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An evolutionary psychological perspective on social capital

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ABSTRACT

We present an evolutionary psychological perspective on social capital. We first suggest that evolutionary psychology provides the most ultimate (as opposed to proximate) theoretical definition and most theoretically driven measures of social capital, by providing a theory of values and specifying what human actors value and want. We then suggest that evolutionary psychology can illuminate certain cognitive constraints and biases to which human actors are subject in their attempt to seek the most efficient means to achieve their ultimate goal of reproductive success. We illustrate the utility of an evolutionary psychological perspective on social capital with its application to some empirical puzzles: Why women have more kin in their personal relationships than men do, and why we are closer to our maternal grandmothers than to our paternal grandfathers.

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1. Introduction

What is social capital? *Capital* is any resource that helps individuals produce or achieve some goal. *Social capital* inheres in relationships between individuals, just as *physical capital* inheres in physical objects and *human capital* inheres in humans. Thus social capital is any resource that inheres in relationships between individuals that helps them produce or achieve some goal. But what are individuals' goals? What do humans want?

Any resource can be capital depending upon the goal. If your goal is to run an efficient drugs market in your neighborhood, then guns and ammunition are important physical capital, the ability to distinguish between high-quality and low-quality drugs is important human capital, and connections to corrupt cops in the precinct are important social capital. None of these resources qualify as capital if your goal is to earn an MBA in Harvard Business School. If we don't know what the goals of human behavior are, we don't know what capital is (social or otherwise). And if we don't know what it is, we can't measure it precisely.

The problem of defining social capital may therefore be largely a problem of values. We need a theory of values that explains what humans want in order to define what social capital is. Without it, any definition of social capital is likely to be *ad hoc*. Unfortunately, however, while some have made promising starts (Hechter, Ranger-Moore, Jasso, & Horne, 1999;

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Schwartz, 1992; Schwartz & Bilsky, 1987; Wildavsky, 1987), there is presently no general theory of values that is widely accepted (Hechter, 1992, 1994; Hechter, Nadel, & Michod, 1993). This is why nobody seems to know what exactly social capital is, or different people define it differently (Paxton, 1999).

The lack of consensus on what social capital is has led researchers to define it in widely varied ways: participation in voluntary associations (Paxton, 1999, 2002; Putnam, 1995); voter turnout (Putnam, 1995); norm enforcement and social control (Coleman, 1988); trust (Coleman, 1988; Paxton, 1999, 2002); social network ties (Burt, 1998); family composition (presence of two biological parents; Portes, 2000); and "embedded social resources" (resources one can access through network ties; Lin, 2000). The lack of consensus has also led many empirical studies on social capital to contain sections called "Social Capital" or "What is Social Capital?" (Coleman, 1988, pp. S97–S100; McNeal, 1999, pp. 119–120; Paxton, 1999, pp. 91–97; Paxton, 2002, p. 256; Renzulli, Aldrich, & Moody, 2000, pp. 524–530; Schiff, 1992, pp. 159–161). Paxton (1999, p. 90) observes that "the term "social capital" is used in many recent articles but in vastly different ways."

We do not seem to have as much trouble defining physical or human capital as we do defining social capital, because the concepts of physical and human capital are often used in microeconomics and rational choice theory, where the human goals are narrowly defined economically (the maximization of individual utility, which practically often means wealth or income maximization). In contrast, scholars who discuss social capital have a wider view of social life than how economists view economic life, and do not always know what humans value *in social life* (even though they may know what humans value in economic life). What makes clear definitions of physical and human capital possible is economists' clear definition of human values in economic life.

Evolutionary psychology is currently a strong contender for a general theory of values (Ben-Ner & Putterman, 2000; Horne, 2004; Kanazawa, 2001a). It is a general theoretical perspective that can explain the ultimate (as opposed to proximate) causes of human behavior, cognition, preferences and emotions. Evolutionary psychology can therefore theoretically define human goals, and thus social (as well as physical and human) capital. Evolutionary psychology is compatible with a variety of proximate theories of values and goals.

In this paper, we present an evolutionary psychological perspective on social capital. Our aim is twofold. First, we suggest that evolutionary psychology provides the most ultimate (as opposed to proximate) theoretical definition and most theoretically driven measures of social capital, by specifying what human actors value and want. Second, we suggest that evolutionary psychology can illuminate certain cognitive constraints and biases to which human actors are subject in their attempt to seek the most efficient means to achieve their ultimate goal of reproductive success. We then illustrate the utility of an evolutionary psychological perspective on social capital with its application to one empirical puzzle: why women have more kin in their social networks than men do.

2. Biases and constraints in how the mind works

2.1. The Savanna Principle

Evolutionary psychology rejects the view of the human mind as *tabula rasa*, and avers instead that it is *content-rich* and *biased*. The human brain, and all of its psychological mechanisms, are adapted to the ancestral environment and are therefore biased in favor of viewing and responding to the world as if it were still the ancestral environment. The psychological mechanisms we possess today are still the same psychological mechanisms that we possessed in the ancestral environment. It is not impossible to overcome this bias through conscious effort, but it is often difficult.

Phobias and fears provide a good example. Most humans have deep-seated fear of spiders and snakes, and they appear to have an innate capacity for prepared learning for such fears (Öhman & Mineka, 2001). This is because spiders and snakes, many species of which are poisonous, represented genuine threats to human survival in the ancestral environment (Nesse, 1990). That is why humans have biological mechanisms (either freezing or fleeing) to deal with these threats. Humans have been selected to have the evolved psychological mechanism to learn to fear spiders and snakes with a minimal environmental stimulus and the physical mechanisms to freeze or flee to avoid the danger.

This is true even today. Even though very few of us, living in urban cities, encounter poisonous spiders and snakes, we still have phobias for them. For most of us, cars and guns represent far greater danger for survival than spiders and snakes; about 50,000 people die in car accidents in the United States every year, whereas fewer than 20 people die from spider and snake bites (nearly all of them owners of poisonous spiders and snakes) (Hagen & Hammerstein, 2006, p. 341). However, most of us still have innate and strong fear of spiders and snakes, rather than cars and guns, because our brain is biased to perceive our environment as if it were still the ancestral environment, where there were no cars and guns.

Pioneers of evolutionary psychology (Crawford, 1993; Symons, 1990; Tooby & Cosmides, 1990) all recognized that the evolved psychological mechanisms are adapted to the conditions of the ancestral environment, not to those of the current environment. Kanazawa (2004b) systematizes these observations into what he calls the Savanna Principle: *The human brain has difficulty comprehending and dealing with entities and situations that did not exist in the ancestral environment.* Burnham and Johnson (2005, pp. 130–131) refer to the same observation as *the evolutionary legacy hypothesis,* while Hagen and Hammerstein (2006, pp. 341–343) call it *the mismatch hypothesis.*

The Savanna Principle can potentially explain why some otherwise elegant scientific theories of human behavior, such as the subjective expected utility maximization theory or game theory, often fail empirically, because they posit entities and

situations that did not exist in the ancestral environment. For example, many players of one-shot Prisoner's Dilemma games may make the theoretically irrational choice to cooperate with their partner, possibly because the human brain has difficulty comprehending completely anonymous social exchange and absolutely no possibility of knowing future interactions (which makes the game truly one-shot). Neither of these situations existed in the ancestral environment, but they are crucial for the game-theoretical prediction of universal defection.

