signal displayed more often by those with a stronger exploration strategy.

*Hand/arm gestures.* Hand and arm gestures appear to be an affiliation cue, used more often in interactions between friends or romantic partners who feel closer to each other (Gonzaga, Turner, Keltner, Campos, & Altemus, 2006; Gonzaga, Keltner, Londahl, & Smith, 2001). However, again, greater rates of gesturing are also associated with extroversion (Neff, Wang, Abbott, & Walker, 2010). Thus it was hypothesized that greater use of hand and arm gestures would be associated with a stronger exploration friendship strategy.

*Eyebrow raises.* Raising both eyebrows has been considered a possible signal of engagement (Kraus & Keltner, 2009); Kraus and Keltner (2009) found that higher-SES individuals displayed fewer engagement cues with interaction partners, including eyebrow raises. In the current work, it has been hypothesized that higher SES would be associated with a stronger exploration friendship strategy, suggesting that those with a stronger exploration strategy would raise their eyebrows less. On the other hand, single-eyebrow raises are seen by viewers as signaling greater dominance (Arya et al., 2006), a trait hypothesized to be associated with a stronger exploration strategy. Thus it was hypothesized that those with a stronger exploration strategy would raise both eyebrows less often, but would raise a single eyebrow more often.

#### Behaviors Signaling a Stronger Intimate Exchange Strategy

*Duchenne smile.* Smiling, in general, appears to positively influence viewers' perception of both generosity and extroversion (Mehu, Little, & Dunbar, 2007) or, in another study, both dominance and affiliation (Hess, Blairy, & Kleck, 2000). Dominance and extroversion are characteristics more associated with an exploration friendship strategy, whereas generosity and

intimate affiliation are characteristics more associated with an intimate exchange strategy. However, the Duchenne smile (Ekman & Friesen, 1975) is a specific type of smile which involves action of both the lips and cheeks (via the zygomatic major muscle) as well as the eyes (via the obicularis oculi muscle), and is considered a “genuine” smile (Frank, Ekman, & Friesen, 1993). Duchenne smiling is an affiliation cue that is used more often between friends and romantic partners when the partners report feeling closer and more loving toward each other (Gonzaga et al., 2001; 2006). Thus it was hypothesized that the Duchenne smile would be seen more often in individuals with a stronger intimate exchange strategy.

*Nodding.* Nodding during interactions has been considered a signal of engagement (Kraus & Keltner, 2009). It is also, again, a signal used more often between interaction partners (friends or romantic partners) when the partners report feeling closer (Gonzaga et al., 2001; 2006). Additionally, it is a signal that viewers associate with lower dominance (Arya et al., 2006). Based on this evidence, it was hypothesized that nodding would be seen more often in those with a stronger intimate exchange strategy.

*Leaning toward interaction partner.* Leaning toward the interaction partner is a signal that is used more often between friends or romantic partners when the partners report feeling closer (Gonzaga et al., 2001; 2006). It is also a signal that viewers associate with greater intimacy, attraction, rapport, and trust when watching interactions between two other people (Burgoon, Buller, Hale, & de Turck, 1984; Trout & Rosenfeld, 1980). Thus it was hypothesized that leaning toward the partner would be seen more often in those with a stronger intimate exchange strategy.

#### A Behavior with Differing Hypotheses for Men and Women

*Neutral facial expression.* Unlike the other behaviors examined in this study, hypotheses for the neutral facial expression were different for men and women. Riggio and Friedman (1986) found that female participants who displayed more changes in their facial expression rated themselves as more extroverted and were seen by viewers as more confident and expressive; these findings did not extend to male participants. Similarly, Hareli, Shomrat, and Hess (2009) found that men who displayed more neutral expressions were seen as more socially dominant, whereas women who displayed more neutral expressions were seen as less socially dominant. Thus, it was hypothesized that in men, a more neutral facial expression would be associated with a stronger exploration strategy, whereas in women, a more neutral facial expression would be associated with a stronger intimate exchange strategy.

### Method

#### Participants

A total of 85 undergraduate students (43 women) participated in these tasks. The average age was 20.2 ( $SD = 1.6$ ) for men and 20.8 ( $SD = 3.4$ ) for women. Ethnicity of participants was as follows: 47 Asian/Pacific Islander, 19 Caucasian, 8 Latino/a, 1 African American, and 10 other ethnicities or mixed ethnicity. The average income of the family of origin was 3.94 ( $SD = 2.38$ ) on an 8-point scale, which corresponds to an average income of approximately \$76-100,000 a year. The highest level of education for either parent was an average of 5.00 ( $SD = 2.15$ ) on a 7-point scale; 5 indicated that the parent had a Bachelor’s degree. The mean Friendship Strategy Survey (FSS) score was 3.49 ( $SD = .68$ ) for men and 2.92 ( $SD = .71$ ) for



women. Men's scores were significantly higher than women's,  $t(83) = 3.75, p < .001$ , consistent with previous samples.

Participants were scheduled in pairs. Occasionally, one participant would show up for the study and the other would not. In those cases, the participant completed the games with a member of the research team filling in as the other "participant." These were not confederates; participants were aware that they were interacting with a research assistant. These participants could not be included in behavioral analyses, but their videos were used to develop the coding system and check coders' reliability before they began to code the rest of the videos. Videos of eight female and two male participants could not be used for this reason. Additionally, one pair of male participants could not be used because they were previously acquainted. One pair of female participants could not be used because the video of one of them was incomplete, and the other's face was obscured by a hat and glasses. One member of a male pair could not be used because the video of him was incomplete, but the other member's video was used. Finally, the videos of two female pairs, one female who had completed the task with a researcher, and one male pair were accidentally deleted during a file transfer. Thus a total of 15 female and 7 male participants were not included in behavioral analyses, and the final sample size of participants whose videotaped data could be used was 35 male and 28 female participants.

Demographic information for this reduced sample mirrored that of the sample as a whole. The average age was 20.1 ( $SD = 1.6$ ) for men and 21.0 ( $SD = 3.5$ ) for women. Ethnicity of these participants was as follows: 39 Asian/Pacific Islander, 13 Caucasian, 5 Latino/a, 1 African American, and 5 other ethnicities or mixed ethnicity. Average family income was 3.95 ( $SD = 2.33$ ) on an 8-point scale, again corresponding to an average income of approximately \$76-100,000 a year. The highest level of education completed by either parent was 5.21 ( $SD = 2.06$ ) on a 7-point scale. The mean FSS score was 3.54 ( $SD = .74$ ) for men and 3.01 ( $SD = .68$ ) for women. Men's scores were still significantly higher than women's,  $t(61) = 2.91, p = .005$ .

## Materials

Two interactive tasks were chosen which required cooperation and were expected to elicit physical and verbal indices of interaction and negotiation between participants. Specifically, participants played the word game "Taboo" (Parker Brothers) and the puzzle game "Tangoes" (Rex Games, Inc.; also known generically as Tangram puzzles). In Taboo, one person is the clue-giver, and is given one card at a time with a word on it. The other person is the guesser; he or she must guess the word on the card. The clue-giver can give as many verbal hints as he or she wants, except that he or she must refrain from using any of a list of related words which are also given on the card. The cards were provided to the participant in a plastic holder which came with the game, and the participant was to draw one card at a time from the holder. The same set of cards was used for all pairs of participants. In Tangoes, participants were given a set of three- and four-sided flat shapes molded from plastic, and a sheet of paper with the outlines of various 2-dimensional images. Their task was to arrange the plastic pieces in a way that recreated each image given on the paper, and to recreate as many of the images as possible. Two Canon FS300a digital video recorders were used to record each participant's behavior during these tasks.

Participants also completed the FSS, as well as all survey questions completed by previous survey participants (described in detail in Chapter 1): questions about their current friendships, acquaintanceships, kin relationships, and romantic relationships; the Revised Sociosexual Orientation Inventory (RSOI; Penke & Asendorpf, 2008); their own personality (Gosling, Rentfrow, & Swann, 2003); their own attachment style (Mikulincer, Florian, & Tolmacz, 1990); and demographic information including age, gender, ethnicity, sexual orientation, and socioeconomic status (SES).

### Procedure

Participants were recruited from psychology classes via a centralized, online recruiting system, and were given course credit in exchange for participation. Participants were scheduled two at a time, always with another participant of the same sex, with whom they were previously unacquainted. They were seated at right angles to each other at a small square table. They were videotaped continuously while playing the Taboo and Tagoes games together; each was videotaped separately. The video captured each participant's head and upper torso. Participants first played Taboo for four minutes. For the first two minutes of this game, one participant served as the clue-giver and the other guessed the words; for the second two minutes, participants switched roles. The number of words correctly guessed in each two-minute period was recorded. Participants next played a game of Tagoes for four minutes. No specific instructions were given with regard to how the participants should interact when playing the Tagoes game. However, participants were told with regard to both games that they were to work cooperatively in order to perform as well as possible, and that their scores would be compared to those of other participants. This set of instructions was meant to encourage participants to interact in friendly and cooperative ways that would be likely to elicit friendship-related signals. When they had completed these games, participants were each seated at a computer and each completed all online surveys. All of these surveys were administered via an online survey-hosting site (Qualtrics, Inc.).

The videotaped behavior of each participant was coded by four trained coders. The participants were coded for behavior during the Taboo game only, not during the Tagoes game. Because the latter involved looking down at the puzzle pieces for most of the task, it was determined that more relevant behaviors were being displayed during the Taboo game. Participants' behavior during both parts of the Taboo game was coded: both when acting as clue-giver and when acting as guesser.

Each video was coded by two assistants, and each assistant coded half of the videos. Coding was organized such that each coder was paired with every other coder for one-quarter of the videos. Each coder noted the beginning and end of each discrete bout of behavior, and an overall agreement rate was calculated for each behavior across all four coders. Specifically, following Gonzaga and colleagues (2001; 2006), if both assistants coded the behavior as occurring during overlapping time points, or at time points which fell within 1 second of each other, this was counted as an agreement. If neither assistant coded a behavior as occurring at all in a given participant, this was also counted as one agreement. Any codes that did not overlap within 1 second were counted as disagreement. Details regarding the coding of each behavior, and agreement rates for each, are as follows.

