

**Evolutionary psychology and social thinking:  
History, issues and prospects**

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Psychology has undergone a profound paradigmatic shift in the past few decades. For most of the second half of the twentieth century, a kind of unquestioning belief in the power of environmental influences on social thinking and behavior has ruled supreme in the social sciences. This environmentalist ideology rested on some notably fallacious scientific claims, such as Margaret Mead's now debunked arguments that even patterns of mating behavior are essentially culturally determined. In hindsight, it is puzzling why well-meaning psychologists and social scientists should have chosen to deny the obvious for so long - that biological, genetic and evolutionary influences do play a fundamental role in understanding social behavior.

In one way, we may regard this book as a celebration of the belated return of balance to theories about human cognition and behavior. Using twin studies, numerous converging lines of evidence now show that there is significant genetic contribution even to high-level, elaborate social cognitive processes that shape our attitudes, beliefs and interpersonal strategies. Complementary research programs have repeatedly demonstrated the cross-cultural universality of a large number of sophisticated social behaviors including emotional communication, partner selection, gender differences in mating strategies and the like. The message of these research programs was not universally welcomed. Many adherents of ideological environmentalism saw any evidence for genetic or evolutionary influences on behaviour as a grievous threat to their belief that the potential for re-engineering of social arrangements has no natural limits. It is partly for such political reasons that research into evolutionary influences on social cognition and behaviour has been so controversial for so long. This book seeks to bring together some of the most recent research and theorising in the field of social cognition and evolutionary psychology, in an attempt to show that there are significant benefits that can be derived by adopting evolutionary principles in the scientific study of social thinking.

## Evolutionary psychology and social cognition

To commemorate the 100<sup>th</sup> anniversary of the publication of Darwin's psychological treatise, *The Expression of Emotions in Man and Other Animals* (Darwin, 1872), a young Berkeley Zoologist named Ghiselin gave an address at the American Psychological Association Conference (Ghiselin, 1972). In the address, subsequently published in *Science* (Ghiselin, 1973), Ghiselin pointed out that Darwin's radically new way of studying behavior—which he called “evolutionary psychology”—hadn't fully caught on. The study of white rats and college sophomores missed the mark, and much of what purported to be evolutionary psychology was a “warmed over version of *scala naturae* which arranged beings... from highest to lowest” (God to man to brutes to plants, p. 179). Nonetheless, he argued, there clearly seemed to be promise—not only in understanding the emotions, as many had already acknowledged, but also the important role played by sexual selection in human behavior and in so-called “higher” attributes such as moral sentiments.

In the three and half decades since this address, the field of evolutionary psychology has seen dramatic progress. In the early nineties the publication of *The Adapted Mind* (Barkow, Cosmides, & Tooby, 1992; see also Buss, 1996; Buss & Kenrick 1998) established the outlines of the paradigm of evolutionary psychology. In the coming years (as the contributions in the current volume aptly demonstrate), researchers began to take seriously the notion that the brain, like the body, is rich in evolved design. As Darwin promised, the evolutionary approach has begun to provide a new foundation for psychological theorizing—and along with it, new insights. By a coarse count, there are hundreds of new discoveries that probably would not have been found without explicit evolutionary psychological theorizing (perhaps thousands by a fine count, see Buss, 2005). The discoveries span the domains of affect and emotion (see chapters by Allen & Badcock; Buck; Forgas; Ellsworth), cooperation and sociality (Dunbar; Lieberman; Spoor & Williams), leadership (van Vugt & Kurzban), social perception and inference (Gangestad & Thornhill; Halberstadt; Kenrick, Delton, Robertson, Becker, & Neuberg; Schaller & Duncan; Ybarra), kinship (Lieberman), moral-

ity (Buck; Lieberman) and, of course, romantic relationships, mating, and sexuality (Buunk, Massar, & Dijkstra; Fletcher & Overall; Gangestad & Thornhill; Simpson & LaPaglia; Todd).

