Mating

Intelligence

Sex, Relationships,
and the Mind's
Reproductive System

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Chapter 16

Mating Intelligence: An Integrative Model and Future Research Directions

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In conceiving of mating intelligence (MI) as the whole set of cognitive processes tied to mating-relevant outcomes, it becomes clear that we are talking about a very broad domain of psychology, and a major portion of human nature. Accordingly, the MI construct can usefully guide future research only insofar as we can develop a clear, systematic, evidence-based model of MI's main components, including their evolutionary origins, adaptive functions, design features, and inter-relationships. In light of the variegated perspectives on MI presented in this volume, this chapter describes such a provisional model.

DOMAINS OF MATING INTELLIGENCE

What domains comprise MI? To the extent that MI encompasses all the cognitive processes that bear upon mating-relevant outcomes, MI potentially relates to all elements of human mating psychology. Major psychological domains of human mating would include at least the following:

1. *courtship display mechanisms*, including behavioral displays of physical qualities such as strength, virility, fertility, and athleticism, and

similar displays of psychological qualities ('mental fitness indicators') such as kindness, creativity, intelligence, resourcefulness, status, humor, and mental health (e.g., the chapters in this volume by Kaufman, Kozbelt, Bromley, & Miller; Keller; Nettle & Clegg; Shaner, Miller, & Mintz);

2. *mate-choice mechanisms* for evaluating and choosing among potential sexual partners, based on integrating diverse physical and behavioral cues of mate value, whether directly observed (e.g., chapters by Li and Penke, Todd, Lenton, & Fasolo, this volume) or reported by others (see De Backer, Braeckman, & Farinpour, this volume);

3. *self-evaluation mechanisms* for assessing one's own mate value, attractiveness, mating intelligence, and capacity for sexual competition (see Penke et al., this volume);

4. *mechanisms for making context-sensitive decisions about mating strategies,* including:

   (a) whether to pursue short-term or long-term relationships (Weekes-Shackelford, Easton, & Stone, this volume),

   (b) whether to pursue honest or deceptive courtship (O'Sullivan, this volume),

   (c) seeking good parent or good genes traits (Miller, this volume),

   (d) adopting mate-attraction or rival-intimidation tactics (Kaufman et al., this volume)

   (e) evaluating the local mating market's current ecological, social, cultural, and demographic features (Ash & Gallup; Figueredo, Brumbach, Jones, Sefcek, Vasquez, & Jacobs, this volume), and

   (f) evaluating one's own mate value in relation to the mate value distribution of potential mates in the local mating market (Penke et al., this volume);

5. *cross-sex mind-reading mechanisms* for understanding and influencing the behavior of potential mates, and of their friends, families, and children (De Backer et al.; O'Sullivan, this volume);

6. *same-sex mind-reading mechanisms* for understanding and influencing the behavior of potential sexual rivals, and of their friends, families, and allies (Kaufman et al., this volume).

Although future MI research is sure to uncover other fundamental domains of MI, these six domains capture much of what we mean to this construct. A model based on these domains should serve as a useful foundation for further MI research.

FIXED VERSUS VARIABI OF MATING INTELLIGE

Two competing ideas can be ments of MI. One suggests t ancestrally shaped adaptation als and, thus, be relatively fixe volume). The other view argu tualized as prototypical fitne cernable heritable component indicators, and should show a tion (see Miller, 2000). Howev nature of MI need not be char: integrated model presented h likely best described by the model, whereas other eleme indicators.

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FIXED VERSUS VARIABLE COMPONENTS OF MATING INTELLIGENCE

Two competing ideas can be advanced regarding the nature of the elements of MI. One suggests that the elements of MI are best treated as ancestrally shaped adaptations, which should vary little among individuals and, thus, be relatively fixed within the population (see Kanazawa, this volume). The other view argues that the elements of MI are best conceptualized as prototypical fitness indicators and, thus, should have a discernable heritable component, should be strongly related to other fitness indicators, and should show a great deal of variability within the population (see Miller, 2000). However, our position is that this debate over the nature of MI need not be characterized as an "either/or" proposition. The integrated model presented here suggests that some elements of MI are likely best described by the 'fixed within the population' adaptation model, whereas other elements may be best conceptualized as fitness indicators.

Some elements of MI—especially the courtship display mechanisms—should be highly variable and heritable, because they evolved as fitness indicators (Keller, Miller, Nettle, Shaner et al., this volume). Such mental fitness indicators should reflect an individual's overall phenotypic quality and/or genetic quality. In conceiving of these qualities as *fitness indicators*, we see them as valued in mate choice *partly* because genetic quality reveals a low mutation load, so predicts good offspring. Thus, such qualities may have survival benefits separate from their benefits to offspring as fitness indicators, but their nature is conceptualized as having evolved partly due to their utility in helping potential mates discriminate among different partners with genotypes that vary in quality. As such, the quality of these indicators should correlate positively with each other, with general intelligence, and with physical health, fertility, and attractiveness.

Other elements of MI, however, that either do not serve a courtship-signaling function at all, or that do not have such signaling as a primary purpose, likely do not behave as would be expected of fitness indictors. Rather, these other elements of MI should be human universals—tightly optimized adaptations shared by all normal, sexually mature men and/or women (Kanazawa; Miller, this volume). Although we might expect large individual differences in capacities for attracting mates through the display of intelligence, creativity, or humor, we might expect much smaller differences in mate choice mechanisms, self-evaluation mechanisms, decision-making mechanisms regarding mating strategies, and cross-sex and same-sex mind-reading abilities. The functional efficiency of these mechanisms should show much lower positive correlations with each other,

with general intelligence, with rated psychological attractiveness, with physical health, or with achieved reproductive success.

For instance, consider the cognitive abilities for satisficing in sequential mate search (Penke et al., this volume), including the process of setting an optimal aspiration level for potential mates based on feedback about one's own mate value. This process does not primarily serve to advertise one's own fitness to potential mates. These cognitive abilities are unlikely to have originated as fitness indicators in their own right. In principle, the mechanism for setting an aspiration level could be a human universal, with low variance and low heritability, and a functional efficiency that is not very correlated with general intelligence or genetic quality.

The output of the mechanism—one's aspiration level itself—could come to be perceived as a fitness indicator of sorts. For example, a person with a long and successful mating history is likely to set a high aspirational level for potential mates. That trait of being "choosy" could well become a valid attractiveness cue to others. However, our concern here in modeling MI is more focused on the mechanism itself and people's ability to optimally set a satisficing threshold. This ability should demonstrate less inter-individual variability compared with abilities that are more clearly tied to fitness advertisement. Further, such a satisficing ability may demonstrate less heritability compared with abilities that are more defensibly characterized as fitness indicators.

The MI model presented here (see Figure 16–1) suggests that many elements of MI can be dichotomized into high-variability fitness indicators versus low-variability mating adaptations. This distinction may point to a reconciliation between the models of MI proposed by Miller (2000b) and by Kanazawa (2004). In short, perhaps the fitness-indicator elements of MI are strongly and reliably related to general intelligence (g), as suggested by Miller (2000), whereas the other, more universal elements of MI are best conceptualized as ancestral adaptations with low g-loadings (consistent with Kanazawa's (2004) approach). In a subsequent section on future MI research, we discuss potential research that could shed light on this aspect of our integrative model.

