

Friends and Happiness: An Evolutionary Perspective on Friendship

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1 Friendships are fundamental to human social life. People direct great effort toward
2 both the formation and maintenance of friendships, investing time, energy, money,
3 and emotional resources. Across cultures, friendship is reliably linked to the experi-
4 ence of positive emotions such as happiness (Brannan et al. 2013; Camfield et al.
5 2009; Chan and Lee 2006; Lu 1995, 1999; for a review see Demir et al. 2013),
6 an association that is present in both same-sex and cross-sex friendships (Argyle
7 1999), and which holds from early adulthood (Demir and Weitekamp 2007) through
8 old age (Larson et al. 1986). Why are friendships so important to our happiness?

9 An evolutionary perspective may shed light on this issue. Friendships were al-
10 most certainly recurrently linked to survival and reproduction during human evo-
11 lutionary history, and the specific benefits that accrue to individuals in different
12 types of friendship may offer unique insight into the evolutionary impetuses for
13 these relationships. An evolutionary perspective can offer insight into how specific
14 types of friendship would have benefitted ancestral humans in both the currency
15 of natural selection—reproductive success—and the currency of subjective well-
16 being, happiness.

17 In this chapter, we discuss the relationship between friendship and happiness
18 from an evolutionary perspective by outlining the hypothesized ancestral functions
19 of friendship, and explain why we would expect immersion in such friendships to
20 result in positive emotions such as happiness. We then explore the empirical lit-
21 erature on different friendship types and how each friendship type (e.g., same-sex

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22 friendship, cross-sex friendship) is characterized by a unique profile of benefits as
23 well as costs. Finally, we propose evolutionarily inspired strategies for individuals
24 to enhance their friendships and maximize the happiness they reap from these im-
25 portant social relationships.

26 **An Evolutionary Approach to Friendship and Happiness**

27 An evolutionary approach may yield valuable insight into why friendships and im-
28 mersion in quality social relationships are consistently linked to happiness (Corneau
29 2009; Demir et al. 2013). It suggests that positive emotions such as happiness are
30 produced by motivational programs that evolved because of their ability to guide
31 ancestral humans to repeat behaviors associated with increased survival and repro-
32 ductive success (Cosmides and Tooby 2000; Hill et al. 2013; Kenrick et al. 2010).
33 **AQ1** Having friends would have dramatically increased ancestral humans' likelihood of
34 survival and reproduction (Tooby and DeVore 1987). Consequently, selection could
35 have favored mechanisms that produced happiness in response to such friendships
36 to the extent that this subjective experience motivated ancestral humans to form and
37 maintain these beneficial relationships. In the following section, we briefly outline
38 several different evolutionary pathways by which psychological adaptations to form
39 and maintain friendships could have evolved.

40 **Evolutionary Models of Friendship**

41 *Reciprocal Altruism*

42 Non-evolutionary research has investigated friendship as a means of social ex-
43 change in which individuals select friends on the basis of the costs and benefits
44 associated with these friendships (Befu 1977; Emerson 1976; Homans 1958). Al-
45 though these hypotheses about friend preferences and selection do not articulate the
46 specific benefits exchanged in these friendships, an evolutionary perspective can
47 illuminate how such social exchange relationships could have evolved. The theory
48 of reciprocal altruism postulates that altruistic tendencies toward non-relatives can
49 evolve when the delivery of benefits is reciprocated at some point in the future
50 (Axelrod 1984; Cosmides and Tooby 1992; Trivers 1971). Such exchange relation-
51 ships can result in net fitness benefits for both parties involved—a condition econo-
52 mists refer to as a “gain in trade” (Kemp 1995). Selection could thus have led to
53 the evolution of mechanisms that motivate individuals to form and maintain these
54 highly beneficial social exchange relationships.

55 To illustrate how such exchange relationships could have evolved, consider the
56 adaptive problem our ancestors faced of hunting large game to acquire meat. An-
57 cestral humans rarely hunted large game alone due to the risky and costly nature of

58 hunting dangerous prey (Milton 1999; Tooby and DeVore 1987). Ancestral humans
59 who formed friendships and coalitions in the service of solving this adaptive prob-
60 lem would have experienced improved survival and reproductive rates, as these co-
61 alitions incur fewer costs and enjoy greater success in the hunt for dangerous game
62 (Buss 2004; Hill and Hurtado 1996; Tooby and DeVore 1987). Because individuals
63 who hunted together were more likely to secure nutritious food, over many genera-
64 tions, selection would have favored mechanisms that motivated individuals to form
65 friendships and coalitions to achieve these goals.

66 The key concept illustrated here is that friendships relationships may have deliv-
67 ered unique sets of benefits linked to ancestral humans' survival and reproduction.
68 It is likely that our ancestors benefitted greatly from these kinds of relationships,
69 and that reciprocal exchange formed the basis not only for many ancestral friend-
70 ships, but for the mechanisms that lead to friendships in modern environments as
71 well.

72 **The Alliance Model of Friendship**

73 Another recent evolutionary perspective suggests that human friendship is based
74 on evolved computational systems for building alliances (DeScioli and Kurzban
75 2012, 2009). The alliance-building model is distinct from the theory of reciprocal
76 altruism, as it is not based on exchange, but rather on concerns about interpersonal
77 conflict. These concerns are a central feature of the alliance-building model, but do
78 not feature prominently in reciprocal altruism models of human friendship.

79 The central premise of the alliance model is that humans habitually get into con-
80 flicts with one another. Having a supportive network of alliances is crucial to suc-
81 cessfully navigating these problems and emerging on the "winning" side of direct
82 interpersonal conflicts. Crucially, the likelihood of winning such conflicts depends
83 not only on one's own wit, agility, and physical formidability, but also on one's abil-
84 ity to mobilize other individuals—friends—to support one in such conflicts.

85 The alliance-building model of friendship proposes that humans have evolved
86 computational systems dedicated to cognitively representing different friends' de-
87 gree of loyalty to oneself, because those who are most loyal are most likely to
88 provide support in future disputes. DeScioli and Kurzban (2012) insightfully note
89 that "individuals frequently have relationships with both sides in a conflict, particu-
90 larly because human social networks are locally dense" (p. 216). This suggests that
91 ancestral humans needed to be able to determine whom they would support in any
92 possible pairwise within-group conflict—including one between two close friends.
93 As the authors suggest, one way to do this is to rank one's allies, prioritizing certain
94 friendships over others.

95 The most important aspect of this hypothesis is that an individual (let's call him
96 Tom) should count among his closest friends *those who rank him as one of their*
97 *closest friends*. The logic is that those who consider Tom a very close friend are
98 those who are most likely to be fiercely loyal to him and support him in future

99 disputes. This leads to the central prediction derived from the alliance-building hy-
100 pothesis: other individuals' ranking of Tom should be the strongest predictor of
101 Tom's ranking of these same individuals. By contrast, the reciprocal exchange hy-
102 pothesis predicts that the friends who provide the largest benefits should be ranked
103 highest. And still other non-evolutionary perspectives contend that the key predic-
104 tors of friendship rankings will be proximity, similarity, and familiarity (e.g., see
105 Berscheid et al. 1971; Byrne et al. 1968; Singh and Ho 2000).

106 In three different samples that measured a host of different variables, DeScioli
107 and Kurzban (2009) found that, as predicted, Tom's (perceived) rank in his friends'
108 lists was the strongest predictor of his own friend rankings. Interestingly, consis-
109 tent but weaker effects were also found for benefits, similarity, and secret-sharing.
110 These findings are intriguing, since they suggest that perceived friendship ranking
111 (which the researchers view as a proxy for loyalty in future disputes) is a more
112 important determinant of friendship closeness than a variety of other predictors put
113 forth by alternative evolutionary and non-evolutionary models. However, the alli-
114 ance-building and reciprocal exchange hypotheses are not mutually exclusive, and
115 friendship may serve multiple functions.

116 Positive Externalities

117 Although reciprocal exchange may be one viable route for human friendship to
118 evolve, altruism in the context of friendship often appears distinctly non-reciprocal
119 in nature. Some scientists argue against the idea that friendship is based on explicit
120 reciprocity, because many individuals report feeling good assisting a close friend,
121 and report no desire for compensation or future reward (Tooby and Cosmides 1996;
122 DeScioli and Kurzban 2012). Rather, an emphasis on returning favors is indicative
123 of a relationship that is *not* close; repayment of debts and favors is not characteris-
124 tic of close friendships (Argyle and Henderson 1984). Consistent with this, people
125 perceive a *lack* of friendship when someone insists on the return of a favor (Shack-
126 elford and Buss 1996). At least at the level of conscious awareness, then, reciprocal
127 altruism is not a defining characteristic of friendship.

