

Machiavellianism: A Synthesis of the Evolutionary and Psychological Literatures

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Manipulative strategies of social conduct (Machiavellianism) have been studied by both psychologists and evolutionary biologists. The authors use the psychological literature as a database to test evolutionary hypotheses about the adaptive advantages of manipulative social behavior. Machiavellianism does not correlate with general intelligence and does not consistently lead to real-world success. It is best regarded as 1 of several social strategies, broadly similar to the “defect” strategy of evolutionary game theory, which is successful in some situations but not others. In general, human evolutionary psychology and evolutionary game theory provide useful frameworks for thinking about behavioral strategies, such as Machiavellianism, and identify a large number of specific hypotheses that have not yet been tested by personality and social psychologists.

Niccolo Machiavelli (1469–1527) was a Florentine diplomat who visited the courts of Europe and observed firsthand the rise and fall of their leaders. His own fall came with the overthrow of the regime that he served. He wrote *The Prince* (Machiavelli, 1513/1966) to ingratiate himself with the new ruler. *The Prince* is a book of advice on how to acquire and stay in power. It is based entirely on expediency and is devoid of the traditional virtues of trust, honor, and decency. A typical passage is, “Men are so simple and so much inclined to obey immediate needs that a deceiver will never lack victims for his deceptions” (p. 63). Machiavelli failed to gain favor with the new prince, but his name has come to represent a strategy of social conduct in which others are regarded entirely as means toward personal ends. As a historical aside, Machiavelli himself was not very Machiavellian, displaying an uncommon devotion to his city. Some of his other works, such as *Discourses* (Machiavelli, 1513/1950), also stress nonmanipulative themes.

Christie and Geis (1968, 1970a, 1970b) were the first psychologists to study Machiavellianism as an important axis of human behavioral variation. They developed a series of *Mach tests* that measure a participant’s agreement with statements such as “Never tell anyone the real reason you did something unless it is useful to do so.” High and low scorers on the test, often referred to as *high-Machs* and *low-Machs*, respectively, differ in many other aspects of their behavior, from vocational choice to success at games that involve forming alliances. The

psychological literature on Machiavellianism now includes over 300 references.

More recently, *Machiavellianism* has become a term of interest in evolutionary biology. Several authors have speculated that social interactions are by far the most challenging aspect of the environment for the higher primates and were a major factor in the evolution of human intelligence (e.g., Byrne & Whiten, 1988; De Waal, 1982, 1986). The focus on social interactions contrasts with previous theories of intelligence and a long tradition in experimental psychology that studies intelligence in a nonsocial context. Humphrey (1976) amusingly made the basic point by saying that Robinson Crusoe’s intellect was not really challenged until the arrival of his man Friday. “If Monday and Tuesday, Wednesday and Thursday had turned up as well then Crusoe would have had every need to keep his wits about him” (p. 305).

The purpose of this review is to integrate the evolutionary and psychological literatures on Machiavellianism. The evolutionary literature is full of interesting hypotheses on the adaptive value of manipulative behaviors but is short on experimental tests with either humans or other species. The psychological literature is full of empirical results on humans but—we hope we do not offend our psychological colleagues by saying this—does not provide a conceptual framework that integrates the results and guides future research. We therefore use evolutionary theory to derive some specific predictions about Machiavellianism in humans and turn to the psychological literature as a database for testing these predictions.

For the purposes of this review, we define *Machiavellianism* as a strategy of social conduct that involves manipulating others for personal gain, often against the other’s self-interest. Machiavellianism should be regarded as a quantitative trait. Everyone is capable of manipulative behavior to some degree, but some are more willing and more able than others. It has been argued that manipulative behavior is not a single trait but rather a complex set of traits that cannot be captured by a single scale (Ahmed & Stewart, 1981; Allsopp, Eysenck, & Eysenck, 1991; Hunter, Gerbing, & Boston, 1982; Lamdan & Lorr, 1975; O’Hair & Cody, 1987; Panitz, 1989; Ray, 1983; Stone & Russ, 1976; but see Jones & White,

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1983). We agree and hope that this article contributes to a more sophisticated taxonomy of manipulative social strategies. Nevertheless, the single-trait definition is a useful starting point that can be elaborated as inadequacies are revealed.

Before proceeding, it is important to stress that some of our evolutionary predictions can also be derived from other theoretical frameworks, such as economic theory, that view human behavior as a form of utility maximization or "satisficing." However, these other frameworks have had no more influence on the Machiavellianism literature in psychology than evolutionary theory. Furthermore, economic and other theories of human behavior must ultimately turn to evolution to explain their own assumptions (Buss, 1995; Hirshleifer, 1982; Hirshleifer & Coll, 1988; Tooby & Cosmides, 1992).

Evolutionary Theories of Machiavellianism

Machiavellianism as Adaptation and Intelligence

Although *Machiavellianism* is a relatively new term in evolutionary biology, related terms such as *selfish* and *manipulation* have been widely used, and it is important to understand their meanings. Dawkins and Krebs (1978) stated that "natural selection favours individuals who successfully manipulate the behaviour of other individuals, whether or not this is to the advantage of the manipulated individuals" (p. 309). In this view, any social behavior that evolves is classified as manipulation, even when it is not manipulative in a colloquial sense. Similarly, Dawkins's (1976) term *selfish gene* refers to any trait that evolves because the genes coding for the trait must, by definition, be more fit than alternative genes at the same loci. These overextended definitions of selfishness and manipulation are not useful because they include too much. Clearly, the field needs more restricted definitions so that other terms such as *unselfish*, *altruistic*, *cooperative*, *nonmanipulative*, *trusting*, *loyal*, and so forth can exist as potentially viable alternatives (see Wilson, 1992; Wilson & Dugatkin, 1992; and Wilson & Sober, 1994, for more thorough discussions of these terms as they are used in evolutionary biology).

Recent evolutionary discussions of Machiavellian *intelligence* are more interesting because they are more restrictive. Interactions with conspecifics, other species, and the physical environment are treated as separate selection pressures for the evolution of intelligence. The kind of intelligence that is adaptive in social interactions may not be adaptive in other contexts (e.g., tool use), and visa versa. Similar views have appeared in the psychological literature (e.g., Ceci, 1990; Sternberg, 1985). The relative importance of various contexts in the evolution of intelligence(s) is therefore a substantive empirical issue. Two interesting possibilities are discussed by Byrne and Whiten (1988). In the first one, human intelligence is largely an adaptation for social interactions. Intelligence is often applied to other problems (e.g., tool use) but did not evolve to solve those problems. This distinction is important because it implies that human dealings with the nonsocial world will sometimes be inappropriate. For example, one might treat the weather as an animate being that responds to one's own actions, such as rain dances. In fact, almost all human societies have personified nature and attempted to socially interact with it. Alternatively, hu-

man intelligence could be a product of multiple-selection pressures acting on a common trait of intelligence or on a family of traits consisting of specialized intelligences (e.g., Sternberg & Ruzgis, 1994; Tooby & Cosmides, 1992).