RELATEDNESS TO GENERAL INTELLIGENCE (g)

Given the prominent place of general intelligence (the g factor) in the psychological literature on individual differences, any human attribute hypothesized as comprising a sort of intelligence should show some positive and reliable relationship with g (Mayer, Caruso, & Salovey, 2000). Our model suggests that different elements of MI should vary in their g-loadings. In light of recent work suggesting that g may directly reflect phenotypic and genetic quality (Prokosch, Yeo, & Miller, 2005), we might expect higher g-loadings among the courtship-display abilities than among the
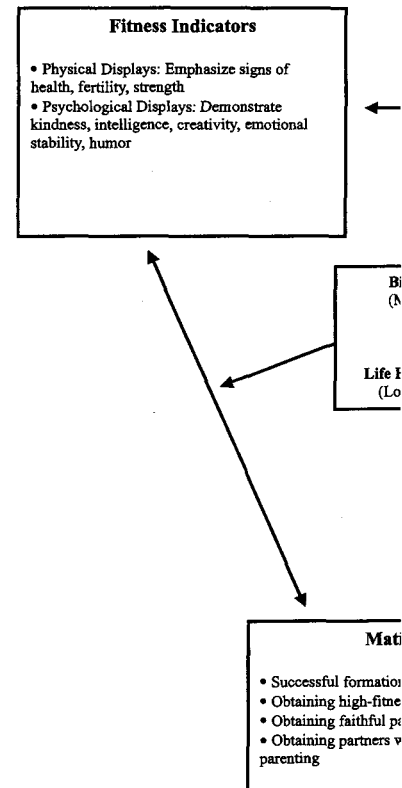
Fitness Indicators

• Physical Displays: Emphasize signs of health, fertility, strength
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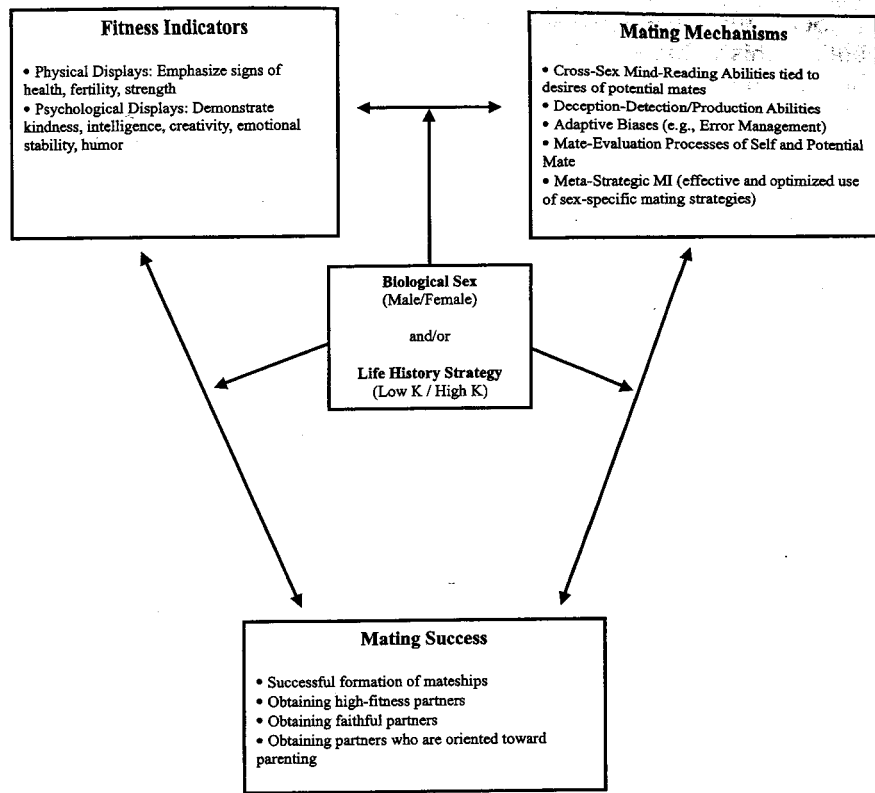isplay abilities than among the

Figure 16–1.   General Model of Mating Intelligence.

universal mating adaptations (for mate choice, self-evaluation, strategic decision-making in mating, and cross-sex and same-sex mind-reading). Future tests of this prediction should clarify the relationships between mating intelligence and general intelligence.

THE MODERATING EFFECTS OF SEX AND LIFE-HISTORY STRATEGY

A coherent, unified theory of MI needs to take into account variables such as sex and life-history strategy (see Figueredo et al., this volume) that have been demonstrated to influence mating behaviors across cultures. The most relevant such variables will be fundamental traits (such as being male or female) that have pervasive influences across all aspects of mate search, mate choice, courtship, sexual rivalry, relationship formation, mate retention, and reproduction.

Male-Specific Fitness

• Physical: Demonstrate physical :
athleticism, muscles, virility
• Psychological: Demonstrate kin
intelligence, humor, ambition, fon

Sex differences in human mating outcomes are so well-documented (both in this volume and in other publications), that, regardless of one's theoretical orientation, any serious scientific research on human mating must address sex differences. In terms of the two general classes of MI constructs included in our model, for instance, males and females have been found to differ in the quality and quantity of different courtship display behaviors (e.g., humor; see Kaufman et al., this volume), with males often *producing* a larger quantity of such displays, and females often *discriminating* more accurately the quality of such displays (see Miller, 2000a). Further, a great deal of research demonstrates that the sexes differ in their general mating strategies, with males using short-term, opportunistic, and coercive strategies more often than females (see Buss, 2003).

In the light of a unified framework for understanding MI, then, biological sex must be seen as a major moderating variable (see Figures 16–2 and 16–3). In terms of courtship-display components of MI, we expect sex differences in the cognitive processes underlying both the production and perception of such signals. Specifically, we predict that male humans will show higher means and variances in the quantities, qualities, costs, and risks of their courtship displays, just as Darwin (1871) observed for males of most species. Conversely, we expect that female humans will show higher accuracies, lower biases, higher reliabilities, and higher validities in their judgments of courtship displays by the opposite sex, just as Darwin (1871) observed for females of most species. Regarding courtship displays, MI among males will primarily be evidenced through proficiency in signal production, while MI among females will primarily be evidenced through signal detection and judgment.

We also predict important sex differences in other components of MI apart from courtship display. For example, males should generally be more adept at short-term mating strategies, whereas females should be more adept at long-term mating strategies. Thus, males may be better at judging whether a female is interested in casual sex, whereas females may be better at screening out males who feign commitment in hopes of obtaining sexual relations (see Figures 16–2 and 16–3).

Life-history strategy (Figueredo, Vasquez, & Brumbach, 2005) concerns the hierarchy of fundamental biological trade-offs of time, energy, resources, and risk. At the most general level, there are trade-offs between 'somatic effort' (growth, survival) and 'reproductive effort' (mating, parenting). Within reproductive effort, there are trade-offs between trying to produce new offspring (mating) versus investing in existing offspring (parenting). In the sphere of mating, there are trade-offs between trying to attract new mates (courtship effort) versus trying to retain an existing mate (mate retention effort). Within courtship effort, there are

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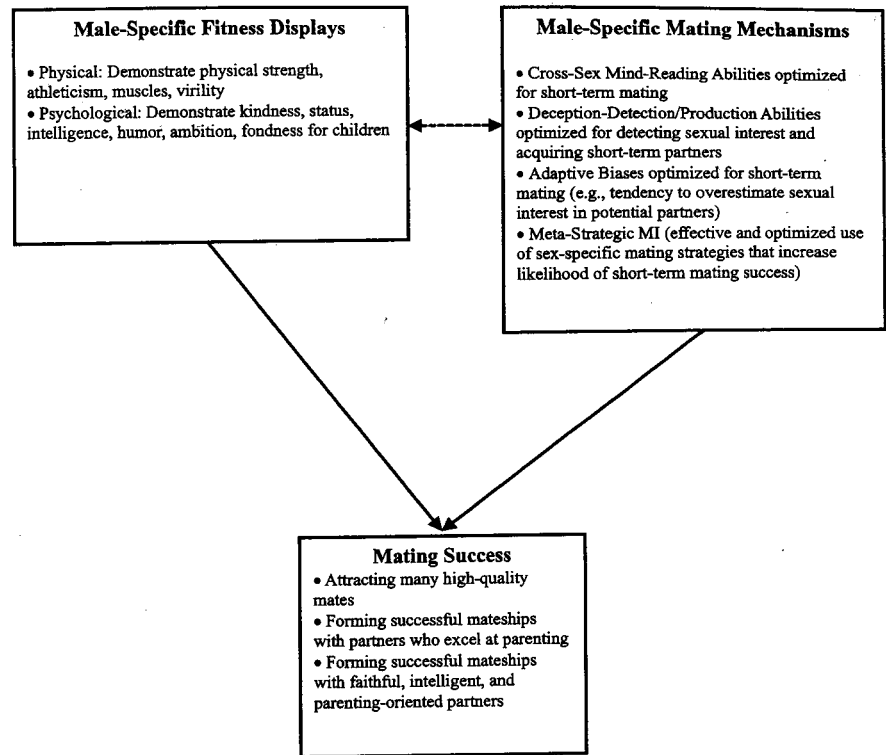and energy they alloc
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Figure 16–2.   A Model of Mating Intelligence for Males.

trade-offs between focusing all energy on one potential mate (falling in love) versus spreading effort across several potential mates (playing the field).

