

## Chapter 37

### Integrating Evolutionary Psychology and Social Psychology: Reflections and Future Directions

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### Abstract

Human social psychology was shaped over a long ancestral past and should not be considered with a view to modern circumstances alone. However, social psychology and evolutionary psychology have progressed relatively independently, despite the advantages of integrating these positions. The current chapter provides a brief overview of the eight sub-areas of social psychology covered in this volume: social cognition, the self, attitudes and attitude change, interpersonal processes, mating and relationships, violence and aggression, health and psychological adjustment, and individual differences. Within each area, we outline several broad advantages of applying evolutionary reasoning. We suggest that future research continue to apply an evolutionarily perspective when considering social psychological questions. We conclude that the integration of evolutionary psychology and social psychology will prove invaluable to researchers investigating the proximate and ultimate mechanisms underlying human social behavior.

Key words: evolution, evolutionary psychology, social psychology, behavior, cognition

Using a present-oriented perspective sometimes provides a poor guide when investigating modern social behavior because the psychological mechanisms that produce these behaviors have been shaped over a long ancestral past, rather than molded recently in accordance with modern conveniences. By adopting the design stance, standard social psychological principles can reach a broader audience (e.g., evolutionary biologists) and consider broader questions. Thus, an evolutionary perspective – which suggests that our minds were designed by past, rather than present, environmental demands (Tooby & Cosmides, 1990) – sensibly accounts for the history of our species when posing explanations for social behavior and development. Indeed, it is not possible to properly consider the ultimate causation — questioning *how* a behavior came to be — for any aspect of social psychology without considering evolutionary explanations. Nonetheless, evolutionary psychology and social psychology have progressed somewhat independently.

Throughout this volume, various experts have outlined what an evolutionary perspective offers mainstream social psychologists. The current chapter provides a brief overview of the different sections of this volume, namely social cognition, the self, attitudes and attitude change, interpersonal processes, mating and relationships, violence and aggression, health and psychological adjustment, and individual differences. Within each section, we highlight advantages of an evolutionarily perspective when considering social psychological questions. Additionally, we suggest avenues for future research that apply a Darwinian rationale to conventional social psychological matters.

### **Social Cognition**

Social cognition is a multifaceted topic within social and cognitive psychology that contains many sub-topics, including adult (Fiddick, Chapter 2) and child (Machluf & Bjorklund,

Chapter 3) cognition, comparative cognition (Vonk, McGuire, & Johnson-Ulrich, Chapter 7), modularity (Barrett, Chapter 4), emotion (Ketelaar, Chapter 5), and religiosity (Kirkpatrick, Chapter 6). Despite arguments that social psychology has nothing to contribute to the study of cognition (Kelley, 1973), research into social cognition has made important strides by integrating social psychological concepts and evolutionary reasoning. For instance, the modularity of the mind view — the idea that the mind is composed of neural structures or modules with specialized functions — has recently expanded from equating the mind to a series of fixed, independent systems to evolved interconnected biological modules that are interactive, flexible, and shaped by learning (e.g., Barrett, 2005, 2006, 2012; Barrett, Chapter 4). This view of modularity allows for a complementary overlap of related evolutionary, biological, and social psychological concepts. Similarly, adaptationist accounts of emotion (i.e., the position that emotions are evolved defenses rather than defects; see Ketelaar, Chapter 5) enable an understanding of the social utility of emotions, such as guilt and anger, and why some moral sentiments are absent in some individuals (e.g., psychopaths; Mealey, 1995). Thus, it is clear that research concerning social cognition has and will continue to benefit from an evolutionary perspective.

Human social behavior and cognition develops in infancy and early childhood (reviewed in Machluf & Bjorklund, Chapter 3), making the study of social-cognitive development an important aspect of understanding the evolution of human social psychology. Human preferences for social interaction begin in infancy such that newborns selectively attend to faces and face-like stimuli relative to other stimuli (e.g., Mondloch et al., 1999), are more attentive to depictions of biological versus other motion (Bardi, Regolin, & Simion, 2011; Simion, Regolin, & Bulf, 2008), and match facial expressions made by adults (Abravanel & Sigafos, 1984; Bjorklund, 1997; Oppenheim, 1983). The human ability to view others as intentional agents (e.g., Bandura,

2006; Tomasello, 2009; Tomasello & Carpenter, 2007) serves as the foundation for theory of mind (i.e., the ability to attribute psychological states to others), which develops over the preschool years (Bjorklund, Causey, & Periss, 2010). These skills are honed during our extended childhood and solve various adaptive problems (Bjorklund, 2003) and may have been observed to varying extents in some nonhuman species (e.g., Neilsen, 2012; cf. Povinelli & Vonk, 2003).