Fehr and Henrich (2003) suggest that one-shot encounters and exchanges might have been common in the ancestral environment. In their response to Fehr and Henrich, Hagen and Hammerstein (2006) point out that, even if one-shot encounters were common in the ancestral environment, *anonymous* encounters could not have been common, and the game-theoretic prediction of defection in one-shot games requires both noniteration and anonymity. A lack of anonymity can lead to reputational concerns even in nonrepeated exchanges.

As another illustration of the Savanna Principle, individuals who watch certain types of TV shows are more satisfied with their friendships, just as they are if they had more friends or socialized with them more frequently (Kanazawa, 2002). This may be because realistic images of other humans, such as television, movies, videos, and photographs, did not exist in the ancestral environment, where all realistic images of other humans *were* other humans. As a result, the human brain may have implicit difficulty distinguishing their "TV friends" (the characters they repeatedly see on TV shows) and their real friends.

Most evolutionary psychologists and biologists concur that humans have not undergone significant evolutionary changes in the last 10,000 years, since the end of the Pleistocene Epoch, and this is the assumption behind the Savanna Principle. More recently, however, some scientists have voiced opinions that human evolution has continued and even accelerated during the Holocene Epoch (Cochran & Harpending, 2009; Evans et al., 2005). While these studies conclusively demonstrate that new alleles have indeed emerged in the human genome since the end of the Pleistocene Epoch, the implication and importance of such new alleles for evolutionary psychology are not immediately obvious. In particular, with the sole exception of lactose tolerance, it is not clear whether these new alleles have led to the emergence of new evolved psychological mechanisms in the last 10,000 years.

While humans are quite flexible and adaptable in their choice of the *means* to achieve their goals, their *goals* themselves are often evolutionarily given and thus tend to be fixed. For example, men throughout the world and in different historical periods can achieve higher status by being a skilled hunter, killing many men in neighboring tribes, exploring uncharted territories, earning a lot of money, driving the fastest cars, designing the coolest website, or publishing in prestigious academic journals, but their desire to attain higher status tends to be constant because it is evolutionarily given. Men have everywhere and always attempted to attain higher status, but adapted their means to achieve it depending upon their specific circumstances.

As a general theory of values, evolutionary psychology explains what *goals* (or values or preferences) humans have. On the other hand, what does evolutionary psychology have to say about the *means* they employ to pursue their goals?

2.2. The evolution of general intelligence

General intelligence refers to the ability to reason deductively or inductively, think abstractly, use analogies, synthesize information, and apply it to new domains (Gottfredson, 1997; Neisser et al., 1996). The concept of general intelligence poses a problem for evolutionary psychology. Evolutionary psychologists contend that the human brain consists of domain-specific evolved psychological mechanisms, which evolved to solve specific adaptive problems in specific domains. If the contents of the human brain are domain-specific, how can evolutionary psychology explain general intelligence?

In contrast to views expressed by Cosmides and Tooby (2002) and Chiappe and MacDonald (2005), Kanazawa (2004c) proposes that what is now known as general intelligence may originally have evolved as a domain-specific adaptation to deal with evolutionarily novel, nonrecurrent problems. The human brain consists of a large number of domain-specific evolved psychological mechanisms to solve recurrent adaptive problems. In this sense, our ancestors did not really have to *think* in order to solve such recurrent problems. Evolution has already done all the thinking, so to speak, and equipped the human brain with the appropriate psychological mechanisms, which engender preferences, desires, cognitions, and emotions, and motivate adaptive behavior in the context of the ancestral environment.

Even in the extreme continuity and constancy of the ancestral environment, however, there were occasional problems that were evolutionarily novel and nonrecurrent, which required our ancestors to think and reason in order to solve. To the extent that these evolutionarily novel, nonrecurrent problems happened frequently enough in the ancestral environment (different problem each time) and had serious enough consequences for survival and reproduction, then any genetic mutation that allowed its carriers to think and reason would have been selected for, and what we now call "general intelligence" could have evolved as a domain-specific adaptation for the domain of evolutionarily novel, nonrecurrent problems. In this view, general intelligence may have become universally important in modern life (Gottfredson, 1997; Herrnstein & Murray, 1994; Jensen, 1998) only because our current environment is almost entirely evolutionarily novel.

The new theory suggests, and empirical data confirm, that more intelligent individuals are better than less intelligent individuals at solving problems *only if* they are evolutionarily novel but that more intelligent individuals are *not better* than less intelligent individuals at solving evolutionarily familiar problems, such as those in the domains of mating, parenting, interpersonal relationships, and wayfinding (Kanazawa, 2007). Three recent studies, employing widely varied methods, have

shown that the average intelligence of a population appears to be a strong function of evolutionary novelty of its environment as well as its annual mean temperature (Ash & Gallup, 2007; Bailey & Geary, 2009; Kanazawa, 2008).

2.3. Savanna-IQ Interaction Hypothesis

The logical conjunction of the Savanna Principle and the theory of the evolution of general intelligence suggests a qualification of the Savanna Principle. If general intelligence evolved to deal with evolutionarily novel problems, then the human brain's difficulty in comprehending and dealing with entities and situations that did not exist in the ancestral environment (proposed in the Savanna Principle) should interact with general intelligence, such that the Savanna Principle holds stronger among less intelligent individuals than among more intelligent individuals. More intelligent individuals should be better able to comprehend and deal with evolutionarily novel (but *not* evolutionarily familiar) entities and situations than less intelligent individuals.

There has been accumulating evidence for this *Savanna-IQ Interaction Hypothesis.* First, individuals' tendency to respond to TV characters as if they were real friends, first discovered by Kanazawa (2002), is limited to those with below-median intelligence (Kanazawa, 2006a); individuals with above-median intelligence do not become more satisfied with their friendships by watching more television.

Second, net of age, race, sex, education, marital status, and religion, less intelligent individuals have more children than more intelligent individuals, even though they do not want to, possibly because they have greater difficulty effectively employing evolutionarily novel means of modern contraception (Kanazawa, 2005). Another indication that less intelligent individuals may have greater difficulty employing modern contraception effectively is the fact that the correlation between the lifetime number of sex partners and the number of children is positive among the less intelligent but negative among the more intelligent. The more sex partners less intelligent individuals have, the more children they have; the more sex partners more intelligent individuals have, the fewer children they have.