Different species, sexes, and individuals tend to adopt different 'life-history strategy' at each of these levels, which correspond to different points on these trade-off curves. At the psychological level, a life-history strategy can be viewed as a super-ordinate personality variable that incorporates both domain-general personality traits (e.g., emotional stability/neuroticism, extraversion/introversion; see Nettle & Clegg, this volume) and mating-specific aspects of social and sexual behavior (such as adult attachment style—Zeifman & Hazan, 1997). In Figueredo et al.'s conception of life-history strategy (this volume), individuals differ in the time and energy they allocate to survival versus mating, depending on the predictability of the environment. If ecological conditions are generally unstable (making life expectancy short), it makes more sense to focus on fast,
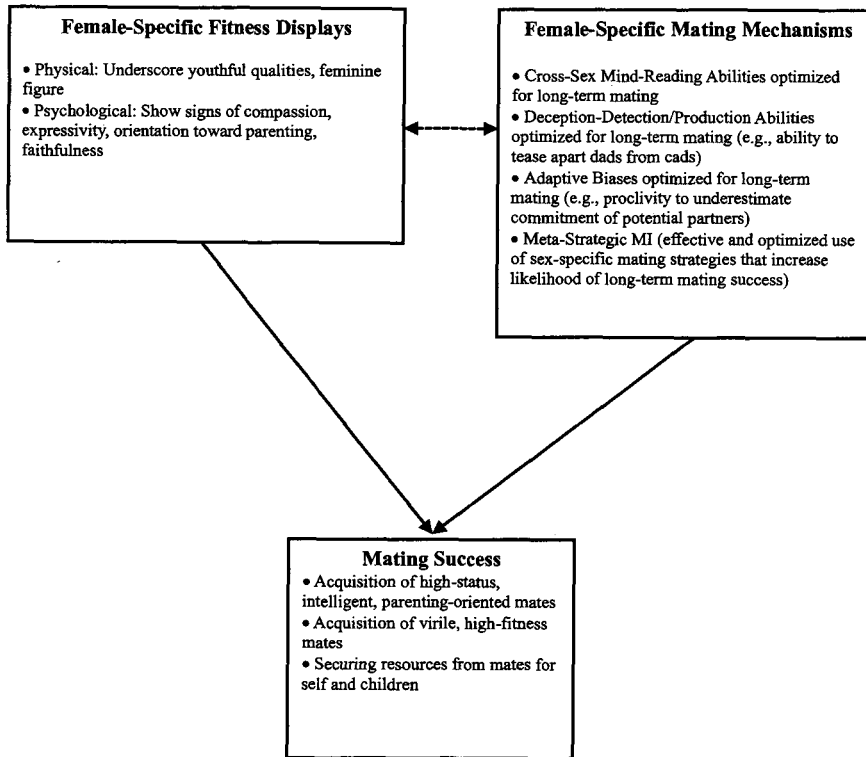
Female-Specific Fitness Displays

• Physical: Underscore youthful qualities, feminine figure
• Psychological: Show signs of compassion, expressivity, orientation toward parenting, faithfulness

Female-Specific Mating Mechanisms

• Cross-Sex Mind-Reading Abilities optimized for long-term mating
• Deception-Detection/Production Abilities optimized for long-term mating (e.g., ability to tease apart dads from cads)
• Adaptive Biases optimized for long-term mating (e.g., proclivity to underestimate commitment of potential partners)
• Meta-Strategic MI (effective and optimized use of sex-specific mating strategies that increase likelihood of long-term mating success)

Mating Success
• Acquisition of high-status, intelligent, parenting-oriented mates
• Acquisition of virile, high-fitness mates
• Securing resources from mates for self and children

Figure 16–3.   A Model of Mating Intelligence for Females.

Low-K Specific Fitness Displays

• Physical: Advertise fertility, sexuality, physicality in general
• Psychological: Downplay interest in long-term relationships, emphasize interest in sex, promiscuity

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Figure 16–4.   A Model of Mating Ir
Life-History Strategy.

opportunistic mating and reproduction (live fast, die young—the 'low K' strategy). Under more stable, low-risk, resource-rich conditions, it makes more sense to grow slowly, mate carefully, and parent conscientiously (live long and prosper—the 'high K' strategy).

This low-K (fast, reckless) versus high-K (slow, careful) life-history dimension is exactly the kind of unifying, evolutionarily informed, big-picture construct that warrants inclusion in a general model of MI. Just as biological sex has important theoretical ramifications for both the courtship-display and mating-adaptation elements of MI, life-history strategy probably does too (see Figures 16–4 and 16–5).

In terms of the courtship-display elements of MI, life-history strategy may influence the kinds of signals one emits in courtship and the kinds of signals that one prefers from a potential mate. We predict that explic-itly sexual signals (e.g., provocative clothing, dance movements, double entendres) should be produced more often by individuals with a relatively
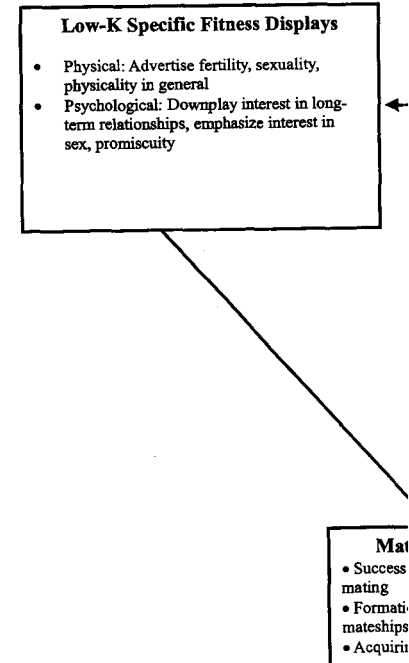
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Female-Specific Mating Mechanisms

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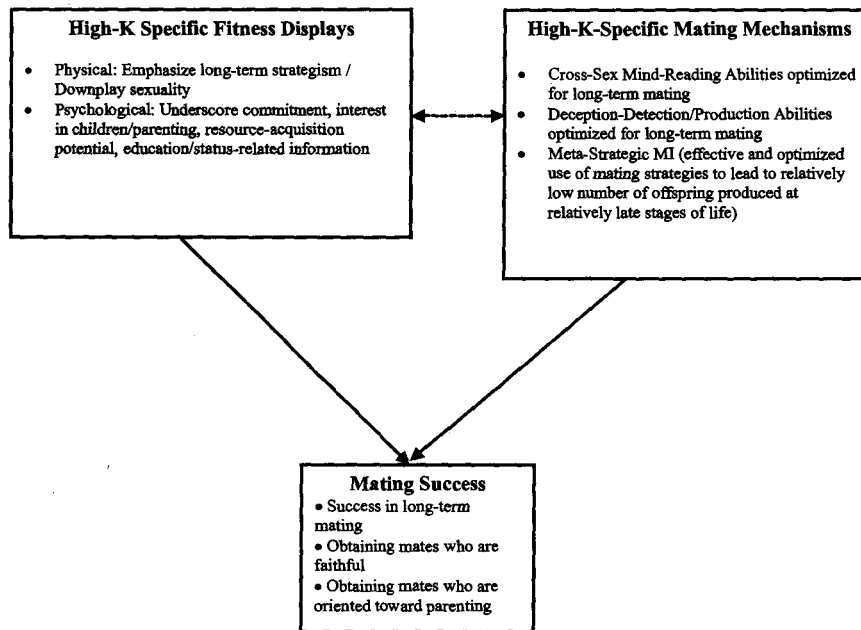ng, dance movements, double
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Low-K Specific Fitness Displays

