My background, research interests, and future plans
By Geoffrey Miller

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After I got a B.A. in psychology and biology from Columbia University, I went to graduate school in psychology at Stanford in 1987. I intended to study cognitive psychology, but found it too boring and abstract. Fortunately, two founders of evolutionary psychology – Leda Cosmides and John Tooby – were working as post-docs with my advisor Roger Shepard. Along with David Buss, Martin Daly, Margo Wilson, and Gerd Gigerenzer – who were visiting Stanford in 1989-1990 – they introduced me to the possibility of applying evolutionary theory to study human nature. After that, my Stanford friend Peter Todd and I knew that we wanted to join this new field of evolutionary psychology, but we weren't quite sure what research to do. We had learned about genetic algorithms – ways of simulating evolution by natural selection in computers – and we applied them to designing neural networks for learning some simple tasks. We hoped to illustrate how evolution and learning could interact to produce adaptive behavior. Our research led to my post-doc at University of Sussex in England in the early 1990s, working on artificial life and evolutionary robotics. That was fun, but I realized that I was more interested in human psychology than in cognitive engineering.

At Stanford, I also grew interested in sexual selection through mate choice. It seemed like a very powerful but neglected process, not only for explaining sex differences in bodies and brains, but also for explaining the fast evolution of any extravagant mental abilities, whether bird song or human language. I read as much as I could about sexual selection, which was only starting to attract more serious attention in biology. My 1993 dissertation suggested that mate choice played a key role in human brain evolution, especially in the origins of traits that were hard to explain through natural selection for survival – traits such as art, music, humor, creativity, and language. Those ideas were the foundation of my 2000 book *The Mating Mind*, and for much of my work since then.

After various jobs in England and Germany in the 1990s, in 2001 I came to University of New Mexico, which is a great center of evolutionary psychology, biology, and anthropology, with colleagues such as Steve Gangestad, Randy Thornhill, Hilly Kaplan, and Jane Lancaster. After a few years of low productivity and difficulties finding any psychology job, this was my first tenure-track job, and I felt the pressure to publish more. This led me to think hard about how to test the ideas in *The Mating Mind*, and I realized I needed to learn a lot more about individual differences, including intelligence, personality, psychopathology, and behavior genetics. I've spent most of the last few years trying to integrate evolutionary psychology with individual differences research, which is one nice way to spread evolutionary thinking to new areas of psychology.

So, most of my work has concerned the evolutionary psychology of human sexuality, mate choice, person perception, individual differences, evolutionary genetics, and psychopathology. I've especially focused on analyzing human mental traits as 'fitness indicators' (costly, reliable signals of underlying phenotypic traits and genetic quality) that arose through sexual and social selection. This also led to applying fitness indicator theory to some clinical psychology issues, trying to understand the evolutionary genetics, phenotypic symptoms, and demographics of

schizophrenia, depression, personality disorders, and sexual dysfunctions. It also provoked some work concerning ovulatory cycle effects on female mate choice and sexual attractiveness, including our infamous lap-dancer study.

In the late 1990s when I worked in the economics department at University College London, I also developed an interest in economic decision-making and consumer behavior. The world of marketing, advertising, and product design seemed central to modern human culture, so I thought that evolutionary psychology really needed to pay more attention to consumerism. This led to my book *Spent* and a bit of work on evolutionary consumer psychology, which is one of my main interests now. It's also a great way to meet bright people in business schools, the corporate world, and social policy.

My future research plans were strongly influenced by a recent sabbatical at Nick Martin's genetic epidemiology group in Brisbane, Australia. They have one of the largest twin samples in the world, and are doing excellent research in both multivariate behavior genetics (studying the genetic correlations among human traits) and genome-wide association studies (looking for specific genes that influence human traits). I think that evolutionary psychologists must learn more about evolutionary genetic theory, behavior genetic research methods, and comparative genomics (across species), so we can connect our theories about prehistoric evolution to the genes that embody human nature.

Future research frontiers and challenges in evolutionary psychology

Evolutionary psychology has expanded unevenly. It's had profound influences on the study of human mating, parenting, kinship, group living, status, and aggression. It's had moderate influences in the study of mental development, mental illnesses, personality, language, intelligence, emotions, and decision-making. Yet it's had very little influence on cognitive psychology, industrial/organizational psychology, consumer psychology, cultural psychology, positive psychology, or health psychology, or on other fields concerned with human nature, such as psychiatry, anthropology, political science, economics, sociology, linguistics, philosophy, and the humanities. These gaps will gradually be filled by young researchers who master both evolutionary psychology and the field to which they're applying its insights. Believe me, it doesn't work to be an arrogant evolutionary psychologist who pretends they have all the answers when talking with somebody from another field. Interdisciplinary work requires genuine mutual respect, outstanding social skills, and a willingness to learn about another field's favorite ideas and findings, even when they sound stupid at first. I've worked with interdisciplinary research groups in Sussex, Munich, London, Los Angeles, Brisbane, and Albuquerque, and I've attended dozens of interdisciplinary conferences. The ones that work are the ones with strong and visionary leadership, humble and hard-working researchers, bright and open-minded students, facilities that promote informal chats, good lunches on-site, and strong coffee. Find a place to study and work with these features, if you possibly can.