Third, net of education, social class, income, age, sex, race, and marital status, more intelligent individuals stay healthier and live longer than less intelligent individuals possibly because they are better able to recognize and deal with evolutionarily novel threats and dangers to health in modern society (Deary, Whiteman, Starr, Whalley, & Fox, 2004; Gottfredson & Deary, 2004; Kanazawa, 2006b). Consistent with the Hypothesis, however, general intelligence does not affect health and longevity in sub-Saharan Africa, where many of the health threats and dangers are more evolutionarily familiar than elsewhere in the world.

Finally, the application of the Hypothesis to the acquisition and espousal of values shows that, net of age, sex, race, education, income, and religion, more intelligent children are more likely to grow up to acquire and espouse evolutionarily novel values (such as liberalism, atheism, and, for men, sexual exclusivity) as adults than less intelligent individuals (Kanazawa, in press). Consistent with the Hypothesis, general intelligence does not affect the acquisition and espousal of evolutionarily familiar values (such as those in marriage, children, family, and friends).

The Savanna-IQ Interaction Hypothesis, and empirical evidence in support of it, suggest that, while goals may be evolutionarily given and more or less constant across individuals, different individuals may employ different means to pursue their evolutionarily given goals. In particular, more intelligent individuals are more likely to employ evolutionarily novel means to pursue their goals than less intelligent individuals, but general intelligence does not affect the employment of evolutionarily familiar means. Now what does evolutionary psychology – in particular, the biases and constraints on the human brain proposed by the Savanna Principle and the Savanna-IQ Interaction Hypothesis – have to say about the topic of social capital?

3. Social capital from an evolutionary psychological perspective

From an evolutionary psychological perspective, reproductive success, making as many copies of one's genes as possible, is the ultimate (albeit largely unconscious) goal of all humans (as it is for all other species), or, more precisely, the goal of their *genes,* and all other goals are secondary and subsequent to it (Dawkins, 1989; Kanazawa, 2004a). Even survival is a means to reproductive success. From this perspective, we are all created and designed to reproduce by evolution by natural and sexual selection. That is the reason humans exist; that is the reason amebas exist. The fact that many of us do not think that is the ultimate reason for human existence or that some of us choose not to reproduce is immaterial. We are no more privy to the evolutionary logic behind our design than amebas are, and, no matter what we choose to do in our own lifetimes, we are all descended from people who chose to reproduce. None of us inherited our psychological mechanisms from our ancestors who remained childless.

Whether we like it or not, whether we know it or not, reproductive success is the ultimate goal of all living organisms, including humans, and everything else is a means toward it. For humans, a *K*-strategy species,[1] this means that they reproduce a small number of children and invest heavily in them so that they will reach the age of sexual maturity and reproduce

[1] *K*-strategy species, such as humans and other great apes, reproduce a few offspring, and care for and invest in them heavily to ensure that most or all of them will grow to sexual maturity. In contrast, *r*-strategy species, such as most fish species, reproduce millions of offspring at a time but do not care for or invest in them at all (MacArthur & Wilson, 1967).

themselves. Having children in itself does not necessarily accomplish reproductive success. If many or most of them die before they can reproduce themselves, then the parents have managed to leave very few copies of their genome. Parents instead must make sure that their children themselves have children.

Social capital from an evolutionary psychological perspective is therefore any resource that inheres in relationships between individuals that, directly or indirectly, helps them attain reproductive success in a given environment. Various aspects of social relationships (such as trust and associations with others) (Paxton, 1999, pp. 97–104) qualify and count as social capital *only to the extent* that they help individuals do so. Social relationships that do not even indirectly or remotely contribute toward individuals' reproductive success do not count as social capital.

An evolutionary psychological perspective on social capital suggests a *hierarchy* of values (Kanazawa, 2001a). It specifies reproductive success as the ultimate goal, but is otherwise compatible with a variety of proximate goals which help actors attain reproductive success in their specific circumstances. For example, to continue our earlier example, an evolutionary psychological perspective on social capital is compatible with a theory of why men in some societies engage in physical competition to attain status or an entirely different theory of why men in other societies pursue quality university education for the same purpose. Human behavior in any given circumstances is a function of both their ultimate and proximate goals. Sometimes the pursuit of proximate goals interferes or even circumvent the pursuit of the ultimate goals, as when people postpone or altogether forego having children in order to pursue higher education or a demanding career.

The Savanna-IQ Interaction Hypothesis suggests that not all individuals are equally likely to make use of all potential sources of social capital. In particular, the Hypothesis implies that *more intelligent individuals are more likely to employ evolutionarily novel forms of social capital than less intelligent individuals, while general intelligence makes no difference for the employment of evolutionarily familiar forms of social capital.* For example, the Hypothesis suggests the less intelligent men are relatively more likely to choose (evolutionarily familiar) physical competition as a means to attain status (because they are less likely to employ other, evolutionarily novel means), while more intelligent individuals are more likely to choose (evolutionarily novel) university education for the same purpose.

This may be why, for example, less intelligent men are more likely to resort to crime as a means of accumulating resources and attracting mates. Criminologists have long known that criminals on average have lower intelligence than the general population (Herrnstein & Murray, 1994; Hirschi & Hindelang, 1977; Wilson & Herrnstein, 1985). Juvenile delinquents are less intelligent than nondelinquents (Wolfgang, Figlio, & Sellin, 1972; Yeudall, Fromm-Auch, & Davies, 1982), and a significant difference in IQ between delinquents and nondelinquents appears as early as ages 8 and 9 (Gibson & West, 1970). Chronic offenders are less intelligent than one-time offenders (Moffitt, 1990; Wolfgang et al., 1972), and serious offenders are less intelligent than less serious offenders (Lynam, Moffitt, & Stouthamer-Loeber, 1993; Moffitt, Gabrielli, Mednick, & Schulsinger, 1981). The negative correlation between intelligence and criminality is not an artifact of a selection bias, whereby less intelligent criminals are more likely to be caught than more intelligent criminals, because the correlation exists even in self-report studies that do not rely on official police statistics (Moffitt & Silva, 1988).

From the perspective of the Savanna-IQ Interaction Hypothesis, there are two important points to note. First, much of what we now call interpersonal crime today, such as murder, assault, robbery, and theft, were routine means of intrasexual competition and resource acquisition and accumulation in the ancestral environment. This is most obvious from the fact that crime is a cultural universal (Brown, 1991) and that violent and predatory acts that would be classified as criminal if committed by humans are quite common among nonhuman species (de Waal, 1989, 1992; de Waal, Luttrell, & Canfield, 1993; Ellis, 1998; Thornhill & Palmer, 2000). More than likely, our ancestral men competed with each other for resources and mating opportunities by physical assault, theft, rape, and other means now classified as criminal. In other words, most forms of criminal behavior are evolutionarily familiar.

Second, the technology and institutions that deter, control, and punish criminal behavior today – CCTV cameras, the police, the courts, the prisons, and the DNA fingerprinting – are all evolutionarily novel. There was probably very little formal third-party enforcement of norms in the ancestral environment; what little third-party enforcement that existed was probably informal (ostracism by neighbors), not formal (arrest and prosecution) (Boehm, 1999). In other words, the modern criminal justice system is an evolutionarily novel institution to deal with evolutionarily familiar criminal behavior.