Although Byrne and Whiten (1988) distinguished social intelligence from other forms of intelligence, they unfortunately did not distinguish between kinds of social intelligence. Humphrey's (1976) classic paper, entitled "The Social Function of Intellect," however, is sensitive to this possibility (see also De Waal, 1982, 1986). Humphrey appreciated the advantages of Machiavellianism, but he also emphasized other aspects of social intelligence that sound decidedly non-Machiavellian. He proposed that "the chief role of creative intellect is to hold society together" (p. 307), and he emphasized that "there are benefits to be gained . . . both from preserving the overall structure of the group and at the same time from exploiting and outmanoeuvring others within it" (p. 309). He spoke of the social system as a protective environment for its members and thought that interactions within the group are not entirely selfish but tempered by *sympathy*, which he defined as

a tendency on the part of one social partner to identify himself with the other and so to make the other's goals to some extent his own. The role of sympathy in the biology of social relationships has yet to be thought through in detail, but it is probable that sympathy and the "morality" which stems from it is a biologically adaptive feature of the social behaviour of both men and other animals—and consequently a major constraint on 'social thinking' wherever it is applied. (p. 313)

Clearly, Humphrey's (1976) vision of social life, as well as the intelligence that evolved from it, includes more than Machiavellianism as narrowly construed. Humphrey's article was the inspiration for Byrne and Whiten's (1988) edited volume, but somehow the term *Machiavellian intelligence* was broadened to include all aspects or forms of social intelligence. Although narrower than the definition of selfish gene, this definition of Machiavellianism is still too broad to be very useful. It also contrasts with the psychological literature on social intelligence, which if anything focuses too heavily on prosocial skills, that would be considered non-Machiavellian in the conventional sense (e.g., Cantor & Kihlstrom, 1987; Ford 1994; Ford & Tisak, 1983; Keating, 1978, 1984; Sternberg, 1985; Walker & Foley, 1973). We think that it is important to restrict Machiavellianism to a *subset of social intelligence*. The important question is, when does Machiavellianism succeed in competition with other forms of social intelligence that are less manipulative?

Machiavellianism as a Strategy in Game Theory Models

Evolutionary game theory (also called ESS theory for "evolutionarily stable strategy") is similar to economic game theory, except that the strategies compete in Darwinian fashion as opposed to being adopted by rational choice. If we can represent Machiavellianism as an explicit set of rules for social interactions, we can use evolutionary game theory to determine the fitness of Machiavellianism relative to alternative sets of rules.

The concepts of *trust*, *honor*, and *decency* all include an element of vulnerability that can be exploited, at least over the short term. It is therefore tempting to associate Machiavellian-

ism and its alternatives with defecting and cooperative strategies, respectively, in prisoner's dilemma models. This literature has been reviewed many times (e.g., Axelrod & Dion, 1988; Axelrod & Hamilton, 1981; Maynard-Smith, 1982), and therefore only the most salient aspects are presented here. Consider the two simplest strategies, always cooperate (C) and always defect (D), and the payoff matrix shown in Figure 1. The payoff values are arbitrary beyond their rank order but are included for illustrative purposes. Assume that individuals are dichotomous on this variable, with the types existing in frequencies p and $1 - p$, respectively. If the pairing of players is random, then the average payoff (or fitness) for each type is

$$W_C = (p)(3) + (1 - p)(0) = 3p$$

$$W_D = (p)(5) + (1 - p)(1) = 1 + 4p.$$

We expect cooperators to go extinct in this model because W_D is always greater than W_C . Now assume that interactions are non-random. Suppose cooperators can identify and preferentially associate with fellow cooperators, leaving defectors to interact with each other by default. The average payoff for each type is then $W_D = 1$ and $W_C = 3$, and the defectors go extinct. Dawkins (1976) and Fagen (1980) call this a *conspiracy of doves*.

Of course, this is not the end of the story but only the beginning of a coevolutionary race, involving evermore sophisticated forms of defection and guarded cooperation. In all cases, cooperators succeed to the degree that they can segregate themselves from defectors. Segregation can be accomplished in two basic ways. First, cooperators can avoid interacting with defectors, as in the conspiracy of doves example. However, if defectors cannot be identified before interaction, cooperators can be exploited at least once before avoidance is possible. Second, cooperators can continue interacting with defectors but withhold their cooperation if they are exploited (e.g., adopt the tit-for-tat [TFT] strategy that initially cooperates but thereafter imitates its associate's last move). In this case, cooperators continue to interact at random with defectors, but the act of cooperation becomes highly segregated (Michod & Sanderson, 1985). Notice that both forms of segregation require multiple interactions between individuals because the first interaction is required to

identify a defector. If defectors can be identified before the first interaction, for example, by observation or by word of mouth, then segregation is even easier to achieve (e.g., Maynard-Smith, 1982; see also Frank, 1988).

Some game theory models predict that all individuals should either cooperate or defect, depending on the parameter values. Other models predict a stable mix of cooperators and defectors that is maintained by frequency-dependent forces. These models are especially interesting because they might explain the coexistence of high-Machs and low-Machs in human populations. As one example, Dugatkin and Wilson (1991) considered a defecting strategy called "Rover" that competes with TFT in a population that is subdivided into a large number of groups. Rover enters a group and initially receives a high payoff by exploiting TFT in first-time interactions. The pool of "suckers" is gradually replaced by a pool of "sadder-but-wiser" TFTs, and there is an optimal point at which Rover departs to exploit another group. Some parameter values result in a stable mix of sedentary cooperators and mobile defectors (see also Dugatkin, 1992).

These models provide a number of testable hypotheses, as long as we are willing to associate Machiavellianism with defect. For example, the advantages of cooperation are usually long term, whereas the advantages of exploitation are usually only short term, that is, until the exploited individuals detect the exploiter and leave or retaliate. We might therefore expect high-Machs to have shorter relationships, on average, than low-Machs. If populations, vocations, or situations differ in the stability of relationships, we might expect to find correlated differences in the frequency of high-Machs or in the average Mach score. Moreover, low-Machs should suffer primarily from exploitation, whereas high-Machs should suffer primarily from retaliation. We might therefore expect differences in response to a key word such as *revenge*. All of these hypotheses are potentially testable.

Is it appropriate, however, to equate Machiavellianism with defect? Consider the following passage from *The Prince* (Machiavelli, 1531/1966):

It will be well for him to seem and, actually, *to be* [italics added] merciful, faithful, humane, frank and religious. But he should preserve a disposition which will make a reversal of conduct possible in case the need arises. (p. 63)

According to this passage, it is part of the Machiavellian strategy to be genuinely cooperative, trustworthy, and so forth when it is advantageous. Perhaps we should regard Machiavellianism as a kind of master strategy that includes both cooperative and defecting substrategies, plus a system of rules for when to use them. In principle, this master strategy could be so comprehensive that it would always bring about the right behavior in the right situation, returning one to the notion of Machiavellianism as the major factor in the evolution of intelligence. Although all individuals are probably flexible to some degree, this Olympian form of Machiavellianism probably exceeds human cognitive abilities. Most people are not master chess players and can only see one or two moves ahead of the game. Even master chess players can only see one or two moves ahead in the game of life, which is more complicated than the game of chess. Limited minds that view defection as a viable option may often use that option with unforeseen consequences. Limited minds that eschew defection as a matter of principle (or empathy) lose cer-

		Playing against	
		C	D
Fitness of	C	3	0
	D	5	1

Figure 1. Game theory payoff matrix with a cooperative (C) strategy and defecting (D) strategy. The fitness increment for each type depends on the type with which it interacts.

tain opportunities but may benefit from the conspiracy of doves. A diversity of coexisting strategies is probably a necessary consequence of "bounded rationality" (Simon, 1983). In any case, the degree to which individuals can switch from manipulative to nonmanipulative behaviors is an empirical question that we attempt to address below.