*Gazing toward interaction partner.* This variable was operationalized as the duration of time, during the four minutes of the Taboo game, that the participant spent looking at his or her interaction partner. Because the game required participants to glance often at the Taboo cue cards, gaze was coded continuously if a participant glanced away from the interaction partner for less than 2 seconds and then looked back. Agreement across all four coders was 82.6% for this behavior. To derive the final duration score for each participant, the total amount of time spent gazing was summed separately for each coder, and the average of these two sums was taken as the final score for each participant. On average, male participants gazed at their partners for 118.36 seconds ( $SD = 40.40$ ) and female participants for 135.53 seconds ( $SD = 48.94$ ).

*Laughter.* This variable was operationalized as the amount of time that the participant spent engaging in vocalized laughter during the Taboo game, as determined via audio. Agreement across all four coders for laughter was 71.6%. Total time spent laughing was summed separately for each coder, and the average of these two sums was used as the final data point for each participant. On average, male participants laughed for 5.12 seconds ( $SD = 5.61$ ), and female participants for 7.89 seconds ( $SD = 5.28$ ).

*Hand/arm gestures.* This variable was operationalized as the amount of time during the Taboo game that participants moved their hands and/or arms, while not touching or reaching to touch the self or any other object or person. Arm and hand movements in which the participant was reaching for an object or person, or movements made while any object (e.g., a Taboo card) was in the hand, were not considered to be gestures. Agreement across all four coders was 75.1% for this behavior. The total amount of time spent gesturing was summed for each coder, and the average of these sums was used as the final data point for each participant. On average, male participants gestured for 45.57 seconds ( $SD = 34.66$ ) and female participants for 42.10 seconds ( $SD = 30.62$ ).

*Eyebrow raises.* Coders attempted to code both single and double eyebrow raises; however, some participants' hair or hats were blocking their eyebrows, and this facial movement was subtle enough that it proved difficult to establish reliability among the coders. Thus, the behavior was dropped from the coding scheme.

*Duchenne smile.* This variable was operationalized as the number of times during the Taboo game that the participant showed a Duchenne smile. To be coded as a Duchenne smile, the expression needed to have four characteristic features: corners of the lips drawn up (with or without teeth showing), a wrinkle at the corners of the mouth, cheeks raised, and a wrinkle either under or at the corner of the eye (Ekman & Friesen, 1975). Agreement across all four coders was 65.9% for this behavior. The final score for each participant was calculated by counting the number of smiles that each coder noted, and taking the average of the two coders' ratings for each participant. Number of smiles was used rather than duration of smiling because the Duchenne smile is by definition a brief signal, and thus an interaction partner may be expected to take greater note of the number of smiles a partner displays, rather than the duration of the smile. The brief duration of these smiles, and the subtle and precise definition of the behavior, also likely explain the somewhat low inter-coder agreement for this behavior. However, coders overall did agree on the number of smiles seen at a rate of 91.3%. On average, male participants displayed a Duchenne smile 9.74 times ( $SD = 3.48$ ) and female participants 10.98 times ( $SD = 4.93$ ).

*Nodding.* This variable was operationalized as the duration of time during the Taboo game that the participant spent nodding his or her head up and down. To assure that the behavior was a true nod and not an extraneous head movement, the participant's head needed to move up and down at least twice to be recorded as a nod. However, this behavior also proved difficult to code; ultimately, inter-coder reliability reached only 57.1%, and thus this behavior was not used for analysis.

*Leaning toward interaction partner.* Coders attempted to code the duration of time that the participant spent leaning toward the partner. However, in the initial stages of developing the code, it was difficult to make a distinction in these participants between leaning forward as a socially-directed behavior and leaning forward that was instead a component of another behavior, such as picking up or putting down Taboo cards or resting the arms on the table. As a result, preliminary reliability could not be established for this behavior, and it was dropped from the coding scheme. (Difficulty with this behavior has also been encountered by other researchers; Hagad, Legaspi, Numao, & Suarez, 2011.)

*Neutral facial expression.* This variable was operationalized as the duration of time that each participant spent with a neutral facial expression, that is, with no emotion-related facial movement. This code could be given while the participant's mouth was moving to speak, while blinking, or while touching the face with the hand, for example to scratch an itch. However, this code was not used during times when participants evinced long-lasting, relatively fixed expressions, such as a "polite" (non-Duchenne) smile. It proved difficult to establish inter-coder reliability for this behavior as well. To improve reliability, neutral facial expressions lasting less than 1 second were not coded, and neutral facial expression was coded continuously even if very brief (less than 1 second) facial movements occurred. However, even with these allowances, agreement between all four coders reached only 57.0%, and thus this behavior was not used in analyses.

## Results

Ultimately, reliable observations were obtained for four of the behaviors that had been hypothesized to relate to friendship strategy: gazing toward the interaction partner, Duchenne smiles, voiced laughter, and hand/arm gestures. Smiling and laughing were positively correlated with each other,  $r(63) = .588, p < .001$ , and gazing and gesturing were positively correlated with each other,  $r(63) = .307, p = .015$ . No other observed behaviors were correlated. The correlations between FSS scores and each of these behaviors was examined; none of these correlations was significant, when tested separately in men and women and when tested in the sample as a whole.

The number of friends a participant reported having, their emotional closeness to their friends, scores on the RSOI, self-reported personality, and self-reported attachment scores had each been related to FSS scores in Chapter 1. Therefore, analyses were run to test whether these variables related to observed behaviors in the videotaped participants, separately for male and female participants.

For male participants, only laughter was correlated with self-report variables. The amount of time spent laughing was correlated with the number of friends men reported having,  $r(35) = .478, p = .004$ , with RSOI behavior,  $r(35) = .480, p = .004$ , and with attachment anxiety,  $r(35) = .338, p = .047$ . An examination of correlations among these three self-report measures

showed that RSOI behavior and the number of friends men reported having were positively correlated,  $r(35) = .837, p < .001$ . A stepwise regression revealed that when both of these variables were entered simultaneously as predictors of time spent laughing, only RSOI behavior remained a significant predictor,  $Beta = .480, p = .004$ . Personality self-ratings and observed behaviors were not significantly correlated for male participants.

For female participants, a broader set of associations was found. Each of the three RSOI subscale scores was correlated with either gesturing, gazing at the partner, or both (Table 11). However, applying a Bonferroni correction for multiple comparisons, only the association between RSOI attitude and gesturing remained significant at the corrected significance level of  $p < .004$ . Self-ratings of extroversion were positively correlated with both time spent gazing at the partner,  $r(28) = .408, p = .031$ , and time spent gesturing,  $r(28) = .380, p = .046$ . Self-ratings of kindness/generosity were negatively correlated with time spent gazing at the partner, but only at a trend level,  $r(28) = -.367, p = .055$ . Additionally, attachment security was correlated with the amount of time spent gazing at the partner,  $r(28) = .386, p = .043$ . The association between gazing at the partner and gesturing among female participants was significant only at trend level,  $r(28) = .350, p = .068$ .

Because extroversion, kindness/generosity, attachment security, and RSOI scores were related to gazing at the partner and/or gesturing among female participants, the correlations between all of these variables were examined, for female participants only. Attachment security and extroversion were positively correlated,  $r(28) = .719, p < .001$ , and kindness/generosity was negatively correlated with both RSOI attitude,  $r(27) = -.516, p = .006$  and RSOI behavior,  $r(27) = -.420, p = .029$ . No other correlations were significant. Applying a Bonferroni correction for multiple comparisons, the critical value for these 11 tests was  $p < .005$ ; with this criterion, only the association between attachment security and extroversion remained significant. Both of these variables were related to the amount of time spent gazing at the partner. Therefore, a stepwise regression was run, with both of these variables entered simultaneously as predictors of time spent gazing. Only extroversion remained a significant predictor in this model,  $Beta = .408, p = .031$ .

Table 11

*Correlations Between Observed Behaviors and Revised Sociosexual Orientation Inventory Scores, for the Female Videotaped Participants*

	2	3	4	5	6	7
1. RSOI attitude	.355*	.573****	.475*	.559***	-.084	-.155
2. RSOI desire		.139	.387*	.354†	.182	.175
3. RSOI behavior			.120	.445*	.120	-.112
4: Gaze to partner				.350†	.099	-.031
5: Gesturing					-.027	.003
6: Laughter						.746****
7: Duchenne smile						

† $p < .10$ . \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .004$ . \*\*\*\* $p < .001$ . All tests 2-tailed.

## Discussion

Overall, the hypotheses of this study were not supported. Individuals' self-reported friendship strategy was not associated with the specific behaviors that had been hypothesized as signals of that strategy to an interaction partner. There are a number of possible explanations for this lack of findings. First, of course, it is possible that individuals are not signaling their friendship strategy to interaction partners, and that friends are chosen according to entirely different considerations. But it is also possible that there are in fact reliable signals of friendship strategy, which were simply not seen in the current study. There are at least two possible reasons why this might be the case.

First, it is possible that there are reliable signals of friendship strategy, but that these consist of some other set of behaviors than those assessed in the current study. Indeed, it is possible that signals of friendship strategy may include those which proved difficult to code in the current study, which were thus not included in analyses. The way that participants were videotaped contributed in part to the difficulty in establishing reliability for some behaviors. Participants were not asked to remove their hats or move their hair out of their faces, and they were videotaped from across the table, while interacting with a partner who was sitting to the side, such that participants were often oriented somewhat sideways in relation to the video camera. These problems would be relatively easy to remedy in a replication of this study.

Second, it is possible that the task that participants engaged in was too structured to reveal signals of friendship strategy. Asking participants to cooperate in order to compete with other pairs of participants may have led them to display a different set of signals and behaviors than those that they might have used when interacting more casually or getting to know a new acquaintance. Allowing participants to interact more freely, perhaps by asking them to discuss a topic of mutual interest, may have resulted in displays of signals more related to friendship strategy. Relatedly, it is also possible that signals of friendship strategy are not used so early in interactions with strangers, and that they would start to emerge only after repeated interactions between two individuals. These considerations suggest that a replication of this study is called for, in which participants are asked to engage in a more unstructured interaction and are asked to interact more than once, and in which some technical details of videotaping are corrected.

