social ornamentation to signify their mate value. In sharp contrast, the standards and criteria by which women are judged for their mate value are socially and culturally universal, and thus women have no need to fear foreign cultures.

Conclusion

Stump the Evolutionary Psychologists

A FEW TOUGHER QUESTIONS

In the preceding chapters, we have used evolutionary psychology to explain a wide variety of puzzles in many areas of social life, from sex and mating to marriage and the family; from crime and violence to economics, politics, and religion. We hope we have succeeded in convincing you that evolutionary psychology is an approach that can provide at least some (partial) answers to many persistent questions about human behavior. Given the range and number of questions that we have attempted to address in this book, you may rightfully wonder if there is anything that evolutionary psychology *cannot* address.

In the appendix of his 1994 international bestseller *The Moral Animal: The New Science of Evolutionary Psychology* (the book that introduced evolutionary psychology to both of us), the science writer Robert Wright lists six questions that evolutionary psychology could

then not answer. We would like to return to these six questions and see how far evolutionary psychology has come in solving these puzzles in the last thirteen years.

1. ***What about homosexuals?***

How can evolutionary psychology explain homosexuality, when it places so much emphasis on reproductive success (accomplished largely through heterosexual sex) as the ultimate motive of all behavior? This is usually among the first questions that we receive from students, neighbors, and academic colleagues alike when we present our evolutionary psychological ideas. In his 2000 book *The Mating Mind: How Sexual Choice Shaped the Evolution of Human Nature*, the evolutionary psychologist Geoffrey F. Miller admits that he cannot explain homosexuality.[1] To the best of our knowledge, no one else can. There is still no definitive and accepted explanation of homosexuality in 2007, thirteen years after Wright posed the question "What about homosexuals?"

There are some ideas, however, not from evolutionary psychology but from the related field of behavior genetics. The geneticist Dean Hamer and his team have discovered the genetic roots of male homosexuality. While they have not discovered the "gay gene" (the actual genes that increase the probability of male homosexuality), they have located a region of a chromosome that is involved—a genetic marker at Xq28.[2]

Even if a "gay gene" or genes are eventually discovered and sequenced, it still does not explain how such genes can survive if their carriers are exclusively or predominantly homosexual. The evolutionary biologists Robert L. Trivers and William R. Rice have an idea. Their theory of the evolution of male homosexuality is described in Hamer's book *The Science of Desire: The Search for the Gay*

Gene and the Biology of Behavior.[3] Trivers suggested the theory to Hamer in a phone conversation, but he and Rice never published their theory.[4]

Trivers and Rice believe that genes for male homosexuality may be passed on to the next generation, not by the gay men themselves but by their sisters and other female relatives. They posit that the so-called gay genes may incline their carriers, male or female, toward the same behavior: the desire to have sex with men. If the carriers are male, then they become male homosexuals (and they do not pass on their genes to the next generation). If the carriers are female, however, they will have more children than other women who do not carry such genes because they will have a larger number of male sex partners and have sex with them more frequently. The reduced reproductive success of gay men is compensated for by the heightened reproductive success of their sisters, and the male homosexuality genes will survive.

Their idea, which might be dubbed the "horny sister hypothesis," is a very provocative one, but it has been supported by a recent study that shows that female maternal relatives of male homosexuals have more children than female maternal relatives of male heterosexuals.[5] (Because they are on the X chromosomes, the "gay genes" are passed on to gay men by their mothers, not their fathers.)

We also note, however, that the most likely reason that male homosexuality has survived to this day is that throughout most of recorded history, gay men were forced to hide their sexuality by social norms and legal sanctions, and so got married and had children like straight men.[6] If so, the liberation of homosexuals, which allows them to come out of the closet and not pretend to be straight, may ironically contribute to the end of homosexuality.

So far no one has found a genetic basis for female homosexuality.

2. *Why are siblings often so different from one another?*

This is one of the clear examples of the triumph of recent evolutionary psychological theory and research. This was an unresolved question in 1994 but has now been answered, thanks to two somewhat unconventional heroes of evolutionary psychology: Frank J. Sulloway[7] and Judith Rich Harris.[8]

In his 1996 book *Born to Rebel: Birth Order, Family Dynamics, and Creative Lives*, Frank J. Sulloway argues that siblings within the same family must occupy different familial niches.[9] Firstborns (the eldest siblings), who are born into a family without any siblings with whom to compete for parental resources, typically grow up to identify with the parents and, by extension, other authority figures. Later-borns (younger siblings), in contrast, are always born into a family in which there are older siblings who have already taken the niche of identifying with the parents. So they must carve out their own niche by distancing themselves from the parents and becoming rebels. Sulloway's massive historical data show that in religious, political, and scientific spheres, firstborns are more likely to become the conservative vanguards of the old tradition, and later-borns are more likely to become the leaders of new revolutions. Thus, birth order, whether one is the eldest or younger, is one factor that makes siblings raised in the same family different in their personalities.