Machiavellianism and the State-Trait Continuum

When psychologists say that a behavior has a *biological* or *genetic* basis, they usually mean that the behavior is genetically predisposed and relatively inflexible—a *trait* as opposed to a *state* (or role, e.g., Kagan, Reznick, & Snidman, 1988). The relatively inflexible aspect of this meaning is too narrow. Organisms that live in variable environments frequently evolve flexible patterns of development that can produce a range of adaptive phenotypes. As one example, many aquatic invertebrates grow spines and other defensive armor in the presence of predators, which are sensed by chemical cues. One might conclude that the spines do not have a genetic basis because they are elicited entirely by an environmental stimulus. The entire pattern of phenotypic plasticity, however, including the phenotypes that are elicited and the detection of the triggering environmental stimuli, is genetically encoded (see Tooby & Cosmides, 1992, and Wilson, 1994, for general discussions of the relationship between adaptation, genetic variation, and phenotypic plasticity).

An evolutionary account of Machiavellianism therefore can span the entire range from inflexible traits to situation-specific states. Because the advantages of phenotypic plasticity are manifest, we can expect plasticity to evolve unless there are counterbalancing costs. Two conjectures about the costs and benefits of plasticity are described here to illustrate the way that evolutionists think about the problem. Frank (1988) proposed that emotions evolved as commitment devices that influence the behavior of others. For example, Jones might be tempted to steal \$100 from Smith if Jones knows that it will cost Smith \$300 to prosecute. However, Jones will reconsider if Jones thinks that Smith will become irrationally angry and pursue Jones to the ends of the earth. Similarly, people who are emotionally incapable of hurting others may be exploited and may miss opportunities for exploiting others, but they are also eagerly sought after by other doves who know that they (the doves) will not be exploited. In both of these cases, the short-term costs of apparently irrational behavior yield long-term benefits by their effects on the behavior of others. To qualify as commitment devices, however, the emotional dispositions must fall on the trait end of the state-trait continuum. Frank predicts that frequency-dependent forces maintain both emotionally committed types and emotionally uncommitted, more calculating types in the population. Obviously, Frank's theory is directly relevant to Machiavellianism and its alternatives.

As a second conjecture, Wilson and Yoshimura (1994) and Wilson (1994) regarded flexible genotypes as developmental generalists that are "jacks" of all phenotypes but masters of none. Developmentally canalized genotypes (traits) outcompete developmentally plastic genotypes (states) in constant environments. In fluctuating environments, however, natural selection can favor a complex mix of developmental specialists and generalists. In other words, the same behavior that can re-

flect a trait in some individuals can reflect a state in others. This model was inspired, in part, by the psychological literature on shyness and boldness in humans, which seems to arise from strong genetic predispositions in some individuals but not in others (Kagan et al., 1988). Thus, there may be no single answer to the question of states versus traits.

Specific Evolutionary Hypotheses

In addition to providing a general framework for thinking about Machiavellianism, evolutionary theory can be used to generate a large number of more specific hypotheses. For example, when mechanisms of segregation are effective, doves replace hawks and groups become corporate entities with a common purpose and a minimum of subversion from within (Wilson & Sober, 1994). If groups interact with other groups, however, the problems of cooperation and defection appear all over again at a higher level. Humans frequently restrict prosocial behaviors to members of their own group, while openly exploiting other groups. We might therefore expect individuals to follow a double standard, displaying genuine loyalty to members of their own group, while attempting to manipulate members of other groups. Machiavellianism might be especially encouraged in leaders who are responsible for conduct toward other groups. The concept of Machiavellianism as a strategy of conduct toward other groups is close to the spirit of Machiavelli himself, who combined his manipulative political ways with genuine loyalty toward his own city. More important, we can make specific predictions about the propensity to manipulate others as a function of their in-group versus out-group status. In the same fashion, we can develop specific hypotheses to predict the effects of genetic relatedness, age, gender, and situational factors on the adaptedness of Machiavellianism. Some of these more specific hypotheses are presented, along with the relevant data from the psychological literature, below.

Our review of the evolutionary literature on Machiavellianism can be summarized as follows: One possibility is that the ability to manipulate others is the defining feature of social intelligence, which in turn was the major selective force in the evolution of human intelligence. However, this is a relatively one-dimensional view in which "more" manipulative is better than "less" manipulative. Evolutionary game theory offers an alternative view in which more manipulative is better in some situations but worse in others, leading to a diversity of social strategies in human life. Whereas a single master strategy that would always bring about the right behavior at the right time is possible in principle, it is probably beyond the cognitive abilities of humans, who therefore must specialize on a subset of social strategies, leading to individual differences in Machiavellianism. The question of where manipulative social strategies fall on the state-trait continuum is an important issue, but the entire spectrum from inflexible traits to highly labile states falls within the evolutionary framework. In addition to these general points, a large number of more specific hypotheses can be developed to predict the adaptedness of Machiavellianism versus less-manipulative social strategies in specified situations.

Psychological Literature

Our analysis of the psychological literature is based on reviews by Christie and Geis (1970a), Vleeming (1979), and 265

articles published during 1972–1994 that were obtained by entering the key word *Machiavellianism* into the computerized reference service *PsycLIT*. The abstracts of these articles were downloaded from *PsycLIT* and converted into a single text file. We systematically searched this database by using the find function on our word processor to locate key words such as *intelligence*, *deception*, and so on. Articles located by the key words were then read in full, along with other pertinent articles that they referenced. This method is not exhaustive, but it has the virtue of being a relatively unbiased sampling procedure.

Machiavellianism, Intelligence, and Success in the Real World

As outlined above, the evolutionary literature sometimes gives the impression (a) that human intelligence is primarily an adaptation for social interactions and (b) that social intelligence is a one-dimensional concept that involves the ability to manipulate others. It is often unclear whether *manipulation* is being defined in the conventional sense or so broadly that it becomes tautological, a synonym for “anything that evolves.” If we adopt the conventional definition, then we might expect a positive correlation between Machiavellianism and measures of general intelligence. The psychological literature does not support this hypothesis. At least nine studies have related Machiavellianism to a variety of intelligence measures, such as IQ, grade point average, the Digit Span Test, and so forth, and all nine have not found a correlation (Table 1). This is one of the most consistent results that emerges from the Machiavellianism literature.

It is possible that measures of general intelligence such as IQ do not correlate with Machiavellianism because they themselves do not correlate very highly with success in everyday life. We therefore used keywords, such as “*achieve*, *success*, *status*, and *income*,” to locate studies that relate Machiavellianism to more practical measures of success in modern social environments (Table 2). Once again, there is no evidence that high-Machs consistently outperform low-Machs. There is apparently no correlation between Machiavellianism and success in sales jobs (Turnbull, 1976), marketing

Table 1
Studies That Relate Machiavellianism to Measures of General Intelligence

Correlation	Measurement	Reference
None	IQ	Christie & Geis (1970b)
None	IQ	Christie & Geis (1970b)
None	Verbal ability test	Christie & Geis (1970b)
None	General classification test	Christie & Geis (1970b)
None	MCAT	Christie & Geis (1970b)
None	Moore–Castore test	Singer (1964)
None	Guilford–Zimmerman test	Wrightsmen & Cook (1965)
None	Digit span	Steininger & Colsher (1979)
None	GPA	Ames & Kidd (1979)

Note. The first seven studies are reviewed by Christie and Geis (1970a, pp. 36–37). The two IQ tests were performed on separate samples of 115 college students and 218 preparatory school students, respectively. MCAT = Medical College Admissions Test; GPA = grade point average.