In spite of the lack of support for the hypotheses of the study, some findings of note did emerge, and these findings were quite different for men and women. Among female participants, women who spent more time gazing at their partners rated themselves higher in extroversion and higher in attachment security (although only extroversion remained a significant predictor when these two were compared in a stepwise regression), and they reported that they had a more short-term mating strategy with regard to both attitudes and desires (though not in terms of concrete behaviors). They also self-reported lower levels of kindness/generosity, though this relationship was significant only at trend level. Similarly, women who spent more time gesturing rated themselves higher in extroversion and reported a more short-term mating strategy, with regard to attitude and concrete behavior (and at trend level with regard to desire). Gazing at the partner and gesturing were positively correlated in the sample as a whole, though these were only correlated at trend level when analyzed among female participants only. Overall, these findings suggest that for women, gazing at interaction partners and gesturing with the hands and arms might be reliable signals of both an

extroverted personality and a more short-term mating strategy. These findings are generally consistent with previous research, although it is unclear why these results emerged only for female participants. Specifically, the current results replicated an association between extroversion and gesturing found by Neff and colleagues (2010), and are consistent with findings associating more gazing at partners with partners' ratings of higher dominance (Arya et al., 2006) and viewers' perceptions of greater strength and leadership (Brooks et al., 1986). Although not specifically related to friendship strategy, these results do support the more general idea that humans use reliable signals to "advertise" some of their social traits to their interaction partners.

For male participants, the only behavior that appeared to be meaningful was how much time they spent laughing while interacting with their partners. More time spent laughing was associated with men's self-reports of being higher in attachment anxiety, of having more friends, and of having a more short-term mating strategy, in terms of actual behavior (but not in terms of attitudes or desire). The number of friends men reported having was correlated with short-term mating strategy, and only the latter remained a significant predictor of laughter when the two were compared in a stepwise regression. It is interesting that laughter appears to be an important signaling behavior between pairs of men, one which seems to convey information about at least two quite different features. It is also worth noting that it was hypothesized in this study that laughing would be a signal of a stronger exploration strategy, and results of Chapter 1 showed that individuals with a stronger exploration strategy reported having a more short-term mating strategy, and thus these findings are, in general, in line with the basic ideas of these studies' hypotheses. However, the meaning of the finding regarding attachment anxiety is difficult to interpret; the current hypotheses did not include predictions about attachment anxiety, and in Chapter 1, attachment anxiety had been related to a stronger intimate exchange strategy (only in the second sample; it was unrelated to friendship strategy in the first sample). Thus the meaning of this particular finding remains unclear.

Chapter 3 will explore whether naïve viewers are able to perceive and detect videotaped participants' friendship strategies, when watching brief segments of their behavior, and whether these will influence the viewers' preference when choosing potential new friends.

### Chapter 3: Reliable Signals of Friendship Strategy and Signal Receivers

#### Introduction

In the previous chapter, it was argued that if people have conditional friendship strategies, they should also be sending and receiving reliable signals of these strategies when interacting. That is, they should be able to accurately convey information regarding their strategies to interaction partners, and those partners should be able to accurately decode that information (Cronk, 2005; Searcy & Nowicki, 2005; Smith, 1994). Such a signaling system would benefit both the signaler and the receiver (Bliege Bird & Smith, 2005; Cronk, 2005; van Baalen & Jansen, 2003; Silk, Kaldor, & Boyd, 2000), and thus should be an honest signal, allowing both partners to efficiently choose to interact more with others who are likely to be a good fit for their friendship strategy. Inherent in this concept, of course, is that a signal needs both a sender and a receiver in order to be a signal (e.g., Cronk, 2005). The interests of a signal sender are not served if the signal receiver does not notice, or cannot decode, the message being sent (Guilford & Stamp Dawkins, 1991; Rowe, 1999). Therefore, signals tend to complement their receivers' characteristics, such as their sensory abilities and their attentional and memory capacities (Endler & Basolo, 1998; Guilford & Stamp Dawkins, 1991; Ryan, 1998). For example, male guppies have color patterns that are particularly visible to female guppies' visual systems, and which are also relatively invisible to those of guppies' main predators (Endler, 1991).

Therefore, the search for possible reliable signals can be aided by a focus on the signal receiver as well as on the signal sender. The previous chapter focused on the attempt to find evidence of reliable nonverbal signals in senders' behavior, but the data did not reveal any associations between friendship strategy and the specific behaviors that were chosen as possible signals. Therefore, the focus in the current chapter shifts to the signal receiver, to examine whether viewers will be able to infer information about a sender's friendship strategy by watching the sender's behavior, regardless of what the specific behavioral signals they are seeing may be.

Moreover, as mentioned in the previous chapter, there is evidence not only that humans are able to perceive and detect various reliable behavioral signals from others, but that these signals affect their own opinions and behavior *differently* depending on their own conditional strategies. Perhaps the best evidence of this comes from another area of interpersonal relationships: mate choice. For example, men who have a more short-term mating strategy find female promiscuity relatively desirable, whereas those who have a more long-term mating strategy find it more undesirable (Buss & Schmitt, 1993). Reciprocally, the more a woman leans toward a long-term mating strategy, the more she values signals of ambition and social status in men (Buss & Schmitt, 1993). These examples show that picking up on others' reliable signals can be a valuable way for individuals to efficiently pursue the interests of their particular conditional strategy, because they make it possible to focus on partners whose characteristics are compatible with their strategy.

In the previous chapter, it was hypothesized that reliable signals are used in the context of conditional strategies of friend selection. The current chapter further investigates this hypothesis by focusing on signal receivers and whether they are able to accurately decode any such signals. In this study, a new group of participants viewed short clips of silent video of the participants who had been videotaped in the previous study, and these new participants then



answered questions regarding their estimates of the videotaped individuals' friendship-strategy-related personality traits, as well as deciding which of the individuals they would personally most like to have as a friend. Individuals made these ratings and choices only for videotaped participants of the same sex (i.e., men viewed potential male friends, and women viewed potential female friends; also, only heterosexual participants were included), because sexual attraction can be an element in opposite-sex friend choice, particularly for men (Bleske-Rechek & Buss, 2001), and this factor would thus likely interfere with choices made on the basis of friendship strategy. It was hypothesized that viewers would most often choose as a potential friend the videotaped participant whose friendship strategy score most closely matched their own, and that they would also be able to rate the videotaped participants' friendship-strategy-related behavioral traits relatively accurately, when compared to those participants' self-ratings of their own personality traits of extroversion and kindness/generosity.

## Method

### Participants

A relatively large number of participants were dropped from the current sample, for three reasons which had been anticipated at the start of data collection. First, some participants did not see the entirety of the stimulus materials, due to errors in the interface between their browsers and the survey site (see Materials section for details). This resulted in 32 participants (19 men) being removed from analysis. Second, all participants who indicated a non-heterosexual orientation were removed from analysis ( $n = 28$ , 15 men), because the current study was concerned with friendship formation, and not with romantic attraction. This was not due to an assumption that friendship formation works differently in non-heterosexual populations, but rather was to eliminate any possible effect of romantic attraction on participants' impressions when viewing the videos. Third, participants who indicated that they recognized any of the videotaped participants as someone with whom they were acquainted in real life was removed from analysis ( $n = 49$ , 25 men). A sample was collected that was intentionally larger than needed, in order to accommodate these losses.

These removals resulted in a final sample size of 105 male and 109 female participants. The average age was 21.0 ( $SD = 2.7$ ) for men and 20.5 ( $SD = 3.4$ ) for women. Ethnicity of the participants was as follows: 100 Asian/Pacific Islander, 63 White, 14 Latino/a, 6 African American, 1 Native American, and 29 other ethnicities or mixed ethnicity, with ethnicity data missing for one participant. The mean score for family of origin's income level was 4.50 ( $SD = 2.28$ ); on this scale, 4 corresponded to an income range of \$76,000 to \$100,000. The mean score for parents' highest level of education was 5.08 ( $SD = 2.02$ ); on this scale, 5 corresponded to a Bachelor's degree. These participants completed a measure of SES (see Materials for details) which contained six items asking the participant for his or her subjective sense of financial security during childhood (three items) and currently (three items), on 7-point Likert scales (Griskevicius, Delton, Robertson, & Tyber, 2011). The mean score for childhood subjective SES was 4.47 ( $SD = 1.52$ ) and for current subjective SES was 4.32 ( $SD = 1.42$ ). Alpha reliabilities for these two mean scales were .836 and .791, respectively.

## Materials

The videotapes of individuals who had participated in the previous study (Videotaped Participants: VPs) were used to create stimulus materials for the participants in the current study. First, the videos were reviewed for technical quality, and the VPs' Friendship Strategy Survey (FSS) scores were examined. Then, this information was used to choose four videos of female VPs and four videos of male VPs to be shown to female and male viewers, respectively. Specifically, the female VPs who scored lowest and highest on the FSS, and for whom video quality was acceptable, were chosen. Then, two mid-range FSS scores were calculated that would result in four scores that were equidistant between the highest and lowest scorers. Two more female VPs' videos were then chosen, whose scores matched these numbers as closely as possible, and for whom video quality was acceptable. The highest score among female VPs was 4.125 and the lowest was 1.438. The scores of the intermediate two VPs were 2.438 and 3.125. The same 30-second segment was excerpted from each of these four videos: a segment during which the participant was reading Taboo clues to her partner, and which began 30 seconds after the beginning of her turn. The sound was removed from these segments and they were cropped so that only the participant's head and torso were visible (i.e., any visible background items, and the tabletop, were cropped out). This process was repeated for male VPs. The highest FSS score for male VPs was 4.813 and the lowest was 2.25. The two intermediate participants' scores were 3.063 and 4.00. Again, the same 30-second segments were excerpted from these videos and cropped to remove any background, and the sound was removed.