One of the key areas in which evolutionary theorizing has played an increasing role is social psychology. In a search of all papers published in the *Journal of Personality and Social Psychology* between 1985 and 2004, Webster (2006) found an increasing linear trend in the number of articles published on evolutionary psychology that was comparable in magnitude to other emerging areas in social psychology (including stereotyping and prejudice and emotion and motivation). Thus, consistent with the breadth of the contributions in this volume, evolutionary psychology has played an increasing role in social psychology over the last two decades.

### **A Natural Affinity**

Social and evolutionary psychology are both concerned with humans as highly social animals, and thus they have a natural affinity. For example, evolutionary theorists like Dunbar (this volume) note that humans' long history of living in groups requires adaptations for social living, including sophisticated capacities for representing the mental states of others (and others' mental representations of oneself; and others' representations of one's own representations of others' representations; and so on). Along similar lines, biological anthropologists Boyd and Richerson (in press) argue that humans are unusually cooperative relative to other animals, and that human sociality requires and enables an extraordinary capacity for culture, teaching, and social learning. These are the very capacities that many social scientists regard as central to human nature.

Interpersonal communication is another area where the interests of evolutionary and social psychologists have been converging for some time. Darwin's (1872) classic work on the communication of emotions in man and animals presaged the recent rapid development of empirical research on the mechanisms that influence nonverbal communication between individuals. There is now clear experimental and neuropsychological evidence documenting the close links between emotional expressions and emotional experiences, and there is good reason to believe that some of our

most powerful interpersonal signals, such as eye gaze, touching, spacing and gestures are also produced in part by evolved mechanisms, as Darwin proposed.

Likewise, some of the foundational studies in social psychology conducted by Ashe (1956) and Milgram (1963) documented the surprising extent to which humans are susceptible to social influence. William James (1890) remarked that “solitary confinement is by many regarded as a mode of torture too cruel and unnatural for civilised countries to adopt” and social psychologists followed James’ insight by documenting how devastating social rejection can be and how sensitive people are in detecting it. For example, Spoor and Williams (this volume) describe experiments using minimal cues of rejection such as being left out of a computerized ball toss. Participants in these studies quickly show signs of dejection, and neuroimaging reveals an increase in brain activation associated with the experience of pain: rejection literally hurts (Eisenberger, Lieberman, & Williams, 2003). In sum, there is considerable overlap in the topics of interest to social and evolutionary psychologists.

Social and evolutionary psychology also share a preference for the cognitive level of description. Social psychologists never bought the argument that behavior should be the only unit of analysis, and evolutionary psychologists have similarly suggested that it is most appropriate to theorize about psychological adaptations (rather than to limit one’s analysis to overt behavior; Cosmides & Tooby, 1994; Buss, 1999). Thus, social and evolutionary psychologists are both inclined to theorize about the design of the cognitive adaptations underlying social behavior. Lieberman’s analysis (this volume) of inbreeding avoidance and familial cooperation beautifully illustrates the cognitive approach. She asked what cues were available to ancestral humans that would have allowed them to reliably estimate kinship and what kind of cognitive procedures could take them into account to produce both sexual aversion and cooperation. She hypothesized that co-residence duration during childhood could serve as an appropriate cue, and a well-designed system would vary the intensity of the motivations underlying sexual avoidance and cooperation depending on length of co-residence (and thus with the probability of relatedness). Similarly, Todd’s chapter

(this volume) points out that the social environment can be uncertain and overwhelmingly complex; thus, evolution should favor decision rules that use a small amount of ecologically-valid information and limited processing time to come up with what are often very good choices, when they are employed in the proper environments. This led to the surprising discovery that assessing fewer possible mates rather than more resulted in optimal mate choice in computer simulations (searching too long can result in passing the best mate by or running out of time altogether; see Todd, this volume). (For other excellent examples see contributions by Dunbar; Kenrick et al.; Halberstadt; Schaller & Duncan; and Spoor & Williams.)