Table 2
Studies That Relate Machiavellianism to Measures of Success in Employment Situations

Correlation	Measurement	Reference
None	Sales success	Turnbull (1976)
None	Rank–tenure of college professor	Hollan (1975)
None	Job performance (marketing)	Gable & Martin (1982)
None	Job performance (marketing)	Hunt & Chonko (1984)
Negative	Student rating	Biggers (1977)
Negative	Job satisfaction	Gable & Topol (1987)
Negative	Job satisfaction	Hollan (1983)
Negative	Job satisfaction	Richford & Fortune (1984)
Negative	Stockbroker (structured environment)	Shultz (1993)
Positive	Stockbroker (unstructured environment)	Shultz (1993)
Negative	Income (low education)	Turner & Martinez (1977)
Positive	Income (high education)	Turner & Martinez (1977)

Note. *Positive* and *negative* refer to a statistically significant positive correlation and negative correlation between the measure and score on the Mach test. Two studies (Shultz, 1993; Turner & Martinez, 1977) showed that high-Machs are more successful in some situations but less successful in others.

jobs (Hunt & Chonko, 1984), or among college professors (Hollan, 1975). The most consistent trend is an inverse correlation between Machiavellianism and job satisfaction for a variety of professions. The only two studies that found a positive correlation between Machiavellianism and real-world success also found the advantage of Machiavellianism to be context sensitive. Turner and Martinez (1977) found a positive correlation between Machiavellianism and income for highly educated men but a negative correlation for poorly educated men. Shultz (1993) showed that high-Mach stockbrokers succeed in some organizational structures but not in others (described in more detail below).

The fact that Machiavellianism does not correlate with intelligence or real-world success in modern environments does not necessarily mean that these variables were uncorrelated in ancestral environments or that the ability to manipulate others did not contribute to the evolution of human intelligence (see Cosmides & Tooby, 1992, and Wilson, 1994, for discussions of the relationship between adaptation, phenotypic variation, and heritability). Thus, the one-dimensional view that more manipulative is better than less manipulative cannot be decisively rejected, but it receives no support whatsoever from the psychological literature.

Machiavellianism as One of Several Strategies of Social Conduct

The absence of correlations in Tables 1 and 2 contrasts sharply with the results of psychology experiments in which high-Machs frequently outperform low-Machs in short-term social interactions. Moreover, even though high-Machs are not

more intelligent than low-Machs, they are perceived by their peers as more intelligent and attractive (Cherulnik, Way, Ames, & Hutto, 1981). High-Machs take center stage and adopt leadership roles in small-group situations (Bochner, di Salvo, & Jonas, 1975; Geis, 1968; Okanes & Stinson, 1974; Rim, 1966), they easily beat low-Machs in bargaining and alliance-forming situations (Christie & Geis, 1970a, 1970b), and so on. Christie and Geis concluded that high-Machs are especially likely to succeed in competitive psychology experiments if three conditions are met: The experiments (a) involve face-to-face interactions, (b) allow room for innovation, and (c) involve situations that are emotionally charged (high in "irrelevant affect"), which tends to distract low-Machs more than high-Machs. These results are highly replicable and suggest that Machiavellianism is an important axis of behavioral variation in humans. Why, then, are the advantages of manipulation that are so easy to demonstrate in the laboratory not manifested in the real world? One possibility is that high- and low-Machs do not behave differently in the real world, even though they do in laboratory experiments. Another possibility is that high- and low-Machs do behave differently in the real world, but the consequences are so context sensitive that they tend to cancel each other out when the contexts are not distinguished. To demonstrate the consequences of Machiavellianism in the real world, it is therefore necessary to identify social environments in which high-Machs and low-Machs are especially likely to succeed.

Only one study in Table 2 was designed to identify the situational factors that might allow high-Machs to succeed in the real world. Shultz (1993) studied the sales performance of stockbrokers from companies that differed in their organizational structure. NYNEX is a tightly structured, rule-bound corporation that allows little room for improvisation. Employees are required to abide by a two-volume sales manual, they are assigned potential clients, and it is virtually impossible to manipulate transactions to affect commissions. In contrast, corporations such as Merrill Lynch and Shearson, Lehman and Hutton are loosely structured and encourage wheeling and dealing by their representatives. Employees are provided with a brief "suggestion pamphlet" rather than a sales manual, their pool of clients is unlimited, and ample opportunities exist to manipulate commissions. This corporate structure is closer to the conditions that allow high-Machs to succeed in short-term laboratory experiments. Shultz split the distribution of Mach scores at the median to define high-Mach and low-Mach categories. In loosely structured organizations, high-Machs had more clients and earned twice as much in commissions than low-Machs. In tightly structured organizations, low-Machs earned twice as much as high-Machs. Note that high-Machs cannot be regarded as master strategists who behave appropriately in all situations, or else they would have fared as well as low-Machs in the tightly structured organization.

Shultz's (1993) study demonstrates that individual differences in Machiavellianism, as measured by the Mach test, can have profound consequences in the real world, as they do in short-term laboratory experiments. However, it is necessary to distinguish among contexts because Machiavellianism is only one of numerous strategies of social conduct that succeeds in some situations and fails in others. Although this point was appreciated by Christie and Geis (1970a) and Vleeming (1979)

on the basis of short-term laboratory experiments, it was evidently not appreciated by most of the authors listed in Table 2, who attempted to study the real-world consequences of Machiavellianism without distinguishing among contexts. Future studies should emulate Shultz's by identifying situational factors from the beginning. We now describe how evolutionary game theory offers a rich source of hypotheses about which situational variables are likely to be relevant.

Machiavellianism as a Social Strategy That Is Quick to Defect

Our main hypothesis is that Machiavellianism is similar to a defect strategy in evolutionary game theory, which is relatively quick to exploit more cooperative social strategies without provocation. We do not expect high-Machs to defect under all circumstances, but we do expect them to perceive defection as a viable option, to be more skilled at the art of defection, and to use it in a greater range of social situations than low-Machs.

Participants who score high on the Mach test are explicitly acknowledging their willingness to manipulate others for personal gain. In this sense, our hypothesis appears tautological. However, paper-and-pencil tests are often criticized for not representing behavior in the real world. Therefore, it is important to demonstrate the willingness and ability of high-Machs to actually exploit others and the specific circumstances that cause them to do so.

Evidence that high-Machs are more willing to manipulate others against their interest. There is little doubt that high-Machs actually are more likely to use exploitative tactics, at least in laboratory situations (Harrell, 1980; Harrell & Hartnagel, 1976; Hegarty & Sims, 1979; Vecchio & Sussmann, 1991). For example, Harrell and Hartnagel gave high- and low-Machs an opportunity to steal in a worker-supervisor situation. In one treatment, the supervisor was overtly suspicious that the worker would steal and monitored his or her behavior periodically during the session. In another treatment, the supervisor was more trusting and announced that he or she did not need to monitor the behavior of the worker. The majority of all workers stole from the distrustful supervisor (95% of high-Machs stole an average of \$0.81, 86% of low-Machs stole an average of \$0.92, the differences between high- and low-Machs not being significant). However, high-Machs were much more likely to steal from the trusting supervisor and also stole greater amounts than low-Machs. Specifically, 81% of the high-Machs stole an average of \$1.01, whereas 24% of the low-Machs stole an average of \$0.25. Both of these differences between high- and low-Machs were highly significant. High-Machs tended to conceal their theft and to deny stealing when questioned by the distrustful supervisor. Low-Machs were more righteous about their behavior and in some cases stole openly and challenged the distrustful supervisor to "do something about it." This experiment can be nicely interpreted in game theoretic terms. Low-Machs seemed to be guided by a TFT strategy in which the distrustfulness of the supervisor is perceived as an act of defection that calls for overt retaliation. High-Machs seem to be guided by a defect strategy that allows exploitation as a "first-strike" option.