These eight 30-second videos were embedded into a new online survey. This survey showed male viewers only the four videos of male VPs, always in the same order, and female viewers only the four videos of female VPs, in the same order. The order for each set of videos was chosen at random; the four videos were not shown in order according to FSS scores. Questions about each video were asked immediately after the viewer had watched each. Viewers were asked to estimate each VP's personality traits on a 7-point Likert scale ("Based on this short video, what kind of personality traits would you guess this person has? Rate this person on the following traits"), including the following items: socially dominant, kind/considerate, skillful, funny/witty, helpful, gregarious/charismatic, emotionally open, confident, warm, physically attractive, and sharing/generous. They were then asked to rate, on a 7-point Likert scale, how much they would like to have each VP as a friend ("How much would you like to have this person as a friend?"). They also answered yes/no questions regarding whether they happened to recognize the VP as someone they already knew, as well as whether the video had played in its entirety; due to interactions between viewers' browser cache and the survey site, videos sometimes failed to completely load, and this problem could not be remedied without access to the browser cache.

After watching and answering questions about all four videos, the viewer was shown screen-capture images of all four VPs and was asked to choose which of the four they would most like to have as a friend. Then, viewers completed the same surveys as those completed by all the previous survey participants (described in detail in Chapter 1): the FSS; questions about their current friendships, acquaintanceships, kin relationships, and romantic relationships; the Revised Sociosexual Orientation Inventory (RSOI; Penke & Asendorpf, 2008); their own personality (Gosling, Rentfrow, & Swann, 2003); their own attachment style (Mikulincer, Florian, & Tolmacz, 1990); and demographic information including age, gender, ethnicity, sexual

orientation, and socioeconomic status (SES). There was one change to the demographics section of this survey. One question asking about participants' currently completed level of education was removed, and six questions regarding subjective SES were added; these items were taken from a measure used by Griskevicius and colleagues (2011). These six items asked the participant for his or her subjective sense of financial security during childhood (three items) and currently (three items), on 7-point Likert scales. Griskevicius and colleagues found that these items divided into two factors corresponding to childhood questions and current questions. This change was made because the sample consisted entirely of undergraduate students, and thus a measure assessing childhood SES was more likely to yield meaningful variation. Questions asking about parents' level of education and family income were retained.

### Procedure

Undergraduate participants were recruited from Psychology classes via a centralized, online recruiting system, and were given course credit in exchange for participation. Participants completed all surveys online.

## Results

### Viewers' Most Desired Friend and FSS Scores

FSS scores for the viewers and the VPs were calculated as in previous chapters, by reverse-coding half of the items such that all responses favoring an exploration strategy were at the high end of the scale, and then taking the mean of all items. Thus, low scores indicate a stronger intimate exchange strategy, and high scores indicate a stronger exploration strategy. The mean FSS score was 3.36 ( $SD = .69$ ) for male viewers and 2.99 ( $SD = .74$ ) for female viewers. The mean score for men was significantly higher than that for women,  $t(211) = 3.78, p < .001$ , consistent with previous samples. Again, the FSS scores for the four male VPs were 4.813, 4.00, 3.063, and 2.25; the scores for the four female VPs were 4.125, 3.125, 2.438, and 1.438.

For male viewers, 50 participants chose the male VP with the highest FSS score (i.e., the strongest exploration friendship strategy), 31 chose the video of the second-highest scorer, 19 chose the video of the third-highest scorer, and 5 chose the video of the lowest scorer (i.e., the strongest intimate exchange friendship strategy). The numbers of male viewers choosing each male VP were significantly unequal,  $\chi^2(3) = 40.64, p < .001$ . For female viewers, 32 participants chose the video of the highest-scoring female VP, 34 chose the second-highest scorer, 20 chose the third-highest scorer, and 22 chose the lowest scorer. The numbers of female viewers choosing each female VP were not significantly different,  $\chi^2(3) = 5.48, p = .140$ , although when combined, the two VPs with higher FSS scores were chosen significantly more often than were the two with the lower FSS scores,  $\chi^2(1) = 5.33, p = .021$ .

The main hypothesis of this study was that viewers would reliably choose as their most-desired friend the VP whose FSS score most closely matched their own score. To test this hypothesis, first each viewer's score was subtracted from each of the relevant (same-gender) VP's scores to obtain four difference scores, and these were converted into absolute values. These scores are reported in Table 12, separately for the groups of viewers who had chosen each of the four VPs as their most-desired friend. Then, the difference scores between each viewer's and each VP's FSS scores were coded to indicate which VP's score was closest to that of each viewer. (In four cases, female viewers' scores were exactly halfway between the highest

and second-highest VPs' scores; in these cases, the viewers were matched to the highest scorer, because these viewers' scores were relatively high compared to the average.) A 4x4 chi-squared analysis was then used to examine whether viewers were more likely to choose the VP whose FSS score most closely matched their own. These results were not significant for either women,  $X^2(9) = 12.32, p = .196$ , or men,  $X^2(9) = 5.49, p = .790$ . It was also tested whether participants who chose one of the two higher-scoring VPs had an FSS score that more closely matched either of these scores, by recoding the choice of VP and the FSS difference score match into a 2x2 grid of high versus low. These results were also not significant,  $X^2(1) = 1.05, p = .305$  for men and  $X^2(1) = 0.36, p = .549$  for women.

Table 12

*Mean Difference Scores Between Viewers' and Videotaped Participants' Friendship Strategy Survey scores, According to Which VP the Viewers Most Wanted to Have as a Friend*

	Difference scores			
	Highest video	Second-highest	Third-highest	Lowest
<b>Men</b>				
Chose highest-scoring video <sup>a</sup> ( $n = 50$ )	1.46	.82	.64	1.16
Chose second-highest-scoring video ( $n = 31$ )	1.35	.76	.64	1.21
Chose third-highest-scoring video ( $n = 19$ )	1.58	.77	.47	1.00
Chose lowest-scoring video ( $n = 5$ )	1.58	.76	.45	.99
<b>Women</b>				
Chose highest-scoring video ( $n = 32$ )	1.25	.52	.65	1.47
Chose second-highest-scoring video ( $n = 34$ )	1.25	.71	.80	1.58
Chose third-highest-scoring video ( $n = 19$ )	1.32	.58	.56	1.36
Chose lowest-scoring video ( $n = 22$ )	.95	.49	.83	1.74

<sup>a</sup>The highest-scoring video on the FSS corresponds to the strongest exploration strategy. The lowest-scoring video corresponds to the strongest intimate exchange strategy.

Viewers had also rated how much they would like to have each VP as a friend, separately for each VP. It was examined whether these more specific ratings were related to FSS difference scores (i.e., how far each viewer's FSS score was from that of each VP). Correlations were run between FSS difference scores and the viewers' Likert-scale ratings of how much they would like to have each VP as a friend (Table 13). For women, these correlations were not significant; women did not more strongly prefer as friends those VPs whose FSS scores were closer to their own. For men, these correlations were also not significant, except that male viewers' ratings of how much they wanted to be friends with the lowest-scoring male VP (i.e., the one with the strongest intimate exchange strategy) were significantly correlated with the closeness of their own FSS score to that VP's score (i.e., the difference score was lower). The average desired-friend rating for this VP was 3.76 ( $SD = 1.19$ ) on a 7-point scale.

Table 13

*Pearson Correlations Between Viewers' Friendship Strategy Survey Difference Scores and Their Ratings of How Much They Want Each Videotaped Participant as a Friend*

	Desired friend ratings for each VP			
	Highest-scoring video	Second-highest	Third-highest	Lowest-scoring video
FSS difference scores: men				
Highest-scoring video <sup>a</sup>	.099			
Second-highest-scoring video		.176†		
Third-highest-scoring video			-.089	
Lowest-scoring video				-.230*
FSS difference scores: women				
Highest-scoring video	.011			
Second-highest-scoring video		.162†		
Third-highest-scoring video			-.145	
Lowest-scoring video				.132

<sup>a</sup>The highest-scoring video on the FSS corresponds to the strongest exploration strategy. The lowest-scoring video corresponds to the strongest intimate exchange strategy.

† $p < .10$ . \* $p < .05$ . All tests 2-tailed.

#### Viewers' Ratings of Videotaped Participants' Traits

The second hypothesis of this study was that viewers would be able to accurately read signals in VPs' behavior that reflected VPs' levels of extroversion and kindness/generosity.

*Extroversion.* VPs' self-ratings of extroversion were calculated as the mean of self-ratings of "extroverted/ enthusiastic," "socially exciting," and "reserved/quiet," reverse-coded. Viewers rated VPs on a number of behavioral traits that should relate to extroversion: socially dominant, skillful, funny/witty, gregarious/charismatic, and confident. Viewers' ratings on these five traits made coherent scales for each of the male VPs; alpha reliabilities for the five items were .700 for the VP with the highest FSS score, .851 for the second-highest, .793 for the third-highest, and .796 for the lowest. Thus a mean score for "dominance/charisma" was created for viewers' ratings of each male VP using these items (Table 14). This score was significantly different across VPs,  $F(3, 419) = 35.82, p < .001$ . Post-hoc tests (Tukey's Least Significant Differences, LSD) demonstrated that viewers' dominance/charisma ratings were significantly higher for each of the two male VPs with the highest self-reported FSS scores (i.e., the strongest exploration strategy scores) when compared to each of the male VPs with the lowest FSS scores ( $p < .001$ ). Further, the VP with the lowest FSS score had dominance/charisma ratings that were significantly lower than those given to the second-lowest-scoring VP ( $p = .015$ ). This lowest-scoring VP was desired as a friend more strongly by those viewers whose FSS scores were closer to his, as reported above, and he also rated himself relatively low on extroversion compared to the other VPs.