### **Different “Why” Questions**

Along with a natural affinity based on mutual interests, there are also differences between the approaches of social cognition and evolutionary psychology. Chief among these concerns the nature of explanation. Social psychologists tend to focus on explanations involving proximate mechanisms – attention, cognitive load, schemas, stress, frustration, norms, etc. Evolutionary psychologists, on the other hand, tend to focus on functional explanations, often leaving the details of proximate mechanisms unexamined. Thus, social and evolutionary psychologists may approach the same topic very differently. For example, in understanding certain types of mating decisions, social psychologists may invoke norms, such as sex roles or cultural taboos. Such forces clearly exist. Parents attempt to influence the mating decisions of their children, including, for example, the sexual permissiveness of their daughters. Evolutionary psychologists, on the other hand, begin by asking what adaptive problems mechanisms of mate choice address. Thus, an evolutionary psychologist might locate key theoretical causes at the distal level. In mate choice, for example, evolutionary theorists might argue that females are less sexually permissive than males because of their necessarily larger investment in offspring and greater costs associated with poor mate choice (Trivers, 1972). Of course, evolutionary theorists propose that proximate evolved decision rules execute the functions they study—for example, a selective sociosexual psychology in women or adjustments of sexual aversion based on coresidence—but evolutionary psychologists are less likely to

focus their empirical efforts on the examination of precisely how these decision rules are implemented.

Few social psychologists reject the notion that the entire human body, including the brain, has been shaped by natural selection. Reticence instead stems from questions about the utility of distal explanations. As Conway and Schaller (2002) point out, whereas proximate mechanisms can usually be tested directly, distal evolutionary mechanisms usually cannot. So, social psychologists have often asked what can be gained by this sort of seemingly irrefutable conjecturing. Evolutionary psychologists have responded that well formulated evolutionary hypotheses lead to specific predictions and are therefore falsifiable, evolutionary explanations are required for a complete explanation of behavior, and most importantly, they are useful as they guide researchers to new domains of inquiry, new ideas about behavior, and ultimately new findings (e.g., Buss, 1995; Buss et al., 1998).

As evolutionary psychology has progressed, this promise has been more fully realized. The predictions of evolutionary theories have become sophisticated, more specific, and genuinely difficult to reconcile with alternative accounts, thus making the utility of evolutionary theorizing harder to doubt. An interesting irony, as we note below, is that these advances may be due in part to a more complete integration of proximate and ultimate levels of explanations. For example, some social psychologists have found recent evolutionary work on menstrual cycle effects particularly compelling (see, e.g., Simpson & LaPaglia, this volume). This work may be compelling precisely because researchers have linked women's behaviors to specific proximate mechanisms (cycling hormones) that would seem to rule out the traditional domain-general, socio-cultural explanations that are often touted as alternative explanations (e.g., mass media effects, social roles, etc.)

### **Content-Specificity and Adaptive Design**

Before we elaborate on why evolutionary psychology needs the theories and methodologies of social cognition researchers, we suggest that there are several other lessons that evolutionary psychology might teach social cognition researchers. Perhaps most importantly, when starting with

first principles, evolutionary psychologists tend to arrive at predictions about specialized, content-rich psychological mechanisms designed to address specific adaptive problems. The chapters in this volume describe specific psychologies of kinship (Lieberman), leadership (van Vugt & Kurzban), jealousy (Buunk, Massar, & Dijkstra), mind-reading (Dunbar), and mate selection (Todd) to name a few. The information processing rules involved in each of these areas might overlap with those involved in others (e.g., mind-reading likely plays a role across social domains), but they will also contain specialized features.

In their joint research program, Kenrick, Maner, Schaller and colleagues have collected some of the best evidence for content-specificity in social judgments (see e.g., Kenrick et al., this volume). For example, given the differing demands of mate choice and physical self-protection, Maner et al. (2005) hypothesized that participants induced to feel these motivational states would show qualitatively different biases in interpreting the facial expressions of others, and in specific cases these biases would differ for the sexes. After viewing a scary film clip, participants in the studies conducted by these authors rated neutral male faces as angrier especially when they were the faces of outgroup members (Maner et al., 2005). Thus, when cues indicate increased danger, men and women become vigilant about the potential threat of aggressive others. After viewing a romantic film clip, men but not women in the studies saw more romantic interest in the faces of neutral opposite-sex faces, especially attractive faces (Maner, et al., 2005). Over-perceiving sexual interest may function to help individuals avoid missing sexual opportunities, which would have benefited ancestral men more than ancestral women (Haselton & Buss, 2000), and thus would have selected for precisely the sort of bias Maner et al. (2005) documented.