128 Tooby and Cosmides (1996) propose an alternate model for the evolution of
129 friendship mechanisms based on the notion of *positive externalities*—unintentional
130 benefits that individuals deliver to others without any cost to themselves (Tooby and
131 Cosmides 1996). To illustrate the idea of a positive externality, imagine that you and
132 your friend both need to go to the grocery store, but your friend does not have a car.
133 By allowing your friend to ride along in your car, you provide her with a benefit
134 and yet you incur no additional cost; you were already going to the store. Tradition-
135 ally, however, this would not be classified as true biological altruism, as the clas-
136 sical definition of the concept of altruism in biology requires that the actor pay a
137 cost in the delivery of benefits to another individual. Tooby and Cosmides (1996)
138 make the insightful point, however, that the *less* costly it is to deliver benefits to
139 others, the more widespread we should expect such benefit-bestowing behavior to

140 be. Furthermore, once benefit-bestowing adaptations of any kind evolved, selection
141 would have refined these adaptations to minimize their costs to the actor (Tooby
142 and Cosmides 1996).

143 This positive externalities perspective suggests that a large class of altruistic
144 behavior may have thus far gone largely unrecognized and uninvestigated. Indeed,
145 adaptations to deliver or reap the benefits of positive externalities may be woven
146 into the fabric of human friendship, but they remain uncharted territory and repre-
147 sent a fascinating direction for future research.

148 **Mating Opportunities Within Friendships**

149 Theory and evidence suggest that friends were likely instrumental in helping one
150 another solve a variety of adaptive problems during human evolution, including one
151 particularly close to the engine of natural selection: mating. Indeed, both same- and
152 cross-sex friendships can promote the establishment and maintenance of romantic
153 relationships (see e.g., Bleske and Buss 2000; Connolly et al. 1999; Feiring 1999;
154 Sullivan 1953). Same-sex friends may have played a critical role in helping our
155 ancestors solve adaptive problems related to selecting, attracting, and maintaining
156 mates (Ackerman and Kenrick 2009; Lewis et al. 2011; Lewis et al. 2012), and
157 accumulating evidence suggests that cross-sex friendships hold the potential for
158 both indirectly and directly increasing mating opportunities. Cross-sex friendships
159 provide members of the friendship dyad with information about how the other sex
160 thinks or feels (Bleske and Buss 2000), and can help the sexes better understand
161 each other's communicative style (Swain 1992). Cross-sex friendships sometimes
162 involve casual sexual encounters between members of the dyad, and can even de-
163 velop into committed long-term mateships.

164 Indeed, physical attraction within cross-sex friendships is common and often
165 constitutes a significant component of such relationships (O'Meara 1989), and sexual
166 activity in cross-sex friendships is not uncommon (Afifi and Faulkner 2000;
167 Mongeau et al. 2003). The frequency of mating relations within cross-sex friend-
168 ships, together with the close parallel between mate preferences and cross-sex friend
169 preferences (see Lewis et al. 2011, 2012), suggests that cross-sex friendships may
170 have evolved at least partly for direct mating purposes. We discuss this possibility
171 in detail and present relevant findings later in this chapter.

172 **The Benefits and Costs of Friendship**

173 Friends provide one another with a bounty of benefits: they offer one another food
174 and other resources, help each other solve problems, provide assistance navigating
175 social hierarchies, and even help solve adaptive problems in the domain of mat-
176 ing. Along with these benefits, however, friendships carry the potential costs of

177 competition and rivalry. Friends may inflict costs on one another by competing
178 for access to the same valuable resources, including the same high-quality mates.
179 Their conflicting goals may lead them to interfere with each other's strategies and
180 obstruct each other's path to achieving their objectives, a phenomenon known as
181 *strategic interference* (Buss 1989; Haselton et al. 2005).

182 An evolutionary approach to friendship emphasizes the beneficial exchanges
183 that characterize such relationships, but simultaneously points to their potential to
184 impose considerable costs on both parties. The particular profile of costs and bene-
185 fits differs from friendship to friendship, but also differs markedly from cross-sex to
186 same-sex friendships. Same-sex friendships, for instance, may be hampered by the
187 costs of intrasexual competition for status or mates, whereas cross-sex friendships
188 rarely face this problem. Cross-sex friendships sometimes hold latent potential for
189 mating opportunities, whereas same-sex friendships typically lack this direct ben-
190 efit. In the sections that follow, we consider the costs and benefits that characterize
191 friendships. We discuss those that are common to same- and cross-sex friendships
192 as well as those that are unique to each distinct friendship type.

193 **Benefits**

194 *Same-Sex Friendship*

195 Evolutionary research on friendship has yielded novel insights and fascinating
196 findings about the instrumental role friends play in helping one another solve mat-
197 ing-related problems (Ackerman and Kenrick 2009; Lewis et al. 2011). Same-sex
198 friendships provide both men and women with a bounty of benefits directly or indi-
199 rectly related to mating: communication of sex-related topics between close friends,
200 discussion and analysis of suitors' intentions, the exchange of mating advice, and
201 ultimately, the facilitation of the acquisition of mates (Ackerman and Kenrick 2009;
202 Bleske and Buss 2000; Lefkowitz et al. 2004; Rose 1985).

203 The link between mating and same-sex friendships leads to a nuanced set of
204 evolutionary predictions about friend preferences. Consider the fact that mate pref-
205 erences differ between the sexes (Buss and Schmitt 1993), and the well-established
206 principle that the mate preferences of one sex drive competition between members
207 of the other sex (Buss 1988; Trivers 1972). On the basis of these two considerations,
208 we would expect individuals to place a premium on same-sex friends who possess
209 attributes that are simultaneously (a) desirable to the opposite sex, and (b) directly
210 or indirectly *transferable* to oneself. By choosing same-sex friends who possessed
211 characteristics that are desirable to the opposite sex, ancestral individuals could
212 have experienced beneficial spillover effects. Moreover, if these desirable traits
213 were also transferable to oneself, the benefits would have been further amplified.

214 Consider the following example. Because men value physical attractiveness in
215 their long-term mates more than do women (Buss 1989; Buss and Schmitt 1993; Li
216 et al. 2002), women may have secured greater fitness-related benefits by forming

217 and maintaining friendships with physically attractive members of their own sex. In
218 this way, less attractive women could have benefitted from the newfound proximity
219 of eligible, high-quality males. This magnitude of this benefit would have been fur-
220 ther amplified to the extent that physical attractiveness is a transferable resource—
221 for instance, if befriending an attractive same-sex other helps an individual improve
222 her own physical attractiveness through fitness or beauty-related advice.

223 Similarly, because women value men who command economic resources, we
224 should expect men to have a strong preference for same-sex friends with resources
225 (Vigil 2007). That is, an evolutionary perspective on same-sex friendship predicts
226 that men will be inclined to befriend other men who are in control of such resources,
227 as these friends would have been valuable in helping to enhance one's mating op-
228 portunities. Moreover, economic resources represent a highly *transferable* desirable
229 attribute, so men may derive especially large benefits from befriending individuals
230 who are both wealthy and generous.

231 Lewis and colleagues (2011) found support for these predictions. This research
232 team employed a budget allocation task in which men and women designed their
233 ideal same-sex friends by allocating "friend dollars" to six categories of traits (e.g.
234 Economic Resource Status, Physical Attractiveness, Personality). As predicted,
235 men placed greater value on characteristics in same-sex friends related to status
236 elevation and resource acquisition. Research in this area is just beginning, but these
237 results provide preliminary support for the idea that humans value characteristics
238 in same-sex friends that would have facilitated the solution of sex-specific adaptive
239 problems in ancestral environments. As we might expect, this valuation appears
240 to be amplified when the traits in question are directly or indirectly transferable to
241 oneself.

242 ***Cross-Sex Friendship***

243 Cross-sex friendships also carry great fitness benefits, but they differ in nature from
244 those associated with same-sex friendship. Cross-sex friends can offer benefits that
245 same-sex friends cannot provide. For example, consider the pronounced human
246 sexual dimorphism in muscle mass and upper body strength (Lassek and Gaulin
247 2008; Lassek and Gaulin 2009). This sex difference in physical strength suggests
248 that on average, ancestral women would have derived the benefits of much more ef-
249 fective physical protection by befriending a physically formidable man rather than
250 another woman.