Comparative work on varied species provides insight into the evolution of social cognition and has led to several hypotheses about how the mechanisms of social cognition evolved (reviewed in Vonk et al., Chapter 7). For example, the Domestication Hypothesis — that social behaviors and cognitive traits in nonhumans were shaped over a long domestication process that selected for strong social aptitudes (Hare & Tomasello, 2004; Hare et al., 2010) — highlights the superiority of domestic dogs in reading human pointing gestures when compared to other animals, such as wolves, coyotes (Udell et al., 2012), and chimpanzees (Kirchhofer et al., 2012). Additional research should continue to investigate social cognitive ability and development in adult and juvenile nonhuman animals. However, most comparative research into social cognition has focused on highly social species, often using the Social Intelligence Hypothesis (i.e., that social ability and predicting the behavior of others stems from associated increased benefits in a group setting; Humphrey, 1976; Jolly, 1966) to predict social cognitive ability, and have neglected solitary species (Vonk et al., Chapter 7). A measure of social cognitive ability that considers a full range of socially-diverse species will provide more compelling evidence of the evolutionary bases of social behavior.

### **The Self**

The psychology of the self is the study of the conative, cognitive, and affective aspects of identity or subjective experience. The concept of the self does not appear to be unique to humans

(Neubauer, Chapter 8). Many animals — including other primates (e.g., Boesch & Boesch-Achermann, 2000; Suddendorf & Butler, 2013), land mammals (e.g., McComb et al., 2000; Plotnik et al., 2006) and marine mammals (e.g., Connor, 2007; Reiss & Marino, 2001), and certain birds (e.g., Fraser & Bugnyar, 2010; Prior et al., 2008) — show evidence of self-awareness. Mechanisms underlying human and nonhuman psychology, including self-concept, evolved because they solved ancestral adaptive problems (e.g., Barrett & Kurzban, 2006), making investigation into other animals of varying cognitive ability and social structures important. An evolutionary perspective can shed light on the self by providing a theoretically-sound framework from which to scrutinize the formation of social identity (i.e., the portion of self-concept derived from membership to specific social groups; Park & van Leeuwen, Chapter 9), self-esteem (Kavanagh & Scrutton, Chapter 10), and self-deception (von Hippel, Chapter 12). Further investigation into whether critical periods of development (e.g., puberty) relate to a solidification of different social identities could increase our understanding of the formation of social roles. Moreover, research could address the integration of private versus public social identities in strategically influencing others and in self-deception. Self-deception may have evolved to facilitate deception of others, because it eliminates the taxing cognitive load associated with active deception (Trivers, 2011; von Hippel, Chapter 12), but it may also function to amalgamate private expectations with public realities to facilitate the attainment of desirable social identities. Future research can investigate these possibilities, along with the role of self-deception in the development of negative personality traits (e.g., narcissism), mate selection, intrasexual competition, and self-esteem.

Research concerning self-esteem has a rich history in social psychology (see Zeigler-Hill, 2013, for a review). Grounded in an evolutionary perspective, sociometer theory (Kavanagh &

Scrutton, Chapter 10; Leary & Downs, 1995; Stinson, Cameron, & Huang, Chapter 11) proposes that state self-esteem is a gauge (or sociometer) of interpersonal relationships (i.e., a reflection of a person's perception of how others view him/her) that functions to make individuals aware of their social inclusion and motivate corrective action in advance of social rejection. However, human interactions have changed substantially with the increasing popularity of online social networking (see Piazza & Ingram, Chapter 13) which has led to increased research concerning cyberpsychology. Technology offers novel outlets for social behavior (e.g., cyberbullying; Piazza & Bering, 2009) and many online behavioral patterns mirror offline ones (e.g., sex ratios of stalking perpetrators versus victims; Dreßing, Bailer, Anders, Wagner, & Gallas, 2014). Consequently, cyberpsychological research is a fruitful direction for exploring social questions from an evolutionary perspective.

### **Attitudes and Attitude Change**

A person's attitudes — their assessments of a person, place, object, or event — are relatively stable, but can change according to context in flexible and adaptively-patterned ways (reviewed in Lord, Hill, Holland, Yoke, & Lu, Chapter 14). For example, despite prior beliefs, people tend to obey the requests of authority figures (e.g., Milgram, 1963). Depending on the context, obedience to authority can be adaptively patterned (e.g., when a child obeys their parent), making an evolutionary perspective sensible and informative (see Coultas & van Leeuwen, Chapter 15). An evolutionary perspective can also inform research into cultural shifts in attitude, such as those pertaining to women's rights and other social movements (Nicolas & Welling, Chapter 16). Given that violence has been steadily declining (Pinker, 2011) and that this decline overlaps with social movements that aim to minimize aggression towards others, it is likely that social revolutions have curbed our violent inclinations and are a reflection of human

cultural evolution and social learning (see Morgan, Cross, & Rendell, Chapter 17). Evolutionary psychology offers sound theoretical bases for addressing questions aimed at understanding human attitudes and social change. An evolutionary perspective, which can potentially explain (but not excuse) social inequalities, may be particularly useful for scholars interested in revising public policy.