• Physical: Advertise fertility, sexuality, physicality in general
• Psychological: Downplay interest in long-term relationships, emphasize interest in sex, promiscuity

Low-K-Specific Mating Mechanisms

• Cross-Sex Mind-Reading Abilities optimized for short-term mating
• Deception-Detection/Production Abilities optimized for short-term mating
• Meta-Strategic MI (effective and optimized use of mating strategies to lead to relatively high number of offspring produced at relatively early stages of life)

Mating Success
• Success in short-term mating
• Formation of many mateships
• Acquiring fit partners

Figure 16–4. A Model of Mating Intelligence for Individuals With Low-K (Fast) Life-History Strategy.

fast (low-K) life-history strategy and, likewise, such signals should be more attractive to other low-K individuals. In terms of mating mechanisms, we predict that relatively fast (low-K) individuals should possess cognitive mechanisms better optimized for short-term, opportunistic mating with multiple partners, and for lower parental investment in each offspring, whereas relatively slow (high-K) individuals should possess cognitive mechanisms better optimized for long-term, committed mating with fewer high-quality partners, and for high parental investment in each offspring.

Importantly, sex and life-history strategy should have somewhat similar effects on mating intelligence, with males most similar to the low-K strategy, and females most similar to the high-K strategy. Accordingly, research inspired by this model could benefit from delineating the extent to which sex and life-history strategy explain unique variance within the mating domain, by measuring these factors simultaneously in correlational and experimental studies.

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│  High-K Specific Fitness Displays  │    │ High-K-Specific Mating Mechanisms  │
│                                    │    │                                    │
│ • Physical: Emphasize long-term    │    │ • Cross-Sex Mind-Reading Abilities │
│   strategism / Downplay sexuality  │    │   optimized for long-term mating   │
│ • Psychological: Underscore        │    │ • Deception-Detection/Production   │
│   commitment, interest in          │    │   Abilities optimized for long-    │
│   children/parenting, resource-    │    │   term mating                      │
│   acquisition potential,           │    │ • Meta-Strategic MI (effective and │
│   education/status-related         │    │   optimized use of mating          │
│   information                      │    │   strategies to lead to relatively │
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│                                    │    │   life)                            │
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              │ • Success in long-term     │
              │   mating                   │
              │ • Obtaining mates who are  │
              │   faithful                 │
              │ • Obtaining mates who are  │
              │   oriented toward parenting│
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Figure 16–5. A Model of Mating Intelligence for Individuals With High-K (Slow) Life-History Strategy.

SUMMARY OF OUR INTEGRATED MODEL OF MATING INTELLIGENCE

Our model (see Figures 16–1 through 16–5) suggests that MI can be broken into two basic classes of constructs: those primarily focused on courtship-displays (fitness indicators) and those that are not (what we refer to as mating mechanisms). Courtship-display components of MI are predicted to behave very much like other sexually selected traits, demonstrating high inter-individual variability and heritability, showing sex differences in means and variances for both production and discrimination of such displays, and being inter-correlated with other indices of genetic fitness (such as general intelligence, physical health, and mental health). Mating mechanisms (such as the ability to accurately know if a potential mate is a long-term strategist and is relatively dependable) are predicted to behave more like other species-typical adaptations, showing less variability and heritability among individuals, and being less inter-correlated with indices of genetic fitness (see Figure 16–1).

However, even the reliable mating mechanisms may show some variability due to frequency-dependent selection, which can maintain different strategic forms of an adaptation in a population over evolutionary time.

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High-K-Specific Mating Mechanisms
∙ Cross-Sex Mind-Reading Abilities optimized for long-term mating
∙ Deception-Detection/Production Abilities optimized for long-term mating
∙ Meta-Strategic MI (effective and optimized use of mating strategies to lead to relatively low number of offspring produced at relatively late stages of life)

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For instance, while many males may possess cognitive processes optimized for short-term mating success, others may possess mechanisms more optimized for long-term mating—mechanisms that may be rarer, more attractive, and hence more effective when there is a local excess of short-term strategists (see Geher, Derieg, & Downey, 2004).

As with all constructs in mating psychology, it is important to incorporate biological sex as a major variable that pervades all elements of mating. Our model suggests that the psychometric structure of MI varies between the sexes (see Figures 16–2 and 16–3). Intelligence tied to courtship displays may be sex-differentiated such that male intelligence is more strongly focused on producing displays and female intelligence may be more focused on judging the quality of displays. Further, the mating mechanisms are also likely to be sex-differentiated. Finally, we believe that life-history strategy is an important superordinate individual-differences construct that predicts individual differences in MI (see Figures 16–4 and 16–5).

PROPOSED RESEARCH ON IMPORTANT QUESTIONS RELATED TO MATING INTELLIGENCE

Our integrative model of MI is broad and multi-faceted, identifying several new confluences between *mating* and *intelligence*. Accordingly, the ideas integrated into this volume provide myriad fertile ideas for future researchers. Some of the core hypotheses and research directions inspired by this volume are presented here, in a list intended to be provocative rather than exhaustive.

THE RELATIONSHIP BETWEEN SUCCESSFUL MATING AND INTELLIGENCE: KANAZAWA VERSUS MILLER (OR "HBES 2006 REVISITED")

In one of the more memorable presentations at the 18th meeting of the Human Behavior and Evolution Society conference in Philadelphia (2006), Satoshi Kanazawa argued that general intelligence is both theoretically and empirically unrelated to human reproductive success. One of the slides in his presentation explicitly pointed out the conflicts between his perspective and that of Geoffrey Miller, who argues that general intelligence is a major fitness indicator that was selected because it increased the sexual attractiveness of our ancestors.

Future research on MI should address this apparent conflict between Kanazawa's (2004) and Miller's (2000) theses. The discrepancy is basically this: Miller argues that the centrality of g in human psychology reflects its centrality as a fitness indicator shaped by mate choice throughout prehistory. Thus, he conceptualizes g as a subordinate factor that underlies a gen-

eral biological 'fitness factor' that represents general phenotypic and genetic quality. As such, he argues that g should be moderately related to other indices of phenotypic quality (such as body symmetry, physical health, longevity, fertility, and mental health). Miller, his colleagues, and others have found modest all-positive correlations between g and these variables (Prokosch et al., 2005). On the other hand, Kanazawa conceives of g as a psychological adaptation in its own right that evolved fairly recently to cope with evolutionarily novel ecological challenges, and that therefore should be unrelated to sexual attractiveness or reproductive success in modern societies. His data are consistent with his ideas (see Kanazawa, 2004).

It may be useful to consider the nuanced differences between these approaches. Simply, Miller predicts *a positive correlation* between g and indices of general biological fitness whereas Kanazawa predicts *no correlation* between g and contemporary mating success. These predictions differ in the particular constructs thought to relate to g. In support of his position, Kanazawa reviews substantial evidence that g does not predict mating success (e.g. numbers of sexual partners, numbers of offspring) in modern societies. We may be able to resolve the discrepancy as follows: In ancestral times, g probably correlated with both biological fitness *and* mating success (including quality and quantity of mates and offspring). However, under evolutionarily novel modern conditions (e.g., with contraception and society-imposed monogamy standards), some evidence suggests that individuals higher in g are having fewer children than individuals who are lower in g (see Kanazawa, this volume). This pattern likely pertains to the fact that individuals higher in g are generally more capable of obtaining and using birth control effectively—not necessarily because they are less capable of attracting high-quality mates than others. Thus, highly g-loaded forms of MI might still be fulfilling their evolved adaptive purpose—attracting interest from many high-quality partners. This may explain Kanazawa's observations that g does not predict reproductive success *in modern contexts*.