Evolutionary psychologists will be most successful in exporting our science to fields that have more money than theory, more students per professor, and more anxiety than arrogance. More money means more graduate studentships, post-doc positions, academic jobs, and conference travel. A higher ratio of students to professors means students have more power in demanding courses on new topics. More anxiety means more desperation in appreciating new ideas that can help a field, even if they conflict with a field's prejudices. Economics has very little grant support but very strong theories, has few undergraduate majors per professor, and has a lot of confidence and arrogance (especially from its Nobel prizes), so it will not accept evolutionary

psychology for a long time. By contrast, health psychology gets a lot of research money and student interest, but has very weak theories and a very insecure reputation, so it is a much better target for evolutionary ideas. Likewise for psychiatry, consumer psychology, and positive psychology. These also have the advantage that you might make a higher income from teaching in a medical school or business school, or writing popular science books.

Psychology research methods will soon become much more powerful, and mastery of these methods will become much more important for young researchers. I'm especially excited about two new technologies – preference-learning websites and smartphones. Leading internet companies such as Amazon, Netflix, FaceBook, Match.com, and Hunch are gathering data on the preferences of millions of users, but these datasets are rarely used in psychological research on individual differences, person perception, mate choice, or consumer psychology. These commercial datasets are mostly proprietary, but such companies may be looking to hire or collaborate with ambitious young tech-savvy psychologists – especially when they try to penetrate the Asian markets. Smartphones such as the iPhone and Android are even more exciting, with the potential to bring psychology studies to over a billion potential subjects within a few years. Smartphone research can do almost everything that can now be done with questionnaires, surveys, intelligence tests, clinical interviews, or interactive experiments, and they have further abilities to gather field data through GPS localization, accelerometers, and photo and video recording. Imagine how Asian EP could work when most of the 1.3 billion Chinese and 1.1 billion Indians have smartphones within this decade! The future of psychology is not bringing a few hundred subjects to our experiments, but bringing our experiments to millions of subject through such electronic technologies. If evolutionary psychology leads the behavioral sciences in adopting such technologies, we will have a huge impact.

Four career suggestions for Chinese students and young researchers interested in evolutionary psychology

1. Develop a global perspective on science: learn which countries are English-speaking, economically strong, politically stable, culturally open, respectful of research, and friendly towards Chinese students. Try to get your education and your first academic job in the best universities you can in such places (the U.S., Canada, Britain, Australia, etc.). Then return later to a Chinese university if you want to. It is difficult to study and live abroad – you will often feel lonely, poor, and under-valued – but the long-term rewards are high for your career and for Chinese science. As China's economic strength, cultural prestige, and scientific productivity increase in the coming decades, your desirability as a Chinese student and collaborator will increase too. Americans and Europeans will eventually learn that Asia is the future of science, and they better start collaborating with Asians, or all of their hard work will be ignored and forgotten, like much of early-20th century German-language psychology when American science was maturing.

2. You must learn English very well; it will continue as the international language of science throughout the 21st century, even within Asia. When psychologists from Bangalore, Beijing, and Bangkok chat together at conferences, they will chat in English. Collaborate with native English speakers so your papers are very clear; writing quality is important in getting papers accepted in the leading psychology journals. To build up your research networks, go to English-language conferences, use English-language social networking sites such as FaceBook, and visit English-language research centers.

3. If you want a career as an evolutionary psychologist, remember that there are still very few job advertisements that call for an evolutionary psychologist. Most psychology departments in the U.S. and Europe want to hire tenure-track professors in the 'hot areas' of cognitive neuroscience, clinical psychology, social psychology, health psychology, personality psychology, behavior genetics, or statistical methods. In one or more of these areas, you must learn research skills, teach courses, publish papers, go to conferences, network with leading researchers, and start getting small research grants. This is what I tell my graduate students, and the ones who ignore this advice do not get tenure-track jobs.

4. It will be especially useful to develop some technical skills in brain imaging, multivariate statistics, multivariate behavior genetics, genome-wide association studies, evolutionary theory, population genetics, computer simulations of adaptive behavior, and designing ecologically valid, interactive experiments. Many American and European psychology students are not bright enough, not hard-working enough, or do not have the mathematical background to learn such skills. You will have a big advantage if you spend some time at the leading research centers that use such methods. It is also helpful to do some anthropological field research on humans in small-scale societies, or biological research on animal behavior in the wild; field experience gets a lot of respect in evolutionary psychology.

In summary, the future is very bright for Chinese evolutionary psychology. In some ways, I wish I were a 20-year-old Chinese student today, rather than a 45-year-old American professor. The 20-year-old students now will have research careers stretching from about 2015 through at least 2060 (and perhaps much longer if longevity research makes reasonable progress). They will see scientific advances in understanding human nature that I can't even imagine today. As early as 2020, psychology will be revolutionized by internet datasets, smartphone experiments, whole-genotype sequencing, cheaper brain imaging, and animal models of gene expression in nervous systems. Eventually, nanotechnology, quantum computing, artificial intelligence, virtual reality, and intelligence-boosting drugs will make wondrous contributions to psychology. Most importantly, as economic prosperity and higher education expand throughout Asia, the pool of scientific talent will expand dramatically. I hope you'll consider joining this grand adventure – the quest to understand our human origins, nature, and potential.

Suggested readings

Books

Geher, G., & Miller, G. F. (Eds.). (2007). *Mating intelligence: Sex, relationships, and the mind's reproductive system*. Mahwah, NJ: Lawrence Erlbaum Associates.

Miller, G. F. (2001). *The mating mind: How sexual choice shaped the evolution of human nature*. New York: Anchor.

Miller, G. F. (2009). *Spent: Sex, evolution, and consumer behavior*. New York: Viking.

Papers

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