Another study by Harrell (1980) showed that high- and low-Machs differ not only in their willingness to manipulate others

but also in the specific conditions that cause them to do so. Female participants observed a confederate steal money from them. When accused of stealing, the confederate either expressed or did not express remorse. The participants were then given an opportunity to punish the confederate. High-Machs punished remorseful confederates more than did low-Machs, in part because high-Machs were more suspicious of the remorseful confederate's sincerity. Low-Machs actually punished non-remorseful confederates more than did high-Machs, presumably because they were more offended by the breach of a social convention. Once again, the behavior of low-Machs seems to approximate a TFT strategy that includes both retaliation and forgiveness.

If high-Machs are more likely to exploit others, they should also be less likely to help others in ways that do not advance their own self-interest. This prediction is broadly confirmed by the literature. Machiavellianism is negatively correlated with scores on empathy tests (e.g., Barnett & Thompson, 1985), and high-Machs are less likely to help others in simulated emergency situations (Wolfson, 1981).

High-Machs should not be regarded as complete scoundrels, however, and often they only bend rules without breaking them. For example, Geis (1970) had high-, medium-, and low-Machs play a board game that allowed the formation of coalitions. Two players could team up to beat the third player and divide the winnings. Players bargained with each other to form a coalition and to determine how the winnings would be divided (e.g., 50-50 or 70-30). Coalitions could be formed and broken throughout the game. For example, one might agree to a 20-80 split between oneself and another player to form a coalition and then late in the game break the coalition to earn all the winnings. High-Machs were very successful at winning this game, but even they refrained from certain unscrupulous tactics. In particular, 7 low-Machs who formed a coalition extracted a promise from their partner not to break the coalition. In all cases, the low-Machs behaved as if they had implicitly made the same promise. In contrast, 4 high-Machs extracted a similar promise from their partner, and in all four cases, they themselves later broke the coalition. After all, they had not promised! However, all high-Machs who promised not to break a coalition kept their promise, even when it was against their (short-term) self-interest. They bent social rules but did not break them.

Just as high-Machs should not be regarded as complete scoundrels, low-Machs should not be regarded as paragons of social virtue. Despite their agreement with statements on the Mach test such as "There is no excuse for lying to someone else," low-Machs frequently do lie, cheat, and perform other unethical acts in experiments that are designed to elicit these behaviors (Christie & Geis, 1970a, p. 298 and references therein). For example, Exline, Thiabaut, Hickey, and Gumpart (1970) had participants perform a task with a partner (a confederate) who started to cheat and encouraged the participant to collaborate. The participants could resist cheating at a variety of levels: by attempting to stop their partner, by terminating the experiment, by reporting their partner to the experimenter, or by quickly confessing when the experimenter became suspicious at the end of the experiment. In fact, nearly all participants allowed themselves to become implicated in the unethical act, regardless of their Mach score.

Similarly, Bogart, Geis, Levy, and Zimbardo (1970) had a socially attractive confederate (a supposedly distinguished graduate law student) and a socially unattractive confederate (a student who supposedly scored poorly on a personality test) attempt to persuade participants to cheat on a task. An equal proportion of high- and low-Machs cheated, but high-Machs were more discriminating, cheating primarily in association with the socially attractive confederate. These and other studies suggest that the low-Mach's sense of ethics is confined to his or her immediate associates, as opposed to larger and more abstract entities such as society. Low-Machs refrain from initiating unethical acts, but they actively cooperate when encouraged by a partner. Low-Machs are evidently motivated by an emotional involvement with the partner per se, whereas high-Machs are emotionally detached and motivated more by the strategic consequences of the action (see also Cooper & Peterson, 1980).

Evidence that high-Machs are better at manipulating others. In addition to being more willing to manipulate others, there is abundant evidence that high-Machs are also better at the art of manipulation, at least in short-term, face-to-face interactions. The evidence is especially strong for manipulative tactics that are socially acceptable, such as bargaining and competition for social influence (see Christie & Geis, 1970b). The evidence for socially unacceptable forms of manipulation, such as deliberately lying, is more complex. At least two studies have shown that high-Machs are more believable liars than low-Machs, as rated by independent judges (Exline et al., 1970; Geis & Moon, 1981; see also Berger, 1977; Christie & Geis, 1970a, p. 298). In the Exline et al. study described above, the participant and the confederate were interviewed by the experimenter, who became increasingly suspicious that they had cheated on their task. High-Machs maintained greater eye contact than low-Machs, confessed less often, and were rated as more plausible liars by independent judges. Geis and Moon videotaped participants denying knowledge of a theft. Half of the participants were directly implicated in the theft, whereas the other half made the denial truthfully. Lying high-Machs were as convincing as truthful high-Machs, whereas lying low-Machs were less believed than truthful low-Machs.

However, no differences in the lying abilities of high- and low Machs were found in studies that examined pupillary response (Janisse & Bradley, 1980), a polygraph test (Oksenberg, 1964), and a variety of nonverbal behaviors (O'Hair, Cody, & McLaughlin, 1981). One study even showed that lying high-Machs are more easily detected on the basis of pulse rate and skin resistance (Bradley & Klohn, 1987). These results can be interpreted in two ways. First, the high-Mach's ability to deceive others might be relatively superficial and might not extend to basic physiological processes, such as pupillary response, pulse rate, skin resistance, and subtle body language cues. Second, Exline et al. (1970) and Geis and Moon (1981), who obtained credible lying in high-Machs, actually caused their participants to perform unethical acts, giving them a strong incentive to lie. In the studies that obtained subtle but detectable signs of lying in high-Machs, participants were simply assigned the task of lying by the experimenter, which may not have provided a sufficiently strong incentive to lie effectively. It is therefore important in future studies to examine physiological and body

language differences between high- and low-Machs in situations where there is a strong incentive to lie.

Consequences of Machiavellianism in long-term interactions. In evolutionary game theory, cooperative strategies are favored in long-term interactions that allow the cooperators to avoid or retaliate against defectors. One of the most fundamental predictions we can make, therefore, is that high-Machs will fare poorly in long-term interactions or succeed only by becoming cooperative. Astonishingly, we cannot find any studies in the literature that test this prediction. A few studies have a game theory orientation (e.g., Christie, Gergen, & Marlowe, 1970; Hussy, 1979; Marin, 1973; Martinez, 1981; Whalin, 1967; Wrightsman, 1966), but they do not directly compare the behavior of high- and low-Machs in single versus repeated games. Most authors do not even seem to recognize the potential for repeated interactions as an important variable. Christie and Geis (1970a, p. 342) discussed the issue only briefly and seemed to expect high-Machs to perform as well in long-term as in short-term interactions. Given this regrettable lack of information, we are forced to speculate on the basis of the results of a few studies that are only tangentially relevant.

Many jobs can be regarded as examples of long-term structured relationships with little potential for exploitation. The fact that high-Machs tend to score low in job satisfaction (see Table 2) perhaps reflects an inability to use their skills as manipulators. In the board game described on p. 291 (Geis, 1970), each participant played six games, two of which were with the same partner. Geis briefly speculated that this minimal degree of repeated interactions may have caused the high-Machs to exhibit the modest scruples that they demonstrated. Martinez (1981), using the same board game, informed participants that they would play only once but then had them play four times with the same partners. High-Machs were most successful during the first round, but subsequent rounds seemed to reflect a pattern of retaliation. It would be interesting to conduct a modified version of this experiment in which knowledge that the game would be repeated is incorporated into the experimental design as a treatment effect.