This suggested resolution of Miller's and Kanazawa's frameworks could be tested through cross-cultural research. Specifically, researchers could examine relationships between MI, mating success, and reproductive success in natural-fertility populations (without contraception or 'Western' lifestyles), such as the Ache of Paraguay, the Tsimane of Bolivia, or the Hadza of Tanzania. In such samples, g might positively predict the quality and/or quantity of mates, offspring, and grand-offspring. If so, the apparent discrepancy between Kanazawa's and Miller's theories would represent a classic case of 'mismatch' between ancestral and modern conditions.

Another important feature of MI to consider in future research would be the distinction between courtship-display and non-courtship display domains. Miller's (2000) theory regarding the evolution of higher-order human mental qualities focuses on such qualities as having been shaped for courtship-display. Such qualities are predicted to load onto a general

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THE PSYCHOMETRIC VALIDATION OF MATING INTELLIGENCE

The mating mechanisms in our model may be inter-related much like the abilities that underlie emotional intelligence (see Mayer et al., 2000). The Mayer/Salovey/Caruso ability-based model of emotional intelligence suggests that there are four basic facets of emotional intelligence, which are somewhat inter-related and mildly g-loaded. Specifically, they argue that the main elements of emotional intelligence are the abilities to identify emotions, assimilate emotion into thought, understand emotions, and manage emotions (in one's self and others). While emotional intelligence has provoked much skepticism within academic circles (see Matthews, Zeidner, & Roberts, 2004), the Mayer/Salovey/Caruso four-pronged model has generally been considered the most theoretically and empirically defensible of the different models that do exist (see Casey et al., this volume).

This framework may prove to be a useful model for understanding MI. Just as emotional intelligence may have basic inter-related components that underlie it (such as the identifying-emotion ability), MI may also have basic elements (including the abilities presented in Figure 16-1, such as the ability to accurately assess one's own mate value) which may be inter-related and, ultimately, may be found to comprise a distinct set of mating-relevant cognitive abilities. Given the important distinction between courtship-display and mating-mechanism elements of MI, such a model would need to treat these domains separately, possibly predicting no (or little) correlation between courtship-display and mating-mechanism domains of MI.

The kind of psychometric work that has been done to validate the ability-based model of emotional intelligence (see Mayer & Geher, 1996; Brackett et al., 2003) could also be used to validate our model of MI. In addition to such basic psychometric qualities such as internal reliability of measuring

instruments, etc., such work would need to demonstrate (a) that different elements of MI are inter-related, (b) that they are somewhat related to g, (c) that they are not redundant with well-established personality traits such as the Big Five (Costa & McCrae, 1992), and (d) that abilities which comprise MI are, indeed, predictive of mating success (such as the abilities to attract, choose, court, and retain high-quality sexual partners, and to deter sexual rivals and infidelities). Such psychometric work will be crucial in determining whether MI is a useful individual-differences construct within psychology writ large. Further, given that emotional intelligence is predictive of success in intimate relationships (see Casey et al., this volume), research on the interface between emotional intelligence and MI could be both theoretically and practically valuable.

MATING INTELLIGENCE AND STRATEGIC PLURALISM

One of the core insights of modern evolutionary psychology concerns strategic pluralism (see Buss & Schmitt, 1993; Simpson & Gangestad, 2000), the observation that a variety of strategic behavioral patterns can often co-exist within a population, with each such pattern promoting reproductive success through its own distinctive methods (e.g., Geher et al., 2004). For example, the different sexes may represent different strategies that achieve equal average reproductive success, but through quite different channels, which is why a balanced sex ratio has evolved. Likewise, being extraverted makes it easier to meet new mates but imposes higher social and physical risks, so a balance of extroversion and introversion can persist in human populations (Nettle, 2005).

Human mating strategies comprise the central behavioral domain in which strategic pluralism has been studied (see Buss, 2003). The most commonly studied strategic pluralisms concern male versus female strategies and short versus long-term strategies, which are often framed as sex-specific (Buss & Schmitt, 1993). For instance, Haselton and Miller (2006) found that women are more attracted to creative intelligence in potential short-term mates during fertility peaks in their ovulatory cycle. This may be conceptualized as a sex-specific, short-term mating strategy.

Many of the authors who have contributed to this volume have conceptualized mating intelligence (MI) as the capacity to employ different optimal mating strategies under different conditions. For instance, DeBacker et al. (this volume) address how personal advertisements reflect general sex differences in mating strategies, as well as a rich assortment of sex-specific strategies for advertising one's own fitness and for assessing the fitness of potential others. Similarly, Figueredo et al. (this vol-

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patterns. Nettle and Clegg (this volume) consider strategic pluralism in the
form of different personality traits, such that both extremes of basic per-
sonality traits (e.g., neuroticism vs. emotional stability) reflect alternative
mating strategies with their own distinctive fitness costs and benefits. Li's
chapter considers strategic pluralism as a function of one's 'mate value'
or 'mating budget,' investigating how people modify their mate prefer-
ences depending on the amount of 'mating currency' they possess. Finally,
Weekes-Shackelford et al. suggest that the presence of children from a
prior mateship should have major implications for optimal mating deci-
sions (e.g., a single mother may focus more on good parenting qualities
in choosing future mates).

In short, these chapters underscore the notion that there are many
paths to success in human mating. Accordingly, MI, focusing on cogni-
tive abilities in the mating domain, may be conceptualized in strategic
terms. At a species-typical level, the rich and varied nature of human mat-
ing behaviors reflects a highly tuned intelligence that takes a vast array of
fitness-relevant contingencies into account. For instance, Schmitt's (2005)
work on variability in mating patterns across cultures suggests that the
proclivity toward short-term mating strategies is strongly influenced by
relevant qualities of the local social environment, such as the prevailing
sex ratio (with males, for instance, behaving more promiscuously in places
that have more females than males).

In addition to strategic pluralism at the level of species-typical mat-
ing intelligence, strategic pluralism may unfold at the level of heritable
traits, or individually learned mating tactics. Further, even at the species-
typical level where reliable mating mechanisms should be sensitive to
many contextual variables, some individuals may be better at modulat-
ing their mating preferences and behaviors in reaction to those variables.
This facet of MI represents the cognitive skills for choosing the right mat-
ing strategies given the circumstances—what could be called *meta-strategic
MI*. Some individuals may be good at particular mating strategies (e.g.,
acting provocative vs. coy, acting committed vs. nonchalant), but may be
very poor at knowing which strategy to use in a particular circumstance
(e.g., they may act coy with a nervous introvert, or act nonchalant when
presenting an engagement ring).

Meta-strategic MI concerns the ability to employ the right mating
strategies given the situation at hand. Suppose, for instance, that there are
two heterosexual males (let's call them Andrew and Christopher) at a par-
ticular engineering college (with a 4:1 male-to-female ratio). As products
of the organic evolutionary process, they are (unconsciously) designed to
optimize their mating success. They are each in stable, happy, long-term

relationships (Andrew is with Melissa and Christopher is with Lauren). At a campus party one night, Andrew and Christopher run into two sexually attractive, flirtatious, and extraverted female students (Kathy and Kelly). Suppose that Andrew decides to keep his sexual desires in check while Christopher "makes a move on" Kathy. Several features of this scenario make Christopher's behavior less mating-intelligent thanAndrew's. Kathy is a popular extravert at a college party, so it is likely that Christopher's short-term play for Kathy will become known across campus. This may provoke Lauren toward jealousy and anger leading to a possible break-up. Christopher has much to lose from such a break-up: He is in a happy long-term relationship, and eligible women are rare in this particular environment, so he might have trouble replacing Lauren if she leaves him.

In this case, Andrew's behavior is smarter than Christopher's. He may have had the same sexual desires, but he was better attuned to his position and prospects within the local mating market (good current relationship, unfavorable sex ratio for mate-switching, hot-bed of gossip). His choice to not pursue his short-term desires was adaptive both for his immediate future (his current relationship with Melissa) and his long-term future (his sexual reputation, his prospects for marrying Melissa, etc.). Ultimately, the kinds of relatively intelligent choices made by Andrew here may lead to more mating success.