The Savanna-IQ Interaction Hypothesis thus suggests that men with lower intelligence may be more prone to resorting to evolutionarily familiar means of competition and resource acquisition than to evolutionarily novel means toward the same ends (theft rather than full-time employment in a capitalist economy; forcible rape rather than computer dating). It also makes sense from this perspective that men with lower intelligence may fail fully to comprehend the consequences of their criminal behavior imposed by evolutionarily novel entities of law enforcement and criminal justice system. Hence the Hypothesis can explain why less intelligent men are more likely to engage in criminal behavior than more intelligent men.

An important implication of an evolutionary psychological perspective on social capital is that *what counts as social capital may often be different for men and women.* In the ancestral environment, where our ancestors were hunter-gatherers, there was a clear division of labor between the sexes. It was the male who attained status through game hunting and competition, while the female took physical care of the children. Ancestral men of higher status were better able to protect and provide for their children than men of lower status, and their children had greater chances of survival to sexual maturity. There is evidence to suggest that, for this reason, women to this day are attracted to men of higher status in all societies (Buss, 1989; Kanazawa, 2003).

Recall that evolved psychological mechanisms, such as the one that produces criteria by which women judge their potential mates, are adapted to the conditions of the ancestral environment, not to the current environment. The Savanna Principle

suggests that the fact that women themselves can attain high status today is irrelevant; it has not much altered their evolved psychological mechanisms and the desires and preferences they engender, just as the fact that snakes and spiders present us with little danger today has not altered our phobias for them. At the same time, however, the Savanna-IQ Interaction Hypothesis suggests that more intelligent men and women are better able to overcome such evolutionary constraints and resort to evolutionarily novel forms of social capital in order to increase their reproductive success. We therefore expect less intelligent men and women to adhere to the evolutionarily familiar division of labor while more intelligent men and women resort to evolutionarily novel means toward reproductive success.

We have elsewhere proposed that there are sex differences in human sociality (Savage & Kanazawa, 2004) and that men and women experience differential pleasure and anxiety in certain social relations due to the benefits these responses would have had in the ancestral environment. For instance, we would expect women to experience greater anxiety leaving a baby behind, or at the sound of its cry, than men would. In the current environment, however, it is sometimes in the best interest of the children for the mothers to leave the home for gainful employment. In the ancestral environment, it would have enhanced reproductive success for women to feel profound anxiety when leaving their children behind; the same anxiety when dropping off a child at the day care center works against the women's reproductive success today. The Savanna-IQ Interaction Hypothesis predicts that it is precisely the more intelligent women who are better able to overcome such evolutionarily familiar anxiety, leave their children in day care, and pursue a career as an evolutionarily novel means to achieve reproductive success.

How does an evolutionary psychological perspective contribute to economics and economic psychology in general? Economic theories are based on the model of the *singular* and *unitary* actor (Kanazawa, 2006c) and refer to "a generic "person one/person two" household or "parent-child" family, rather than their anatomically correct counterparts: sons and daughters, fathers and mothers, and grandfathers and grandmothers" (Cox, 2007, p. 91). For example, throughout his treatise on happiness, Layard (2005) investigates what makes *individuals* or *people* happy and devotes very little attention to what may make men or women happy. In a study of the endowment effect motivated by *evolutionary* (as opposed to *evolutionary psychological*) theory, Huck, Kirchsteiger, and Oechssler (2005) specify only two types of actors: "those who have an endowment of *x* only, the '*x*-owners,' and those with an endowment of *y*, the '*y*-owners'" (p. 694), without regard to sex.

The model of the sexless singular and unitary actor in microeconomics often leads to spectacular errors in prediction. In January 1998, the supermarket chain Safeway started implementing the "superior customer service policy," which required all Safeway employees (male and female) to look customers (male and female) in the eye and smile (Liedtke, 2000; Pate, 2001; Ream, 2000). If the customer paid by check or credit card, cashiers were required quickly to scan the customer's last name and thank them by name, as in "Thank you, Mr. so-and-so, for shopping at Safeway," while looking them in the eye and smiling.

This policy, based on the model of the sexless singular and unitary actor, worked very well roughly three-quarters of the time, between a male employee and a male customer, between a male employee and a female customer, and between a female employee and a female customer. However, the policy backfired when the employee was female and the customer was male. When the female employee gazed deeply into his eyes, smiled, and thanked him by his name, the male customer *naturally* assumed that she was attracted to him, and started harassing her by following her around on and off work. Eventually, five female employees had to file a Federal sex discrimination charge against Safeway to force it to stop this policy, which the supermarket chain did when it reached an out-of-court settlement (Kanazawa, 2006c, pp. 98–99).

As it turns out, the Safeway fiasco could easily have been predicted by an evolutionary psychological model called the error management theory (Haselton & Buss, 2000; Haselton & Nettle, 2006). It explains why men are evolutionarily designed to overinfer sexual interest on women's part from ambiguous cues. An evolutionary psychological perspective, which makes a clear distinction between men and women rather than employing the model of singular and unitary actor, can improve the predictions of economic models and prevent the recurrence of the Safeway fiasco.

4. An illustration: why do women have more kin in their personal networks than men do? And why are we closer to our maternal grandmother than to our paternal grandfather?

Empirical studies on personal networks repeatedly demonstrate that otherwise comparable men and women have similar personal networks. The only exception to this rule is that women have more kin and fewer coworkers in their personal networks than men do (Campbell, 1988; Fischer & Oliker, 1983; Marsden, 1987). While there appears little doubt that this sex difference in personal networks exists, few network theorists seem to know why.

An evolutionary psychological perspective on social capital suggests an answer to this question, as a possible function of sex differences in the need for kin in order to achieve reproductive success. The fact that the female gamete (egg) is greater in size and fewer in number than the male gamete (sperm) (which is the biological definition of the sexes), and the fact that gestation takes place within the female body, together lead, directly or indirectly, to almost all of the sex differences in preferences and behavior. One of these differences is parental investment. Across all species for which these two conditions hold, the female makes greater parental investment than the male (Trivers, 1972). In fact, for most species, the male parental investment is limited to the sperm deposited inside the female body during copulation. The sex differences in parental investment occurs because males under these conditions have much higher *fitness ceiling* than the females do; males can potentially produce a far larger number of offspring in their lifetimes than females can.

This is true of humans as well. Thus, while *reproductive success* may be equally important to men and women, *each child* is more valuable to a mother than to a father because it represents a greater share of the mother's lifetime reproductive potential than the father's. Men are exceptional in nature in that they make a large amount of parental investment in their offspring (compared to males of other species). Nonetheless, women (just like females of most other species) usually make greater parental investment in their children than men do, because women's evolved psychological mechanisms incline them to do so.