Table 14

*Individual Self-Ratings for the Eight Videotaped Participants Who Were Rated by Viewing Participants, and the Average Ratings Given to Them by Viewers*

	VPS' self-ratings			Viewers' ratings		
	Friendship strategy	Extroverted	Kind/generous	Dominant/charismatic <sup>b</sup>	Kind/generous <sup>b</sup>	Attractive <sup>b</sup>
Men						
Highest-scoring video <sup>a</sup>	4.813	7.00	5.67	4.74 <sup>†</sup> ( <i>SD</i> = .77)	4.67 ( <i>SD</i> = .71)	4.02 <sup>†</sup> ( <i>SD</i> = 1.18)
Second-highest-scoring video	4.000	5.67	4.67	4.74 <sup>†</sup> ( <i>SD</i> = .90)	4.43 ( <i>SD</i> = .87)	4.10 <sup>†</sup> ( <i>SD</i> = 1.24)
Third-highest-scoring video	3.063	5.33	6.67	4.03 <sup>†</sup> ( <i>SD</i> = .87)	4.51 ( <i>SD</i> = .80)	3.05 <sup>†</sup> ( <i>SD</i> = 1.15)
Lowest-scoring video	2.250	5.33	5.33	3.74 <sup>◊</sup> ( <i>SD</i> = .92)	4.64 ( <i>SD</i> = .83)	3.21 <sup>†</sup> ( <i>SD</i> = 1.25)
Women						
Highest-scoring video	4.125	6.00	6.00	5.13 <sup>†</sup> ( <i>SD</i> = .76)	4.64 ( <i>SD</i> = .81)	4.06 <sup>◊</sup> ( <i>SD</i> = 1.33)
Second-highest-scoring video	3.125	2.67	6.33	4.69 <sup>†</sup> ( <i>SD</i> = .83)	4.76 <sup>◊</sup> ( <i>SD</i> = .81)	4.69 <sup>†</sup> ( <i>SD</i> = 1.10)
Third-highest-scoring video	2.438	2.33	5.33	3.90 <sup>◊</sup> ( <i>SD</i> = .79)	4.81 <sup>◊</sup> ( <i>SD</i> = .82)	4.06 <sup>◊</sup> ( <i>SD</i> = 1.19)
Lowest-scoring video	1.438	5.67	6.67	4.61 <sup>†</sup> ( <i>SD</i> = .80)	4.45 <sup>†</sup> ( <i>SD</i> = .74)	3.92 <sup>◊</sup> ( <i>SD</i> = 1.20)

<sup>a</sup>According to the FSS. The highest-scoring video on the FSS corresponds to the strongest exploration strategy. The lowest-scoring video corresponds to the strongest intimate exchange strategy. <sup>b</sup>Scores with different symbols are significantly different from each other at  $p < .05$  or greater, within gender groups.

Reliabilities for female viewers' ratings of dominance/charisma were .759 for the VP with the highest FSS score, .816 for the second-highest, .739 for the third-highest, and .778 for the lowest. Female viewers' ratings of female VPs' dominance/charisma were significantly different across the four VPs,  $F(3, 427) = 44.37, p < .001$ . Post-hoc tests (Tukey's LSD) demonstrated that all ratings were significantly different from each other at  $p < .001$ , with the exception that ratings given to the VP with the lowest FSS score were not significantly different from those given to the VP with the second-highest FSS score (Table 14). The VP with the highest self-ratings on both extroversion and the FSS received the highest viewer ratings of dominance/charisma. The VP with the second-highest FSS score received the second-highest ratings of dominance/charisma, though she had given herself relatively low self-ratings of extroversion. The female VP with the lowest FSS score received dominance/charisma ratings that were not significantly different from those given to the second-highest-scoring VP, and her self-reported extroversion was relatively high.

*Kindness/generosity.* VPs' self-ratings of kindness/generosity were calculated as the mean of self-ratings of "kind/considerate," "sharing/generous," and "sympathetic/warm." Viewers had rated VPs on these same three traits, as well as the trait "emotionally open." These four items formed coherent viewer-rating scales for each of the VPs. For male VPs, alpha reliabilities for this four-item scale were .688 for the VP with the highest FSS score, .813 for the second-highest, .763 for the third-highest, and .698 for the lowest. For female VPs, alphas were .808 for the VP with the highest FSS score, .816 for the second-highest, .698 for the third-highest, and .723 for the lowest. Mean viewer scores composed of these four items were calculated for each VP (Table 14). For male VPs, viewers' ratings of kindness/generosity were not significantly different, but the data did reflect a trend-level effect,  $F(3, 420) = 2.13, p = .096$ . This was driven by the difference between viewers' ratings of the VPs with the two highest FSS scores,  $p = .027$  in a post-hoc test (Tukey's LSD). Ratings of the VPs with the lowest and second-highest FSS scores were also different at trend level,  $p = .057$ . For female VPs, viewers' ratings of kindness/generosity (Table 14) were significantly different among the VPs,  $F(3, 428) = 4.28, p = .005$ . Post-hoc tests (Tukey's LSD) showed that viewers' kindness/generosity ratings for the VP with the lowest FSS score were significantly lower than those for the VP with the second-lowest FSS score ( $p = .001$ ) and those for the second-highest ( $p = .005$ ); other ratings were not significantly different.

#### Possible Alternate Predictors of Viewer Choice

With one small exception, viewers did not seem to be choosing the VP they preferred as a friend on the basis of inferring that the VP's friendship strategy was similar to their own. Thus it was tested whether viewers' choices could be predicted on the basis of some other systematic preference. Specifically, it was tested whether viewers' choice of VP could be predicted on the basis of VPs' ethnicity, viewers' ratings of VPs' physical attractiveness, or viewers' ratings of how well VPs' personality traits matched their own, independent of whether their ratings of VPs' personality matched VPs' self-assessments of personality.

*Ethnicity.* Ethnicity of the VPs varied, and thus it was explored whether viewers may have chosen their most-desired friend by choosing a VP whose ethnicity matched their own. The numbers of male viewers choosing each male VP were significantly unequal, as reported above. Two male VPs were Asian and two were White. One of the two Asian VPs was chosen

most often (by 50 viewers), and he was also the VP with the highest FSS score. The other Asian VP was chosen third most often (by 20 viewers) and had the third-highest FSS score. The VP with the second-highest FSS score was White and was chosen second most often (by 31 viewers). Thus, Asian VPs were chosen more often overall, but it was also true that the rank of FSS scores and the rank of number of viewers preferring each VP were identical.

The large majority of male participants were either Asian/Pacific Islander or White. Therefore, only the Asian ( $n = 54$ ) and White ( $n = 29$ ) male viewers were selected, and a 2x2 chi-squared analysis was used to check whether these participants had preferentially chosen the VP of their own ethnicity. This result was not significant,  $\chi^2(1) = 1.46, p = .228$ . The ethnicity of male viewers was also recoded into Asian, White, or Other, and again the result of a 3x2 chi-squared analysis was not significant,  $\chi^2(2) = 2.31, p = .315$ . However, 37 of the 54 male Asian viewers chose one of the two Asian VPs; in other words, an Asian VP was chosen 68.5% of the time by male Asian viewers. This was significantly more often than chance,  $\chi^2(1) = 7.41, p = .006$ . The cause of this result is ambiguous because the male VP who was chosen the most often by far was both Asian and had the highest FSS score. Moreover, Asian viewers' second-highest choice (14 of 54 viewers) was the VP with the second-highest FSS score, who was White. However it is possible that ethnicity match did influence Asian viewers' choices to a small extent. Thirteen of the 29 male White viewers chose one of the two White VPs: this was 44.8% of the time; White viewers did not choose either ethnicity significantly more often than chance,  $\chi^2(1) = .31, p = .577$ .

Two of the female VPs were Asian, one was White, and one was Latina. The numbers of female viewers choosing each female VP were relatively equal among the four VPs, as reported above. The majority of female viewers were either Asian ( $n = 46$ ) or White ( $n = 34$ ). There were also a small number of Latina viewers ( $n = 9$ ). Therefore viewers of these three ethnicities only were selected, and it was examined whether these viewers had more often chosen VPs of their own ethnicity. The result of this 3x3 chi-squared test was not significant, but it reached trend level,  $\chi^2(4) = 8.90, p = .064$ . Twenty-eight of the 46 female Asian viewers chose one of the two Asian VPs; this was 60.9% of the time, significantly more often than chance,  $\chi^2(2) = 15.83, p < .001$ . Thus female Asian viewers may have been choosing the VP they most desired as a friend partly on the basis of a match in ethnicity. Fifteen of 34 female White viewers chose the White VP; this was 44.1% of the time, not significantly different from chance,  $\chi^2(2) = 3.94, p = .139$ . Four of the nine Latina viewers chose the Latina VP; this was 44.4% of the time. Due to the small sample size, this proportion could not be checked statistically.

*Attractiveness.* It was next examined whether viewers' ratings of VPs' physical attractiveness influenced their choices. Correlations between viewers' attractiveness ratings for each VP and how much viewers would like to have that VP as a friend (i.e., the preference rating made individually for each VP) were all significant, for both men and women (Table 15). The average attractiveness rating for each VP can be found in Table 14.

Attractiveness ratings were significantly different among both male VPs,  $F(3, 420) = 21.62, p < .001$ , and female VPs,  $F(3, 428) = 8.70, p < .001$ . Among male VPs, the two with the highest FSS scores were rated as significantly more attractive than the two with the lowest FSS scores, according to post-hoc tests (Tukey's LSD; Table 14). These two higher-scoring VPs were chosen as the most desired friend significantly more often (by 81 viewers total) than were the lower-scoring VPs (by 24 viewers total). Among female VPs, according to post-hoc tests (Tukey's



LSD), attractiveness ratings for the VP with the second-highest FSS score were significantly higher than those of each of the other three VPs, whose ratings were not significantly different from each other (Table 14). This second-highest-scoring VP was chosen as the most-desired friend most often by viewers, but not significantly so (34 times, as compared to 32 times for the VP with the highest FSS score and 20 and 22 times for the lowest two FSS scores).