### **Interpersonal Processes**

Statistical models of purely self-interested decision-making among human groups fail consistently across human cultures (Henrich et al., 2005). As the quintessential social species, humans rely on others in our social groups. It is perhaps unsurprising, then, that people spend a great deal of their time behaving prosocially (Krebs, Chapter 18). An evolutionary perspective suggests that the prosocial behaviors studied by social psychologists are produced by evolved mechanisms. Prosocial behaviors facilitate group-living (Kameda, Van Vugt, & Tindale, Chapter 19), and living in groups enhances survival (Van Vugt & Kameda, 2014). Thus, it is likely that many aspects of human cognition are the result of having to navigate complex social interactions with kith, kin, and other group members and of the need to solve the associated recurrent problems (e.g., group coordination, status, cohesion, decision-making; Kameda et al., Chapter 19) that ancestral humans encountered via group-living (e.g., Dunbar, 1993).

Friendship (Hruschka, Hackman, & Macfarlan, Chapter 20) and cooperation (Prentice & Sheldon, Chapter 21) facilitate group-living. Although people are more generous to kin than non-kin of the same level of social closeness (Curry, Roberts, & Dunbar, 2012; Rachlin & Jones, 2008), individuals regularly build discerning and lasting relationships with others (who may or may not be kin) with whom they mutually express affectionate regard and help (Hruschka, 2010). Several theories have addressed why friendships exist, including expectations of



reciprocity (e.g., Tooby & Cosmides, 1996) or reputation maintenance (Roberts, 1998), and additional research is needed to dissociate the various possibilities. Nonetheless, prosociality, friendship, and cooperation offered ancestral advantages, such as the ability to form and maintain alliances (DeScioli & Kurzban, 2009, 2012). Future research should investigate the influence of our modern environment – with its unprecedented crowding and decreased reliance on face-to-face social interactions (and increased preference for online social interactions) – on interpersonal processes.

Evolutionary reasoning also informs language and communication (Scott-Philips, Chapter 22). Human communication involves the expression and inference of intentions, and functions to assist social navigation (e.g., Scott-Phillips et al., 2012), but communication is not limited to language. Status hierarchies of human face-to-face groups bear striking similarities to those observed among other primates (reviewed in Mazur, Chapter 24) and are established through varied forms of communication (e.g., language, dominance displays, expression). Moreover, stereotypes are template-like cognitive representations that function to quickly communicate information about social group membership (Hutchison & Martin, Chapter 23). In the absence of person-specific information, stereotypes facilitate rapid and efficient categorization and judgment of others (Fiske & Neuberg, 1990), including information about sex, ethnicity, and social status. Cultural evolutionary approaches permit and should continue to enlighten the practical examination of the origin and development of different types of communication in the laboratory.

### **Mating and Relationships**

Mating and relationships have shaped human evolution through sexual selection and are key aspects of human social behavior. Far from being arbitrary, there is a great deal of cross-

cultural agreement regarding what is attractive (Langlois et al., 2000). Attractive people are more likely to be hired for jobs (Cash & Kilcullen, 1985; Chiu & Babcock, 2002; Marlowe et al., 1996), are treated more favorably in criminal proceedings (Downs & Lyons, 1991), and receive better care as infants (Langlois et al., 1995) than less attractive people. Physically attractive qualities, such as symmetry and sexually dimorphic traits (reviewed in Little, Chapter 25), are indicators of good physical condition, such that attractive people may have better genes for immunocompetence that could be passed on to offspring and enhance fitness (e.g., Thornhill & Gangestad, 1993, 2006). However, although there is evidence of a genetic influence (e.g., Alanko et al., 2010; Långström et al., 2010), evolutionary psychology has had a more difficult time explaining same-sex attraction, as homosexual men and women reproduce less than heterosexual individuals (e.g., Schwartz et al., 2010). Recently, research on the *fa'afafine* of Samoa — a group of transgendered androphilic men recognized in Samoan culture as belonging to a third gender — provides evidence that same-sex sexual orientation may function to enhance indirect fitness by motivating care for closely related kin (Vasey & VanderLaan, Chapter 26). In other words, the benefits associated with providing additional care to kin (e.g., the offspring of siblings) may offset the costs of not reproducing directly. However, more research is needed, particularly across other cultures and among gynephilic women.

Familial relationships have received relatively little attention within social psychology (discussed in Salmon, Chapter 27). Given our slower life history strategy relative to other mammals and even other primates (reviewed in Figueredo, Patch, & Ceballos, Chapter 28), humans experience extended childhoods and, thus, familial relationships can have a dramatic effect on survival. Adaptationist-minded researchers provide evidence-based explanations for family-related social issues, including preferences for offspring of one sex over the other (e.g.,

Gaulin & Robbins, 1991; Smith, Kish, & Crawford, 1987; Trivers & Willard, 1973), infanticide (Daly & Wilson, 1998), and higher parental investment in first- and last-born children compared to middle-born children (Rohde et al., 2003; Salmon, 2003). Scientists should continue to investigate diverse aspects of mating and relationships from an evolutionary perspective, particularly because such research surrounds questions that are important to personal and relational well-being.