251 Direct mating opportunities represent another important class of benefits unique-
252 ly afforded by cross-sex friends. Indeed, the reported benefits of cross-sex friend-
253 ship (Bleske and Buss 2000) correspond closely to the attributes that men and
254 women desire in mates (Buss and Schmitt 1993). This correspondence between
255 mate preferences and the benefits of cross-sex friendship suggests that the psy-
256 chological mechanisms that motivate cross-sex friendship may be at least partially
257 underpinned by men's and women's evolved mating strategies.

258 Sexual strategies theory (Buss and Schmitt 1993) provides a principled theoretical
259 framework for making *a priori* predictions about sex differences and similarities
260 in men and women's mating strategies. Men and women are predicted to have
261 similar mate preferences in those domains in which they faced the same adaptive
262 problems, and divergent mate preferences in those domains in which they faced dif-
263 ferent adaptive problems (e.g. internal fertilization and gestation, paternity uncer-
264 tainty, age-related fertility decline, etc.). For instance, both men and women place
265 a premium on long-term mates who are kind, cooperative, and trustworthy (Buss
266 2003). However, sex differences in adaptive problems have led to sex differences
267 in mate preferences: men and women differentially prioritize characteristics such as
268 resource acquisition potential and physical attractiveness (Buss and Schmitt 1993).

269 Cross-sex friend preferences follow strikingly similar sex-differentiated pat-
270 terns. For example, men show a stronger preference than women for physically
271 attractive cross-sex friends, whereas women exhibit a stronger desire for cross-sex
272 friends who are successful at acquiring economic resources and are able to provide
273 protection through physical strength and athleticism (Lewis et al. 2011). This strik-
274 ing overlap between cross-sex friend preferences and mate preferences hints at the
275 tantalizing possibility that the initiation and maintenance of cross-sex friendships
276 may involve the activation of mating mechanisms.

277 If mating psychology plays a part in cross-sex friendship, then we should be able
278 to detect the signature of mating activation in cross-sex friend preferences. Specific
279 predictions follow from this *mating activation hypothesis* in cross-sex friendships
280 (Lewis et al. 2012). The mating activation hypothesis predicts that individual differ-
281 ences that influence the costs and benefits of directing mating effort toward cross-
282 sex friends should predict cross-sex friend preferences (Lewis et al. 2012).

283 One such individual difference variable is sociosexual orientation. Sociosexual
284 orientation describes an individual's attitudinal, cognitive, and behavioral inclina-
285 tion toward uncommitted sex (Penke and Asendorpf 2008; Simpson and Gangestad
286 1991). Reasoning that individuals with an "unrestricted" sociosexual orientation—
287 a greater proclivity for engaging in uncommitted sexual relations—would derive
288 greater net benefits from pursuing a mating strategy with cross-sex friends, Lewis
289 and colleagues (2012) predicted that the degree of similarity between cross-sex
290 friend preferences and mate preferences would be directly linked to individuals'
291 sociosexual orientation. This prediction was confirmed for both sexes. Among both
292 men and women, an unrestricted sociosexual orientation predicted the prioritiza-
293 tion of cross-sex friends' physical attractiveness, and among women only, an unre-
294 stricted sociosexual orientation predicted the prioritization of physical prowess in
295 their male friends (Lewis et al. 2012). This striking parallel with mate preferences
296 suggests that unrestricted individuals prefer cross-sex friends who possess precise-
297 ly those characteristics desired in mates. These findings contribute to the growing
298 body of friendship literature by indicating that cross-sex friendship formation may
299 be partly underlain by the activation of mating psychology. Moreover, cross-sex
300 friend preferences may partly depend on individual difference variables that influ-
301 ence the costs and benefits of engaging in mating behavior with cross-sex friends.

302 Research suggests that many of the benefits of cross-sex friendships are enduring
303 ing across the lifespan. This is true, for example, of companionship, emotional or
304 financial support, advice, understanding the perspectives of the opposite sex, and
305 fun and laughter (Bleske-Rechek et al. 2012). However, future research is needed
306 to understand how cross-sex friendships change as individuals age, and how the
307 benefits of cross-sex friendship differ across life stages, including with reproductive
308 maturity and marital or mated status. Little is known specifically about the cross-
309 sex friendships of middle-aged adults, for example (Monsour 2002), but prelimi-
310 nary investigations in this area suggest that the benefits of cross-sex friendships do
311 shift across the lifespan. For example, older adults are more likely to cite enhanced
312 confidence and improved self-esteem as important benefits of cross-sex friendships
313 (Bleske-Rechek et al. 2012).

314 **Costs**

315 *Same-Sex Friendship*

316 Same-sex friends help each other navigate the exigencies of life. However, both
317 men and women perceive same-sex friendship as carrying the potential for costly
318 intrasexual rivalry (Bleske and Buss 2001). Despite the various benefits that same-
319 sex friends receive from each other (e.g. companionship, status enhancement, ac-
320 cess to a larger pool of mates; Bleske and Buss 2000; Lewis et al. 2011; Rose
321 1985), same-sex friends also experience competition with one another in the pursuit
322 of high-quality mates (Bleske and Buss 2000; Bleske and Shackelford 2001; Buss
323 2003). Intrasexual competition and rivalry in same-sex friendships may even be
324 influential enough to elicit feelings of betrayal (Shackelford and Buss 1996) and
325 result in the dissolution of friendships (Bleske and Shackelford 2001).

326 *Cross-Sex Friendship*

327 Cross-sex friendships can impose tremendous costs as well. Cross-sex friendships
328 can suffer from unwanted sexual attraction (DeSouza et al. 1992), and unwant-
329 ed sexual overtures can result in tension, awkwardness, and harassment (Browne
330 2006). Some people feel that their cross-sex friends misinterpret their friendliness
331 as romantic or sexual interest (Elsesser and Peplau 2006), and while cross-sex
332 friendships are linked to mating-related benefits for some individuals, sexual attrac-
333 tion is seen as a challenge between close cross-sex friends (Halatsis and Christakis
334 2009). Importantly, sexual attraction is more often nominated as a cost than as a
335 benefit of cross-sex friendships (Bleske-Rechek et al. 2012).

336 These costs are especially problematic for women in cross-sex friendships. Be-
337 cause men have a strong desire to gain sexual access to women, derive greater

338 fitness benefits from casual sexual liaisons (Buss 1994), and perceive sexual access
339 to be a greater benefit of cross-sex friendship than do women (Bleske and Buss
340 2000), men may initiate unwanted sexual advances toward their cross-sex friends.
341 Men experience greater physical attraction toward their cross-sex friends than do
342 women (Kaplan and Keys 1997; Bleske-Rechek et al. 2012), are more likely than
343 women to endorse the statement “there was a time when I wanted to be more than
344 just friends with [my closest cross-sex friend]”, and are more likely to initiate a
345 cross-sex friendship with the hope of it developing into a romance (Kaplan and
346 Keys 1997). Men’s mating cognition is also influenced by a bias to interpret friend-
347 ly female greetings as sexual interest, and to infer sexual intent where there is none
348 (the *male sexual overperception bias*, Haselton and Buss 2000; Haselton and Nettle
349 2006; Abbey 1982; Abbey and Melby 1986). Research suggests that this male cog-
350 nitive bias extends into men’s cross-sex friendships (Bleske-Rechek et al. 2012).

351 From an evolutionary perspective, it can be very costly for a woman to remain
352 in a cross-sex friendship in which she is the target of unwanted sexual advances.
353 Women who find themselves in such situations may suffer severe emotional, ener-
354 getic, and reproductive costs. Moreover, a close friendship with a sexually inter-
355 ested male can jeopardize a woman’s chances of finding a mate who is assured of
356 her fidelity and willing to invest in and commit to her (Buss 1994). For women who
357 are already mated, close cross-sex friendships may inspire suspicion and jealousy
358 from one’s mate. This can have a detrimental impact both on the relationship and on
359 the woman’s safety, as men’s sexual jealousy in particular is a powerful predictor
360 of such costly outcomes as spousal abuse, intimate partner violence, and uxoricide
361 (Buss 2005; Daly et al. 1982; Wilson and Daly 1992, 1996, 1998).