Table 15

*Pearson Correlations Between Viewers' Ratings of VPs' Attractiveness and Their Ratings of How Much They Would Like to Have Each VP as a Friend*

	Desired friend ratings for each VP			
	Highest-scoring video	Second-highest	Third-highest	Lowest-scoring video
Men				
Highest-scoring video <sup>a</sup>	.383***			
Second-highest-scoring video		.378***		
Third-highest-scoring video			.358***	
Lowest-scoring video				.394***
Women				
Highest-scoring video	.477***			
Second-highest-scoring video		.373***		
Third-highest-scoring video			.399***	
Lowest-scoring video				.501***

<sup>a</sup>The highest-scoring video on the Friendship Strategy Survey corresponds to the strongest exploration strategy. The lowest-scoring video corresponds to the strongest intimate exchange strategy.

\*\*\* $p < .001$ . All tests 2-tailed.

*Viewers' estimates of VPs' personality.* Finally, it was tested whether viewers' assessments of VPs' personality traits influenced their choice of most-desired friend, independent of whether these assessments matched VPs' self-assessments of these traits or VPs' FSS scores. In other words, were viewers making choices on the basis of whether VPs' inferred personality traits matched their own, even if they were unable to infer these traits with accuracy? Viewers' self-rated extroversion ( $\alpha = .784$ ) and kindness/generosity ( $\alpha = .771$ ) were calculated using the same self-report variables as those used for VPs' self-ratings of these traits. Difference scores were then calculated by subtracting viewers' ratings of VPs' dominance/charisma and kindness/generosity from viewers' self-reported extroversion and kindness/generosity, respectively, and transforming these differences into absolute values. These difference scores were then recoded to indicate the closest match: which VP the viewer assessed as being most similar to him- or herself on each of the two traits. In some cases, participants' self-ratings were equally matched to their ratings of two or more VPs; these instances were dropped from analysis separately for each trait (resulting in the loss of 24 cases

for women rating extroversion, 37 cases for women rating kindness/generosity, 14 cases for men rating extroversion, and 24 cases for men rating kindness/generosity).

Four 4x4 chi-squared analyses were used to test whether viewers were more likely to choose as their most-desired friend the VP who they rated as being most similar to themselves on each of the two personality traits. This test was not significant for female viewers on the basis of similarity in extroversion,  $X^2(9) = 10.43$ ,  $p = .316$ , and was not significant but was at a trend level for female viewers on the basis of similarity in kindness/generosity,  $X^2(9) = 15.45$ ,  $p = .079$ . It was also not significant for male viewers on the basis of similarity in extroversion,  $X^2(9) = 12.90$ ,  $p = .167$ , or similarity in kindness/generosity,  $X^2(9) = 3.67$ ,  $p = .932$ . Viewers did not appear to be choosing the VP they most wanted as a friend on the basis of their own assessments of how closely VPs' personality traits matched their own.

### Discussion

The main hypothesis of this study was not supported. When making their choice about which of four videotaped strangers (VPs) they would most like to have as a friend, viewing participants did not choose the VP whose friendship strategy was most similar to their own. However, there was some evidence that viewers could detect reliable signals of friendship strategy, and that these signals may have had a more unified effect on viewers' choices. This is indicated in the finding that male viewers overwhelmingly preferred the two VPs with the highest friendship strategy scores, and that female viewers had a similar, though weaker, pattern of preference. It also appeared that other factors, including attractiveness, ethnicity, and personality, also had at least a small influence on viewers' choices with regard to who they would like to have as new friends.

In exploring these findings, it is illuminating to compare the rankings of male and female viewers' choices with the rankings of male and female VPs' traits. For men, these rankings were perfectly aligned. Male viewers' choices showed a very clear hierarchy, and male VPs' friendship strategy scores and self-ratings of extroversion were in exactly the same order; those with higher friendship strategy scores had higher self-ratings of extroversion, and were rated as more dominant/charismatic by viewers. The two male VPs with the highest friendship strategy scores were also rated as more physically attractive than the other two. For women, however, the rankings were not so cleanly related. Female viewers preferred the two VPs with the highest friendship strategy scores, but not as strongly as male viewers had, and female viewers did not overwhelmingly prefer the top scorer over the others, as male viewers had. In parallel, female VPs' self-ratings of extroversion were not ranked in order with their friendship strategy scores; the highest- and lowest-scoring VPs reported the highest extroversion. And female viewers' ratings of VPs' dominance/charisma tracked VPs' extroversion more closely than it tracked their friendship strategy. Finally, female viewers rated the VP with the second-highest friendship strategy score as the most attractive.

There are two possible explanations for these differences in findings between men and women. It may be that male VPs' friendship strategy, extroversion, and attractiveness all happened to align such that all were influencing viewers' choices in the same direction, and that female viewers' choices were less clearly hierarchical because female VPs' traits did not happen to align so cleanly. But it is also possible that male viewers' preference was more strongly influenced by signals of either male VPs' friendship strategy or their extroversion, and

that male viewers' ratings of dominance/charisma and attractiveness were then shaped by that preference. And that, in contrast, female viewers' preference was less strongly hierarchical, and their ratings of the VPs' traits reflected that wider variation in preference. A replication of this study, in which VPs are chosen such that the rankings of their friendship strategy and self-rated extroversion are related to each other in the same way for male and female VPs, and in which rankings of the two traits are either in the same order or different orders for different groups of viewers, would provide the data needed to sort out these possible explanations.

There was one exception to the lack of support for the main hypothesis that viewers would prefer VPs whose strategy was most similar to their own. This was in the case of the male VP with the lowest friendship strategy score (i.e., the strongest intimate exchange strategy). Very few male viewers chose this VP as their most-desired friend, when asked to choose among the four VPs. However, when rating the strength of their desire to be friends with him specifically (i.e., not compared to the other VPs), those who wanted to be friends with him more strongly also tended to have a stronger intimate exchange strategy themselves. This finding, combined with findings across all three chapters that men tend to have higher FSS scores (i.e., a stronger exploration strategy) than women, suggests that men with a strong intimate exchange strategy may be relatively few in number, may be more inclined to be friends with other men who also have a strong intimate exchange strategy, and may therefore be particularly aware of signals of such a strategy in potential friends.

Generally, viewers were somewhat able to deduce VPs' level of extroversion; their ratings of this trait were significantly different among some VPs, and were also generally ranked in the same order as were VPs' self-assessments of this trait, suggesting that the trait can be detected via reliable signals of some kind. Although extroversion and friendship strategy have been significantly correlated in previous samples, findings of the current study suggest that the two constructs also have important differences: the female VP with the strongest intimate exchange strategy received dominance/charisma ratings that were not significantly different from those given to the second-highest-scoring VP, and her self-reported extroversion was also quite high. It seems likely that viewers' assessments of the VPs, and their choice of most-desired friend, were influenced by both of these variables, which may be one of the reasons why a less clear pattern of choice based on friendship strategy was seen among female viewers. Another possibility, of course, is that VPs themselves were not entirely accurate in reporting their own friendship strategy; it is possible that a very extroverted person, who displays many signals of an exploration strategy, may currently report having a preference for an intimate exchange strategy. Such mismatches between self-report and behavior could arise for a variety of reasons; for example, an individual may not have had sufficient life experience to have developed an accurate view of him or herself, or may have learned from a peer or family group that one strategy is more desirable than another.

There was also some indication that ethnicity may have played a role in both male and female viewers' choices, with Asian viewers (who constituted the largest number of participants) significantly more likely than chance to choose Asian VPs. However, in the case of male viewers, this result was confounded by the fact that the VP with the highest friendship strategy score, who was chosen most often by far, also happened to be Asian. Thus there is some evidence that ethnicity match was a salient feature for viewers, but it does not appear that ethnicity was an overwhelmingly strong influence on viewers' choices.

### Findings for Male Viewers

There appeared to be somewhat different processes at work for male versus female viewers. Male viewers overwhelmingly chose as their most-desired friend one of the two VPs with the strongest exploration strategy, suggesting that they were able to perceive and detect some form of signal of this strategy, and that those with a stronger exploration strategy were seen as more desirable friends, regardless of the viewer's own friendship strategy. As mentioned, the ranking of male viewers' choices were ordered perfectly with the ranking of VPs' friendship strategy scores; the higher the score, the more viewers chose that VP. This suggests that many male viewers may have made their judgments on the basis of an overarching hierarchy, in which friends who are more charismatic, skillful, socially exciting, and knowledgeable were preferred. Indeed, the two male VPs with the highest friendship strategy scores were seen by viewers as significantly more dominant/charismatic than were the other two male VPs, indicating that viewers not only preferred these VPs, but rated them higher on exploration-related traits. It is of course not clear from the current results what behavioral signals the viewers may have been attending to. It is also an open question whether viewers' ratings of VPs' attractiveness, which were higher for the two VPs with the strongest exploration strategies, were influenced by viewers' other impressions of the VPs, or whether the attractiveness ratings were more objective. If the latter, this might indicate that men who are more attractive may end up with a stronger exploration strategy, perhaps because their social experience leads them to expect that they will receive a lot of positive social attention and therefore that they will have a large pool of potential friends to choose from. Such a possibility would be in line with findings indicating that starting very early in life, more attractive people do get more positive social attention, and are evaluated more positively by others (Langlois, Kalakanis, Rubenstein, Larson, Hallam, & Smoot, 2000; Langlois, Ritter, Casey, & Sawin, 1995).

With regard to personality ratings, it is noteworthy that male viewers' ratings of VPs' dominance/charisma were significantly different and were ranked in the same order as both VPs' self-ratings of extroversion and their friendship strategy scores. These findings suggest that male viewers were able to perceive and detect a reliable signal of VPs' extroversion, and that this may have influenced male viewers' friendship choices. Importantly, male viewers' dominance/charisma ratings of the two VPs with the lowest FSS scores were significantly different, even though those two VPs gave themselves identical self-ratings of extroversion, suggesting that viewers may have been able to detect differences between these individuals that were associated with friendship strategy but were separate from extroversion. However, further studies are needed in order to determine whether signals of friendship strategy largely overlap with signals of extroversion, or whether the two constructs have differing sets of signals.