In her 1998 book *The Nurture Assumption: Why Children Turn Out the Way They Do*, Harris methodically demolishes the universally held assumption that how parents raise their children is a major determining factor in how they turn out.[10] Harris instead argues that

parental socialization has very little effect on children because they are mostly socialized and influenced by their peers. While Harris's conclusion was enormously controversial and widely condemned by politicians and the media alike, it is in fact corroborated by behavior genetic research.[11] Behavior geneticists contend that the rough rule of thumb when it comes to the determinants of child development is 50-0-50—that is, roughly 50 percent of the variance in personality, behavior, and other traits is heritable (determined by the genes); roughly 0 percent by shared environments (what happens within the family, shared by all siblings); and roughly 50 percent by the nonshared environment (what happens outside the family, often not commonly shared by siblings).

Harris's work highlights the importance of the nonshared environment on child development, and therefore gives us another reason why siblings raised in the same family are different. Of course, contrary to how the media portrayed (and viciously attacked) Harris's work, it decidedly does *not* mean that parents are not important for children's development. Parents are *enormously* important because children receive 100 percent of their genes from their biological parents. It simply means that within broad limits, how parents socialize their children is not very important to adult personality.

Both Sulloway's and Harris's research and conclusions have been hugely controversial, but mostly in the media and among non-academic audiences. The scientific community in general and evolutionary psychologists in particular tend to be supportive of their ingenious research and counterintuitive conclusions. Because Sulloway's theory emphasizes family dynamics as a primary determinant of adult personality, whereas Harris's group socialization theory focuses on what happens outside the family, Sulloway and Harris are naturally critical of each other's work.[12]

3. ***Why do people choose to have few or no kids?***
4. ***Why do people commit suicide?***

In contrast to the success of evolutionary psychology and behavior genetics in solving the first two questions on Wright's 1994 list, the next two questions present us with still unresolved puzzles. As far as we know, there is no compelling evolutionary psychological explanation for why some people choose to remain childless or why people commit suicide. Behavior geneticists have recently discovered the genetic basis for fertility behavior;[13] we now know that whether one has many children or a few is partially influenced by genes. However, this still does not explain why some people choose to have none; clearly, genetic tendency toward childlessness could not be selected for.

In some ways, the genetic influence on how many children people have goes against evolutionary logic. It suggests that people who have many siblings (because their parents had many children) themselves have many children, and people who have few siblings (because their parents had few children) themselves have few children. The evolutionary logic would suggest the opposite. If you have many siblings, you don't have to have many children yourself because you can still attain great reproductive success by investing in your siblings; both your children and your siblings carry half your genes. In contrast, if you have few siblings, you have to have many children yourself because you don't have the option of investing in your siblings. The heritability of family size therefore remains a puzzle for evolutionary psychology.

5. ***Why do people kill their own children?***

We do not know why this question was on Wright's 1994 list, because Martin Daly and Margo Wilson had already solved it in their

1988 book *Homicide*, which is partly based on their even earlier work.[14] Daly and Wilson first point out that the answer to the question, "Why do people kill their own children?" is, "They don't." Most parents who are convicted of killing their children are actually stepfathers, who are not genetically related to the children they kill. Crime statistics make it appear as though some biological parents kill their own children, because the police, uninformed by evolutionary psychology, make no distinction between biological parents and stepparents in their statistics.

From the evolutionary psychological perspective, it makes perfect sense for stepparents to neglect; underinvest in; and, in some cases, even kill their stepchildren, so that their spouses will focus their investment of time and resources in the couple's common genetic children, current and future. Among many species, such as baboons and lions, when a new male takes over a group of females with young, the first thing he does is kill all the existing children systematically, so that all the females will reproduce with him. It would be surprising if humans were any different.

Even the few cases where biological parents kill their genetic children can be explained by Daly and Wilson's notion of "discriminative parental solicitude."[15] They point out that all parents have limited resources to invest in their children. Their task is to maximize their reproductive success—not by maximizing the number of children but by maximizing the number of grandchildren. From this strictly Darwinian perspective, any resources invested in children who are not likely to survive to sexual maturity or find mates and reproduce themselves are entirely wasted. Thus, parents are far more likely to neglect, abuse, and kill their biological children who are deformed, handicapped, ill, or even physically unattractive and to shift their parental investment of their limited resources toward

those children with more promising reproductive prospects.[16] As uncomfortable as we may be with such a conclusion, the truth appears to be that parents do favor some of their children over others, even among their own genetic children, to say nothing about stepchildren to whom they are not genetically related, and they overwhelmingly favor those who are intelligent, beautiful, healthy, and sociable.