362 Women certainly suffer the brunt of the sexual costs of cross-sex friendships, but
363 men also report incurring costs in this domain. Men are more likely than women
364 to report that their cross-sex friends have led them on sexually (Bleske-Rechek and
365 Buss 2001)—an outcome that may be attributable to the frequent asymmetry in
366 sexual interest between men and women coupled with the male sexual overpercep-
367 tion bias. Men and women alike also perceive attraction in cross-sex friendships as
368 burdensome, and as a potential threat to their long-term mateships (Bleske-Rechek
369 et al. 2012).

370 Some of the costs of cross-sex friendship are constant across the lifespan, where-
371 as others differ across life stages, partly as a function of changes in age and marital
372 status. Many of the cost categories nominated by individuals in cross-sex friend-
373 ships are shared across age categories. These include sexual attraction and interac-
374 tions that are deemed to be stressful or emotionally draining (Bleske-Rechek et al.
375 2012). Before reaching sexual maturity, however, females perceive their cross-sex
376 friendships to be less significant (Lempers and Clark-Lempers 1993). The spike in
377 the importance of cross-sex friendships after reproductive maturity may heighten
378 both the costs and the benefits of such relationships for women.

379 At later life stages, the costs of cross-sex friendships such as “takes time away
380 from my family life” and “my romantic partner gets jealous of our friendship” are
381 nominated at higher frequencies (Bleske-Rechek et al. 2012). Married individu-
382 als also have less contact with and confide less in their cross-sex friends, and the

383 number of cross-sex friends that women maintain decreases with age (Booth and
384 Hess 1974). An evolutionary perspective suggests that cross-sex friendship like-
385 ly poses different adaptive challenges as a function of an individual's life history
386 phase, and that human friendship psychology may be attuned to the changing nature
387 of cross-sex friendship over the lifespan. This context-driven and lifespan-depend-
388 ent nature of the costs of cross-sex friendship remains a relatively uninvestigated
389 area of scholarship, and an exciting avenue for future research.

390 **Friendships and Maximizing Happiness**

391 Friendship quality is predictive of happiness across age groups and cultures (Bran-
392 nan et al. 2013; Chan and Lee 2006; Demir et al. 2013; Holder and Coleman 2009;
393 Hussong 2000). However, because the members of a friendship dyad frequently
394 have conflicting goals, such relationships often result in the intentional or uninten-
395 tional obstruction of one another's goals. This strategic interference (Buss 1989)
396 underscores the potential for intrasexual and intersexual competition in human
397 friendship, and highlights the unfortunate fact that friendships can often lead to
398 negative experiences such as conflict (Hartup et al. 1988; Laursen 1995), rivalry
399 (Burndt 2002), and even betrayal (Shackelford and Buss 1996).

400 We think that an evolutionary perspective can shed unique light on how humans
401 may be able to reap the benefits of friendships while simultaneously minimizing the
402 costs such relationships impose. Future research would profit from an investigation
403 of the specific costs and benefits of friendship that affect overall happiness, but at
404 present it seems safe to infer that the costs inherent in friendships have a negative
405 impact on the relationship and resultant happiness levels. In this section, we share
406 evolutionarily inspired ideas for enhancing friendships and maximizing their hap-
407 piness yield.

408 Close meaningful friendships are often hampered by the costs that such dyadic
409 relationships can impose. But what if these costs were absent? Might it be possible,
410 for example, for an individual's friendships to be free of intrasexual rivalry and sexual
411 deception? Research suggests that friendships that cross sexual orientation may
412 be unique in this regard (Grigoriou 2004; Hopcke and Rafaty 1999). Specifically,
413 friendships between heterosexual women and homosexual men may enable the
414 beneficial exchange of mating-related benefits without the potential for the typical
415 costs that plague heterosexual same- and cross-sex friendships (Russell et al. 2013).

416 This friendship type is distinct from other friendships, because heterosexual
417 women and homosexual men are neither rivals in the mating domain nor potential
418 romantic partners. In the absence of intrasexual mating rivalry and concealed mat-
419 ing motivations, these friendships are often marked by a level of trust and support
420 not found in other types of friendship (Grigoriou 2004; Hopcke and Rafaty 1999;
421 Malone 1980). It is heartening to find that friendships free of these costs are associ-
422 ated with such positive relationship outcomes. In this light, we suggest strategies
423 that individuals can follow in order to increase the benefits and happiness they can

424 draw from their friendships while simultaneously minimizing the costs of competi-
425 tion, deception, and strategic interference.

426 **The Banker's Paradox and Becoming Irreplaceable**

427 Just as banks prefer to lend money to people with minimal credit risk, and are least
428 likely to provide loans to those who are most in need, we might expect humans
429 to be (paradoxically) least likely to invest in individuals in their hour of greatest
430 need—when they are sick, have poor prospects, or otherwise appear unlikely to
431 be able to return the favor in the future. The *banker's paradox* describes this social
432 dilemma: it is profitable to invest in others who are in good condition and are able
433 to return benefits, and to discount the needs of those who are in poor condition and
434 least likely to be able to repay the actor in the future. This unfortunate payoff matrix
435 would have led our ancestors to avoid precisely those who required the most help.
436 The consequence of this logic is that the ruthless currency of selection would have
437 favored psychological mechanisms that led individuals to desert each other during
438 times of dire need. In short, the banker's paradox predicts that people may be least
439 likely to befriend or help those who are poor credit risks—those that show the great-
440 est signs of urgent need (Tooby and Cosmides 1996).

441 One key solution to this problem may be for individuals to strive to become *ir-*
442 *replaceable* and indispensable to their friends (Tooby and Cosmides 1996). Tooby
443 and Cosmides (1996) illustrate several strategies by which an individual might
444 become irreplaceable. For example, one can promote a reputation that highlights
445 one's unique or exceptional attributes, cultivate specialized skills possessed by no
446 one else within one's social group, demonstrate one's unwavering loyalty, or avoid
447 social groups in which one's unique attributes are not valued. Cultivating a unique
448 set of skills or benefits that nobody else in one's in-group possesses may be critical
449 to the solution of the banker's paradox, as it dramatically lowers the likelihood of
450 desertion in times of vulnerability and despair (Tooby and Cosmides 1996).

451 **Developing Close Friendships**

452 An effective strategy for maximizing happiness in friendships may be to invest in
453 deep, close friendships. Individuals who succeed in establishing a deep bond with a
454 friend may be much more likely to receive critical aid during times of need. Tooby
455 and Cosmides (1996) argue this position cogently, distinguishing between true
456 friends and fair-weather friends. The adaptive problem of distinguishing your true
457 friends from your fair-weather friends is not an easy one, as fair-weather friends
458 appear deceptively similar to true friends when circumstances are favorable and
459 conditions are auspicious. Unfavorable circumstances in which one friend is in need
460 of help that would be costly for the other friend to deliver provide the litmus test for

461 friendships. Because these harsh times would have been critical for ancestral hu-
462 mans' survival and reproduction, we should expect selection to have fashioned psy-
463 chological mechanisms that are acutely sensitive to the behavior that one's friends
464 exhibit under such circumstances.

465 Distinguishing between fair-weather friends and true friends is a critical issue
466 that has received very little attention in the literature, and represents an exciting di-
467 rection for future friendship research. In line with Tooby and Cosmides (1996), we
468 suggest that cultivating true friendships, those characterized by deep engagement,
469 is of paramount importance in deriving deep satisfaction from social relationships.
470 Individuals who emphasize these close friendships can put themselves in a posi-
471 tion to reap the security, support, and happiness that these kinds of friendships are
472 uniquely positioned to deliver. In our view, individuals who wish to maximize the
473 benefits and happiness they can harvest from their friendships should allocate time
474 and effort to developing close, deep friendships over superficial friend networks,
475 and should invest seriously in establishing bonds of loyalty and trust.

476 **Managing Intrasexual Rivalry**

477 Managing intrasexual rivalry is likely a critical path to minimizing the costs of
478 same-sex friendships. Humans display a rich array of strategies designed to com-
479 pete with same-sex others for desirable mates, resources, and positions in the status
480 hierarchy. These tactics include competitor derogation and manipulation (Buss and
481 Dedden 1990; Fisher and Cox 2010), exaggerated self-enhancement, and spreading
482 rumors about intrasexual rivals (Buss and Dedden 1990). Unfortunately, these same
483 strategies sometimes manifest themselves within same-sex friendships.