Unlike ratings of dominance/charisma, the mean scores for male viewers' ratings of VPs' kindness/generosity were not significantly different and did not show a clear relationship with VPs' friendship strategy. Indeed, though the difference was not significant, the participant with the strongest exploration strategy (i.e., the highest friendship strategy score) received the highest mean viewer rating of kindness/generosity, a result directly the opposite of what would be predicted. The viewers' ratings also did not have any clear pattern of relationship to the VPs' self-ratings of kindness/generosity, indicating that male viewers were not perceiving reliable differences in this trait, and thus that there is no evidence of reliable signals of the trait in men.

### Findings for Female Viewers

In contrast to the pattern for male viewers, female viewers' choice of most-desired friend was somewhat more evenly distributed among the VPs. Again, this may be due to the fact that female VPs' friendship strategy, extroversion, and attractiveness did not line up as cleanly as they had for male VPs. It is also possible, however, that women were less inclined than men to make choices according to an overarching hierarchy, that women might agree with each other about who is "on top" of a hierarchy less so than men do, or that they may be less inclined to view social partners in terms of hierarchy in the first place. This latter interpretation gains some support from the finding that female viewers rated the VP with the third-highest friendship strategy score lowest in dominance/charisma but highest in kindness/generosity, and yet this VP was not chosen as most-desired friend less often than the lowest-scoring VP, who was rated much higher in dominance/charisma and lower in kindness/generosity. This pattern suggests that different female viewers placed a different relative value on each of these traits. Indeed, there was a trend-level effect indicating that female viewers may have somewhat preferred VPs whose level of kindness/generosity was perceived as being most similar to their own.

Female viewers also rated one of the VPs as significantly more physically attractive than the other three, but this VP was not the one with the highest friendship strategy score, and she was also not preferred as a friend significantly more often than the other three. Thus, although female viewers did somewhat tend to prefer VPs with higher friendship strategy scores, they did not all tend to prefer the same "top-ranked" VP, as male viewers had. This result is interesting in light of the fact that, in all samples, men scored significantly higher on the FSS than women and that variability in scores has tended to be somewhat greater for women than for men. Thus there is some indication that women do not take account of overarching social hierarchy to the extent that men do when choosing friends, and that instead women may make more personally tailored choices. However, this interpretation should be considered tentative, given that the relative rankings of self-rated traits were not the same among male and female VPs, as described above.

Female viewers rated most of the VPs significantly differently in terms of dominance/charisma, and these ratings were somewhat in line with VPs' self-ratings of extroversion and friendship strategy, again suggesting the presence of reliable signals of these traits. Indeed, the female VP with the strongest exploration strategy and the highest self-rated extroversion was rated as significantly more dominant/charismatic than the other three VPs. The VP with the strongest intimate exchange strategy also rated herself relatively high on extroversion, and viewers' ratings of her dominance/charisma were significantly higher than their dominance/charisma ratings for the VP with the second-lowest friendship strategy score, who had rated herself much lower on extroversion. These findings demonstrate that extroversion and friendship strategy do not coincide perfectly, and that in this case, when they diverged, viewers' perceptions of dominance/charisma tracked VPs' extroversion more strongly than they tracked VPs' friendship strategy. This suggests the possibility that reliable signals of extroversion may be stronger than those of friendship strategy, at least among women.

Female viewers' ratings of VPs' kindness/generosity were significantly different for three of the VPs, but these ratings were not ranked in the same order as VPs' self-ratings of this trait, and they were also ranked in the opposite direction of the theoretical expectation, and findings

in previous samples, that a stronger intimate exchange strategy would be associated with higher levels of kindness/generosity. Indeed, the VP with the strongest intimate exchange strategy received the lowest viewer ratings of kindness/generosity, although she had rated herself higher in this trait than had the other VPs. Thus, in agreement with findings for men, findings for women suggest that viewers were not picking up on any reliable signal of kindness/generosity. It remains possible that such signals might be displayed only after a longer duration of interaction (viewers observed a segment of video that occurred very near the start of the study, and thus VPs had not been interacting with each other for very long), or only in less structured interactions, or that they could be signaled via a different modality (e.g., in verbal exchanges) than that available to viewers in the current study; these possibilities should be explored in future studies.

### Summary

Overall, findings for both men and women suggest that there may well be reliable signals of dominance and charisma, that these are related to extroversion and that they may also reflect friendship strategy, and that these signals do have a general influence on viewers' preference for potential new friends. However, findings do not strongly suggest that different viewers react differently to these signals depending on their own conditional friendship strategy. Findings further suggest that there are not reliable signals of kindness/generosity; male viewers did not rate VPs differently on this trait, and female viewers' ratings did not reflect either VPs' self-ratings of this trait or VPs' friendship strategy scores. Additionally, physical attractiveness, as well as whether the VP's ethnicity matched the viewer's own, both may have had small influences on viewers' choices. A study in which the ethnicity and attractiveness of VPs is more strongly controlled would be useful in disambiguating these various influences and discovering whether they may interact with each other. It would also be useful, in a replication of this study, to allow viewers to observe VPs for longer time periods, to hear what VPs are saying, and to observe VPs interacting with more familiar partners, in order to determine whether reliable signals of friendship strategy emerge either after a longer time period or in a different modality than that of nonverbal behavior.

## General Discussion

Results of the three studies in this dissertation suggest that individuals' friendship preferences do fall along a normally distributed continuum, anchored on one end by those who use friendships for exploration and on the other end by those who use friendships for intimate exchange. Results also show that men tend to have a stronger exploration strategy than women, and that people with a stronger exploration strategy also have a more short-term mating strategy, are more extroverted, and consider themselves to be less kind and generous. These results provide evidence that it may in fact be accurate to characterize friendship preference as a conditional strategy, with an individual's strategy choice stemming from a (conscious or unconscious) assessment of his or her own traits and what kinds of friends will be most suited to those traits. Adopting a particular conditional strategy because that strategy is most advantageous given one's own traits is a common circumstance across species (e.g., Gross, 1996; Moore, 1991). However, results of the second two studies did not provide solid support for reliable signals passing between potential friends, and thus to the extent that reliable signals may be necessary for this particular conditional strategy to operate, the conclusion that friend selection can in fact be considered a conditional strategy remains a tentative one.

Results of Chapter 1 provided some evidence that friendship strategy is related to the number of friends an individual has and how close he or she feels to those friends, indicating that self-reported strategy may in fact be reflected in the makeup of peoples' actual friendship networks. This evidence was found in only one of two samples, however, and thus should be considered inconclusive until replicated. This evidence is important; if future studies indicate that self-reported friendship strategy does not in fact relate reliably to any concrete aspects of individuals' friendship networks or their actual relationships with friends, this would call into question the idea that friendship preferences can be considered a conditional strategy, or at least that the Friendship Strategy Survey (FSS) actually measures friendship strategy. A conditional strategy is by definition a behavioral mechanism by which an organism interacts with or makes decisions in the actual world (e.g., Moran, 1992), and thus friendship preference cannot be considered a conditional strategy if it does not in fact relate to anything about the individual's objective circumstances.

In contrast to the positive findings relating FSS scores to mating strategy, personality, and aspects of individuals' real friendship networks, friendship strategy did not relate to age (although this result cannot be considered conclusive, given the very limited age range of the sample), socioeconomic status (though, again, the range for this variable was limited due to the fact that all participants were college students), attachment avoidance, relationship status, or presence of kin relationships. A conditional strategy is the way that an individual maximizes fitness under a given set of environmental conditions (Moran, 1992). Thus the fact that friendship strategy scores did not relate strongly to the set of environmental conditions measured in this study could suggest one of at least three possibilities: first, that this conditional strategy is influenced by different environmental circumstances than the ones that were measured in this study; second, that this conditional strategy is influenced only by features of the individual and not by an assessment of environmental circumstances, which seems unlikely given that conditional strategies are, by definition, a process of "phenotype-

environment matching” (Moran, 1992, p. 971); or third, that this is evidence against the idea that friendship preferences ought to be conceived of as constituting a conditional strategy. Further investigation of these three possibilities awaits future study.

Results of Chapters 2 and 3, which attempted to find reliable signals of friendship strategy, did not yield strong findings. Results of Chapter 2 did not support the hypothesis that people with a stronger exploration strategy would laugh more, gaze at the interaction partner more, and gesture with their hands more, or that people with a stronger intimate exchange strategy would display more Duchenne smiles. Results of Chapter 3 also did not generally support the hypothesis that, when asked to choose which of four strangers they would most like to have as a new friend after viewing brief videos of each stranger, naïve viewers would choose the stranger whose friendship strategy score most closely matched their own. Thus there was little indication that reliable signals of friendship strategy were being used by actors or decoded by viewers in a way that would help individuals to find a friendship-strategy “match.” These results leave open the question of whether there are in fact reliable signals of friendship strategy. If there are not, this would make it harder to assert that friendship preference does in fact constitute a conditional strategy; to be effective, it would seem that individuals would need to be able to efficiently communicate their strategy to their interaction partners, in order to be able to choose friends whose traits are desirable given their strategy. Indeed, findings in Chapter 3 suggested that viewers might have been more uniformly influenced by signals of friendship strategy; many viewers (particularly male viewers) preferred videotaped participants with a stronger exploration strategy, regardless of the viewer’s own strategy, suggesting that some feature associated with this strategy was more generally accepted as popular or desirable among this sample of participants.

However, there are at least two other possibilities regarding the existence of reliable signals that merit investigation. First, it is possible that the experimental situation used in these studies was not conducive to signals of friendship strategy. In these studies, during the task that was coded for reliable signals, participants were interacting with an unknown fellow student who they had met approximately 10 minutes earlier and who they had no guarantee of ever meeting again, and during this interaction they were being asked to take part in a relatively scripted word-guessing game. It is possible that signals of friendship strategy would not arise readily when interacting with strangers who one is not likely to meet again, and instead that these signals arise only when there is some indication that the interaction partner may be available more regularly and is therefore a viable candidate as a new friend. Indeed, it seems possible that the process of selecting friends might begin only after some brief “grace period” during which new interaction partners are simply attempting to be generally friendly and collaborative in order to get along smoothly with strangers. If this were the case, signals of friendship strategy may only arise somewhat later in an interaction, or not until a second or third interaction, when individuals have gained some small level of comfort with or knowledge of each other. And similarly, it is possible that signals of friendship strategy might arise more readily during unscripted, spontaneous social encounters, and that participation in the relatively scripted social game used in the current studies prevented them from arising.