6. *Why do soldiers die for their countries?*

To the best of our knowledge, there is no satisfactory explanation for this phenomenon from an evolutionary psychological perspective. However, we have a few observations. First, it seems to us that soldiers die for their countries only if their country honors fallen soldiers and provides for their widows and children; in fact, we cannot think of any civilized society that does not honor men who fight and die for their country. Second, many men get married right before they are shipped to war, which explains why so many deployed soldiers have newborn babies whom they have not seen. Perhaps fighting and potentially dying for their countries when the country honors the war dead and provides for their widows and children is some men's reproductive strategy to make sure that their children are taken care of, when they could not provide sufficient parental investment themselves. Historically, soldiers have disproportionately come from lower classes. We may also add that while the last thing men do before they go to war is to get married and impregnate their new brides, unfortunately, sometimes the first thing they do when they conquer their enemy is to rape the women in the conquered society,[17] which also helps increase their reproductive success further. Soldiers would not get this opportunity unless they were willing to fight and die for their countries. But we admit that these

are simply our observations, and we do not have a clear explanation for why soldiers die for their countries. Neither does anyone else.

So the scorecard for evolutionary psychology, as of 2007, is 3–3. Three of the six questions on Wright's 1994 list have been satisfactorily solved; the other three remain unsolved.

To this list of three remaining questions, we would like to add a few more. Here are a few other questions that currently present theoretical puzzles to evolutionary psychology.

7. *Why do children love their parents?*

At first glance, this question may appear absurd. *Of course* children love their parents; it is only natural. But why?

If you really think about it, there is absolutely no evolutionary psychological reason why children should love and care for their parents. Some people (usually parents themselves) have suggested to us that parents will be more motivated to invest in children who love them back. But this is not true; from an evolutionary psychological perspective, parents *have to* love their children, whether the children love them back or not, in order to motivate their parental investment. And, as Daly and Wilson's work on discriminative parental solicitude shows, parents are motivated to invest not necessarily in the children who love them most, but in those who have the greatest potential to attain higher reproductive success themselves (more attractive, more intelligent, healthier children, or boys if the parents are wealthy, girls if they are poor, etc.). If parents with limited resources have two children, one an intelligent, physically attractive, and healthy child who hates them, and the other a handicapped, unattractive, and sickly child who loves them, the cold evolutionary logic dictates that the parents invest in the former,

not the latter. So the children do not really have to love their parents.

This is especially true for adult children. While the parents are still young, they can potentially produce further offspring with whom the children share half their genes. So it might make sense for the children to invest in and take care of their parents, so that they can produce more siblings. But once the parents are past the reproductive age, this is no longer possible. So it makes no evolutionary psychological sense for adult children to take care of their elderly parents.

Yet the overwhelming evidence from most human societies shows that children do love their parents, and this is a theoretical puzzle for evolutionary psychology–although probably *only* for evolutionary psychology.

8. *Why do parents in advanced industrialized nations have so few children?*

This is slightly different from question 3 above on Wright's list about why some people choose to be childless. Most people–for example, 90 percent of contemporary Americans–have children. However, despite the fact that most middle-class Americans could comfortably raise four or five children and invest sufficient resources in each of them, most parents choose to have only about two children.

In fact, there is an additional layer to this puzzle. Most Americans prefer to have a boy and a girl, rather than two boys or two girls. Parents who have two children of the same sex are more likely to have a third child than parents who have a boy and a girl.[18] Why Western parents do not have as many children as they can safely afford and invest in, and why they have a preference for a child of each sex, remains a mystery from the evolutionary psychological perspective.

9. *Why do people find a tan attractive? Why do men hog the remote control and typically channel surf much more than women? Why are men mostly responsible for barbecuing and carving meats while women do most of the other cooking?*

These are some of the trivial observations that we and others have made that are too widespread, consistent, and strong to be coincidental or the result of cultural socialization. It is likely that there are some biological or evolutionary reasons behind such consistent observations. For example, some argue that tanning is young, single women's means to advertise their health and beauty and that this is why young, single women are more likely to get a tan than others.[19] To the best of our knowledge, no one has begun to propose explanations for any of the other puzzles.