484 Individuals in same-sex friendships stand to benefit greatly by communicating
485 and promoting positive reciprocity in order to prevent unnecessary competition and
486 rivalry (Axelrod 1984). Such reciprocity facilitates cooperative strategies and in-
487 hibits the activation of competitive or exploitative strategies, partly because it re-
488 sults in positive feedback loops of cooperation and lowers the payoff of exploitative
489 strategies (Axelrod 1984). If competitive strategies are successfully inhibited, goal
490 obstruction and strategic interference are kept to a minimum, and the resultant stress
491 and negative emotions are consequently minimized as well.

492 Cooperative exchange in friendships can be further facilitated if each party in-
493 sists on no more than equity (Axelrod 1984). Because greed, trying to extract more
494 than one's fair share of benefits, is a downfall in many relationships, setting equity
495 as a goal may help prevent the negative emotions that arise in response to one
496 partner taking more than his fair share of the pair's pooled resources. This type of
497 strategy may be helpful in minimizing conflict and feelings of betrayal or injustice.
498 In this way, employing the principles of fairness and reciprocity that have been inte-
499 gral to the evolution of human cooperativeness will likely prove to be instrumental
500 in minimizing conflict and strife and promoting harmony in friendships.

501 **Minimizing Envy**

502 Minimizing envy may be key for enjoying greater happiness in friendships, as envy
503 is inversely related to happiness (Belk 1984). Same-sex friends can vastly reduce
504 the potential for envy by developing friendships with others who are similar in
505 values, interests, personality, and, importantly, mate value. A growing body of re-
506 search suggests that women who develop friendships with more attractive same-sex
507 friends experience greater envy and feel the need to derogate their attractive friends
508 (Bleske-Rechek and Lighthall 2010; Fisher and Cox 2009). Although women may
509 be able to gain otherwise unattainable access to men of higher mate value by con-
510 sorting with more attractive same-sex friends, they may also be undermining their
511 chances for a close, deep friendship if envy is inextricably intertwined with such
512 benefits. Developing same-sex friendships with individuals of similar mate value,
513 on the other hand, may diminish this envy and result in greater emotional closeness
514 between friends as well as increased happiness.

515 The optimal balance in such tradeoffs will depend on the characteristics of the
516 individual and of the context. Awareness of these issues, however, is sure to be an
517 important building block for mindfully managing these costs. It may also serve indi-
518 viduals well to identify the benefits that they can offer to their same-sex friends and
519 that their friends can offer them, and then to develop courses of action for delivering
520 and attaining these benefits without inducing envy (Hill and Buss 2008).

521 **Allowing for Communication**

522 Fostering open communication is another key strategy for reducing strife and maxi-
523 mizing happiness in friendships. This strategy may be especially useful in cross-
524 sex friendships, in which the different parties often have different intentions and
525 expectations.

526 Although some cross-sex friendships are characterized by mutual sexual attrac-
527 tion, men and women differ in their motivations for forming cross-sex friendships
528 (Bisson and Levine 2009; Bell 1981; Lehmillier et al. 2011). Men are typically more
529 strongly motivated by sexual desire in their formation of these relationships, and
530 perceive having sex with their female friends as a benefit of cross-sex friendships
531 (Bleske and Buss 2000). Women, on the other hand, are more strongly motivated
532 by the desire for an emotional connection in their friends with benefits relationships
533 (Lehmillier et al. 2011). This suggests that men and women likely evaluate the ben-
534 efits of friends with benefits relationships differently. The common asymmetry in
535 sexual desire, together with men and women's conflicting priorities in such relation-
536 ships, hold great potential for disappointment and discord. It is perhaps not surpris-
537 ing, then, that some friends who develop a sexual relationship report positive effects
538 on their friendship quality, whereas others report considerable relational damage as
539 a result of their sexual liaison (Afifi and Faulkner 2000).

540 Investigating these sex-differentiated mating motivations will be important for
541 enhancing our understanding of how friends with benefits relationships can improve
542 relational quality (Afifi and Faulkner 2000) and contribute to each party's happi-
543 ness, as well as the unique obstacles and risks such relationships can pose. Afifi and
544 Faulkner (2000) suggest that individuals who engage in friends with benefits rela-
545 tionships should emphasize an open flow of communication in which both parties
546 discuss the meaning of sexual activity within their relationship. Doing so will likely
547 reduce friction and make the experience more pleasurable, increasing happiness and
548 satisfaction within the dyad (Cooper and Stoltenberg 1987). If friends do not take an
549 active role in resolving discrepant desires and expectations through open communi-
550 cation, the friendship may suffer from dishonesty, inaccurate inference of the other
551 sex's intentions, and even deception designed to fulfill one's own desires (Haselton
552 et al. 2005). On the other hand, by promoting an open flow of communication about
553 each individual's hopes and expectations for the friendship, cross-sex friends can
554 reduce a major source of conflict in their relationships and enjoy the benefits of a
555 close friendship without the adverse impact of uncertainty, strategic interference,
556 and outright deception.

557 **Conclusions**

558 An evolutionary perspective provides a functional approach to the science of friend-
559 ship and our understanding of its link to happiness. This perspective draws attention
560 to the unique profiles of costs and benefits that characterize each type of friendship,
561 and serves as a useful heuristic for investigating areas as diverse as friendship ini-
562 tiation, conflict and discord, relationship dissolution, the predictors of individual
563 differences in friendships, and the activation of mating mechanisms in cross-sex
564 friendships. Evolutionary research on friendship is still in its nascent stages, but
565 the available literature already offers valuable insight into the costs and benefits of
566 friendship, the functions of each friendship type, and individual differences within
567 these friendships.

568 In light of the various fitness-benefits and challenges that characterize different
569 types of friendship, an evolutionary perspective may be instructive in suggesting
570 ways for individuals to reduce discord and enhance the happiness yield of their
571 friendships. For example, because of the pervasive problems associated with com-
572 peting for the same mates, same-sex friendships between heterosexual women or
573 heterosexual men may be maligned by deception and distrust. Awareness of these
574 costs is the first step in mitigating them and moving toward a happier friendship.
575 However, individuals in those fortunate cross-sex friendships that are not burdened
576 by unrequited sexual interest (such as friendships between heterosexual women and
577 gay men; Russell et al. 2013) report feeling particularly fulfilled (Hopcke and Ra-
578 faty 1999). A particularly fruitful direction for future research may be to explore
579 how people can mitigate or even completely eschew the costs of friendship (e.g.,

580 mating competition in same-sex friendships and deceptive sexual intent in cross-sex
581 friendships) in the service of promoting relationship harmony and happiness.

582 Exploring friendship from an evolutionary perspective enables us to bring a prin-
583 cipled theoretical paradigm to bear on these issues, and to situate friendship within
584 a larger framework of biological conflict and cooperation. Evolutionary approaches
585 to friendship simultaneously hold great promise for the basic science of social re-
586 lationships, as well as the practical objective of enhancing our close relationships.
587 Evolutionarily inspired strategies for maximizing the happiness yield of friendships
588 are tailored to specific friendship types, but the common thread underlying all of
589 these recommendations is increased awareness. A critical first step to deepening and
590 enhancing friendships is an awareness of the potential problems that such relation-
591 ships can pose. One of the great virtues of an evolutionary approach to friendship
592 is that it can arm us with this knowledge, which represents the first step to reducing
593 the strife and discord in our relationships. In so doing, we can clear the path to an
594 enhanced sense of joy and satisfaction in our friendships. It is our hope that this
595 chapter makes a modest contribution to these goals, and helps researchers progress
596 toward a comprehensive science of this fundamental social relationship and its rela-
597 tion to human happiness.