High-Machs are often described as charmers by the psychologists who study them, and they are usually rated as more socially attractive than low-Machs by other participants who have just met them (Cherulnik et al., 1981; but see Blumstein, 1973, and Novgorodoff, 1974, for complicating situational factors). If high-Machs are social manipulators, however, we should expect their charming exterior to disguise motives that would be socially unattractive if they were revealed. One way to strip away the veneer is with the use of projective tests that invoke a different response than face-to-face social interactions. Near, Wilson, and Miller (1995) had high- and low-Machs write stories in the first-person singular about someone who has been washed up on a desert island with two other people of the same sex. Participants were asked to write about the events that take place on the island, with special emphasis on the relationships that form among the three people. Stories written by high- and low-Machs were then read by other participants, who evaluated the personalities of the main characters. The readers also filled out a Mach test as they thought the main character of each story would fill it out. The Mach scores for the main characters correlated strongly with the Mach scores of the writers. In addition, the

main characters of high-Mach writers were judged to be more selfish and manipulative and less desirable for most kinds of social interactions than the main characters of low-Mach writers. High-Machs may be charming in short-term, face-to-face interactions, but evidently they do not think to apply their social veneer to the main character of their stories. The suggestion is that the social veneer will also wear off as real relationships progress and that high-Machs will actually exploit their partners, but this conjecture obviously needs to be tested directly. There is a great need for studies of Machiavellianism in short-term versus long-term relationships.

To summarize, the psychological literature offers some support for the idea that high-Machs approximate a defect strategy that is specialized to exploit others without provocation, whereas low-Machs approximate a TFT strategy that includes elements of retaliation and forgiveness. However, virtually all of the evidence must be pieced together from studies that were designed for other purposes and therefore falls far short of a definitive test. Future empirical studies should be based explicitly on evolutionary game theory that provides a powerful framework for modeling the interactions among multiple social strategies.

Machiavellianism and the State-Trait Continuum

Very little is known about the phenotypic stability of Machiavellianism, much less its genetic heritability. Machiavellianism appears to be lower in first-born offspring (Gupta, 1986, 1987; Tripathi & Sinha, 1981), lower in people from villages than cities (Gupta, 1986), and lower in cultures such as China that discourage individualism (Okane & Murray, 1982; Oksenberg, 1971; but see Kuo & Marsella, 1977). These studies suggest that Machiavellianism is not a fixed property of individuals but can be modified on the basis of experience (although strictly speaking, the difference between cities and towns and between cultures could be genetic).

Wardle and Gloss (1982) administered the Mach test to participants both before and after they were given an opportunity to lie. The Mach scores shifted upward for those that yielded to the temptation and downward for those that resisted the temptation. However, most of the experiments that we reviewed were conducted on participants that took the Mach test several weeks before the experimentation, so Machiavellianism appears to be phenotypically stable at least over this limited time scale. Thus, it seems that Machiavellianism does not appear to sit at either extreme of the state-trait continuum, and it would be naive to expect otherwise. We can find only one study that examines phenotypic stability of Machiavellianism over intermediate time scales. Dien and Fujisawa (1979) gave the Mach test to both parents and offspring when the offspring were 4 years old and again when they were 7 years old. The children's Mach scores were not phenotypically stable but rather varied in a complex fashion that differed for boys and girls and reflected parent-offspring interactions during development. Dien and Fujisawa implied that the Mach scores of the parents were phenotypically stable over this period but did not actually provide data to support this conclusion.

Although the Mach test has not been used in behavior genetics studies that are designed to measure heritability, other traits

such as altruism and empathy, which are supposedly heritable on the basis of twin studies (Rushton, Fulkner, Neal, Nias, & Eysenck, 1986), correlate negatively with Machiavellianism (Rushton, Chrisjohn, & Fekken, 1981). Some psychologists distinguish between primary and secondary sociopaths, who differ in the degree to which their behavior can be explained by environmental factors (Mealey, 1995). It is reasonable to expect a similar distinction for Machiavellianism, which correlates with measures of sociopathy (Allsopp et al., 1991; Skinner, 1988; Smith & Griffith, 1978). Parent-offspring correlations in Machiavellianism appear to change with offspring age. Two studies show that young children (less than 6 years) of high-Mach parents tend to be *low*-Mach (Dien, 1974; Dien & Fujisawa, 1979); perhaps they are being successfully manipulated to comply with their parent's wishes. Two studies show a positive parent-offspring correlation for older children (12-17 years; Kraut & Price, 1976; Ria & Gupta, 1989), but Touhey (1973) found no correlations for college-age children, concluding that Machiavellianism is acquired outside the family. To summarize, the literature sheds little light on Machiavellianism and the trait-state continuum, apart from excluding the extremes of completely innate and completely labile.

Specific Evolutionary Hypotheses

Earlier we stated that evolutionary theory can be used to generate a large number of specific hypotheses about the influence of factors such as in-group versus out-group status, genetic relatedness, age, and gender on Machiavellianism. We conclude our review of the psychological literature by framing some of these hypotheses and reviewing relevant data.

Machiavellianism in groups. The dynamics of Machiavellianism in group situations are expected to be complex. To the extent that low-Machs are cooperators, they should outperform high-Machs in group situations that require coordinated action, subordination of individual interests to shared goals, and so on. However, the same manipulative skills that allow high-Machs to beat low-Machs within groups may also allow groups containing high-Machs to outcompete other groups. We therefore expect a double standard in which Machiavellianism is disapproved *within* groups but tolerated or even encouraged *between* groups. In the Near et al. (1995) study described above, participants were asked to rate the main character of each story as partners in a variety of relationships, most of which involved a potential for exploitation (e.g., roommate or business partner). However, one relationship was a "member of a debating team," in which manipulative skills are obviously directed against other groups and would not be applied within groups. This was the only relationship for which affiliation with high-Machs was rated more desirable than with low-Machs.

We could find only eight studies that examined the effect of Machiavellianism on group-level performance. Groups led by high-Machs were superior in some cases (Geis, 1968; Jones & White, 1983) but not in others (Drory & Gluskinos, 1980; Gleason, Seamen, & Hollander, 1978; Jaffe, Nebenzahl, & Gotesdyner, 1989; Oksenberg, 1968). Fry (1985) showed that diads composed of 1 high-Mach and 1 low-Mach were less able to achieve a jointly desirable solution than diads composed of pure high-Machs or pure low-Machs. There are indications that these equivocal results

can be explained by context-dependent factors. For example, the group task provided by Oksenberg (1968) was highly structured, and high-Machs found it less enjoyable than did low-Machs (see also Jones, 1989). Clearly, studies of group-level performance are needed in which factors such as group task, between-group competition, and potential for exploitation within groups are varied as part of the experimental design.

Genetic relatedness. If Machiavellianism frequently results in the exploitation of others, then individuals should be less Machiavellian toward genetic relatives and reciprocators than toward strangers. Barber (1994) recently tested this hypothesis by modifying the Mach test to refer to conduct toward specific categories of people such as "family members," "friends," and so on. On average, participants indicated a lower degree of Machiavellianism toward family members and friends than toward people in general. However, there were no differences between the categories of friends and family members, or among finer degrees within friendship or within genetic relatedness.

Age. Daly and Wilson (1988) showed that the propensity to commit homicide varies with age, peaking in young adulthood for men. If we regard homicide as the ultimate manipulation, we might expect similar trends with age for Machiavellianism. This prediction appears to be confirmed in a variety of studies. Machiavellianism increases with age up to late adolescence (Gupta, 1986, 1987) and declines thereafter (Gupta, 1986; Hunt & Chonko, 1984; Mudrack, 1989; Murray & Okanes, 1980; but see Edelman, 1966).