In describing a related research program, Schaller and Duncan (this volume) argued that one of the most daunting adaptive problems faced by ancestral humans was exposure to communicable pathogens. Thus, these authors argued that humans are endowed with a “psychological immune system” that tracks heuristic cues to disease and leads to behavioral avoidance of contamination. Because judgments of disease threat are uncertain, the psychological immune system may be adap-



tively over-inclusive (Kurzban & Leary, 2001) by responding to a variety of physical disfigurements, even when they are caused by accidents rather than illness. Similarly, humans are more susceptible to pathogens carried by people from foreign lands than those in their local environments (whose pathogens are familiar to their physical immune system). Therefore, the psychological immune system may lead to tendency to stigmatize and avoid various classes of individuals, including disfigured people and foreign immigrants. Schaller and colleagues predicted that these prejudices should increase when disease threat is activated, and, as predicted, participants who score highly on a measure of vulnerability to disease showed stronger implicit associations between images of disabled individuals and disease concepts (Park, Faulkner, & Schler, 2003). In a related study (Faulkner et al., 2004), participants were shown slide show images of accidents or diseases. Relative to the accident condition, those in the disease condition allocated less funding to an effort to recruit immigrants from subjectively foreign lands (allocation of funds to recruiting immigrants from familiar locations did not show this effect; Faulkner et al., 2004). In sum, theorizing about specific adaptive problems has led to successful predictions about the differing effects of mating, self-protection, and pathogen avoidance on how information is processed.

In social cognition, key concepts and proposed mechanisms tend to be far more general and content-free. For example, theories of stereotyping, social memory, and attribution tend not to propose specific mechanisms for how these processes differ with different types of targets, and indeed theorizing is even rare concerning how social vs. non-social cognition differ. Given the evidence that human brains adapted in part from the influence of other humans (Dunbar, this volume), it seems likely that certain social cognitive routines are only initiated in certain social situations, and that these routines differ in important ways by the type of target. Thus, it might be useful to infuse theorizing about social cognitive processes with more content by starting with adaptive problems rather than assuming that cognitive procedures will be domain-general (see Alexander, Brewer & Herrmann, 1999). In addition to leading to new predictions, this type of integration of content and

process might also enable researchers to fill in some of the “conceptual holes” in social psychology (see Daly, Salmon, & Wilson, 1997; Kenrick et al., this volume).

### **Refining the Metaphor for Social Cognition**

Although social cognition is now much more concerned with motivation and emotion than it was ten or twenty years ago, we suggest that the nature of that motivation is still under-specified and poorly understood. It is undoubtedly a step in the right direction to conceptualize humans as motivated tacticians rather than cognitive misers, but what motivates humans, and why are they being tactical? Evolutionary theory provides a well-articulated perspective on these questions that can focus social cognition research on the fundamental goals chronically held by humans in different situations. For example, Trivers’ work on parental investment (1972) and reciprocal altruism (1971) provides hugely influential mid-level theories about important motivations and tactics, but evolutionary theorizing also provides much more specific predictions as well. A wonderful example of such a prediction can be found in the chapter by Ybarra in the current volume, in which he proposes that sometimes it is in our interests to be figured out by others and sometimes it is not. Consistent with his perspective, cues that suggest competition lead people to ensure that their behaviors and motivations are opaque, whereas cues that suggest cooperation lead people to be more transparent in their actions.

More broadly, however, the evolutionary approach to the motivated tactician clearly reveals that people were never as dumb as they were made out to be when the field was focused on bias and error. Rather, when people must make decisions under uncertainty (which is probably most of the time), evolutionary processes appear to have shaped human decisions to be biased in favor of the least costly error (Haselton & Buss, 2000, 2003; Haselton & Nettle, 2006; Kenrick et al., this volume; Schaller and Duncan, this volume; Williams, this volume). Furthermore, when problems are framed in a manner that is consistent with experience, or with adaptively recurrent problems such as cheater detection, previously unsolvable problems suddenly become simple for even uneducated individuals (Cosmides & Tooby, 1996, 2005). People thus appear much more like savvy bookies

playing the odds than hopeless incompetents who somehow manage to survive despite themselves (see Todd, this volume). Evolutionary psychology thus suggests that it is time to refine our metaphor of the motivated tactician by considering what motivates him, what motivates her, and what tactics are likely to have emerged in the never-ending social cognitive arms race of manipulation, cooperation, and competition among individuals and groups as people navigate an increasingly complex social world.