In order for evolutionary psychology to explain such phenomena, however, we must first make sure that they are truly culturally invariant human universals (or if there are minor cultural variations, they can be explained as interactions between evolved psychological mechanisms and local ecology and environment).[20] If the observations are not truly culturally universal, then it is unlikely that they have biological or evolutionary roots. The first thing evolutionary psychologists must do in order to explain widespread behavior is to establish that it is culturally universal.

This is exactly what the pioneer evolutionary psychologist David M. Buss did in the 1980s, when he conducted research in thirty-seven different cultures on all continents to ascertain that the preferences for ideal mates expressed by students at the University of Michigan are indeed widely shared by people in all human societies.[21] Others have followed in Buss's footsteps. One recent study was conducted in fifty-two nations, ten major world regions, six continents, and thirteen islands, and found that expressions of sexual

desires (such as the desire for sexual variety) and their consequences (such as the practice of "mate poaching"–stealing someone else's mate) are more or less the same in all societies.[22] Cultural universality is one of the hallmarks of the evolved mind.

We hope this quick survey of remaining theoretical puzzles in evolutionary psychology makes it abundantly clear that there are still many questions to be asked and many puzzles to be solved in modern evolutionary psychology. We both left sociology and became evolutionary psychologists in response to *one sentence* by Robert Wright in his 1994 book *The Moral Animal*: "For now, this is the state of evolutionary psychology: so much fertile terrain, so few farmers."[23] We became farmers and started tilling the fertile terrain. Wright's observation for evolutionary psychology is much less true now in 2007 than it was in 1994, as a large number of young and talented graduate students in psychology, anthropology, and elsewhere choose to pursue evolutionary psychology, which is probably the fastest growing academic field today.

At the 17th Annual Conference of the Human Behavior and Evolution Society (the main academic organization of evolutionary psychologists) held in Berlin in 2004, the then HBES president Bobbi S. Low remarked that the number of people who were on the program committee, which successfully planned and organized the Berlin conference in 2004, was larger than the entire group of people who originally gathered only two decades earlier to form the academic organization that later became HBES. Many attendees of these early meetings slept on the floor of Low's house when they met at the University of Michigan in the 1980s.[24] Twenty years later, the 2005 HBES meetings were held in the Hyatt Regency in Austin, Texas, with nearly five hundred participants. We have a feeling that

five hundred house guests would have stretched even Low's enormous hospitality.

The growth of evolutionary psychology has also been international; in addition to the United States and the United Kingdom, where scientific research in every field is most active, evolutionary psychology has a particularly and disproportionately large following in Japan and Belgium. Yet we could always use more bright minds to help us solve the remaining theoretical puzzles in evolutionary psychology. Apply within.

Afterword

In the hardcover edition of *Why Beautiful People Have More Daughters*, we ask and answer twenty-eight different questions in all areas of life. Of course, there are many more questions that evolutionary psychology can shed light on, as well as many others that still defy it. For example, there is a phenomenon that has mystified scientists for more than half a century. Everybody knew about it, but nobody knew why. Ever since I learned about it in 2000, I always wanted to solve the puzzle myself. It's also a timely question, given that we are in the middle of a war right now. The puzzle is . . .

Q. Why Are More Boys Born during and after Major Wars?

The phenomenon was first noticed in 1954 with regard to white children born during World War II in the United States.[i] It has since been replicated for most of the belligerent nations in both world wars.[ii] The phenomenon has been dubbed the "returning soldier effect."[iii] There is no doubt that the phenomenon is real, but nobody has been able to explain it. Why are soldiers who return from wars more likely to father sons than other men?

There is now evidence that, at least among the British soldiers who fought in World War I, those who survive battle and return home to be reunited with their wives are taller than those who die, never to have another chance to have a child.[iv] A comparison of the physical characteristics of the British soldiers who survived or died in World War I shows that surviving soldiers are on average nearly one inch taller than fallen soldiers. The average height of the surviving soldiers is 66.4 inches, while that of the fallen soldiers is 65.5 inches. Even in the small sample that is examined, this one-inch difference is highly statistically significant.

As we note on page 102 ("Boy or Girl? What Influences the Sex of Your Child?" in chapter 5), taller parents are more likely to have sons than shorter parents are. So the excess boys born during and immediately after the world wars might be a consequence of the fact that taller soldiers, who are more likely to have sons to begin with, are more likely to survive the war and return home, whereas shorter soldiers, who are more likely to have daughters, are less likely to survive the war and return home to have daughters.

Now you may be asking yourself, What difference can such a small height advantage–slightly less than one inch–possibly make? Detailed calculations show that the one-inch difference is more than twice as sufficient to account for all the excess boys born in the United Kingdom during and immediately after World War I. True, a one-inch increase in height only increases the odds of having a son by 5 percent. However, because so many men (nearly one-third of those between the ages of 15 and 40 in the United Kingdom) were mobilized during World War I, the 5 percent increase in the odds of having a son for the taller surviving soldiers translates into millions of excess boys. It is more than enough to account for the entire "returning soldier effect" in the United Kingdom.