This analysis does not imply that long-term mating strategies are always superior to short-term strategies. (If the college's sex ratio were reversed, Kathy might be more likely to respond positively to Christopher's advances, and Lauren might be more forgiving of his attempted infidelity). Rather, the point here is that the decisions to pursue long versus short-term mating strategies should vary as a function of many contextual factors. An individual who is high in MI may be more adept at using short versus long-term strategies in ways that would have promoted reproductive success under ancestral conditions (if not modern conditions).

This meta-strategic dimension of MI mating mechanisms could be studied by examining mating-relevant choices that people make in real-world or hypothetical scenarios. For instance, as with ability-based measures of emotional intelligence (e.g., Bracket & Salovey, 2004), people could read scenarios (such as the Andrew/Christopher scenario above), in which mating-relevant contextual variables are manipulated, and their strategic choices are recorded. These choices could then be examined in terms of agreement with choices of other subjects making such judgments or of the options deemed most adaptive by a panel of experts on mating research. Each individual's meta-strategic MI ability could then be estimated and studied in future research. Meta-Strategic MI may emerge as a particularly important kind of cognitive ability when it comes to increasing mating success.

ACCURACY VERSUS ERR(MIND-READING

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ACCURACY VERSUS ERROR IN CROSS-SEX MIND-READING

Some core components of MI concern Theory of Mind abilities (Baron-Cohen, 1999) as applied in the mating domain. Cross-sex and same-sex mind reading are needed to understand the mating psychologies of potential mates, sexual rivals, and interested on-lookers (e.g., friends, parents, children, siblings). For instance, a high-MI individual should be able to discern if a potential mate is sexually interested, is an honest long-term strategist, is someone with high subjective mate value, etc. Such social attributions are crucial to mating success in our highly social, highly talkative species.

However, when it comes to domains of social intelligence, raw accuracy may often be less intelligent—or at least less adaptive—than a proclivity toward adaptive biases in judgment, which minimize the expected *costs* rather than the raw *likelihood* of errors (Haselton & Buss, 2000; Haselton & Nettle, 2006). In particular, Haselton and her colleagues argue that mating-relevant biases, such as the tendency for males to overestimate the sexual interest of females, may be adaptive and may ultimately have been selected for precisely that reason. Because a 'miss' (failing to detect a woman's sexual interest when it is there) would be very costly (perhaps reducing reproductive success by one entire child), whereas a 'false alarm' (attributing sexual interest when it is not there) would be fairly cheap (entailing some wasted courtship effort), men should, from this perspective, be adaptively biased to minimize misses. Given a particular level of detection accuracy, such a pattern necessarily increases false alarms. Higher discrimination accuracy is of course always better, but in the real world, the accuracy of social attribution is always limited. Where accuracy is limited, adaptive biases should evolve to minimize the costs of errors and these adaptive biases should correspondingly be related to MI.

As described in Chapter 1, this error management perspective has important implications for research on the cross-sex and same-sex mind-reading elements of MI. In the initial research on MI conducted at SUNY New Paltz (Geher, DeWispelaere, Lavallee, & Musicaro, 2006), we created sex-specific indices of long-term MI and short-term MI modified from ability-based research on emotional intelligence (Mayer & Geher, 1996). We briefly describe this research here to provide an example of MI research dealing with cross-sex mind-reading.

A total of 481 (329 females; 152 males) young adults judged which personal ads (written by opposite-sex individuals) represented the most desirable short and long-term mates. All participants then engaged in a cross-sex mind-reading task by guessing which ads were rated most desirable by opposite-sex individuals. Overall, males were more accurate than females across both short and long-term judgments. (That is, men better understood what women wanted from male personal ads than women

understood what men wanted from female personal ads.) A content analysis showed that males mildly overestimated the degree to which females focused on sexual qualities in short-term mates, whereas females more strongly over-estimated the degree to which males focused on sexual qualities in both short-term and long-term mates.

These errors are consistent with Haselton and Buss' (2000) Error Management Theory which suggests that *biased* (as opposed to *accurate*) social judgments should be typical when biases would have been evolutionarily adaptive. Recall that we propose mating mechanisms (such as the abilities to make adaptive mating-relevant judgments) to likely be somewhat g-loaded (while being *less* g-loaded than courtship display mechanisms). In support of this theory, we found a positive correlation between this male bias to 'overestimate sexual interest' and males' scores on an index of general intelligence (Yerkes, 1921), supporting a model of MI which includes adaptively biased cross-sex mind-reading.

In an interesting post-hoc analysis, we delved into the relationship between *g* and short-term mating judgments by males to address a question raised by Geoffrey Miller (2006; personal communication). Specifically, we investigated whether males were accurately matching the stated short-term preferences of females who were high in sociosexuality (Simpson & Gangestad, 1991), a construct roughly synonymous with promiscuity. Miller's rationale for this question was that high-sociosexuality women are most likely to acquiesce to advances for short-term encounters, whereas low-sociosexuality women are not. Although sociosexuality is hard to discern, men might benefit (i.e., minimize the fitness costs of sexual-interest attribution errors) by treating most women as high on sociosexuality until proven otherwise. This may be especially useful for males seeking casual sex.

We looked at the personal-ad preferences of high-sociosexuality women choosing short-term mating partners, with high sociosexuality defined as scoring more than one SD above the mean. There were only two items where high-sociosexuality women preferred a more sexually overt personal ad as desirable for a short-term partner compared with other women. Consistent with Miller's hunch, men who chose both of these sexually overt options as reflecting the short-term desires of women scored higher on our index of general intelligence than men who did not choose both of these options as reflecting the short-term desires of women.

These preliminary findings suggest that more intelligent males may overestimate women's sexual interest more often. Additionally, these results indicate that accuracy in knowing the short-term judgments of relatively promiscuous women and making the error of overgeneralizing those judgments to other women may be positively related to *g* for males. These findings suggest that certain kinds of accuracy and adaptive biases in cross-sex mind-reading—an important form of MI—may be associated with general intelligence.

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The summary of this research here is intentionally brief, and is included mainly to provide a snapshot of research driven by the notion of MI. A key point is that raw accuracy in mating-relevant judgments may not necessarily be most closely associated with intelligence. Future empirical work on MI as a form of judgment and decision-making needs to carefully consider the success criterion being optimized by such decisions—expected net fitness payoffs may often be more important than some narrowly defined notion of 'accuracy.' When total accuracy is not likely or even plausible, *erroneous but adaptive* may be a good definition of intelligent.

This summary of our initial MI research suggests that future research on cross-sex mind-reading should not assume (as some marital therapists might) that 100 percent accurate telepathy and empathy is the gold standard of adaptive functioning. Systematic biases, omissions, blind spots, wishful thinking, and self-deceptions may often pay. The most biologically successful courtships and relationships may be characterized by a patchwork quilt of mutual insight and mutual ignorance. Further research should address the ways in which MI predicts accuracy in some domains, adaptive bias in others, and adaptive ignorance in still others. It should also explore the *g*-loadings and personality correlates of MI, and how MI predicts different forms of mating success (see later section dealing with issues tied to operationalizing this important outcome variable).

RESEARCH ON THE COURTSHIP-DISPLAY COMPONENT OF MATING INTELLIGENCE

Several of the chapters in this volume focus on the courtship-display component of MI (e.g., Kaufman et al.; Keller; Shaner et al.). Generally, the ideas included in these chapters are steeped in Miller's (2000a) theory of higher-order mental qualities as serving a courtship-display function and as having evolved via sexual selection through mutual mate choice.

Since the publication of *The Mating Mind* (Miller, 2000a), several studies have tested varied aspects of Miller's thesis (e.g., Haselton & Miller, 2006; Prokosch et al., 2005). With regard to the nature of MI, several hypotheses regarding the interface of human intelligence and courtship-displays used in human mating can be tested by future researchers. The variety of hypotheses that follow from extant research and theory on this topic is impressive in scope.