### **Interface with Modern Evolutionary Biology**

Lastly, principles of modern evolutionary biology may be brought to bear on theorizing in social cognition. Gangestad and Thornhill (this volume) point out that social inference permeates the topics studied within social psychology and yet surprisingly few researchers have made use of the vast evolutionary literature on signalling theory. Signalling theory suggests two types of systems involved in social inference, signalling systems and non-signalling systems. The first type of system involves the transmission of factual information from senders to receivers. The second kind of system is one in which receivers make inferences on the basis of cues emitted by targets, but targets possess no adaptations designed to convey information to perceivers; instead, receivers base their inferences on incidental effects of adaptations in targets that have non-communicative functions. Signalling systems tend to collapse if information is not factual—over time, receivers will cease attending to deceptive signals. Given that the perfect alignment of fitness interests is rare in the animal kingdom, senders will rarely benefit from always signalling their true intentions. The consequence is that social inference is probably based on co-evolving adaptations in senders and receivers in which senders are selected to often conceal cues indicating their true intentions and receivers are selected to detect them (also see Ybarra, this volume). This perspective leads to new predictions about the conditions under which communication is characterized by deception or honesty; it may explain many of the cases in which social inference fails; and it may drive theorists to ask themselves whether the social inference psychologies they propose obey principles derived from modern evolutionary biology (see Gangestad & Thornhill, this volume).

## What can Social Cognition Bring to the Table?

By now we hope that it's clear what evolutionary psychology can bring to the study of social cognition, but the question remains concerning what social cognition can offer to the study of evolutionary psychology. In answering this final question, we find it helpful to consider the predominant criticisms of evolutionary psychology and how social cognition might address them. To enable a preliminary examination of these criticisms, we sent an email to the list serve for social psychologists (SPSP) and evolutionary biologists (evoldir) asking list members about their perception of evolutionary psychology and whether they have found it helpful to their understanding of human behavior. Despite the rather disparate perspectives of members of these two groups (and keeping in mind that respondents were undoubtedly not a representative sample of their lists), responses to this request showed a great deal of similarity across the two lists (see Table 1). In both lists evolutionary psychology evokes strong feelings, with approximately equal numbers voicing strong support for the enterprise, strong reservations (or even animosity) for evolutionary psychology, or a bit of both. Indeed, several respondents requested that all identifying information be removed from their responses prior to any dissemination.

Examination of the responses of those who are critical of evolutionary psychology revealed a variety of concerns with the science among both social psychologists and evolutionary biologists (for a more thorough discussion of criticisms of evolutionary psychology, see Hagen, 2005). Furthermore, among both disciplines, dissatisfaction with the science most often centered around the concern that evolutionary psychologists tell "just so" stories about how we became the way we are, and that these stories cannot be adequately tested. This criticism is surprising, given the enormous amount of progress made by evolutionary psychologists in the last twenty years. Nevertheless, a substantial portion of the psychological and biological community appears to regard the enterprise with doubt or disdain, in part because they perceive the product of this research as the telling of tales that are largely impossible to disconfirm. With these criticisms in mind, we turn now to the

topic of how a social cognitive approach might help address these concerns, and thereby further the discipline of evolutionary psychology.

Although evolutionary psychologists are already methodological pluralists, the most obvious contribution that social cognition can make to the study of evolutionary psychology is by providing new methodological tools that can supplement the frequent reliance on self-report as means of testing evolutionary hypotheses. Because social cognitive theorists are concerned with the more micro-level workings of the social mind, from the beginning of the enterprise they have been dubious about people's ability to self-report on these processes. Thus, researchers in social cognition have borrowed and developed a large set of procedures and tools that enable the study of social functioning without directly asking people what they're thinking. A variety of social cognitive methods now exist for the assessment of goals, attention, accessibility, and (more controversially) attitudes, even if people are unwilling or unable to directly report on the contents of their mind.