### **Violence and Aggression**

The human capacity for affiliative behaviors notwithstanding, one need only scan the headlines of any news source for examples of the human potential for violence and aggression. War and aggression are ubiquitous throughout history, and an evolutionary perspective offers telling insight into these phenomena (reviewed in Liddle, Shackelford, & Weekes-Shackelford, 2012; Friend & Thayer, Chapter 29). Terrorism provides one such example. When survival prospects are low and the “sacred values” held by violent extremists mobilizes collective action against a perceived outside threat to their primary reference group, extreme sacrifice by a sufficient number of individuals may afford the group hope to circumvent stronger but less devoted adversaries (Atran & Sheikh, Chapter 31). In other words, aggressive behaviors are often rooted in survival-related problems, such as competition for resources and mates, and, although destructive in nature, they are not necessarily maladaptive.

One form of aggression that has received considerable media attention in recent years is bullying (Volk, Della Cioppa, Earle, & Farrell, Chapter 30). Bullying is an inherently social process that involves deliberate, harmful aggression toward another to cause a power imbalance that favors the aggressor (Volk, Camilleri, Dane, & Marini, 2012a). Like other social species, humans bully each other in diverse situations and at various ages (e.g., in the work place;

Einarsen, Hoel, Zapf, & Cooper, 2010) for social status, mates, and resources (Volk et al., 2012b). As with war and other forms of aggression, understanding the evolutionary origins of bullying is a first step to reducing its incidence. More fundamentally, research can inform theories about decision-making by using a combined social-evolutionary perspective to investigate how and why people engage in aggression, including perceptions and misperceptions of threat.

### **Health and Psychological Adjustment**

Mental health and affect play a major role in human social psychology. Positive psychologists endeavor to scientifically explain positive human development and happiness, and understanding why evolution bestowed humans and other sentient creatures with the capacity for both pleasant and unpleasant experiences is theoretically and empirically important (Grinde, Chapter 33). The default state of contentment displayed by humans and other animals in the absence of adverse factors (Diener & Diener, 1996; Grinde, 2004) may reflect the fact that a positive attitude is more conducive to the pursuits required for survival and reproduction. Conversely, negative affect may function to encourage the individual to seek a more advantageous environment or situation (e.g., feelings of loneliness encourage group-living which enhances survival; Grinde, Chapter 33). Investigation into positive and negative affect using Darwinian reasoning may facilitate efforts to improve the well-being of individuals suffering from conditions such as anxiety and depression, which is especially important given the prevalence of these and related mental health issues in modern society (e.g., Grant et al., 2005).

Physical health also may affect the selection of social-behavioral traits. Research suggests that psychological mechanisms evolved during ancestral interactions with parasites to allow individuals to detect the presence of disease-causing agents and to motivate behaviors that

reduce the individual's risk of infection. This set of evolved health-related behaviors, known collectively as the behavioral immune system (Schaller, 2006), broadly influences social exchanges, preferences, and prejudices (reviewed in Thornhill & Fincher, Chapter 32). Thornhill and Fincher (chapter 32; see also Fincher & Thornhill, 2012a, 2012b; Thornhill & Fincher, in press) have expanded on this perspective, dubbing it *the parasite-stress theory of sociality*, by presenting evidence that human interactions with infectious disease risk-factors across the lifespan directly cause and track changes in morals and preferences and their associated emotions, cognition, and social behavior. For instance, work by DeBruine and colleagues (DeBruine et al., 2010, 2011, 2012) demonstrates a link between women's preferences for masculinity in a potential partner, a putative indicator of male genetic quality (e.g., Thornhill & Gangestad, 2006), and high levels of environmental parasite stress. This suggests that negative health-related environmental cues may increase women's preferences for cues to immunocompetence that may be passed on to potential offspring (see also Penton-Voak, Jacobson, & Trivers, 2004). Although support for the parasite-stress theory of sociality is accumulating, further investigation into the impact of health-related environmental cues on individual differences in preferences, social behavior, and personality is warranted.