For instance, Shaner et al. (this volume) suggest several hypotheses regarding abnormal behavior and mating intelligence. These authors argue that several mental disorders, such as schizophrenia, have their etiologies rooted in high mutation loads, and that, across evolutionary time, people evolved to pay close attention to symptoms of such disorders, as cues of relatively low fitness (high mutation load) in potential mates. This

theory, which conceives of mental disorders such as schizophrenia as the low-fitness extremes of fitness-indicator dimensions, leads to several novel hypotheses. For instance, it suggests that biases against individuals with mental disorders which act as (low) fitness indicators should be stronger in females (who are typically choosier than males), particularly during the relatively fertile parts of their ovulatory cycles.

Two important general issues that should be addressed by future research on the courtship-display components of MI—the structure of fitness-indicator dimensions, and the apparent positive manifold among fitness indicators—are discussed next.

The Structure of Fitness Indicator Dimensions. The fitness-indicator model suggests that we are particularly attuned to behavioral qualities of potential mates that reveal 'good' versus 'not so good' genes. In particular, Keller (this volume), Miller (this volume), and Shaner et al. (this volume) suggest that many attractive traits (e.g., facial symmetry, voice timbre, happy mood) evolved to be attractive because they signal that a potential mate has a low mutation load. Because any particular harmful mutation is likely to go extinct sooner or later, it is usually better to avoid having offspring who carry such mutations, by avoiding mates who display their manifestations. Thus, much of mate choice can be explained as an adaptive fear of heritable mutations—as *mutation-phobia.*

Researchers in this mutation-phobia camp suggest that overall genetic quality (the inverse of mutation load) exists on a continuum, roughly approximating a normal distribution. However, sometimes this continuous dimension may show up in a more categorical way, as the presence or absence of a particular behavioral trait or syndrome. Often, our mate preferences may have been shaped more to avoid mating with high-mutation-load individuals who have obvious physical or psychological problems, than to make very fine discriminations among individuals who seem more or less normal. Zebrowitz and Rhodes (2004) provide some evidence for this idea. They found that people could accurately predict overall health and intelligence for targets with relatively unattractive faces, but not for targets with relatively attractive faces. Facial attractiveness was predictive of health and intelligence only at the low-fitness extreme. These findings suggest an asymmetry between attraction toward high-fitness individuals and repulsion toward low-fitness individuals. Such an asymmetry suggests that for some fitness-indicator dimensions, there may be a curvilinear relationship between indicator quality and sexual attractiveness (concave-downwards, with rapidly diminishing returns above the mean of indicator quality). For example, someone with an IQ of 90 may be much more attractive than someone with an IQ of 70, but a potential mate with an IQ of 150 may be only a little more attractive than one whose IQ is 130.

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As a thought experiment, consider college professors. Generally, professors are quite intelligent and creative. However, as one of our spouses pointed out in conversations during the writing of this book, not all professors would look great strutting on a Paris catwalk in this season's trendiest designer clothes. Intelligence may not be highly correlated with physical attractiveness at the upper end of the distribution. On the other hand, most average people would not look great in haute couture fashions either. The notion of an overall fitness factor suggests, rather, that professors, given their relatively high g (on average!), compared with the non-professorial counterparts, are relatively good looking (Miller, 2000b), free of psychological abnormality (Shaner et al., this volume), pleasant to listen to (Hughes, Dispenza, & Gallup, 2004) and pleasant-smelling (Thornhill & Gangestad, 1999). That is, the mutation-phobia camp suggests that there should be a 'positive manifold' (all-positive correlations) among fitness indicators—an idea addressed in detail in the next section.

Our alternative conception of fitness-indicator theory suggests that we are repulsed by high mutation loads (and low-quality fitness indicators) more than we are attracted to low mutation loads (and high-quality indicators). In this view of the world, some people are "messed up" in almost every way, but almost nobody is perfect in every way. If so, we can better understand how bright professors can so often be rather asymmetrical in body and abnormal in mind. Much more research needs to be done on the (probably nonlinear) functions that relate mutation load to mental fitness indicators, and that relate indicator quality to attractiveness in mating. A methodological issue arises here: If fitness indicators correlate differently at low-quality and high-quality extremes, then bright, healthy, college sophomores may not be the best and/or only population we should be studying for MI research on the display and judgment of fitness indicators! We will need to sample populations from all strata of society to have an honest chance of answering the MI questions we seek to ask.

The Positive-Manifold Principle. The courtship-display domain of MI, including costly, conspicuous displays of cognitive prowess in language, music, art, and humor (Miller, 2000a), may be thought of as reflecting a person's overall genetic quality (see Keller & Miller, 2006; Keller, this volume, & Shaner et al., this volume). An important characteristic of this fitness-indicator view concerns the positive-manifold principle, initially delineated by Spearman (1904) in describing the nature of general intelligence. In terms of g, Spearman's insights regarding the positive manifold speak to the consistently positive nature found among correlations between different intelligence indices.

In conceiving of g-loaded mental traits as having arisen from sexual selection processes, Miller (2000b) posits that g is basically an index of neurodevelopmental stability and brain efficiency that taps into an over-

all fitness factor (roughly, the first principal component of genetic quality across all fitness-related traits). Further, he proposes that the existence of this superordinate fitness factor should be manifest as a positive manifold (all-positive correlations) among fitness indicators in general, both physical and mental. As evidence of this notion, Miller cites research demonstrating positive correlations among disparate traits that are reasonably considered good fitness indices, including multiple aspects of intelligence, body symmetry, longevity, mental health, and physical health (see, e.g., Furlow, Armijo-Prewitt, Gangestad, & Thornhill, 1997).

This fitness-indicator conceptualization of MI is truly provocative (if unsettling!). It also has many important implications for future empirical work in the behavioral sciences. In his prior paper on this topic, Miller (2000b) delineates nine specific predictions, mostly concerning the positive-manifold among fitness indicators. An initial prediction is that factor analysis of fitness-indicator traits should demonstrate a super-ordinate, unifying factor with positive loadings across fitness indicators. Further, he proposes that the g factor should prove subordinate to the fitness factor in such an analysis, a finding that would be consistent with this notion of g as having a courtship-display function. See Miller (2000b) for a detailed rationale underlying this positive-manifold notion in addition to clearly articulated predictions. Future research on the positive-manifold model of fitness indicators should shed a great deal of light on the nature of the courtship-display components of MI.

OPERATIONALIZING MATING SUCCESS

Because of the nature of the MI construct, many research ideas that address MI share a common dependent variable: mating success. In light of the evolutionary reasoning that underlies MI, mating success is, in fact, a conceptual proxy for the more accurate index of the Darwinian success of a trait: reproductive success. In research on non-humans, reproductive success is often measured in terms of number of offspring produced—a straightforward and construct-valid index of success from an evolutionary perspective. However, for reasons described in this section, this index of evolutionary success is simply not appropriate when studying modern humans.

When considering Darwinian success in the animal world, reproductive success becomes a bit more complex than simply considering total number of offspring produced. Fisher (1915) suggested that the struggle to replicate should not only be measured by the number of offspring produced, but also by the success of these offspring in producing and rearing *offspring of their own*, who in return would also be able to produce

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Variation in reproductive success is the driving force behind evolution. "All selection is sexual selection in the sense that sex is the only means by which genes find their way from one generation to the next" (Ash & Gallup, this volume). In sexually reproducing species, there are often major sex differences in the nature of the elements underlying reproductive success. In humans, male reproductive success is generally limited by access to fertile females, while female reproductive success is limited by the resources she can acquire for herself and her offspring (Buss, 1989).

Pérusse (1993) investigated the relationship between education, occupation, and income (what he termed "cultural success") and reproductive success among men from Quebec. He hypothesized that males with higher cultural success would have more reproductive success (operationalized as number of offspring) than males with lower cultural success. However, the opposite was found: males with *less* cultural success actually left *more offspring* than males with more cultural success. Pérusse reasoned that the use of contraceptives and institutionalized monogamy underlied this discrepancy. He attempted to resolve this problem by using a contemporary proxy for reproductive success: mating success.