598 References

- 599 Abbey, A. (1982). Sex differences in attributions for friendly behavior: Do males misper-
600 ceive females' friendliness? *Journal of Personality and Social Psychology*, *32*, 830–838.
601 doi:10.1037/0022-3514.42.5.830.
- 602 Abbey, A., & Melby, C. (1986). The effect of nonverbal cues on gender differences in perceptions
603 of sexual intent. *Sex Roles*, *15*, 283–298. doi:10.1007/BF00288318.
- 604 Ackerman, J. M., & Kenrick, D. T. (2009). Cooperative courtship: Helping friends raise and
605 raise relationship barriers. *Personality and Social Psychology Bulletin*, *35*, 1285–1300.
606 doi:10.1177/0146167209335640.
- 607 Afifi, W. A., & Faulkner, S. L. (2000). On being 'just friends': The frequency and impact of sexual
608 activity in cross-sex friendships. *Journal of Social and Personal Relationships*, *17*, 205–222.
609 doi:10.1177/0265407500172003.
- 610 Argyle, M. (1999). Causes and correlates of happiness. In D. Kahneman, E. Diener, & N. Schwarz
611 (Eds.) *Well-being: The foundations of hedonic psychology* (pp. 353–373). New York: Russell
612 Sage Foundation. <http://www.mendeley.com/catalog/causes-correlates-happiness/>
- 613 Argyle, M., & Henderson, M. (1984). The rules of friendship. *Journal of Social and Personal*
614 *Relationships*, *1*, 211–237. doi:10.1177/0265407584012005.
- 615 Axelrod, R. (1984). *The evolution of cooperation*. New York: Basic Books. <http://www.amazon.com/Evolution-Cooperation-Revised-Robert-Axelrod/dp/0465005640>.
- 616 Befu, H. (1977). Social exchange. *Annual Review of Anthropology*, *6*, 255–281. doi:10.1146/an-
618 nurev.an.06.100177.001351.
- 619 Belk, R. W. (1984). Three scales to measure constructs related to materialism: Reliability, validity,
620 and relationships to measures of happiness. *Advances in Consumer Research*, *11*, 291–297.
621 doi:10.1177/0092070306289291.
- 622 Berscheid, E., Dion, K., Walster, E., & Walster, G. W. (1971). Physical attractiveness and dat-
623 ing choice: A test of the matching hypothesis. *Journal of Experimental Social Psychology*, *7*,
624 173–189. doi:10.1177/0146167286124001.

AQ3

- 625 Bisson, M. A., & Levine, T. R. (2009). Negotiating a friends with benefits relationship. *Archives of*
626 *Sexual Behavior*, 38, 66–73. doi:10.1007/s10508-007-9211-2.
- 627 Bleske, A. L., & Buss, D. M. (2000). Can men and women be just friends? *Personal Relationships*,
628 7, 131–151. doi:10.1177/01461672012710007.
- 629 Bleske, A. L., & Shackelford, T. K. (2001). Poaching, promiscuity, and deceit: Combat-
630 ating mating rivalry in same-sex friendships. *Personal Relationships*, 8, 407–424.
631 doi:10.1111/j.1475-6811.2001.tb00048.x.
- 632 Bleske-Rechek, A. L., & Buss, D. M. (2001). Cross sex friendship: Sex differences and similari-
633 ties in initiation, selection, and dissolution. *Personality and Social Psychology Bulletin*, 27,
634 1310–1323. doi:10.1177/01461672012710007.
- 635 Bleske-Rechek, A., & Lighthall, M. (2010). Attractiveness and rivalry in women's friendships
636 with women. *Human Nature*, 21, 82–97. doi: 10.1007/s12110-010-9081-5.
- 637 Bleske-Rechek, A., Sommers, E., Micke, C., Erickson, L., Matteson, L., Stocco, C., Schumacher,
638 B., & Ritchie, L. (2012). Benefit or burden? Attraction in cross-sex friendship. *Journal of So-*
639 *cial and Personal Relationships*, 29, 569–596. doi: 10.1177/0265407512443611.
- 640 Booth, A., & Hess, E. (1974). Cross-sex friendship. *Journal of Marriage and Family*, 36, 38–47.
641 doi:10.2307/350992.
- 642 Brannan, D., Biswas-Diener, R., Mohr, C. D., Mortazavi, S., & Stein, N. (2013). Friends and fam-
643 ily: A cross-cultural investigation of social support and subjective well-being among college
644 students. *The Journal of Positive Psychology*, 8, 65–75. [http://dx.doi.org/10.1080/17439760.](http://dx.doi.org/10.1080/17439760.2012.743573)
645 2012.743573
- 646 Browne, K. R. (2006). Sex, power, and dominance: The evolutionary psychology of sexual harass-
647 ment. *Managerial and Decision Economics*, 27, 145–158. doi:10.1002/mde.1289.
- 648 Burndt, T. J. (2002). Friendship quality and social development. *Current Directions in Psychologi-*
649 *cal Science*, 11, 7–10. <http://dx.doi.org/10.1111/1467-8721.00157>
- 650 Buss, D. M. (1988). The evolution of human intrasexual competition: Tactics of mate attraction.
651 *Journal of Personality and Social Psychology*, 54, 616–628. doi:10.1037/0022-3514.54.
- 652 Buss, D. M. (1989). Conflict between the sexes: Strategic interference and the evocation of an-
653 ger and upset. *Journal of Personality and Social Psychology*, 56, 735–747. doi:10.1037/0022-
654 3514.56.5.735.
- 655 Buss, D. M. (1994). The strategies of human mating. *American Scientist*, 82, 238–249. [http://www.](http://www.jstor.org/stable/29775193)
656 [jstor.org/stable/29775193](http://www.jstor.org/stable/29775193).
- 657 Buss, D. M. (1994/2003). *Evolution of desire*. New York: Basic Books. [http://www.ebook3000.](http://www.ebook3000.com/The-Evolution-Of-Desire_89872.html)
658 [com/The-Evolution-Of-Desire_89872.html](http://www.ebook3000.com/The-Evolution-Of-Desire_89872.html).
- 659 Buss, D. M. (2004). *Evolutionary psychology: The new science of the mind* (4th ed.). Boston: Al-
660 lyn and Bacon. <http://booksgreatchoice.com/getbook/p304099/?id=30>.
- 661 Buss, D. M. (2005). *The murderer next door: Why the mind is designed to kill*. New York: Penguin.
662 http://www.goodreads.com/book/show/488723.The_Murderer_Next_Door.
- 663 Buss, D. M., & Dedden, L. A. (1990). Derogation of competitors. *Journal of Social and Personal*
664 *Relationships*, 7, 395–422. doi:10.1177/0265407590073006.
- 665 Buss, D. M., & Schmitt, D. P. (1993). Sexual strategies theory: An evolutionary perspective on hu-
666 man mating. *Psychological Review*, 100, 204–232. doi:10.1037/0033-295X.100.2.204.
- 667 Byrne, D., London, O., & Reeves, K. (1968). The effects of physical attractiveness, sex,
668 and attitude similarity on interpersonal attraction. *Journal of Personality*, 36, 259–271.
669 doi:10.1111/j.1467-6494.1968.tb01473.x.
- 670 Camfield, L., Choudhury, K., & Devine, J. (2009). Well-being, happiness and why relationships
671 matter: Evidence from Bangladesh. *Journal of Happiness Studies*, 10, 71–91. doi:10.1007/
672 s10902-007-9062-5.
- 673 Chan, Y. K., & Lee, R. P. L. (2006). Network size, social support and happiness in later life: A
674 comparative study of Beijing and Hong Kong. *Journal of Happiness Studies*, 7, 87–112. [http://](http://dx.doi.org/10.1007/s10902-005-1915-1)
675 dx.doi.org/10.1007/s10902-005-1915-1.
- 676 Connolly, J., Craig, W., Goldberg, A., & Pepler, D. (1999). Conceptions of cross sex friendships
677 and romantic relationships in early adolescence. *Journal of Youth and Adolescence*, 28, 481–
678 494. doi:10.1023/A:1021669024820.