Gender. Most studies of Machiavellianism that include male and female participants find gender differences. Generally, the distributions of Mach scores for male and female participants are broadly overlapping with the mean slightly lower for female participants (exceptions are cited below in *Multiple strategies within the genders*). More important, the correlations between Mach score and behavior in subsequent tests are usually stronger or different in male than in female participants (Allsopp et al., 1991; Brown & Guy, 1983; Dingle-Duhon & Brown, 1987; Domelsmith & Dietch, 1978; O'Conner & Simms, 1990; Rosenthal, 1978; Van Strien, Dukkers, & Van der Kamp, 1982). According to Christie and Geis (1968), "With but one or two exceptions, no studies have found predicted relationships between agreement with Machiavelli[anism] and predicted or other behavior among female subjects, but these are almost invariably found among male subjects" (p. 963). Although the literature since 1968 does not warrant such a strong statement, several authors still conclude that the entire construct of Machiavellianism is more appropriate for men than for women (e.g., Brown & Guy, 1983; Rosenthal, 1978).

Evolutionary psychologists have made numerous predictions about gender differences in reproductive strategies (Buss, 1992), spatial abilities (Gaulin & Hoffman, 1988), risk taking (Daly & Wilson, 1988), and other traits. We have found it difficult, however, to think of compelling predictions about gender differences in Machiavellianism. It would be naive to think that women are simply more nurturing and therefore less Machiavellian than men (Gruber & White, 1986; Winter, 1988). Women have had ample reasons and opportunities to manipulate others throughout their evolutionary history (Hrdy, 1981). The female manipulator is a common stereotype

(Gruber & White, 1986). We must therefore make predictions about gender differences in style of manipulation, in addition to differences in extent. We tentatively offer the following hypothesis.

Male-male interactions are frequently characterized by overt power struggles and short-term alliances. A vanquished man passes from the scene to be replaced by another contender. Today's ally becomes tomorrow's opponent. These kinds of male-male interactions characterize not only humans but many primate species (De Waal, 1982) and likely have operated throughout human history. Female-female interactions are often characterized by more long-term interactions, frequently but not always, among genetic relatives. The interactions are often competitive, but the participants remain with each other to interact again no matter what the outcome. In most human societies, women are also less likely to use physical violence and must get their way by other and often more subtle means. The same differences that characterize male-male and female-female interactions may also characterize male-female interactions. Men are more likely to openly manipulate women, often with violence or threat of violence, whereas women may manipulate men in more subtle ways that include deception. We are tempted to invoke the biological concept of mimicry to explain Machiavellianism in women. Perhaps female manipulators must appear, like low-Machs, to be attractive for long-term relationships (Novgorodoff, 1974) and must maintain this facade while they manipulate over the long term. As we have seen, the charm of high-Mach men can also be viewed as a form of mimicry, but one that is often dropped relatively quickly in favor of overt manipulation. The concept of mimicry might explain the positive correlation between Machiavellianism and self-disclosure that is observed more consistently in women than in men. High-mach women are more willing than low-mach women to reveal information about themselves and to become intimate in conversations with others that they have recently met (Brown & Guy, 1983; Domelsmith & Dietch, 1978; O'Conner & Simms, 1990; but see Dingler-Duhon & Brown, 1987, for context-specific factors in men). Perhaps the con-woman must play a different game than the con-man, which is more difficult to measure with paper-and-pencil tests and short-term laboratory experiments.

Multiple strategies within the genders. The same reasoning that allows us to predict differences between men and women also can be used to predict strategic differences within a gender. For example, women might adopt an overtly Machiavellian strategy in situations that require malelike interactions. Indeed, studies of business executives show either no gender difference (Okanes & Murray, 1980) or a reverse difference in average Mach score (i.e., women score higher than men; Burnett, Hunt, & Chonko, 1986; Chonko, 1982; Gable & Topol, 1987; Hunt & Chonko, 1984). Women apparently behave like men in a man's world, either by a process of selection or individual change. Similarly, men who are subordinate in a dominance hierarchy, and likely to stay that way, are in a position similar to women and might be correspondingly subtle in their styles of manipulation.

It would be especially interesting to relate Machiavellianism to alternative reproductive strategies in men and women. Some men seem to pursue a strategy that maximizes their investment in offspring whereas others attempt to maximize

the number of fertilized women (Buss & Schmitt, 1993). Women also have alternative reproductive strategies that are predicated on the amount of investment they can expect from men (Draper & Harpending, 1982). Because these alternative strategies differ in important variables, such as the average length of a relationship, we might anticipate associated differences in Machiavellianism.

Although these subtleties have not been addressed in the Machiavellianism literature, the related concept of *self-monitoring* provides relevant information. A self-monitoring scale that distinguishes between individuals "whose social behavior is particularly responsive to situational and interpersonal cues (high self-monitoring)" from individuals "whose actions typically reflect underlying attitudes, dispositions and other personal attributes (low self-monitoring)" has been developed by Snyder and Simpson (1984, p. 1281). Snyder and Simpson found that high self-monitors were more willing to terminate current relationships in favor of other partners and had a history of more and shorter relationships than low self-monitors. However, the relationship between self-monitoring and Machiavellianism is complex. The high self-monitor sounds like a high-Mach, but the correlation between scores on the two scales are either not significant (Snyder, 1974) or only weakly positive (Ickes, Reidhead, & Patterson, 1986). Perhaps the relationship between the two scales can be clarified by distinguishing between styles of self-monitoring. For example, Ickes et al. distinguished between a self-oriented "assimilative" style and an other-oriented "accommodative" style, which can be identified by measuring the relative frequency of first-person pronouns versus third-person pronouns used in conversation. In future research, it will be important to distinguish between styles of impression management and to examine the relationship of Machiavellianism *per se* on mating strategies.

Barber and Raffield (1994) recently predicted that individuals should be more manipulative toward members of the opposite gender than toward members of their own gender. Accordingly, they modified the Mach test to refer to conduct toward men and women. As predicted, men were highly manipulative toward other men but even more manipulative toward women. Women were even more manipulative toward men than men were to each other but were relatively nonmanipulative toward women. This study, plus the previous study by Barber (1994) on relatedness, illustrates the importance of studying Machiavellianism as a context-sensitive trait.

Discussion

At its best, science is a feedback process in which a theoretical framework provides testable hypotheses and experiments provide results that are used to modify the framework. The literature on Machiavellianism falls far short of this ideal. The problem begins with an almost total lack of communication between those who emphasize theory (including evolutionary biologists) and those who emphasize experiments (personality and social psychologists). We hope that this review helps to bring these two disciplines together, and we offer the following comments to improve the feedback process.

Evolutionary Biology

As we discussed earlier, two broad theoretical frameworks exist in evolutionary biology for understanding Machiavellianism. In the first, the ability to manipulate others is treated as always adaptive and a primary force in the evolution of human intelligence. Within this framework, it is often unclear whether *manipulation* is being defined in the conventional sense or so broadly that it becomes tautological, a synonym for anything that evolves. The conventional definition leads to the prediction that Machiavellianism should correlate with measures of intelligence or measures of real-world success. The psychological literature provides no support whatsoever for this hypothesis. Machiavellianism is a social skill of sorts, but not one that correlates with measures of general intelligence or consistently leads to social success, at least in modern environments. This is an important empirical result and should be recognized as such by evolutionary biologists. It weighs against the one-dimensional view of Machiavellianism, even if it does not decisively refute it.

The second theoretical framework treats Machiavellianism as one of several social strategies that compete with each other in Darwinian fashion. By this, we mean that the most successful strategy in any particular situation becomes phenotypically common. The specific mechanism that causes the strategy to become common could be genetic evolution, cultural change, or individual learning (see Boyd & Richerson, 1985; Tooby & Cosmides, 1992; and Wilson, 1994, for discussions of the proximate mechanisms that can underlie the expression of biologically or culturally adaptive behaviors). Machiavellianism has obvious advantages, but it also has costs, mostly in the form of retaliation and avoidance by others, that allow less manipulative strategies to prevail in at least some situations.

