Introduction to Comparative Evolutionary Psychology: Merging Perspectives

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Guest Editors

Historically, Psychology as a new field struggled to find its footing on its Philosophy and Anatomy foundations. Early in its history, Psychology emerged from paradigms such as Voluntarism, Structuralism, Functionalism, Behaviorism, Cognitivism, and Positive Psychology, with these paradigms molding and defining a singular field of study. More recently, different theoretical perspectives have found homes within the ever-expanding and diverse parent discipline. Researchers have attempted to identify themselves within particular sub-disciplines and the breadth that is gained from having a diverse background has waned (Vonk & Shackelford, in press). Despite the current push from funding mechanisms for interdisciplinary programs of research, psychologists have been reluctant to bridge the gaps between areas. This special issue was inspired by the observation that two of Psychology's many sub-fields—comparative psychology and evolutionary psychology—have not taken full advantage of the opportunity to embrace the methodologies and theoretical insights of the other. These missed opportunities have done a disservice to both areas of Psychology. Articles in this issue highlight ways in which comparative psychology can inform evolutionary psychology and vice versa. That is, evolutionary psychologists might better appreciate the ways in which comparative research with non-humans can inform thinking about the evolution of traits and behaviors in humans. Likewise, comparative psychologists might better appreciate the insights that an explicitly evolutionary perspective can provide about many non-human and human traits and behaviors. It is not our intent to imply that researchers consistently fail to take advantage of such insights; rather, we propose that such cross-sub-field influences become the norm rather than the exception and that Psychology, in general, can benefit from lesser focus on defining sub-disciplines or fields and greater focus on forming connections across areas.

Evolutionary theory provides a broad perspective that should be applied as widely within Psychology as it is within Biology. Indeed, different sub-disciplines, such as social, developmental, cognitive, and comparative psychology could cease to be distinguished if instead of focusing on broad areas of study, researchers focused on questions of interest, which could then be tackled from developmental, social, cognitive, or comparative perspectives. In fact, comparative as a label does not describe specific topics of study, but points to an emphasis on research with non-humans. Comparative psychologists might study cognition, development, social behavior, or many other topics such as communication, parenting, mating, navigation, and so on. There is tremendous overlap between these topics and those studied by psychologists who focus on humans. Differentiating comparative psychologists into a single, unique group limits the use of knowledge imported from those studying similar topics but with a focus on humans. Evolutionary psychologists similarly study a broad range of topics such as development, cognition, and mate selection. A primary distinction between evolutionary and comparative psychology is the focus on a single broad theory (evolution by natural selection) by evolutionary psychologists, along with a bias toward research on humans. We propose that both comparative psychologists and evolutionary psychologists maintain this theoretical focus but expand their studies to include a range of species, each with its own unique evolutionary history.

Contributors to this special issue conduct research that illustrates our desire to bridge evolutionary perspectives with comparative research. They study a range of topics and species, but all ask questions that are of interest to researchers in both sub-fields. Indeed, we have included work from biologists and anthropologists as well as psychologists. We sought to expose the readers of this new journal, *Animal Behavior and Cognition*, to areas of study that are showing growth and encouraging interdisciplinary collaborations. These articles will be of interest to zoologists, economists, and philosophers, as well. We also sought to highlight topics that we had previously neglected in our edited volume (Vonk & Shackelford, 2012) and our special issue of the journal, *Evolutionary Psychology* (Vonk & Shackelford, 2013). No single volume can address successfully all the important topics that appeal to researchers in both sub-disciplines, but here we do our best to fill some gaps left by the previous volume

and special issue. For instance, animal welfare is a rapidly growing area of research within comparative psychology, and has been largely ignored by major volumes of comparative psychology and cognition, including our own (Vonk & Shackelford, 2012). Personality research focusing on non-humans, on the other hand, has been gaining momentum in the last several years and is now a prolific area of research. Torgerson-White and Bennett (this issue) propose that the study of individual differences in behavior can play a role in the adjustment of animals to lives in captivity. They use data from a study of captive African lions (*Panthera leo*) to uncover a relationship between personality traits and fecal glucocorticoid levels taken before, during, and after a habitat renovation – presumed to be a stressful experience for the lions. Their observations point to vocal frequency and activity levels as important predictors of an individual's ability to cope with stressors. Such research is increasingly valuable as we struggle to understand the impact of human decisions regarding husbandry and housing on the animals in our care. With recent advances in the study of animal sentience (Duncan, 2006; Walker, Diez-Leon & Mason, 2014; Webster, 2006), we can no longer neglect emotional well-being in our animal subjects.

Osvath, Kabadayi and Jacobs (this issue) investigate issues associated with the evolution of complex cognition, highlighting differences in convergent and parallel evolutionary processes. Their work with non-humans can help elucidate factors responsible for the emergence of complex cognition in humans – often argued to exhibit the most complex cognitive abilities of any living or extinct organism. In recent years, much attention has been given to the physical and social intelligence of corvids, with some referring to these birds as "feathered apes" and championing convergent evolution (Emery & Clayton, 2004). In this issue, Szipl and Bugnyar investigate calling and landing frequency as a function of individual identity and residency status to inform our understanding of the social knowledge and communication of ravens (*Corvus corax*). They acknowledge the difficulty in identifying a single factor to account for differing call frequencies, but hope to inspire others to further investigate the relationship between personality, fission-fussion dynamics, and communication in ravens and other corvids. Whereas Szipl and Bugnyar focus on intraspecies communication, Gibson, Scavelli, Udell and Udell (this issue) focus on domestic dogs' (*Canis lupus familiaris)* understanding of human vocal commands. Like the research on animal welfare, research focusing on animal-human interactions is becoming increasingly common. Herzog (this issue) examines the quality of human-animal interactions in the context of owners' attachment to pets. These studies address practical concerns as humans continue to encroach on the well-being of both captive and wild animals, but also are theoretically important as they showcase the role of factors such as group-living, socialization, and domestication in the evolution of abilities such as comprehension of communicative cues across species. Herzog, for example, concludes that pet-keeping is a product of social learning-based cultural evolution.