- 679 Cooper, A., & Stoltenberg, C. D. (1987). Comparison of sexual enhancement and communication
680 training program on sexual and marital satisfaction. *Journal of Consulting Psychology, 34*,
681 309–314. doi:10.1037/0022-0167.34.3.309.
- 682 Corneau, A. (2009). Doctoral student social support and satisfaction with life. *Dissertation Ab-*
683 *stracts International, 69*. <http://gradworks.umi.com/33/20/3320378.html>.
- 684 Cosmides, L., & Tooby, J. (1992). Cognitive adaptations for social exchange. In J. Barkow, L.
685 Cosmides, & J. Tooby (Eds.), *The adapted mind* (pp. 163–228). New York: Oxford University
686 Press. <http://www.cep.ucsb.edu/papers/Cogadapt.pdf>.
- 687 Cosmides, L., & Tooby, J. (2000). Evolutionary psychology and the emotions. In M. Lewis & J.
688 M. Haviland-Jones (Eds.), *Handbook of emotions* (2nd ed., pp. 91–115). New York: Guilford.
689 <http://www.cep.ucsb.edu/papers/Emotions.pdf>.
- 690 Daly, M., Wilson, M., & Weghorst, S. J. (1982). Male sexual jealousy. *Ethology and Sociobiology*,
691 3, 11–27. doi:10.1016/0162-3095(82)90027-9.
- 692 Demir, M., & Weitekamp, L. A. (2007). I am so happy 'cause today I found my friend: Friend-
693 ship and personality as predictors of happiness. *Journal of Happiness Studies, 8*, 181–211.
694 doi:10.1007/s10902-006-9034-1.
- 695 Demir, M., Orthel, H., & Andelin, A. K. (2013). Friendship and happiness. In S. A. David & I.
696 Boniwell (Eds.) *Oxford handbook of happiness* (pp. 860–870). New York: Oxford University
697 Press. <http://www.axon.es/axon/LibroFicha.asp?Libro=94159&T=THE+OXFORD+HANDBOOK+OF+HAPPINESS>.
- 698 DeScioli, P., & Kurzban, R. (2009). The alliance hypothesis for human friendship. *Public Library*
699 *of Science ONE, 4*(6), e5802. doi:10.1371/journal.pone.0005802.s001
- 700 DeScioli, P., & Kurzban, R. (2012). The company you keep: Friendship decisions from a func-
701 tional perspective. In J. I. Krueger (Ed.), *Social judgment and decision making* (pp. 209–225).
702 New York: Psychology Press. [http://www.amazon.com/Social-Judgment-Decision-Frontiers-](http://www.amazon.com/Social-Judgment-Decision-Frontiers-Psychology/dp/1848729065)
703 [Psychology/dp/1848729065](http://www.amazon.com/Social-Judgment-Decision-Frontiers-Psychology/dp/1848729065).
- 704 DeSouza, E. R., Pierce, T., Zanelli, J. C., & Hutz, C. (1992). Perceived sexual intent in the U.S.
705 and Brazil as a function of nature of encounter, subjects' nationality, and gender. *Journal of Sex*
706 *Research, 29*, 251–260. doi:10.1080/00224499209551645.
- 707 Elsesser, K., & Peplau, L. A. (2006). The glass partition: Obstacles to cross-sex friendships at
708 work. *Human Relations, 59*, 1077–1100. doi:10.1177/0018726706068783.
- 709 Emerson, R. M. (1976). Social-exchange theory. *Annual Review of Sociology, 2*, 335–362.
710 doi:10.1146/annurev.so.02.080176.002003.
- 711 Feiring, C. (1999). Other-sex friendship networks and the development of romantic relationships in
712 adolescence. *Journal of Youth and Adolescence, 28*, 495–512. doi:10.1023/A:1021621108890.
- 713 Fisher, M., & Cox, A. (2009). The influence of female attractiveness on competitor derogation.
714 *Journal of Evolutionary Psychology, 7*, 141–155. doi:10.1556/JEP.7.2009.2.3.
- 715 Fisher, M., & Cox, A. (2010). Four strategies used during intrasexual competition for mates. *Per-*
716 *sonal Relationships, 18*, 20–38. doi:10.1111/j.1475-6811.2010.01307.x.
- 717 Grigoriou, T. (2004). *Friendship between gay men and heterosexual women: An interpretive phe-*
718 *nomenological analysis*. London: London South Bank University, Families and Social Capital
719 ESRC Research Group. <http://www.lsbu.ac.uk/ahs/downloads/families/familieswp5.pdf>.
- 720 Halatsis, P., & Christakis, N. (2009). The challenge of sexual attraction within heterosexuals'
721 cross-sex friendship. *Journal of Social and Personal Relationships, 26*, 919–937.
722 doi:10.1177/0265407509345650.
- 723 Hartup, W. W., Laursen, B., Stewart, M. I., & Eastenson, A. (1988). Conflict and the friendship
724 relations of young children. *Child Development, 59*, 1590–1600. doi:10.2307/1130673.
- 725 Haselton, M. G., & Buss, D. M. (2000). Error management theory: A new perspective on bi-
726 ases in cross-sex mind reading. *Journal of Personality and Social Psychology, 78*, 81–91.
727 doi:10.1037/110022-3514.78.1.81.
- 728 Haselton, M. G., & Nettle, D. (2006). The paranoid optimist: An integrative evolutionary mod-
729 el of cognitive biases. *Personality and Social Psychology Review, 10*, 47–66. doi:10.1207/
730 s15327957pspr1001_3.
- 731

- 732 Haselton, M., Buss, D. M., Oubaid, V., & Angleitner, A. (2005). Sex, lies, and strategic interference: The psychology of deception between the sexes. *Personality and Social Psychology Bulletin*, *31*, 3–23. doi:10.1177/0146167204271303.
- 733
- 734
- 735 Hill, S. E., & Buss, D. M. (2008). The evolutionary psychology of envy. In R. Smith (Ed.) *Envy: Theory and research* (pp. 60–70). New York: Oxford University Press. <http://homepage.psy.utexas.edu/homepage/group/busslab/pdf/evolution%20of%20envy.pdf>.
- 736
- 737
- 738 Hill, K., & Hurtado, A. M. (1996). *Ache life history: The ecology and demography of a foraging people*. New York: Aldine De Gruyter. <http://www.abebooks.com/Ache-Life-History-Ecology-Demography-Foraging/6136325563/bd>.
- 739
- 740
- 741 Hill, S. E., DelPriore, D., & Major, B. (2013). An evolutionary psychological perspective on happiness. In I. Boniwell & S. David (Eds.) *Oxford handbook of happiness* (pp. 875–886). New York: Oxford University Press. <http://www.axon.es/axon/LibroFicha.asp?Libro=94159&T=THE+OXFORD+HANDBOOK+OF+HAPPINESS>.
- 742
- 743
- 744
- 745 Holder, M. D., & Coleman, B. (2009). The contribution of social relationships to children's happiness. *Journal of Happiness Studies*, *10*, 329–349. doi:10.1007/s10902-007-9083-0.
- 746
- 747 Homans, G. C. (1958). Social behavior as exchange. *American Journal of Sociology*, *63*, 597–606. <http://www.jstor.org/stable/2772990>.
- 748
- 749 Hopcke, R. H., & Rafaty, L. (1999). *Straight women, gay men: Absolutely fabulous friendships*. Berkeley: Wildcat Canyon Press. http://books.google.com/books/about/Straight_Women_Gay_Men.html?id=MlcUCx8XuBYC.
- 750
- 751
- 752 Hussong, A. M. (2000). Perceived peer context and adolescent adjustment. *Journal of Research on Adolescence*, *10*, 187–224. doi:10.1207/SJRA1004_02.
- 753
- 754 Kaplan, D. L., & Keys, C. B. (1997). Sex and relationship variables as predictors of sexual attraction in cross-sex platonic friendships between young and heterosexual adults. *Journal of Social and Personal Relationships*, *14*, 191–206. doi: 10.1177/0265407597142003.
- 755
- 756
- 757 Kemp, M. C. (1995). *The Gains from trade and the gains from aid: Essays in international trade theory*. London: Routledge. <http://www.questia.com/library/104457971/the-gains-from-trade-and-the-gains-from-aid-essays>.
- 758
- 759
- 760 Kenrick, D. T., Neuberg, S. L., Griskevicius, V., Becker, D. V., & Schaller, M. (2010). Goal driven cognition and function behavior: The fundamental-motives framework. *Current Directions in Psychological Science*, *19*, 63–67. doi:10.1177/0963721409359281.
- 761
- 762
- 763 Larson, R., Mannell, R., & Zuzanek, J. (1986). Daily well-being of older adults with friends and family. *Psychology and Aging*, *1*, 117–126. <http://www.ncbi.nlm.nih.gov/pubmed/3267387>.
- 764
- 765 Lassek, W. D., & Gaulin, S. J. C. (2008). Waist-hip ratio and cognitive ability: Is gluteofemoral fat a privileged store of neurodevelopmental resources? *Evolution and Human Behavior*, *29*, 26–34. doi:10.1016/j.evolhumbehav.2007.07.005.
- 766
- 767
- 768 Lassek, W. D., & Gaulin, S. J. C. (2009). Costs and benefits of fat-free muscle mass in men: Relationship to mating success, dietary requirements, and native immunity. *Evolution and Human Behavior*, *30*, 322–328. doi:10.1016/j.evolhumbehav.2009.04.002.
- 769
- 770
- 771 Laursen, B. (1995). Conflict and social interaction in adolescent relationships. *Journal of Research on Adolescence*, *5*, 55–70. doi:10.1207/s15327795jra0501_3.
- 772
- 773 Lefkowitz, E. S., Boone, T. L., & Shearer, C. L. (2004). Communication with best friends about sex-related topics during emerging adulthood. *Journal of Youth and Adolescence*, *33*, 339–351. doi:10.1023/B:JOYO.0000032642.27242.c1.
- 774
- 775
- 776 Lehmiller, J. J., Vanderdrift, L. E., & Kelly, J. R. (2011). Sex differences in approaching friends with benefits relationships. *Journal of Sex Research*, *48*, 275–284. doi:10.1080/00224491003721694.
- 777
- 778 Lempers, J. D., & Clark-Lempers, D. S. (1993). A functional comparison of same-sex and opposite-sex friendships during adolescence. *Journal of Adolescent Research*, *8*, 89–108. doi:10.1177/074355489381007.
- 779
- 780
- 781 Lewis, D. M. G., Conroy-Beam, D., Al-Shawaf, L., Raja, A., DeKay, T., & Buss, D. M. (2011). Friends with benefits: The evolved psychology of same- and opposite-sex friendship. *Evolutionary Psychology*, *9*, 543–563. <http://www.epjournal.net/articles/friends-with-benefits-the-evolved-psychology-of-same-and-opposite-sex-friendship/>.
- 782
- 783
- 784