### **Individual Differences**

Although evolutionary psychology has largely focused on explaining universal human psychological mechanisms, individual differences are of interest to social and evolutionary psychologists alike. A key topic within individual differences research is the development of differences in personality (Sefcek, Black, & Wolf, Chapter 35; van den Berg & Weissing, Chapter 34). Personality traits are relatively stable over time and are heritable (e.g., Jang, Livesley, & Vernon, 1996; Vernon, Villani, Vickers, & Harris, 2008), but show marked variation

across individuals. Evolutionary game theory is a set of methods (traditionally used by biologists to understand the origins of social behavior in animals) that has recently been applied to human social behavior and differences in personality (van den Berg & Weissing, Chapter 34). Games such as the Prisoner's Dilemma (Axelrod & Hamilton, 1981) explore within-species variation in traits and enable scientists to disentangle the complexities of social interactions while accounting for psychological and behavioral variation (i.e., differences in personality; van den Berg & Weissing, Chapter 34). An evolutionary perspective also provides an explanation for variance in negative, seemingly maladaptive social traits, such as psychopathy (e.g., Lalumiere, Mishra, & Harris, 2008) and narcissism (Holtzman & Donnellan, Chapter 36), and generates novel hypotheses. Narcissism, for example, may reflect a strategic response to an individual's heritable physical traits (e.g., a dominant stature), may result from a genetic predisposition interacting with environmental triggers, or may originate in selection for specific strategies that have different cost-benefit ratios depending on ecological conditions (e.g., short-term mating; reviewed in Holtzman & Donnellan, Chapter 36). Understanding the ultimate causation behind negative personality traits may inform clinical treatment of personality disorders. More broadly, an evolutionary perspective enables a more thorough comprehension of the sources and influences of individual differences.

### **Conclusion**

We outlined several research themes found within social psychology and emphasized how an evolutionary perspective can generate novel interpretations and research questions within the respective areas. The chapters in this volume expertly outline many pertinent social psychological issues using compelling evolutionary logic. Future research should continue to promote the integration of social psychology and evolutionary psychology. These

complementary approaches combine to deliver exciting new insights into long-standing social subjects. The amalgamation of evolutionary and social psychology can be of tremendous value to scholars, as it speaks to both the proximate and ultimate mechanisms underlying human social emotion, cognition, and behavior.

## References

- Abravanel, E., & Sigafos, A. D. (1984). Exploring the presence of imitation during early infancy. *Child Development, 55*, 381-392.
- Alanko, K., Santtila, P., Harlaar, N., Witting, K., Varjonen, M., Jern, P., Johansson, A., von der Pahlen, B., & Sandnabba, N. K. (2010). Common genetic effects of gender atypical behavior in childhood and sexual orientation in adulthood: A study of Finnish twins. *Archives of Sexual Behavior, 39*, 81-92.
- Axelrod, R., & Hamilton, W. D. (1981). The evolution of cooperation. *Science, 211*, 1390-1396.
- Bandura, A. (2006). Toward a psychology of human agency. *Perspectives on Psychological Science, 1*, 164-180.
- Bardi, L., Regolin, L., & Simion, F. (2011). Biological motion preference in humans at birth: Role of dynamic and configural properties. *Developmental Science, 14*, 353-359.
- Barrett, H. C. (2005). Enzymatic computation and cognitive modularity. *Mind & Language, 20*, 259-287.
- Barrett, H. C. (2006). Modularity and design reincarnation. In P. Carruthers, S. Laurence, & S. Stich (Eds.), *The innate mind: Vol. 2. Culture and cognition* (pp. 199-217). New York, NY: Oxford University Press.
- Barrett, H. C. (2012). A hierarchical model of the evolution of human brain specializations. *Proceedings of the National Academy of Sciences, 109*(Suppl. 1), 10733-10740.
- Barrett, H. C., & Kurzban, R. (2006). Modularity in cognition: Framing the debate. *Psychological Review, 113*, 628-647.



- Bjorklund, D. F. (1997). The role of immaturity in human development. *Psychological Bulletin*, *122*, 153-169.
- Bjorklund, D. F. (2003). Evolutionary developmental psychology: A new tool for better understanding human ontogeny. *Human Development*, *46*, 259-281.
- Bjorklund, D. F., Causey, K., & Periss, V. (2010). The evolution and development of human social cognition. In P. Kappeler & J. Silk (Eds.), *Mind the gap: Tracing the origins of human universals* (pp. 351-371). Berlin: Springer Verlag.
- Boesch, C., & Boesch-Achermann, H. (2000). *The chimpanzees of the Tai Forest: Behavioural ecology and evolution*. New York, NY: Oxford University Press.
- Cash, T. F., & Kilcullen, R. N. (1985). The eye of the beholder - Susceptibility to sexism and beautyism in the evaluation of managerial applicants. *Journal of Applied Social Psychology*, *15*, 591-605.
- Chiu, R. K., & Babcock, R. D. (2002). The relative importance of facial attractiveness and gender in Hong Kong selection decisions. *International Journal of Human Resource Management*, *13*, 141-155.
- Connor, R. C. (2007). Dolphin social intelligence: Complex alliance relationships in bottlenose dolphins and a consideration of selective environments for extreme brain size evolution in mammals. *Philosophical Transactions of the Royal Society B-Biological Sciences*, *362*, 587-602.
- Curry, O., Roberts, S. G., & Dunbar, R. I. (2012). Altruism in social networks: Evidence for a 'kinship premium'. *British Journal of Psychology*, *104*, 283-295.
- Daly, M., & Wilson, M. (1998). *The truth about Cinderella: A Darwinian view of parental love*. New Haven, CT: Yale University Press.