Vonk and Galvan (this issue) are also concerned with the factors underlying complex cognitive abilities in various species. They examine strategies used by American black bears (*Ursus americanus*) to solve concept discrimination problems, comparing the strategies and outcomes to previous work conducted with three great ape species—orangutans (*Pongo abelii*), gorillas (*Gorilla gorilla gorilla*) and chimpanzees (*Pan troglodytes*). Categorization is a fundamental cognitive ability that presumably underlies much of apparently intelligent behavior in a wide range of species and has been intensively studied. However, these studies have often been restricted to more common lab-housed animals. Vonk and Galvan promote the utility of adopting previously productive methodologies to less well-studied species, noting that these methodologies can be used to highlight the relative importance of factors such as sociality, technical expertise, brain size, and domestication. Along that vein, DesFosses, Allard and Earles (this issue) studied spatial memory in a foraging task in giant anteaters (*Myrmecophaga tridactyla*), a species about which little is known. Spatial and quantity estimation abilities have been highly studied in the lab but less so in captive zoological settings. Mahamane, Gruni, Baker, Young and Jordan (this issue) investigated memory-based quantity estimation in coyotes (*Canis latrans)*. Coyotes, like bears, are members of the order *Carnivora* that are not domesticated and not typically socialized with humans. However, both have large brains, and coyotes have evolved for group-living. Unlike earlier findings from bears (Vonk & Beran, 2012) and findings from much work on non-human primates, Mahamane et al. did not find that coyotes' quantity estimation performance followed Weber's law.

Although further work is needed using more similar ratios and numerical comparisons across species, such results point to differences in quantity estimation in species that differ significantly in morphology and phylogeny. Agrillo has also recently pointed to the possibility of different mechanisms for estimating different amounts of quantites based on his innovative work with fish, but his data have supported the presence of homologous systems in species as diverse as fish and humans (Agrillo, Piffer, Bisazza, & Butterworth, 2012). By exploring the same topics across taxa that vary in different domains, we can shed light on evolutionary factors responsible for the emergence of similar and different mechanisms and traits across taxa.

Garland, Low and Burns (this issue) use a well-known paradigm, the violation of expectancy paradigm, in a natural environment to study the behavioral responses of North Island robins (*Petroica longipes)* to varying prey types to shed light on the robins' understanding of animacy. Robins searched longer when there was a mismatch between the animacy status of prey initially shown and eventually revealed. They also searched longer when immediately consuming prey relative to when retrieving cached prey. These studies indicate how experimental procedures can be conducted in a field setting to elucidate complex cognitive processes while preserving ecological validity.

Although sharing methodologies across areas can be beneficial, sharing terminology can sometimes be problematic. Carter (this issue) tackles the difficult issue of differing definitions across disciplines. This problem is pervasive across many topics in psychology, as well as outside of psychology. In this case, Carter promotes a particular definition of reciprocity that reflects the approach of Evolutionary Biology, but conflicts with its treatment in Economics and Psychology. Carter points to the difficulty that this divergent use of similar terms has caused for researchers attempting to study and quantify reciprocity in various species. Just as evolutionary psychologists would learn much from the work of comparative psychologists, comparative psychologists might find the biological approach to the study of animal behavior highly illuminating. Also relevant to behavioral economics, Parrish, Brosnan, Wilson and Beran (this issue) focus on behavioral flexibility in responses to partner choices in a coordination game – the Assurance game. Their work compares the game-playing strategies of humans to those of various non-human primate species (here focusing on rhesus macaques, *Macaca mulatta*) with similar methodologies (see also Brosnan, Beran, Parrish, Price, & Wilson, B. J., 2013; Brosnan et al, 2011). Thus, one can make conjectures about the evolution of mechanisms such as those underlying reciprocity and gain maximization, which may produce ostensibly cooperative behaviors for different motivations.

Leca, Gunst, Carrier and Vasey (this issue) present evidence for the social transmission of courtship behaviors and mating preferences, specifically female-male and female-female mounting in Japanese macaques (*Macaca fuscata*), which may have implications for sexual preference fluidity in human females. Their emphasis on both evolutionary and current social factors in driving these group-specific dynamics showcases an approach whereby studying non-humans can shed light on a puzzling human behavior. Mate choice is well-studied topic within evolutionary psychology and evolutionary biology. Little (this issue) investigates condition-dependent preferences for healthy facial appearance in prospective mates in humans. This work highlights an area of study than can be conducted with both humans and non-humans to shed light on widespread phenomena. Likewise, Pham and Shackelford (this issue) review data on sperm competition in humans and non-humans, focusing on adaptations to sperm competition that may be shared across species.

We hope that readers of this special issue of *Animal Behavior and Cognition* will recognize the value of a comparative approach to understanding the evolution of human behavior and cognitive abilities, and that readers will also appreciate the clarity that an evolutionary perspective can provide when predicting the presence or absence of traits across species.

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