However, women cannot always do it alone; sometimes, they need help from others, especially in the ancestral environment where resources were scarce and life was precarious. When mothers need help in their effort to raise their children, nobody is more likely or willing to deliver it than their kin. Women's kin are sometimes even more motivated to invest in the children, materially or otherwise, than the putative fathers are, because, due to paternity uncertainty (created by the possibility of cuckoldry), the fathers may or may not be genetically related to the children, whereas the maternal kin are guaranteed to be genetically related to the children.[2] For the same reason, paternal kin are not as motivated to invest in the children as maternal kin are. We suggest that this may be why women, even today, have a larger number of kin in their personal networks than men do.

Consistent with this explanation, Kanazawa (2001b) reports that, net of employment status, occupational prestige, race, and parenthood, family income has a significantly negative effect on the kin density (the proportion of personal network ties that are kin) among women, while it has no effect on men's kin density. One possible interpretation is that women with more resources may need less help from their kin in raising their children than women with fewer resource. Similarly, net of the same control variables, being currently married has a significantly negative effect on women's kin density, but not on men's. This may be because married women can rely on their husbands in raising their children, while currently unmarried women don't have this option and sometimes have to resort to their kin in order to get help.

From our perspective, women may have more kin in their personal networks because such networks count as social capital for them. Women's close ties with their kin may help them better raise their children. Women's kin may be (unconsciously) motivated to help invest in the children because they are certain to be genetically related to them. In contrast, close ties with kin may not count as social capital for men because they do not help them attain reproductive success. Men's kin may be (unconsciously) less motivated to invest in the children because they cannot be certain that they are genetically related to them. Further, our perspective on social capital can simultaneously explain why men are more likely to have coworkers in their personal networks because their ties to coworkers often help them attain higher status in the workplace, and hence (indirectly) greater reproductive success. Men have evolved preferences for all-male relationships which would have constituted valuable social capital in the ancestral environment because of the need for male–male coalitions in cooperative hunting, politics, and warfare (Tiger, 1969).

If women have more kin in their personal networks than men do, it logically follows that, among the children's generation, individuals (both men and women) have more maternal kin than paternal kin in their personal networks. This makes theoretical sense from an evolutionary psychological perspective, because, once again, individuals are certain to be genetically related to their maternal kin whereas, due to paternity uncertainty, they may or may not be genetically related to their paternal kin. From our perspective, maternal kin are better sources of social capital than paternal kin.

There is evidence to suggest that individuals are closer to and have more contact with maternal kin than paternal kin. Salmon (1999) shows that, among undergraduate students at McMaster University in Canada, not only do women visit and phone their relatives significantly more frequently than men do, but both men and women visit and phone their maternal grandparents and maternal uncles and aunts more frequently than paternal grandparents and paternal uncles and aunts. This is despite the fact that they live much closer to paternal grandparents and paternal uncles and aunts than to maternal grandparents and maternal uncles and aunts. Relationships between and among maternal relatives appear much tighter and closer despite their greater physical distances.

If paternity uncertainty is a problem for the father, it's an even greater problem for the paternal grandfather (Cox, 2007). Paternal grandfathers have two reasons why they may not be related to their grandchildren (they may have been cuckolded by their wives, or their sons may have been cuckolded by *their* wives). In sharp contrast, maternal grandmothers are guaranteed to be related to their grandchildren. Paternal grandmothers and maternal grandfathers fall in between these two extremes; both categories of grandparents each have one reason why they may not be related to their grandchildren. It therefore follows from evolutionary psychological logic that maternal grandmothers have more contact with and invest more heavily in their grandchildren than either paternal grandmothers or maternal grandfathers, who in turn have more contact with and invest more heavily in their grandchildren than paternal grandfathers.

There is a large amount of evidence to confirm this hypothesis. DeKay (1995) shows that undergraduate students at the University of Michigan are emotionally closer to, spend more time with, and receive more resources from maternal grandmothers than either paternal grandmothers or maternal grandfathers, and they are in turn closer to, spend more time with,

[2] More precisely, whether the putative father or the maternal kin are more motivated to invest in the children crucially hinges on the average level of paternity uncertainty (the possibility of cuckoldry). The biological father shares 50% of his genes with the child (coefficient of relatedness $r = .50$) whereas maternal grandparents and maternal uncles and aunts share 25% of their genes with it ($r = .25$). It means that, as long as paternity uncertainty is less than .50 (the probability of cuckoldry $p < .50$), then the biological father is still more closely related to the child on average than the maternal kin. It is only when $p > .50$ that maternal kin are on average more closely related to the child and thus more motivated to invest in it than the putative father. In some tribal societies where paternity uncertainty is consistently high, it is the maternal uncle, not the putative father, who is expected to invest in the child.

and receive more resources from maternal grandfathers and paternal grandmothers than paternal grandfathers. Euler and Weitzel (1996) find exactly the same pattern in their study of German respondents, and Pashos (2000) in his comparative study of Germans and Greeks. In a study of bereaved parents, Littlefield and Rushton (1986) find that, not only do mothers grieve the death of their children more than do fathers, but maternal grandmothers grieve the death of their grandchildren more than either paternal grandmothers or maternal grandfathers, who in turn grieve more than paternal grandfathers. We are not aware of any theoretical perspective besides evolutionary psychology which can explain the precise ordering: maternal grandmother > paternal grandmother = maternal grandfather > paternal grandfather.

More recently, however, Laham, Gonsalkorale, and von Hippel (2005) suggest that evolutionary logic predicts that maternal grandfathers should invest more in their grandchildren than paternal grandmothers (in other words, maternal grandmother > maternal grandfather > paternal grandmother > paternal grandfather, instead of maternal grandmother > paternal grandmother = maternal grandfather > paternal grandfather). This is because paternal grandmothers often have other grandchildren (their daughters' children) to invest in where there is no possibility of cuckoldry anywhere. In other words, paternal grandmothers often have the opportunity to invest in other grandchildren *as maternal grandmothers*, whereas maternal grandfathers have no such opportunity. Consistent with this logic, Laham et al. (2005) find that individuals feel closer to maternal grandfathers than to paternal grandmothers *only when* paternal grandmothers have other grandchildren through their daughters. In his analysis of the National Survey of Families and Households, Cox (2008) finds that paternal grandmothers are more willing to provide childcare for their grandchildren if their daughters-in-law are more committed to their marriage to their sons, which presumably reflects the probability of their sons' cuckoldry.

Now what do these findings mean for social capital? There are of course other important factors besides certainty of genetic relatedness in evaluating the sources of social capital, so, for example, a wealthy paternal grandfather will be a more important source of material resources than a destitute maternal grandmother. However, all else equal, an evolutionary psychological perspective suggests that a close relationship with a maternal grandmother will constitute a more important source of social capital than a similarly close relationship with other types of grandparents, because a maternal grandmother will be more willing to invest in a grandchild than other grandparents.