- DeBruine, L. M., Jones, B. C., Crawford, J. R., Welling, L. L. M., & Little, A. C. (2010). The health of a nation predicts their mate preferences: Cross-cultural variation in women's preferences for masculinized male faces. *Proceedings of the Royal Society of London B*, *277*, 2405-2410.
- DeBruine, L. M., Jones, B. C., Little, A. C., Crawford, J. R., & Welling, L. L. M. (2011). Further evidence for regional variation in women's masculinity preferences. *Proceedings of the Royal Society of London B*, *278*, 813-814.
- DeBruine, L. M., Little, A. C., & Jones, B. C. (2012). Extending parasite-stress theory to variation in human mate preferences. *Behavioral and Brain Sciences*, *35*, 86-87.
- Diener, E., & Diener, C. (1996). Most people are happy. *Psychological Science*, *7*, 181-185.
- DeScioli, P., & Kurzban, R. (2009). The alliance hypothesis for human friendship. *PLoS One*, *4*, e5802.
- Descioli, P., & Kurzban, R. (2012). The company you keep: Friendship decisions from a functional perspective. In J. Krueger (Ed.), *Social Judgment and Decision-Making* (pp. 209-226). New York, NY: Taylor and Francis Group.
- Downs, A. C., & Lyons, P. M. (1991). Natural observations of the links between attractiveness and initial legal judgments. *Personality and Social Psychology Bulletin*, *17*, 541-547.
- Dunbar, R. I. M. (1993). Coevolution of neocortical size, group size, and language in humans. *Behavioral and Brain Sciences*, *16*, 681-735.
- Dreßing, H., Bailer, J., Anders, A., Wagner, H., & Gallas, C. (2014). Cyberstalking in a large sample of social network users: prevalence, characteristics, and impact upon victims. *Cyberpsychology, Behavior & Social Networking*, *17*, 61-67.

- Einarsen, S., Hoel, H., Zapf, D., & Cooper, C. (2010). *Bullying and harassment in the workplace: Developments in theory, research, and practice*. Boca Raton, FL: Taylor-Francis.
- Fraser, O. N., & Bugnyar, T. (2010). Do ravens show consolation? Responses to distressed others. *PLoS One*, *5*.
- Fincher, C. L., & Thornhill, R. (2012a). Parasite-stress promotes in-group assortative sociality: The cases of strong family ties and heightened religiosity. *Behavioral and Brain Sciences*, *35*, 61-79.
- Fincher, C. L., & Thornhill, R. (2012b). The parasite-stress theory may be a general theory of culture and sociality Response. *Behavioral and Brain Sciences*, *35*, 99-119.
- Fiske, S. T., & Neuberg, S. L. (1990). A continuum of impression formation, from category-based to individuating processes: Influences of information and motivation on attention and interpretation. In M. P. Zanna (Ed.), *Advances in Experimental Social Psychology* (Vol. 23, pp. 1-74). San Diego, CA: Academic Press.
- Gaulin, S. J. C., & Robbins, C. J. (1991). Trivers-Willard effect in contemporary North American society. *American Journal of Physical Anthropology*, *85*, 61-69.
- Grant, B. F., Hasin, D. S., Stinson, F. S., Dawson, D. A., Ruan, W. J., Goldstein, R. B., Smith, S. M., Saha, T. D., & Huang, B. (2005). Prevalence, correlates, co-morbidity, and comparative disability of DSM-IV generalized anxiety disorder in the USA: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Psychological Medicine*, *35*, 1747-1759.
- Grinde B. (2004). Darwinian happiness: Can the evolutionary perspective on well-being help us improve society? *World Futures – Journal of General Evolution*, *60*, 317-329.