Greater use of these procedures is critically important for the development of evolutionary psychology as a discipline. First of all, measures of social cognitive processing often provide clearer and more in-depth evidence for the phenomena of interest than is possible through self-report. Indeed, the methods of social cognition are uniquely well suited for the study of proximal mechanisms, as they allow researchers to get a handle on the processes by which the mind executes important evolved functions. Evidence of these advantages of a social cognitive approach to evolutionary psychology abounds in this book. For example, in their work on the behavioral immune system, Schaller and Duncan use reaction time to show that people have an automatic association between bodily disfigurement and disease, and that this association is stronger among people who perceive themselves as particularly vulnerable to disease. Indeed, Schaller and Duncan show that people automatically activate thoughts of disease even when they are confronted by a bodily disfigurement that they know is not contagious (such as a birth mark or obesity), yet these automatically activated thoughts of disease are not evident when people encounter individuals who appear healthy but are known to carry a contagious and dangerous disease. Such findings speak to the pri-

macy of appearances in activating automatic disease cognitions, and suggest a possible functional role for these cognitions in pre-medical societies. These data also provide an excellent example of the benefits of a social cognitive approach to evolutionary psychology, as not only would people be loath to report such negative responses to disabled, disfigured, or obese others, but it is also unlikely that people would be able to introspect about such associations in their mind between surface-level abnormalities and fear of disease.

The chapter by Kenrick et al. also provides a clear example of the advantages of evolutionary social cognition in elucidating some of the details of proximal mechanisms for achieving distal functions. In their research, they find that both males and females focus greater visual attention on attractive members of the opposite sex, but only females also spend more time encoding attractive members of the same sex. Furthermore, although women initially attend more to the faces of attractive men, they do not show an advantage in memory for these attractive male faces. Thus, in line with evolutionary reasoning that physical attractiveness is valued in both sexes but is more important in women than men, eye gaze translates into memory for attractive women but not for attractive men. In addition, and as predicted by an evolutionary account, these differences in eye gaze and memory are themselves moderated by factors such as the relationship and ovulatory status of the individuals doing the perceiving.

Second, social cognitive measures can help researchers avoid the criticism that evolutionary psychologists are simply tapping societal stereotypes of how people believe they are supposed to think and act, and that these stereotypes don't reflect the real workings of the mind. For example, consider the evolutionary prediction that men should be particularly jealous of high-status rivals whereas women should be more jealous of beautiful rivals. When men and women self-report such an effect, critics of the evolutionary approach respond that society suggests that men should be concerned with status and women concerned with beauty, and thus people dutifully self-report that these are their concerns, when in fact they may not really be at issue. Setting aside why society should shape the mind in such evolutionarily advantageous ways (as sociocultural critics of the

evolutionary approach are typically unswayed by the argument that culture is a mechanism for achieving evolutionary goals), these criticisms are clearly addressed by experiments such as those reported by Buunk et al. In their chapter, these authors show that non-conscious priming of status or attractiveness cues leads to gender differences in jealousy, whereby high mate value females are more jealous when primed with attractiveness cues and high mate value males are more jealous when primed with status cues. Low mate value individuals were uniformly jealous, regardless of priming. This sort of pattern of responses is very difficult to explain away as an artifact of social stereotypes or culturally induced values, particularly when moderated by individual differences (such as perceived mate value in these experiments, or relationship or ovulatory status in the experiments of Kenrick et al.).

Third, and for the very reasons outlined above, social cognitive approaches have the potential to address what appears to be the most widespread scientific criticism of evolutionary psychology by psychologists and biologists who are dubious of the enterprise. That is, a social cognitive approach to evolutionary psychology is very well suited to confront the criticism that evolutionary theorists are weaving a bunch of “just so” stories about the origins and development of human nature. By couching research in terms of information processing, with a clear emphasis on proximal mechanisms underlying distal evolutionary goals, evolutionary social cognition has the potential to address these important criticisms.