Given that most parents have both sons and daughters, grandparents have a choice of maternal grandchildren (children of their daughters) and paternal grandchildren (children of their sons). Given this choice, an evolutionary psychological perspective suggests (and available studies confirm) that they are more likely to invest in maternal grandchildren than paternal grandchildren. A given amount of resources is expected to increase their reproductive success (inclusive fitness) further if invested in maternal grandchildren than in paternal grandchildren.

Patterns of kin relationships and personal networks consistent with an evolutionary psychological perspective on social capital appear even in studies of women only. For example, Essock-Vitale and McGuire (1985) show that women are much more likely to give and receive help from their parents, full siblings and children (with whom they share 50% of their genes: $r = .50$) than from their half siblings, grandparents, uncles, aunts, and grandchildren (with whom they share 25% of their genes: $r = .25$), and they are in turn more likely to give and receive help from the latter categories of relatives than from their more distant ones (cousins: $r < .25$).

Hamilton's law (Hamilton, 1964) states that any benefit conferred to genetic kin must be discounted by the coefficient of relatedness between the benefactor and the recipient. A given sum of money is worth twice as much to the benefactor's genome if offered to a sister ($r = .50$) as it is if offered to a niece ($r = .25$). From the perspective of the recipient, it means that, all else (such as the wealth of a potential benefactor) equal, a close tie to a sister is twice as important a source of social capital as a close tie to an aunt, because she is twice as likely to receive resources (material or otherwise) which help her reproductive success from a sister as from an aunt. And both categories of relatives are far more important sources of social capital than cousins or unrelated friends.

In sum, studies of men's and women's relationships with kin are consistent with an evolutionary psychological perspective on social capital. Women have more kin in their personal networks than men do (Campbell, 1988; Fischer & Oliker, 1983; Marsden, 1987), and they have an even greater density of kin in their networks when they have fewer alternative means of support for raising children (Kanazawa, 2001b). Women are more likely to receive help from or give help to closer relatives than more distant ones (Essock-Vitale & McGuire, 1985). We are closer to our maternal kin than to our paternal kin even when greater geographical distances separate us (Salmon, 1999). We are closer to maternal grandmother than to our paternal grandmother or maternal grandfather, and we are in turn closer to the latter than to our paternal grandfather (DeKay, 1995; Euler & Weitzel, 1996; Littlefield & Rushton, 1986; Pashos, 2000). We are closer to our maternal grandfather than to our paternal grandmother but only when the latter has alternative grandchildren in whom to invest (Laham et al., 2005). We suggest that it would be very difficult to find any other general theoretical perspective on social capital besides evolutionary psychology that can simultaneously account for all these facets of our relationships to kin.

5. Conclusion

We understand the appeal of focusing on the construct of social capital in order to understand social life. But because social capital inheres in relationships it is important to understand individual motivations for establishing and maintaining relationships in the first place. We therefore believe that an overemphasis on narrow empirical questions like "Does social capital reduce the odds of school drop out?" is largely misguided. The recent lament that social capital is in decline (Putnam,

1995) demonstrates a very narrow view of social life and a very short memory of human history. Americans today are upset to see that there are fewer and fewer nuclear families and that social institutions that we fondly recall from our youth (the welcome wagons, Boy Scouts, and bowling leagues) are on the wane. If we take a longer view of history, however, we soon realize that such institutions were only common for a relatively short period in our history. In earlier years, families were often torn apart – mothers died in child birth, children died from accidents and diseases, wars killed many young men. Boy Scouts and bowling leagues had not been invented. Throughout human evolutionary history, the nuclear family has been the exception, not the norm. The nature of social ties varies a great deal across space and time, and the reliance on any narrowly focused measures of "social capital" or positive life outcomes (such as school attendance) is likely to result in inconsistent empirical findings.

In this paper we advance an evolutionary psychological perspective on social capital. We reiterate and emphasize our point that evolutionary psychology is but one perspective on social capital. It has the advantage of offering a clear definition of what social capital is from metatheoretical first principles, which few other perspectives can. However, we encourage others to propose their own theories and clear definitions of social capital, and subject competing hypotheses (including ours) to rigorous empirical tests.

Apart from its ability to suggest a solution to an empirical puzzle of why women have more kin in their social networks, we believe an evolutionary psychological perspective on social capital has several distinct advantages: what, why, when, where, and how. First, an evolutionary psychological definition of social capital can finally tell us exactly *what* social capital is. While there has been a great deal of discussion of the concept, there currently appears to be no clear consensus as to what social capital is. This may be because one needs a theory of values in order to define capital (social or otherwise), and there presently is no widely accepted theory of values that explains what humans want.

Second, an evolutionary psychological perspective, which is one of the current contenders for a general theory of values, can tell us *why* social capital is important, and, in a more general sense, why humans are social. While everyone recognizes that humans are social, they may not necessarily know why. From an evolutionary psychological perspective, humans (and members of many other species) are social because their sociality promotes reproductive success. Human sociality is largely how our ancestors survived long enough to reproduce and raise their offspring. That is why humans are social and that is why social capital is important for humans.

Third, an evolutionary psychological perspective can tell us *when* and *where* we expect humans to maintain their social ties. While the perspective explains why humans are social, it does not predict them to be universally and indiscriminately social. Humans are social and maintain their social ties with others only when and where such ties help them attain reproductive success. They join bowling leagues and other local groups, if doing so ultimately promotes their reproductive success, but not if otherwise. Few other theoretical perspective can explain why most of us maintain closer ties to our maternal grandmothers than to paternal grandfathers, when the latter live closer to us than the former.

Finally, an evolutionary psychological perspective on social capital, with its clear definition of the concept, can tell us precisely *how* to measure it at different times and in different places. It would strongly argue against using the same measure across time and places, because which relationships promote reproductive success can vary across time and places. An evolutionary psychological perspective suggests that we count as social capital only those relationships that, directly or indirectly, promote individuals' reproductive success.

References

Ash, J., & Gallup, G. G. Jr., (2007). Paleoclimatic variation and brain expansion during human evolution. *Human Nature, 18*, 109–124.

Bailey, D. H., & Geary, D. C. (2009). Hominid brain evolution: Testing climatic, ecological, and social competition models. *Human Nature, 20*, 67–79.

Ben-Ner, A., & Putterman, L. (2000). On some implications of evolutionary psychology for the study of preferences and institutions. *Journal of Economic Behavior and Organization, 43*, 91–99.

Boehm, C. (1999). *Hierarchy in the forest: The evolution of egalitarian behavior*. Cambridge: Harvard University Press.

Brown, D. E. (1991). *Human universals*. New York: McGraw-Hill.

Burnham, T. C., & Johnson, D. D. P. (2005). The biological and evolutionary logic of human cooperation. *Analyse and Kritik, 27*, 113–135.

Burt, R. S. (1998). The gender of social capital. *Rationality and Society, 10*, 5–46.

Buss, D. M. (1989). Sex differences in human mate preferences: Evolutionary hypotheses tested in 37 cultures. *Behavioral and Brain Sciences, 12*, 1–49.