In Pérusse's subsequent research, mating success was operationalized as the number of consensual sexual partners, which should reflect attractiveness to the opposite sex. Pérusse (1993) reasoned that before contraception, a male's mating success would strongly predict his reproductive success (for arguments against this thesis, see Alcock, 1993). Pérusse proposed the following formula to estimate the number of potential conceptions (NPC) for a male in the absence of contraceptives (adopted from Kanazawa, 2003):

$$\text{NPC} = \sum_{i=1}^{n} [(1 - (1 - p)]^{Pi}$$

where n is the total number of female sex partners, p is the probability of conception per coital act, and Pi is the number of coital acts with partner i.

However, there are potential problems with this formula. First, the reproductive success of monogamous males is limited by one's partner's ability to produce offspring, no matter how many times they copulate (Bookstein, 1993). Second, the formula does not take into account the survivability of the offspring produced. These criticisms raise doubts as to whether Pérusse's (1993) formula is an accurate index of male reproductive success.

In an attempt to replicate Pérusse's (1993) findings with a larger, more representative sample, Kanazawa (2003) found that wealthy men, while not producing more offspring, did have sex more frequently with more partners than less financially secure males. Wealth had no such effect for females. These findings support for the theories of Trivers (1972) and Buss (1989) that females should value financial security in a potential mate.

Research suggests that in industrialized societies, there is a rift between MI and actual reproductive success (see Kanazawa, this volume). However, the problems created by this rift may be reduced, at least in studying males, by remembering that evolution has equipped males with psychological mechanisms leading them to act as if copulation, not reproduction, is their ultimate goal (Kanazawa, 2003). Before contraceptives, there was probably a near-linear relationship between copulation and reproductive success for males. Now that the use of contraceptives is widespread in contemporary industrial societies, the relationship between number of copulations and reproductive success has been virtually severed (Kanazawa, 2003). The problem is how to study traits (such as MI components) that evolved to promote reproductive success in the ancestral past. Pérusse's (1993) number of potential conceptions index seems to be a good first step to resolve this dilemma, but it has the problems mentioned earlier. Like many first steps, it travels in the right direction but doesn't arrive at the final desired destination.

Landolt, Lalumière, and Quinsey (1995) developed a self-perceived mating success scale, to measure individual differences in the ability to attract mates through a series of self-report items. The scale showed good internal reliability (Cronbach's alpha 0.83), and showed some convergent validity, correlating positively with self-reported "approximate number of sexual invitations received over the past year" and "over the past three years" (Landolt et al., 1995, p. 13). One obvious drawback is that this scale relies on self-report data, which may produce inaccurate results through memory biases and social desirability effects (Nisbett & Wilson, 1977).

Another self-report method to measure mating success is simply to ask how many sexual partners an individual has had in a given time period, or during his or her lifetime so far (e.g., Gangestad & Simpson, 1990; Rhodes, Simmons, & Peters, 2005). This method seems viable since an increase in the number of sex partners should be associated with traits that are seen as attractive by the opposite sex, but, as pointed out by Linton and Wiener (2001), "These kinds of data [number of partners, frequency of coitus and self-perceived mating success], however (unlike the potential conceptions index), fail to take into account the low probability of conception per copulation in humans" (p. 685). These authors suggest that it is important not only to take into account the low probability of conception per coitus, but also the possibility that the female will mate with competing males, further reducing the first male's chances of conception.

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Linton and Wiener (2001) propose a slightly altered form of Pérusse's (1993) equation that takes into account the number of coital acts a female has with competing males:

$$NPC = \sum_{i=1}^{n} [(1-(1-p)]^{Pi} Pi/Ti$$

where n is the total number of female sex partners, p is the probability of conception per coital act, Pi is the number of coital acts with partner i and Ti is the number of coital acts with partner i plus the number of coital acts that partner n takes part in with competing males.

One severe limitation regarding the measurement of mating success is the lack of data on females. As suggested by Trivers (1972) and Buss (1989), female reproductive success is limited by the ability to secure resources for her and her offspring. A female's reproductive success is not measured in the number of fertile males available (Buss, 1989), but by the number of offspring who survive to produce offspring of their own (Trivers, 1972). The most reproductively successful males have the potential to leave many times more children than any female could. However females are always certain about their maternity, while males can never be completely sure of their paternity (Trivers, 1972). Accordingly, measuring the reproductive success of any female should be relatively easy, while accurately measuring the reproductive success of males may be harder due to the risk of cuckoldry. These differences relate back to parental investment—to reproduce, males only need to fertilize the female's eggs, while females must carry the offspring to term, run the risk of injury or even death during pregnancy, and care for the child until it can care for itself. So, successful females can never have as many offspring as the most successful males (Trivers, 1972). This reasoning suggests that measures of human mating success must be sex-differentiated. If males' reproductive success is influenced by access to fertile women, then a male's mating success should reflect his ability to mate with fertile women. If a female's reproductive success is measured by access to resources, then a female's mating success should represent the ability to procure resources from males.

In a recent attempt to model female mating success, Putz et al. (2004) suggested the following formula:

$$NPC = 1 - (1-p)^k$$

where p is the probability of conceiving a child per copulation and k is the number of copulatory acts since the females' last conception. With

the use of contraceptives, this equation has a lot of drawbacks because many females can go for years without ever having a conception, and it does not take into account the genetic quality of the male.

Mating success has been used as a proxy for reproductive success given our contemporary use of contraceptives and monogamy (Pérusse, 1993). Evolution depends not on the number of copulations, or sexual partners, but on the number of offspring who survive to produce offspring of their own. As suggested by Pérusse (1993) and Kanazawa (2003), contraception makes current reproductive success a misleading index of mating success. It is clear that much more work needs to be done before the field has a commonly accepted methodology for quantifying the mating success of males and females. Future research on MI will likely benefit from better ways to operationalize mating success in sex-differentiated ways, that take into account the quantity and the quality of copulations, mates, and relationships. However, the MI model outlined in this chapter offers an integrated, theoretically derived, and research supported set of predictor variables that will be useful in assessing the potential utility of future mating success measures. While the MI construct proposed in this volume can benefit from future improvements in measuring mating success, we propose that MI as outlined in this chapter can be useful in evaluating the validity of the mating success measures yet to come.

CONCLUSION

The MI construct can lead to important research that connects human sexuality to human intelligence. In light of recent contributions in evolutionary psychology (e.g., Buss, 2005), we know that human mating is central to any understanding of the human mind. Further, Miller's (2000a) insights regarding the evolutionary origins of mating psychology and human intelligence provides a major step toward understanding how these domains of human functioning have been integrally linked across the evolutionary history of our species.

The integrative model of MI presented in this chapter is designed as a roadmap for researchers in this area. The primary contribution that this model presents concerns the distinction between mating-relevant cognitive domains that may be thought to primarily serve courtship-display functions (e.g., creative intelligence) and those which act as mating mechanisms (mating-relevant areas of human cognition that are not fitness indicators, such as cross-sex mind-reading). We hope that this model provides a useful framework for future research.

The origins and nature of human intelligence are eternally mystifying. Approaches to understanding the evolution of intelligence have been

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multi-faceted and contentious ever since Darwin's *The Descent of Man*. There is still no consensus among the varied perspectives (see Sternberg & Kaufman, 2002; Geher, Murphy, & Miller, this volume). Given its focus on the domains of human behavior that are most clearly linked to our evolutionary origins, the MI construct advanced in this book may provide important insights on the origins and nature of intelligence. Further, we hope that the integrative framework provided here may foster the development of common ground in our search for the evolutionary origins of human intelligence. History, of course, will be the ultimate arbiter regarding the theoretical and empirical utility of the MI construct. But should it prove useful, it may serve as bridge allowing safe passage of ideas and fruitful commerce between neighboring yet disparate disciplines—human intelligence, evolutionary psychology, social psychology, cognitive neuroscience, biological sciences, sociology, anthropology, and more.

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