For a wonderful example of this marriage of evolutionary theory and social cognition, we need only consider Halberstadt’s chapter, in which he describes his research on preferences for prototypical faces and the possible evolutionary origins of these preferences. Beginning with the hypothesis that the preference for prototypical faces is an adaptation for enhancing mate quality, Halberstadt’s first experiments reveal the unexpected result that prototypical members of almost all categories are preferred, whether positive or negative and whether natural or artificial. This finding suggests that perhaps the preference for prototypical faces is not an adaptation for mating, but rather is simply an aspect of a more general preference for items that are easily categorized. To test

this possibility, he then partials out the subjective familiarity of the different category members, and finds that the sense of familiarity mediates the effect of prototypicality for artificial categories but not for natural categories.

This result narrows the range of possible causes for preferences for prototypicality as found in nature, but still leaves open a wide variety of reasons for why humans prefer prototypicality in animals as well as humans. Halberstadt then tests the possibility that prototypes are preferred because prototypicality communicates safety, but finds that sometimes prototypical animals are actually the more dangerous members of their category. This result leads to a test of an alternative possibility that is closer to his original hypothesis, which is that natural prototypes are preferred because they represent an over-generalization of a mechanism adapted for the perception of humans. Consistent with this possibility, the magnitude of the correlation between prototypicality and attractiveness in animals is found to be a direct function of the similarity of the animals to humans, with animals that are more similar to humans showing an increased association between prototypicality and attractiveness. Because similarity between these animal categories and humans was only measured rather than manipulated, and thus potentially confounded with other factors, Halberstadt then constructed drawings of faces and described them as sketches of either criminals or aliens. Consistent with the idea that preference for prototypicality is an adaptation for face perception, prototypical faces were preferred for both humans and aliens, but the latter and not the former effect was mediated by the subjective familiarity of the face.

This sequence of experiments represents a superb combination of basic research in categorization and prototypicality – long areas of interest within social cognition – with evolutionary principles concerned with attraction and mate selection. This series of experiments demonstrates how both disciplines can inform each other, and how an evolutionary social cognitive approach leads to unique predictions that are readily tested. Had Halberstadt not focused on underlying mechanisms such as perceived familiarity and perceptual fluency, this research might have started and ended with the speculation that preference for prototypical faces may be an adaptation for finding high



quality mates. Although more experimentation is clearly necessary, Halberstadt's social cognitive approach to evolutionary psychology has moved beyond speculation about ultimate goals to specific tests of underlying hypotheses, with the end result that we can be much more confident about the evolutionary origins of preferences for prototypical faces.

### **Overview of the book**

This book is organized into four main sections. Following this introductory chapter, Part 1 deals with some of the fundamental theoretical issues that form the foundation of an evolutionary framework for social cognition. Robin Dunbar (Chapter 2) describes his 'social brain' hypothesis that postulates a close interdependence between the evolution of human brain and human group size, suggesting that brain evolution was most likely driven by that primordial social cognitive task, the need to navigate and coordinate the activities of ever larger and ever more sophisticated and effective interacting social groups. In the next chapter, Steve Gangestad and Randy Thornhill (Chapter 3) outline a carefully elaborated evolutionary framework for understanding one of the most basic social cognitive processes, the way social inferences are formed. Doug Kenrick and his colleagues (Chapter 4) focus on a key aspect of evolutionary social cognition – the fact that certain kinds of information contents receive preferential treatment, as illustrated by the emergence of numerous domain-specific mechanisms that appear to be adapted to solve specific fitness problems. Evolutionary approaches thus offer a complementary, content-focused framework to the traditional information processing models that characterise mainstream social cognitive research seeking universal (and mostly domain-general) explanatory principles.

The second part of the book discusses the evolutionary psychology of affect and cognition. Adaptive emotional reactions to social events require sophisticated cognitive appraisal strategies, and Phoebe Ellsworth (Chapter 5) outlines how appraisal theories of emotion can inform evolutionary theorising. Ross Buck (Chapter 6) argues that the origins of moral emotions that regulate so much of our social thinking and behavior go back to the dawn of evolution, and he points to the ubiquity of such emotional reactions in everyday social communication. Joseph Forgas (Chapter 7)

argues that negative affective states have an important adaptive function, recruiting more focused and accommodative thinking strategies that produce identifiable benefits in many social cognitive tasks. In the final chapter in this section, Badcock and Allen (Chapter 8) suggest that depressed moods may also serve another adaptive function, reducing risk taking and possibly competitive behaviors.