Campbell, K. E. (1988). Gender differences in job-related networks. *Work and Occupations, 15*, 179–200.

Chiappe, D., & MacDonald, K. (2005). The evolution of domain-general mechanisms in intelligence and learning. *Journal of General Psychology, 132*, 5–40.

Cochran, G., & Harpending, H. (2009). *The 10,000 year explosion: How civilization accelerated human evolution*. New York: Basic.

Coleman, J. S. (1988). Social capital in the creation of human capital. *American Journal of Sociology, 94*, S95–S120.

Cosmides, L., & Tooby, J. (2002). Unraveling the enigma of human intelligence. Evolutionary psychology and the multimodular mind. In R. J. Sternberg & J. C. Kaufman (Eds.), *The evolution of intelligence* (pp. 145–198). Mahwah: Lawrence Erlbaum.

Cox, D. (2007). Biological basics and economics of the family. *Journal of Economic Perspectives, 21*, 91–108.

Cox, D. (2008). Intergenerational caregiving and exchange: Economic and evolutionary approaches. In A. Booth, A. C. Crouter, S. M. Bianchi, & J. A. Seltzer (Eds.), *Intergenerational caregiving* (pp. 81–126). Washington: Urban Institute.

Crawford, C. B. (1993). The future of sociobiology: Counting babies or proximate mechanisms? *Trends in Ecology and Evolution, 8*, 183–186.

Dawkins, R. (1989). *The selfish gene* (2nd ed). Oxford: Oxford University Press.

de Waal, F. B. M. (1989). Food sharing and reciprocal obligations among chimpanzees. *Journal of Human Evolution, 18*, 433–459.

de Waal, F. B. M. (1992). Appeasement, celebration, and food sharing in the two Pan species. In T. Nishida, W. C. McGrew, & P. Marler (Eds.), *Topics in primatology: Human origins* (pp. 37–50). Tokyo: University of Tokyo Press.

de Waal, F. B. M., Luttrell, L. M., & Canfield, M. E. (1993). Preliminary data on voluntary food sharing in brown capuchin monkeys. *American Journal of Primatology, 29*, 73–78.

Deary, I. J., Whiteman, M. C., Starr, J. M., Whalley, L. J., & Fox, H. C. (2004). The impact of childhood intelligence on later life: Following up the Scottish mental surveys of 1932 and 1947. *Journal of Personality and Social Psychology, 86*, 130–147.