The psychological literature does not provide a definitive test of this hypothesis, but it does provide some encouragement. High-Machs do appear more willing and more able to exploit others, and low-Machs do appear to behave in ways that resemble the TFT strategy of game theory. The fact that the high-Machs's charm disappears in a projective test (Near et al., 1995) suggests that they are pursuing a con-man strategy. However, almost all the evidence for the game theory perspective has come from empirical studies that were designed for other purposes. More explicit empirical tests of the predictions of game theory are needed, and we have suggested several during the course of our review.

Although the game theory framework seems to be on the right track, it only begins to address the diversity and sophistication of human social strategies. We have already speculated about varieties of Machiavellianism, such as an overt form that is successful in situations commonly encountered by men and a more subtle form that is successful in situations commonly encountered by women. Other varieties are possible, such as a "principled" form that is manipulative only with respect to means and not ends (Martinez, 1987; Nelson & Gilbertson, 1991). At some point, the theoretical framework must explicitly define variation in manipulative strategies such as these and pit them against each other in specified social environments.

Personality and Social Psychology

Evolutionary approaches to human behavior have received a mixed reception from social scientists, ranging from enthusiasm (e.g., Campbell, 1983, 1991) to hostility (reviewed by Tooby & Cosmides, 1992). The problem is complicated by a number of misunderstandings about the relationship among evolution, culture, and learning. For example, evolution is erroneously associated with so-called innate behaviors that cannot be modified. The general issues have been discussed elsewhere (e.g., Buss, 1995; Tooby & Cosmides, 1992), and we focus here on points more specifically related to Machiavellianism.

First, although the theoretical framework that we have used in this article is derived from evolutionary theory, many of our most basic predictions could have been derived from economic game theory or any theory that assumes that humans are utility maximizers. It is a curious fact, however, that even though evolutionary game theory is derived from economic game theory, the multistrategy perspective of the former is not conspicuous in the human behavioral sciences. In other words, economists and personality and social psychologists do not customarily predict that a diversity of social strategies exists in human life that are maintained by situational factors or frequency-dependent forces. A few have speculated along these lines (e.g., Frank, 1988; Hogan, 1983), but their work has had no greater impact on the Machiavellianism literature than has the evolutionary framework.

Thus, the Machiavellianism literature has been guided neither by an evolutionary framework nor by a comparable framework derived from economics or any other utilitarian theory. In fact, the majority of Machiavellianism studies do not appear to be guided by any theoretical framework at all. Even the original insight of Christie and Geis (1968, 1970a, 1970b) was based on the purely empirical observation that there *are* individual differences in Machiavellianism, without much attention to *why* there are individual differences. In his 1979 review, Vleeming commented that only 8 of 34 studies (23%) on Machiavellianism that he examined were designed to address the major issues identified by Christie and Geis (1970b). The more recent literature is no better. In fact, interest in the very subject of Machiavellianism appears to have waned among psychologists, with the number of publications per annum peaking in 1982. Recent textbooks either do not discuss Machiavellianism at all or provide a short paragraph that reads like an obituary, a description of something that happened in the history of psychology, unconnected to any ongoing conceptual theme. This is a pity because Machiavellianism does represent a fundamental theme, the tension that exists between exploitative and prosocial behaviors in human life. One does not need to be an evolutionary biologist to recognize this as an important topic that should be guided by a predictive theoretical framework of some sort.

Second, even though the evolutionary framework can be criticized in a variety of ways, it does have the virtue of generating a large number of testable hypotheses. The best way to modify the theory is therefore not to criticize it in abstract terms (although this can also be useful) but to force changes by falsifying some of the hypotheses. One of the most fundamental predictions is that high-Machs will fail in long-term interactions or

will succeed only by becoming phenotypically similar to low-Machs. This prediction can be easily tested by having high- and low-Machs play single versus iterated games in a laboratory environment. It would also be interesting to inform participants that they will be playing a single game and then surprise them with an iterated game (a variant on Martinez, 1981). It seems extraordinary to us that these kinds of experiments do not already exist in the Machiavellianism literature. Many other predictions that we have made can also be easily tested in the laboratory or even in mass testing situations. For example, Barber's (1994; Barber & Raffield, 1994) technique of modifying the Mach test to refer to specific categories of interactions (e.g., relatives, strangers, same sex, and opposite sex) could be extended to other categories (e.g., situational factors such as short-term vs. long-term relationships).

Third, in addition to standard psychology experiments, there is a great need for Machiavellianism to be studied outside the laboratory in real-life situations. There is nothing in the Machiavellianism literature that corresponds to the field studies that form the foundation of research on nonhuman species. In our experience, when the subject of Machiavellianism arises, almost everyone offers a story about an acquaintance who is a "classic" high- or low-Mach and what it means in terms of their daily lives. Usually the classic high-Mach succeeds by dancing from one short-term relationship to another, leaving anger and resentment in his or her wake (see Hogan, Curphy, & Hogan, 1994; Babiak, in press, for possible examples that are not related to Machiavellianism per se). It should be possible to confirm or refute these anecdotes by administering the Mach test to participants and then monitoring subsequent events by direct observation, periodic questionnaires about daily life, or assessments from peers. Why should humans be the only primate species that is not studied in the field?

Finally, just as game theory does not reflect the full diversity and sophistication of human social strategies, the Mach test also creates an illusion of a single behavioral axis, where multiple axes almost certainly exist. We have already speculated about qualitative differences in the manipulative styles of men and women, which can appear on the Mach test only as differences in means, variances, and correlations with other variables that are difficult to interpret. Several authors have criticized the Mach test for lumping together potentially independent factors, such as manipulateness, cynicism, and so on (Ahmed & Stewart, 1981; Allsopp et al., 1991; Hunter et al., 1982; Lamdan & Lorr, 1975; O'Hair & Cody, 1987; Panitz, 1989; Ray, 1983; Stone & Russ, 1976; but see Jones & White, 1983). These criticisms are legitimate, but they do not invalidate the basic concept of Machiavellianism. Rather, they illustrate that there are many aspects to manipulation and cooperation in human life that require a multidimensional scale to classify (Falbo, 1977). We anticipate that game theory can be used to identify the specific regions of the multidimensional space that constitute successful social strategies.

We end our review with a caution about our own methods. By restricting our analysis to papers that were obtained with the key word *Machiavellianism*, we may have missed studies that do not use this keyword but are nevertheless relevant. Our somewhat critical assessment of the Machiavellianism literature may therefore not apply to other areas of personality and social

psychology. However, this by itself would be a criticism because it would indicate a lack of communication, not only between psychology and evolutionary biology but also between various branches of psychology. In any case, we hope that readers who are aware of relevant studies that we have missed will make them known to us, so we can revise our assessment if necessary.

It is difficult to imagine a more fundamental theme in human life than the interaction between exploitative and cooperative behaviors. Machiavellianism has become the symbol for manipulative strategies of social conduct, but the psychological literature on Machiavellianism has not done justice to the importance of the subject, in part because it lacks a conceptual framework for guiding empirical research. Evolutionary biology does provide a conceptual framework, but it has developed in an empirical vacuum, especially with respect to human social behavior. We hope that our review has helped to bring these disciplines together and to organize the existing literature around the conceptually relevant questions.

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New Editor Appointed

The Publications and Communications Board of the American Psychological Association announces the appointment of Kevin R. Murphy, PhD, as editor of the *Journal of Applied Psychology* for a six-year term beginning in 1997.

As of March 1, 1996, submit manuscripts to Kevin R. Murphy, PhD, Department of Psychology, Colorado State University, Fort Collins, CO 80523-1876.