- Hare, B., & Tomasello, M. (2004). Chimpanzees are more skillful in competitive than cooperative cognitive tasks. *Animal Behaviour*, *68*, 571-581.
- Hare, B., Rosati, A., Kaminski, J., Bräuer, J., Call, J., & Tomasello, M. (2010). The domestication hypothesis for dogs' skills with human communication: A response to Udell et al. (2008) and Wynne et al. (2008). *Animal Behaviour*, *79*, e1–e6.
- Henrich, J., Boyd, R., Bowles, S., Camerer, C., Fehr, E., Gintis, H., ... Tracer, D. (2005). Models of decision-making and the coevolution of social preferences. *Behavioral and Brain Sciences*, *28*, 838-855.
- Hruschka, D. J. (2010). *Friendship: Development, ecology, and evolution of a relationship* (Vol. 5). Berkeley, CA: University of California Press.
- Humphrey, N. (1976). The social function of intellect. In P. P. G. Bateson & R. A. Hinde (Eds.), *Growing points in ethology* (pp. 303-317). Cambridge: Cambridge University Press.
- Jang, K. L., Livesley, W. J., & Vernon, P. A. (1996). Heritability of the Big Five personality dimensions and their facets: A twin study. *Journal of Personality*, *64*, 577-591.
- Jolly, A. (1966). Lemur social behavior and primate intelligence. *Science*, *153*, 501-506.
- Kelley, H. H. (1973). The process of attribution. *American Psychologist*, *28*, 107-128.
- Kirchhofer, K. C., Zimmermann, F., Kaminski, J., & Tomasello, M. (2012). Dogs (*Canis familiaris*), but not chimpanzees (*Pan troglodytes*), understand imperative pointing. *PloS One*, *7*, e30913.
- Lalumiere, M. L., Mishra, S., & Harris, G. T. (2008). In cold blood: The evolution of psychopathy. In J. Duntley & T. K. Shakelford (Eds.), *Evolutionary forensic psychology: Darwinian foundations of crime and law* (pp. 139-159). New York, NY: Oxford University Press.

- Langlois, J. H., Kalakanis, L., Rubenstein, A. J., Larson, A., Hallamm, M., & Smoot, M. (2000). Maxims or myths of beauty? A meta-analytic and theoretical review. *Psychological Bulletin*, *126*, 390-423.
- Langlois, J. H., Ritter, J., Casey, J., & Solwin, D. (1995). Infant attractiveness predicts maternal behaviours and attitudes. *Developmental Psychology*, *31*, 464-472.
- Långström, N., Rahman, Q., Carlström, E., Lichtenstein, P. (2010). Genetic and environmental effects on same-sex sexual behavior: A population study of twins in Sweden. *Archives of Sexual Behavior*, *39*, 75-80.
- Liddle, J. R., Shackelford, T. K., & Weekes-Shackelford, V. A. (2012). Why can't we all just get along? Evolutionary perspectives on violence, homicide, and war. *Review of General Psychology*, *16*, 24-35.
- Marlowe, C. M., Schneider, S. L., & Nelson, C. E. (1996). Gender and attractiveness biases in hiring decisions: Are more experienced managers less biased? *Journal of Applied Psychology*, *81*, 11-21.
- McComb, K., Moss, C., Sayialel, S., & Baker, L. (2000). Unusually extensive networks of vocal recognition in African elephants. *Animal Behaviour*, *59*, 1103-1109.
- Mealey, L. (1995). The sociobiology of sociopathy: An integrated evolutionary model. *Behavioral and Brain Sciences*, *18*, 523-599.
- Milgram, S. (1963). Behavioral study of obedience. *Journal of Abnormal and Social Psychology*, *67*, 371-378.
- Mondloch, C. J., Lewis, T. L., Budreau, D. R., Maurer, D., Dannemiller, J. L., Stephens, B. R., & Kleiner-Gathercoal, K. A. (1999). Face perception during early infancy. *Psychological Science*, *10*, 419-422.

- Nielsen, M. (2012). Imitation, pretend play, and childhood: Essential elements in the evolution of human culture? *Journal of Comparative Psychology, 126*, 170-181.
- Oppenheim, R. W. (1981). Ontogenetic adaptations and retrogressive processes in the development of the nervous system and behavior. In K. J. Connolly & H. F. R. Prechtl (Eds.), *Maturation and development: Biological and psychological perspectives* (pp. 73-108). Philadelphia, PA: International Medical Publications
- Penton-Voak, I. S., Jacobson, A., & Trivers, R. (2004). Populational differences in attractiveness judgements of male and female faces: Comparing British and Jamaican samples. *Evolution and Human Behavior, 25*, 355-370.
- Piazza, J., & Bering, J. M. (2009). Evolutionary cyber-psychology: Applying an evolutionary framework to Internet behavior. *Computers in Human Behavior, 25*, 1258-1269.
- Pinker, S. (2011). *The better angels of our nature: Why violence has declined*. New York, NY: Penguin.
- Plotnik, J. M., de Waal, F. B. M., & Reiss, D. (2006). Self-recognition in an Asian elephant. *Proceedings of the National Academy of Sciences of the United States of America, 103*, 17053-17057.
- Povinelli, D. J., & Vonk, J. (2003). Chimpanzee minds: Suspiciously human? *Trends in Cognitive Science, 7*, 157-160.
- Prior, H., Schwarz, A., & Gunturkun, O. (2008). Mirror-induced behavior in the magpie (*Pica pica*): Evidence of self-recognition. *PLoS Biology, 6*, 1642-1650.
- Rachlin, H., & Jones, B. A. (2008). Altruism among relatives and non-relatives. *Behavioural Processes, 79*, 120-123.