DeKay, W. T. (1995). Grandparental investment and the uncertainty of kinship. In *Paper presented at the annual meetings of the human behavior and evolution society*. Santa Barbara, CA.
Ellis, L. (1998). Neodarwinian theories of violent criminality and antisocial behavior: Photographic evidence from nonhuman animals and a review of the literature. *Aggression and Violent Behavior, 3*, 61–110.
Essock-Vitale, S. M., & McGuire, M. T. (1985). Women's lives viewed from an evolutionary perspective II: Patterns of helping. *Ethology and Sociobiology, 6*, 155–173.
Euler, H. A., & Weitzel, B. (1996). Discriminative grandparental solicitude as reproductive strategy. *Human Nature, 7*, 39–59.
Evans, P. D., Gilbert, S. L., Mekel-Bobrov, N., Vallender, E. J., Anderson, J. R., Vaez-Azizi, L. M., et al (2005). Microcephalin, a gene regulating brain size, continues to evolve adaptively in humans. *Science, 309*, 1717–1720.
Fehr, E., & Henrich, J. (2003). Is strong reciprocity a maladaptation? On the evolutionary foundations of human altruism. In P. Hammerstein (Ed.), *Genetic and cultural evolution of cooperation* (pp. 55–82). Cambridge: MIT Press.
Fischer, C. S., & Oliker, S. J. (1983). A research note on friendship, gender, and the life cycle. *Social Forces, 62*, 124–133.
Gibson, H. B., & West, D. J. (1970). Social and intellectual handicaps as precursors of early delinquency. *British Journal of Criminology, 10*, 21–32.
Gottfredson, L. S. (1997). Why *g* matters: The complexity of everyday life. *Intelligence, 24*, 79–132.
Gottfredson, L. S., & Deary, I. J. (2004). Intelligence predicts health and longevity, but why? *Current Directions in Psychological Science, 13*, 1–4.
Hagen, E. H., & Hammerstein, P. (2006). Game theory and human evolution: A critique of some recent interpretations of experimental games. *Theoretical Population Biology, 69*, 339–348.
Hamilton, W. D. (1964). The genetical evolution of social behaviour. *Journal of Theoretical Biology, 7*, 1–52.
Haselton, M. G., & Buss, D. M. (2000). Error management theory: A new perspective on biases in cross-sex mind reading. *Journal of Personality and Social Psychology, 78*, 81–91.
Haselton, M. G., & Nettle, D. (2006). The paranoid optimist: An integrative evolutionary model of cognitive biases. *Personality and Social Psychology Review, 10*, 47–66.
Hechter, M. (1992). Should values be written out of the social scientist's lexicon? *Sociological Theory, 10*, 214–230.
Hechter, M., Nadel, L., & Michod, R. E. (Eds.). (1993). *The origin of values*. New York: Aldine de Gruyter.
Hechter, M. (1994). The role of values in rational choice theory. *Rationality and Society, 6*, 318–333.
Hechter, M., Ranger-Moore, J., Jasso, G., & Horne, C. (1999). Do values matter? An analysis of advanced directives for medical treatment. *European Sociological Review, 15*, 405–430.
Herrnstein, R. J., & Murray, C. (1994). *The bell curve: Intelligence and class structure in American life*. New York: Free Press.
Hirschi, T., & Hindelang, M. J. (1977). Intelligence and delinquency: A revisionist review. *American Sociological Review, 42*, 571–587.
Horne, C. (2004). Values and evolutionary psychology. *Sociological Theory, 22*, 477–503.
Huck, S., Kirchsteiger, G., & Oechssler, J. (2005). Learning to like what you have – Explaining the endowment effect. *Economic Journal, 115*, 689–702.
Jensen, A. R. (1998). *The g factor: The science of mental ability*. Westport: Praeger.
Kanazawa, S. (2001a). De gustibus *est* disputandum. *Social Forces, 79*, 1131–1163.
Kanazawa, S. (2001b). Where do social structures come from? *Advances in Group Processes, 18*, 161–183.
Kanazawa, S. (2002). Bowling with our imaginary friends. *Evolution and Human Behavior, 23*, 167–171.
Kanazawa, S. (2003). Can evolutionary psychology explain reproductive behavior in the contemporary United States? *Sociological Quarterly, 44*, 291–302.
Kanazawa, S. (2004a). Social sciences are branches of biology. *Socio-Economic Review, 2*, 371–390.
Kanazawa, S. (2004b). The Savanna Principle. *Managerial and Decision Economics, 25*, 41–54.
Kanazawa, S. (2004c). General intelligence as a domain-specific adaptation. *Psychological Review, 111*, 512–523.
Kanazawa, S. (2005). An empirical test of a possible solution to "the central theoretical problem of human sociobiology". *Journal of Cultural and Evolutionary Psychology, 3*, 249–260.
Kanazawa, S. (2006a). Why the less intelligent may enjoy television more than the more intelligent. *Journal of Cultural and Evolutionary Psychology, 4*, 27–36.
Kanazawa, S. (2006b). Mind the gap... in intelligence: Reexamining the relationship between inequality and health. *British Journal of Health Psychology, 11*, 623–642.
Kanazawa, S. (2006c). "First, kill all the economists....": The insufficiency of microeconomics and the need for evolutionary psychology in the study of management. *Managerial and Decision Economics, 27*, 95–101.
Kanazawa, S. (2007). Mating intelligence and general intelligence as independent constructs. In G. Geher & G. Miller (Eds.), *Mating intelligence. Sex, relationships, and the mind's reproductive system* (pp. 283–309). Mahwah: Lawrence Erlbaum.
Kanazawa, S. (2008). Temperature and evolutionary novelty as forces behind the evolution of general intelligence. *Intelligence, 36*, 99–108.
Kanazawa, S. (in press). Why liberals and atheists are more intelligent. *Social Psychology Quarterly, 73*(1).
Laham, S. M., Gonsalkorale, K., & von Hippel, W. (2005). Darwinian grandparenting: Preferential investment in more certain kin. *Personality and Social Psychology Bulletin, 31*, 63–72.
Layard, R. (2005). *Happiness: Lessons from a new science*. Allen Lane: London.
Liedtke, M. (2000). Smiles more discerning at Safeway. *Contra Costa Times*, January 18. Business and Financial News Section.
Lin, N. (2000). Inequality in social capital. *Contemporary Sociology, 29*, 785–795.
Littlefield, C. H., & Rushton, J. P. (1986). When a child dies: The sociobiology of bereavement. *Journal of Personality and Social Psychology, 51*, 797–802.
Lynam, D., Moffitt, T., & Stouthamer-Loeber, M. (1993). Explaining the relation between IQ and delinquency: Class, race, test motivation, school failure, or self control? *Journal of Abnormal Psychology, 102*, 187–196.
MacArthur, R. H., & Wilson, E. O. (1967). *The theory of island biogeography*. Princeton: Princeton University Press.
Marsden, P. V. (1987). Core discussion networks of Americans. *American Sociological Review, 52*, 122–131.
McNeal, R. B. Jr., (1999). Parental involvement as social capital: Differential effectiveness on science achievement, truancy, and dropping out. *Social Forces, 78*, 117–144.
Moffitt, T. E. (1990). The neuropsychology of delinquency: A critical review of theory and research. *Crime and Justice. An Annual Review of Research, 12*, 99–169.
Moffitt, T. E., Gabrielli, W. F., Mednick, S. A., & Schulsinger, F. (1981). Socioeconomic status, IQ, and delinquency. *Journal of Abnormal Psychology, 90*, 152–156.
Moffitt, T. E., & Silva, P. A. (1988). IQ and delinquency: A direct test of the differential detection hypothesis. *Journal of Abnormal Psychology, 97*, 330–333.
Neisser, U., Boodoo, G., Bouchard, T. J., Jr., Boykin, A. W., Brody, N., Ceci, S. J., et al (1996). Intelligence. Knowns and unknowns. *American Psychologist, 51*, 77–101.
Nesse, R. M. (1990). Evolutionary explanations of emotions. *Human Nature, 1*, 261–289.
Öhman, A., & Mineka, S. (2001). Fears, phobias, and preparedness: Toward an evolved module of fear and fear learning. *Psychological Review, 108*, 483–522.
Pashos, A. (2000). Does paternal uncertainty explain discriminative grandparental solicitude? A cross-cultural study in Greece and Germany. *Evolution and Human Behavior, 21*, 97–109.
Pate, K. (2001). Seller beware! Secret shoppers check service; some call it spying. *Denver Post*, July 1. Business Section, K-01.
Paxton, P. (1999). Is social capital declining in the United States?: A multiple indicator assessment. *American Journal of Sociology, 105*, 88–127.
Paxton, P. (2002). Social capital and democracy: An interdependent relationship. *American Sociological Review, 67*, 254–277.
Portes, A. (2000). The two meanings of social capital. *Sociological Forum, 15*, 1–12.
Putnam, R. D. (1995). Bowling alone: America's declining social capital. *Journal of Democracy, 6*, 65–78.
Ream, S. L. (2000). When service with a smile invites more than satisfied customers: Third-party sexual harassment and the implications of charges against Safeway. *Hastings Women's Law Journal, 11*, 107–122.

Renzulli, L. A., Aldrich, H., & Moody, J. (2000). Family matters: Gender, networks, and entrepreneurial outcomes. *Social Forces, 79*, 523–546.
Salmon, C. A. (1999). On the impact of sex and birth order on contact with kin. *Human Nature, 10*, 183–197.
Savage, J., & Kanazawa, S. (2004). Social capital and the human psyche: Why is social life "capital"? *Sociological Theory, 22*, 504–524.
Schiff, M. (1992). Social capital, labor mobility, and welfare: The impact of uniting states. *Rationality and Society, 4*, 157–175.
Schwartz, S. H. (1992). Universals in the content and structure of values: Theory and empirical tests in 20 countries. *Advances in Experimental Social Psychology, 25*, 1–65.
Schwartz, S. H., & Bilsky, W. (1987). Toward a universal psychological structure of human values. *Journal of Personality and Social Psychology, 53*, 550–562.
Symons, D. (1990). Adaptiveness and adaptation. *Ethology and Sociobiology, 11*, 427–444.
Thornhill, R., & Palmer, C. T. (2000). *A natural history of rape: Biological bases of sexual coercion*. Cambridge: MIT Press.
Tiger, L. (1969). *Men in groups*. New York: Random House.
Tooby, J., & Cosmides, L. (1990). The past explains the present: Emotional adaptations and the structure of ancestral environments. *Ethology and Sociobiology, 11*, 375–424.
Trivers, R. L. (1972). Parental investment and sexual selection. In B. Campbell (Ed.), *Sexual selection and the descent of man 1871–1971* (pp. 136–179). Chicago: Aldine.
Wildavsky, A. (1987). Choosing preferences by constructing institutions: A cultural theory of preferences formation. *American Political Science Review, 81*, 3–21.
Wilson, J. Q., & Herrnstein, R. J. (1985). *Crime and human nature: The definitive study of the causes of crime*. New York: Touchstone.
Wolfgang, M. E., Figlio, R. M., & Sellin, T. (1972). *Delinquency in a birth cohort*. Chicago: University of Chicago Press.
Yeudall, L. T., Fromm-Auch, D., & Davies, P. (1982). Neuropsychological impairment of persistent delinquency. *Journal of Nervous and Mental Diseases, 170*, 257–265.