The third part of the book looks at one of the social cognitive problems most intensively studied from an evolutionary perspective: the evolutionary psychology of mate selection. Peter Todd (Chapter 9) offers a cognitive-evolutionary analysis of how the all-important adaptive task of mate selection is performed. Simpson and LaPaglia (Chapter 10) describe the intriguing phenomenon of patterned changes in mate preferences across the ovulatory cycle of women, changes that are consistent with evolutionary theories but would be difficult to explain in terms of alternative cognitive models of decision-making. Lieberman (chapter 11) looks at the evolutionary problem of inbreeding avoidance, and shows how humans use information readily available from their environment to solve the problem of whom to avoid as a mate. Garth Fletcher and Nicola Overall (Chapter 12) offer an intriguing discussion of the role of the self in mate-selection decisions, and in particular, how assessment of one's own and one's partner's value may impact mate choices and relationship functioning.

The final, and largest section of the book features chapters that adopt an evolutionary perspective in analysing a variety of interpersonal and intergroup processes involving social cognitive mechanisms. The phenomenon of jealousy is the topic of the chapter by Buunk and his colleagues (Chapter 13), who argue that men and women are of a different mind when it comes to jealousy. Women are more likely to be jealous of a rival's physical attractiveness, whereas men are more jealous of a rival's status and dominance, judgmental differences that are readily understandable in terms of evolutionary mechanisms. Van Vugt and Kurzban (chapter 14) offer an incisive analysis of the evolutionary psychology of leadership and followership, an approach that has the capacity to greatly enrich existing theorising in these domains. Jamin Halberstadt (Chapter 15) looks at the

evolutionary basis of preferences for prototypical faces, and suggests that such preferences are indeed likely to endure because prototypicality indicates greater reproductive fitness in a potential mate. Ybarra and his colleagues (Chapter 16) discuss the notion of human unpredictability as the basic problem of social perception and prediction, and suggest that humans may possess adaptive mechanisms that predispose us to avoid being too easily known and predicted. Spoor and Williams (Chapter 17) look at the evolutionary psychology of social rejection and ostracism, and discuss the importance of an ostracism detection system. In the final chapter, Schaller and Duncan (Chapter 18) propose the existence of an evolutionarily shaped behavioural immune system that plays an important role in influencing a variety of social cognitive phenomena, such as norms, values, attitudes and social communication. In their entirety, these chapters offer a broad and integrated overview of the many specific domains and research areas where evolutionary theorizing has contributed to social cognitive research in recent years. As editors, we hope that readers will find these contributions as exciting and intriguing as we did, and we hope that collecting them in one volume will stimulate further interest in the rapidly expanding interface of evolutionary psychology and social cognition.

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Positive	No details/ other	Hypothesis Generation	Framework	Totals
SPSP	3.5	6	28.5	(72%)
evoldir	4	1	6	(42%)
Totals	(15%)	(14%)	(70%)	

Negative	No details/ other	Implications/ Political uses	Just So stories/ Not tested	Not X-cultural/ Not socialization	Not X- species	Not genetic/ bio'ly naive	Totals
SPSP	1.5	.5	7	4	1	1	(28%)
evoldir	2	1.5	5.5	1.5	1.5	3	(58%)
Totals	(12%)	(8%)	(42%)	(19%)	(8%)	(10%)	

Table 1 – Numbers represent frequency counts of social/personality psychologists (SPSP) and biologists (evoldir) who endorsed a particular category of positive or negative reactions to evolutionary psychology. Responses could be placed in up to two categories if more than one issue was raised in the response (a very common situation), in which case each of the two categories received .5 of a response. Thus, the total number of respondents in both lists who made positive or negative responses in a particular category can be inferred from column totals. The total number of social psychologists and evolutionary biologists who made positive or negative comments can be inferred from the row totals (although this number is probably less informative than the nature of the reasons, as it seems more likely to be influenced by the likely non-representative nature of the sample).