- Reiss, D., & Marino, L. (2001). Mirror self-recognition in the bottlenose dolphin: A case of cognitive convergence. *Proceedings of the National Academy of Sciences of the United States of America*, *98*, 5937-5942.
- Roberts, G. (1998). Competitive altruism: from reciprocity to the handicap principle. *Proceedings of the Royal Society of London, Series B: Biological Sciences*, *265*, 427-431.
- Rohde, P. A., Atzwanger, K., Butovskaya, M., Lampert, A., Mysterud, I., Sanchez-Andres, A., & Sulloway, F. (2003). Perceived parental favoritism, closeness to kin, and the rebel of the family: The effects of sex and birth order. *Evolution and Human Behavior*, *24*, 261-276.
- Salmon, C. A. (2003). Birth order and relationships: Family, friends and sexual partners. *Human Nature*, *14*, 73-88.
- Scott-Phillips, T. C., Blythe, R. A., Gardner, A., & West, S. A. (2012). How do communication systems emerge? *Proceedings of the Royal Society of London, Series B*, *279*, 1943-1949.
- Schaller, M. (2006). Parasites, behavioral defenses, and the social psychological mechanisms through which cultures are evoked. *Psychological Inquiry*, *17*, 96-101.
- Schwartz, G., Kim, R. M., Kolundziji, A. B., Rieger, G., & Sanders, A. R. (2010). Biodemographic and physical correlates of sexual orientation in men. *Archives of Sexual Behavior*, *39*, 93-109.
- Simion, F., Regolin, L., & Bulf, H. (2008). A predisposition for biological motion in the newborn baby. *Proceedings of the National Academy of Sciences*, *105*, 809-813.
- Smith, M. S., Kish, B. J., & Crawford, C. B. (1987). Inheritance of wealth and human kin investment. *Ethology and Sociobiology*, *8*, 171-182.
- Suddendorf, T., & Butler, D. L. (2013). The nature of visual self-recognition. *Trends in Cognitive Sciences*, *17*, 121-127.

- Thornhill, R., & Fincher, C. L. (in press). *The parasite-stress theory of values and sociality: Infectious disease, history and human values worldwide*. New York, NY: Springer.
- Thornhill, R., & Gangestad, S. W. (1993). Human facial beauty: Averageness, symmetry, and parasite resistance. *Human Nature, 4*, 237-269.
- Thornhill, R., & Gangestad, S. W. (2006). Facial sexual dimorphism, developmental stability, and susceptibility to disease in men and women. *Evolution and Human Behavior, 27*, 131-144.
- Tomasello, M. (2009). *Why we cooperate*. Cambridge, MA: MIT Press.
- Tomasello, M., & Carpenter, M. (2007). Shared intentionality. *Developmental Science, 10*, 121-125.
- Tooby, J., & Cosmides, L. (1990). The past explains the present: Emotional adaptations and the structure of ancestral environments. *Ethology and Sociobiology, 11*, 375-424.
- Tooby, J., & Cosmides, L. (1996). Friendship and the banker's paradox: Other pathways to the evolution of adaptations for altruism. *Proceedings of the British Academy, 88*, 119-143.
- Trivers, R. (2011). *The folly of fools: The logic of deceit and deception in human life*. New York, NY: Basic Books.
- Trivers, R. L., & Willard, D. (1973). Natural selection of parental ability to vary the sex-ratio of offspring. *Science, 179*, 90-92.
- Udell, M. A. R., Spencer, J. M., Dorey, N. R., & Wynne, C. D. L. (2012). Human-socialized wolves follow diverse human gestures... and they may not be alone. *International Journal of Comparative Psychology, 25*, 97-117.



- Van Vugt, M., & Kameda, T. (2014). Evolution of the social brain: Psychological adaptations for group living. In M. Mikulincer & P. Shaver (Eds.), *Mechanism of social connection: From brain to group* (pp.335-355). Washington, D.C.: American Psychological Association.
- Vernon, P. A., Villani, V. C., Vickers, L. C., & Harris, J. A. (2008). A behavioral genetic investigation of the Dark Triad and the Big 5. *Personality and Individual Differences, 44*, 445-452.
- Volk, A., Camilleri, J. A., Dane, A. V., & Marini, Z. A. (2012a). If, when, and why bullying is adaptive. In T. Shackelford & V. Shackelford (Eds.), *Oxford handbook of evolutionary perspectives on violence, homicide, and war* (pp. 270-288). Toronto, ON: Oxford University Press.
- Volk, A., Camilleri, J. A., Dane, A. V., & Marini, Z. A. (2012b). Is adolescent bullying an evolutionary adaptation? *Aggressive Behaviour, 38*, 222-238.
- Zeigler-Hill, V. (2013). The importance of self-esteem. In V. Zeigler-Hill (Ed.), *Self-esteem* (pp. 1-20). London: Psychology Press.