- 785 Lewis, D. M. G., Al-Shawaf, L., Conroy-Beam, D., Asao, K., & Buss, D. M. (2012). Friends with
786 benefits II: Mating activation in cross-sex friendships as a function of sociosexual orientation
787 and relationship status. *Personality and Individual Differences*, *53*, 622–628. doi:10.1016/j.
788 paid.2012.04.040.
- 789 Li, N. P., Bailey, J. M., Kenrick, D. T., & Linsenmeier, J. A. W. (2002). The necessities and luxuries
790 of mate preferences: Testing the tradeoffs. *Journal of Personality and Social Psychology*, *82*,
791 947–955. doi:10.1037/0022-3514.82.6.947.
- 792 Lu, L. (1995). The relationship between subjective well-being and psychosocial variables in Taiwan.
793 *Journal of Social Psychology*, *135*, 351–357. <http://www.ncbi.nlm.nih.gov/pubmed/7650933>.
- 794 Lu, L. (1999). Personal and environmental causes of happiness. *Journal of Social Psychology*, *139*,
795 79–90. doi:10.1080/00224549909598363.
- 796 Malone, J. (1980). *Straight women/gay men: A special relationship*. New York: Dial Press. [http://](http://www.amazon.com/Straight-women-gay-men-relationship/dp/0803781741)
797 www.amazon.com/Straight-women-gay-men-relationship/dp/0803781741.
- 798 Milton, K. (1999). A hypothesis to explain the role of meat-eating in human evolution. *Evo-*
799 *lutionary Anthropology: Issues, News, and Reviews*, *8*, 11–21. doi:10.1002/(SICI)1520-
800 6505(1999)8:1<11::AID-EVAN6>3.0.CO;2-M
- 801 Mongeau, P. A., Ramirez, A., & Vorell, M. (2003). Friends with benefits: Initial explorations of
802 sexual, non-romantic, relationships. Unpublished manuscript, Arizona State University at
803 Tempe.
- 804 O'Meara, J. D. (1989). Cross-sex friendship: Four basic challenges of an ignored relationship. *Sex*
805 *Roles*, *21*, 525–543. doi:10.1007/BF00289102.
- 806 Penke, L., & Asendorpf, J. B. (2008). Beyond global sociosexual orientations: A more differenti-
807 ated look at sociosexuality and its effects on courtship and romantic relationships. *Journal of*
808 *Personality and Social Psychology*, *95*(6), 1113–1135. doi:10.1037/0022-3514.95.5.1113.
- 809 Rose, S. M. (1985). Same- and cross-sex friendships and the psychology of homosociality. *Sex*
810 *Roles*, *12*, 63–74. doi:10.1007/bf00288037.
- 811 Russell, E. M., DelPriore, D. J., Butterfield, M. E., & Hill, S. E. (2013). Friends with benefits, but
812 without the sex: Straight women and gay men exchange trustworthy mating advice. *Evo-*
813 *lutionary Psychology*, *11*, 132–147. [http://www.epjournal.net/articles/friends-with-benefits-but-](http://www.epjournal.net/articles/friends-with-benefits-but-without-the-sex-straight-women-and-gay-men-exchange-trustworthy-mating-advice/)
814 [without-the-sex-straight-women-and-gay-men-exchange-trustworthy-mating-advice/](http://www.epjournal.net/articles/friends-with-benefits-but-without-the-sex-straight-women-and-gay-men-exchange-trustworthy-mating-advice/).
- 815 Shackelford, T. K., & Buss, D. M. (1996). Betrayal in mateships, friendships, and coalitions. *Per-*
816 *sonality and Social Psychology Bulletin*, *22*, 1151–1164. doi:10.1177/01461672962211006.
- 817 Simpson, J. A., & Gangestad, S. W. (1991). Individual differences in sociosexuality: Evidence
818 for convergent and discriminant validity. *Journal of Personality and Social Psychology*, *60*,
819 870–883. doi:10.1037/0022-3514.60.6.870.
- 820 Singh, R., & Ho, S. Y. (2000). Attitudes and attraction: A new test of the attraction, repulsion
821 and similarity-dissimilarity asymmetry hypotheses. *British Journal of Social Psychology*, *39*,
822 197–211. doi:10.1348/014466600164426.
- 823 Sullivan, H. S. (1953). *The interpersonal theory of psychiatry*. New York: Norton. [http://www.](http://www.amazon.com/Interpersonal-Theory-Psychiatry-Harry-Sullivan/dp/0393001385)
824 [amazon.com/Interpersonal-Theory-Psychiatry-Harry-Sullivan/dp/0393001385](http://www.amazon.com/Interpersonal-Theory-Psychiatry-Harry-Sullivan/dp/0393001385).
- 825 Swain, S. O. (1992). Men's friendship with women: Intimacy, sexual boundaries, and the infor-
826 mant role. In P. Nardi (Ed.), *Men's friendships* (pp. 153–171). Newbury Park: Sage. [http://](http://www.uk.sagepub.com/books/Book3359/toc)
827 www.uk.sagepub.com/books/Book3359/toc.
- 828 Tooby, J., & Cosmides, L. (1996). Friendship and the banker's paradox: Other pathways to the
829 evolution of adaptations for altruism. In W. G. Runciman, J. M. Smith, & R. I. M. Dunbar
830 (Eds.), *Evolution of social behavior patterns in primates and man* (Vol. 88, pp. 119–143). New
831 York: Oxford University Press. <http://www.cep.ucsb.edu/papers/friendship.pdf>.
- 832 Tooby, J., & DeVore, I. (1987). The reconstruction of hominid behavioral evolution through stra-
833 tegic modeling. In W. G. Kinzey (Ed.), *The evolution of human behavior: Primate models*
834 (pp. 183–237). New York: SUNY Press. <http://www.cep.ucsb.edu/papers/Reconst.pdf>.
- 835 Trivers, R. L. (1971). The evolution of reciprocal altruism. *Quarterly Review of Biology*, *46*,
836 35–57. <http://www.jstor.org/stable/2822435>.

- 837 Trivers, R. L. (1972). Parental investment and sexual selection. In B. Campbell (Ed.), *Sexual selection and the descent of man, 1871-1971* (pp. 136–179). Chicago: Aldine. <http://www4.nau.edu/shustercourses/BIO%20698/Literature/Trivers%201972.pdf>.
- 838
- 839
- 840 Vigil, J. M. (2007). Asymmetries in the friendship preferences and social styles of men and women. *Human Nature, 18*, 143–161. doi:10.1007/s12110-007-9003-3.
- 841
- 842 Wilson, M., & Daly, M. (1992). Who kills whom in spouse killings?: On the exceptional sex ratio of spousal homicides in the United States. *Criminology, 30*, 189–215. doi:10.1111/j.1745-9125.1992.tb01102.x.
- 843
- 844 Wilson, M., & Daly, M. (1996). Male sexual proprietariness and violence against wives. *Current Directions in Psychological Science, 5*, 2–7. <http://www.jstor.org/stable/20182377>.
- 845
- 846 Wilson, M., & Daly, M. (1998). Lethal and nonlethal violence against wives and the evolutionary psychology of male sexual proprietariness. In R. E. Dobash & R. P. Dobash (Eds.), *Rethinking violence against women*. Thousand Oaks: Sage <http://www.flyfishingdevon.co.uk/salmon/year3/psy364sexual-selection/daly-wilson-1998.pdf>.
- 847
- 848
- 849
- 850

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