But Why Are Taller Soldiers More Likely to Survive Battle?

This particular explanation of the "returning soldier effect" leads to another question: Why do taller soldiers have a greater chance of survival in war? This is still a puzzle, and I don't have a definitive answer. But there are some possibilities.

First, taller soldiers, especially during the less prosperous times of the early twentieth century, may have been physically stronger and more fit, as well as possibly genetically and developmentally healthier. So they might have been better able to resist diseases and wounds sustained during combat, which might have killed their shorter and less healthy comrades.

Second, height is known to be correlated with intelligence.[v] Although scientific opinions vary as to *why* taller people are more intelligent than shorter people, the fact that they are is beyond dispute. If taller soldiers on average are more intelligent than shorter soldiers, then they may be expected to achieve higher ranks within the military. Even though the sample used in the study of the British soldiers in World War I includes only enlisted men and noncommissioned officers and excludes commissioned officers, it is possible that taller and thus more intelligent soldiers were able to climb the ranks of noncommissioned officers to such ranks as lance corporal and sergeant, and were able to avoid the most dangerous combat situations because of their relative rank. Alternatively, taller and more intelligent soldiers might have been better able to fight successfully and survive in modern wars. For example, a surprising number of British soldiers survived World War I by deserting. They may have needed higher intelligence to desert and avoid court-martial successfully.

Finally, my colleague Dominic D. P. Johnson at the University of Edinburgh has made a very interesting suggestion to me. Vital organs in the body may not grow in size in exact proportion to the

body. In other words, taller soldiers may have bigger vital organs such as the heart and lungs, but they may not be as big as they should be given their body size. If this is the case, then bigger soldiers, while they are statistically more likely to be shot because of their larger body size, nonetheless have more room in their body where they can be "safely" shot and still survive the injury.

Are There More Boys Being Born during the Current War?

Now does this mean that more boys are and will be born during and after our current war? Not likely.

Regardless of the exact reason that taller soldiers are more likely to survive battle, the phenomenon of the "returning soldier effect" is not likely to be observed and repeated in more recent and future wars. This is because a substantial proportion of the population must be deployed for the proposed mechanism to produce excess boys in the population. Military forces of advanced Western nations today do not require as many soldiers as they used to. The transition to smaller military forces is reflected in the discontinuation of a mandatory draft in most Western nations.

With much smaller proportions of the population mobilized in wars, the returning soldier effect is not likely to be repeated, even if taller soldiers are still more likely to survive battle and even if taller parents are more likely to have sons. The higher offspring sex ratios among surviving (and returning) soldiers will not significantly shift the offspring sex ratio of the whole society. Even though an increasing number of young men and women are mobilized in the current war, the rate of mobilization in the United States is nowhere near one-third. Probably for this reason, more boys were *not* born during more recent wars, such as the Iran-Iraq wars in 1980–1988[vi] and the

ten-day war in Slovenia in 1991.[vii] Nevertheless, if the height advantage of surviving soldiers over fallen soldiers in the United Kingdom during World War I is generalizeable to other belligerent nations in both world wars, then this can potentially solve one of the long-standing mysteries in evolutionary psychology.

–Satoshi Kanazawa
London, February 2008

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Notes

Preface

1 Miller and Kanazawa (2000).

Introduction

1 Maynard Smith (1997).
2 Ridley (1999, pp. 54–64).
3 Pinker (2002).
4 Scarr (1995).
[5] Wilson (2007) is a late exception.
6 Moore (1903).
7 Hume (1739).
8 Davis (1978).
9 Ridley (1996, pp. 256–8).
10 Alexander et al. (1979); Kanazawa and Novak (2005).
11 Calden, Lundy, and Schlafer (1959); Gillis and Avis (1980); Sheppard and Strathman (1989).
12 Davis et al. (1993); Rand and Kuldau (1990).

Chapter 1

1 Buss (1989); Daly and Wilson (1988).
2 Barkow, Cosmides, and Tooby (1992).
3 Ellis and Bjorklund (2005, p. x).
4 Barkow (2006); Tooby and Cosmides (1992, pp. 24–49).
5 Ellis (1996); Daly and Wilson (1988, pp. 152–6).
6 Campbell (1999, p. 243).
7 Pinker (2002).
8 Ellis (1996).
9 Cornwell, Palmer, and Davis (2000); Cornwell et al. (2001); Machalek and Martin (2004).