The second possibility with regard to the existence of reliable signals of friendship strategy is that these signals include behaviors other than those analyzed in Chapter 2. Some of the behaviors that were chosen for analysis could not actually be included and analyzed,



because it proved difficult to establish reliability when coding these behaviors. It is possible that adjustments to the coding protocol, or a replication of this study in which participants interact while doing a different task, would result in more reliable ratings of some of these behaviors. It is also possible that entirely different behaviors, for example verbal behaviors or even the content of conversation, might be the channels for signaling of friendship strategy, rather than the nonverbal behaviors examined in the current study. For example, perhaps individuals rely more on what others say about themselves, or how they verbally respond to one's own comments, when deciding whether another person's friendship strategy matches their own. Such a possibility, of course, would require that participants are asked to engage in an open-ended conversation rather than the scripted task used in the current study.

In spite of the questions that remain regarding whether friendship preference should be considered a conditional strategy, and if so, whether there are indeed reliable signals of this strategy, these studies provide a number of noteworthy findings regarding the general topic of friend choice. In general, the literature on friendship and relationship formation tends to characterize partner choice as being essentially the same process for all individuals, with proximity, similarity, and attractiveness being overarching influences on all individuals' partner choices (Fehr, 1996). Although there is no doubt that these factors are strongly influential, there are also many possible opportunities for individual differences in the process of friend selection. The results of Chapter 1 provide evidence for some specific examples of such individual differences. These results showed that people who consider themselves more extroverted and less kind/generous also prefer a short-term mating strategy (in which they are, for example, more open to casual sexual encounters) as well as preferring friends who are more socially exciting and poised, more adventurous, and more intellectually stimulating. On the other hand, people who consider themselves less extroverted and more kind/generous are more oriented toward a long-term mating strategy, and they prefer friends who are more kind, thoughtful, caring, and empathic. These results suggest a route for further investigation of individual differences in the way that people form friendships, in which extroversion and kindness/generosity are further examined as determinants of the kind of friendship network an individual is likely to pursue.

The results of Chapter 2 also provide some generally noteworthy findings regarding the way that people's self-reported traits relate to their behavior when interacting with a stranger, including some intriguing differences between men and women in these associations. Among women, those who reported themselves to be more extroverted and to be more strongly disposed to a short-term mating strategy also spent more time looking directly at their interaction partners as well as more time gesturing with their hands. Thus, it appeared that women were displaying reliable signals that reflected both an aspect of their personality and their conditional strategy with regard to choosing romantic partners. Among men, in contrast, these two behaviors did not appear to be signals of any personal trait or preference. Indeed, among men, the only significant association was the amount of time that they spent laughing, which was correlated with higher attachment anxiety, reports of having more friends, and a stronger short-term mating strategy. These results are harder to interpret, and suggest that laughter may be used by men for more than one purpose; it may be both a signal of a short-term mating strategy and a self-soothing or appeasement behavior used more often by those who have higher attachment anxiety. It is unclear why women and men displayed such

different patterns of signaling. But given that these signals were related to mating strategy, and were seen in interactions among same-sex, heterosexual pairs, it seems clear that further exploration of this finding would require a study in which participants interact with others of both the same and the opposite sex. Perhaps heterosexual individuals of both genders would display more coherent sets of mating-strategy signals when interacting with opposite-sex partners, because signals of mating strategy would be more salient in opposite-sex encounters.

Results of Chapter 3 similarly suggest the presence of reliable signals of extroversion: the ranking of video viewers' ratings of videotaped participants' (VPs') dominance/charisma agreed with the ranking of VPs' self-ratings of extroversion, suggesting that viewers were able to detect a reliable signal of this trait. This result is perhaps an even stronger suggestion of the presence of reliable signals than are the results of Chapter 2, because the finding in Chapter 3 held for both men and women. Results of Chapter 3 also suggested some interesting differences between men and women in terms of their friendship preferences. Specifically, there was evidence that men's choice of most-desired friend was more strongly hierarchical than that of women; the large majority of male viewers preferred as a friend the male VP who had the strongest exploration friendship strategy, and who had also reported a much higher level of extroversion than had the other male VPs. And the numbers of male viewers choosing each male VP were ranked in the same order as were the VPs' self-reported friendship strategy. In contrast, women's friendship preferences did not appear to be so strongly hierarchical, and may have been based on a wider variety of criteria; female viewers' choices were spread out more evenly among the four female VPs. And whereas among men, viewers' ratings of VPs' kindness/generosity appeared to be essentially random, among women these ratings were significantly different among VPs, suggesting that women were attending to signals of this trait, and agreeing to some extent on what they saw (although their ratings did not line up with VPs' self-assessments of this trait, and thus either viewers or perhaps VPs themselves were not entirely reliable reporters of the trait). This is noteworthy given that there was also a trend-level effect suggesting that women had some preference for VPs whose perceived kindness/generosity was most similar to their own. Overall, women's pattern of choices suggests that different women placed different relative values on various different traits, resulting in less agreement among women regarding which VP was the most desirable friend.

Overall, findings of Chapter 3, as well as the finding that men consistently scored higher on the FSS than women, suggest that men have a stronger tendency than women to make social decisions on the basis of a single, overarching social hierarchy, and that they tend to place value on, and identify more strongly with, traits that are associated with a stronger exploration friendship strategy, such as gregariousness, skillfulness, adventurousness, and wittiness.

In sum, the results of these studies provide some evidence, but not conclusive support, for the hypothesis that human friendship choice can be described as a conditional strategy that has been shaped via social selection (West-Eberhard, 1983) to help individuals maximize their fitness by choosing friends who complement their own traits and circumstances the best. This hypothesis, of course, is strongly shaped by evolutionary theory. Some readers may ask whether this set of hypotheses regarding friendship strategy could be derived without reference to evolutionary theory, and whether they may be more parsimonious without such reference. Some may argue that friendship strategy reduces to personality, that people's

responses on the FSS stem from and can be reduced to their extroversion and their tendency to be kind/generous, plus a preference for friends who are similar. But evidence that individuals' life circumstances, and not just their personalities, relate to friendship strategy, suggest that this is not the case. Indeed, in general, our behaviors and preferences are partly based on our traits, but they are also strongly influenced by our environment, both social and otherwise (e.g., Darley & Batson, 1973; Haney, Banks, & Zimbardo, 1973; Mischel, 2004); indeed the field of social psychology was founded to examine just such influences (Lewin, 1935). And yet the study of how traits and environments affect human behavior has existed as a largely fragmented body of work, a series of theoretical "islands" unlinked by any larger theory that might unite them. In the study of non-human species, the constant use of evolutionary principles in any examination of the way that individual traits and environmental circumstances shape behaviors is unquestioned, because no other framework exists which can so powerfully unite research across such a wide variety of species.

I argue that it is far more difficult, and far less parsimonious, to attempt to study human behavior without reference to the framework of evolutionary theory, and that "adding" it to studies of human behavior is not a practice in adding unnecessary complication, but rather is a much-needed development that can finally bring some overarching theoretical organization to what has been a fragmented field. It is not strange, then, to think that the various sets of behaviors that humans routinely employ to meet our needs probably do constitute a wide variety of conditional strategies—which are simply behaviors that we are able to adjust, given what we're like and what our environments are like. This is the definition of conditional strategies within an evolutionary framework (Gross, 1996; Moore, 1991), and using it to organize our observations of human behavior will make it much easier to engage in much needed, and fruitful, comparisons of similar processes in other species. Indeed, conditional strategies are a common aspect of behavior across species (Moore, 1991), and this is the framework that biologists and evolutionary theorists use to discuss exactly this kind of conditional, strategic behavior. To invent a separate but essentially identical psychological theory to describe it, one which purposely leaves out evolutionary principles because these seem "extraneous," is in fact the more wasteful approach, an approach which fails to anchor itself in a well-elaborated and powerful body of theory that is readily available: evolutionary theory.

To conclude, human friendship may represent the most complex form of non-kin relationship found in the animal kingdom. Its importance not only for human well-being but also for theories of social behavior and reproductive fitness should not be underrated. This dissertation presents a novel theoretical framework for understanding this behavior. The studies described here represent the first empirical attempt to examine human friendship choice through the evolutionary lens of conditional strategies. By so doing, this dissertation has laid the foundation for a new way of understanding how humans form these important, voluntary relationships. However, it was not possible to capture every meaningful nuance of the friendship formation process in these studies, the first of their kind. Possibly for this reason, and due to the complexity of human friendship formation, some hypotheses in the current work were not supported. Tests of many predictions were no doubt constrained by the limited nature of the samples and testing conditions, which can be expanded and made more diverse in future studies. Nonetheless, the model of human friendship and the studies described here are

meaningful first steps in this new understanding of human friendship. Most important, this novel theoretical framework suggests a wealth of testable predictions to pursue in future research. Important unanswered questions for the future include: Would reliable signals of friendship strategy emerge after some number of repeated interactions? Would they emerge under different conditions of interaction, such as a less structured interaction format, or during a longer period of interaction? Would they emerge if participants were led to believe that they would be likely to interact again in the future? Other topics for future study identified in the present work include an examination of these dynamics in participants with a wider age range than college students and with more varied socioeconomic status, both of which are variables known to affect friendships. Overall, although some of the predictions in the current study were not completely supported, they were also not disproven. Indeed, the findings of these studies, including findings regarding the differences between men and women in how they evaluate and value traits in a potential friend, suggest several avenues for future work that could advance a new way of examining relationships within a framework of evolutionary social psychology.

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