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On Changing the Framework of Psychology: Comparative Psychology is What General Psychology Should Be

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When behaviorism became the dominant force in American psychology, many of the concerns of functionalism, including evolution, adaptation, and ontogenesis, were left behind. Contemporary psychology textbooks and curricula continue to perpetuate this behaviorist framework despite its atheoretical, nonbiological orientation. Even as these concepts begin to work their way back into textbooks and classrooms, they are treated unsystematically as appendages to the traditional behaviorist framework. Comparative psychology, the last bastion of the functionalist viewpoint, can solve this problem, but misconceptions about the field abound. Some of these misconceptions are discussed in this article, and I demonstrate how a comparative psychology course can provide the framework for reorganizing the focus of general psychology and integrating it into a neofunctionalist perspective.

Among the army of individuals who make up the diverse discipline of psychology, there is a tiny band who go by the name of comparative psychologists. Most of those who choose not to study what comparative psychologists study nevertheless know what the field is all about and its significance for general psychology, or at least they claim to know. In fact, a significant proportion of these people are wrong. This would not be a particularly important revelation except for the fact that many of the misleading attitudes and mistaken beliefs that psychologists hold make their way into classrooms, textbooks, and psychology curricula. Consequently, we have virtually ignored the role that comparative psychology should play within the framework of general psychology. In doing so, we have overlooked the one common thread that ties together almost all of the diversity that is found in mainstream psychology: an evolutionary perspective.

Misconceptions of the Mainstream Psychologist

There is a long history of criticism concerning comparative psychology stemming, in part, from ideological differences with behaviorists and with ethologists, practical limi-

tations on how much can be generalized from nonhuman to human psychology, and a host of psychosociological factors that have served to segregate comparative psychology from mainstream psychology (Demarest, 1980, 1983, in press; Dewsbury, 1984). This is not the place to review the history of criticism in comparative psychology; however, mentioning some of the misconceptions that have arisen from the debate may be instructive. For example, it is a common belief among psychologists that the primary role of comparative psychology is to reveal some general principles of behavior useful in the study of humans. The phrase most often heard from these people is that studies of animals allow us to explore psychological phenomena that would be impossible or unethical to study in humans. This attitude has been the rationale given in numerous introductory psychology textbooks for much research in learning theory and most physiological psychology (e.g., Coon, 1985; Crider, Goethals, Kavanaugh, & Solomon, 1986; Kagan & Havemann, 1980; Lefton, 1985). The "animal model" approach is, in fact, one technique that could be used in comparative psychology, but it is certainly not fundamental to the field. Indeed, if this approach is applied without paying attention to the ecological and systematic relevance of the animal model to humans, the model may be quite misleading (DeSantis, 1983; Plaut, 1975), and it is the failure to recognize this basic principle of comparative research that accounts for why much research in animal psychology has been irrelevant to human psychology.

Another common claim is that comparative psychology is chiefly concerned with species differences and similarities in learned behavior and is almost exclusively limited to mammals, especially nonhuman primates (e.g., Kagan & Havemann, 1980; Kalat, 1986). This point of view was fostered by criticism from biologists that comparative psychology has been scientifically myopic in concentrating on acquired traits and that it has never been particularly comparative anyway (R. B. Lockard, 1971; Lorenz, 1950). Arguments of this sort are wrong because they fail to distin-

guish between studies of behavior done with animals and studies of animal behavior. Many studies are conducted with animals as a matter of convenience, particularly in the domain of process-oriented learning theory, but studies of animal behavior emphasize the integrated nature of proximate and ultimate causative influences on an organism's actions (Alcock, 1975). The subject's evolution and lifestyle are of central importance. Much of the physiological and learning theory research conducted in the 1940s–1960s was guilty of opportunism in the selection of its subjects, and comparative psychologists did not hesitate to criticize this development (e.g., Beach, 1950). The fact that these opportunists dominated the field, including the journals in which comparative psychology was supposed to be represented, led to the current belief among general psychologists and biologists that the field is narrow and irrelevant.

But the principal concern of comparative psychology, even during the decades dominated by process-oriented learning theory, was always much more comprehensive (cf. Dewsbury, 1984). Although many studies in comparative psychology continue to focus on the behavior of only one species, that is no reason for criticism. On the contrary, it seems desirable to know the species you study as thoroughly as possible so that meaningful comparisons can be made. The point here is that general psychologists do not seem to recognize the evolutionary-ecological focus of comparative psychology, and much of what they call comparative psychology is really either physiological psychology or process-oriented learning theory and sorely misrepresents the nature of the field (Dewsbury, 1984).

Another point is that much of the research done by comparative psychologists that is familiar to mainstream psychologists is recognized under different names in textbooks, scholarly articles, and the popular press. Consequently, these names have come to be associated with contributions to this field. Terms such as *ethology*, *animal behavior*, *sociobiology*, *psychobiology*, and *biopsychology* are often used interchangeably to describe the contributions of individuals who would otherwise be known as comparative psychologists. It is not difficult to verify this for yourself; simply conduct a casual survey of new introductory psychology textbooks. I did this the other day, collecting 17 textbooks from colleagues in my department. Looking through the subject index for words such as *comparative psychology*, *ethology*, and so forth, I found that comparative psychology was listed in only 4 books (Coon, 1985; Kagan & Havemann, 1980; Kalat, 1986; Lerner, Kendall, Miller, Hultsch, & Jensen, 1986), whereas another term, typically *ethology* or *sociobiology*, was used in 13 others (Bootzin, Bower, Zajonc, & Hall, 1986; Brown & Cook, 1986; Crider et al., 1986; Darley, Glucksberg, Kamin, & Kinchla, 1986; Gleitman, 1981; Lefton, 1985; McConnell, 1986; Myers, 1986; Ornstein, 1985; Papalia & Olds, 1985; Roediger, Rushton, Capaldi, & Paris, 1984; Santrock, 1986; Worchel & Shebilske, 1986). *Biopsychology* and *psychobiology* invariably were used to refer to studies of the nervous system (cf. Demarest, 1980), an intriguing development in that the first person to identify himself with these terms was a comparative psychologist, Robert Yerkes (1932).

I also looked through the textbooks to see if the field of comparative psychology was mentioned (with or without

the proper label) and how it was described. In most of the cases in which it was included as an identifiable specialty area, one of the “misconceptions” that I referred to earlier was included (e.g., Coon, 1985; Kagan & Havemann, 1980; Lefton, 1985), and with the single exception of Kalat's (1986) book, this was the only description provided for what a comparative psychologist does. We teach our students incorrectly that studies of primate development and social behavior stem primarily from the work of behavioral biologists, that only ethologists study the behavior of organisms in their natural environment, and that “biological psychology” studies the relationship between the nervous system and behavior (implying in the process that everything else is somehow unrelated to biology). We virtually ignore ecology and evolution in the psychology curriculum, and even when it is not ignored, it is almost always treated as distinct from comparative psychology (e.g., Bootzin et al., 1986; Brown & Cook, 1986; Gleitman, 1981; Kalat, 1986; Roediger et al., 1984). Gleitman's (1981) textbook is heralded as a comprehensive compendium of current knowledge in psychology, and it devotes an entire chapter to evolutionary influences on behavior. In this chapter, he cites the names of many prominent historical and contemporary figures in psychology, including Adler, Azrin, Bermant, Bowlby, Cairns, Carpenter, Erikson, Harlow, Hess, Lehrman, Nissen, Scott, and Suomi. The label he chose to identify these contributors and their approach to the study of behavior was ethology. Mainstream psychologists take note. You are being misinformed!

The Comparative Psychology Course

What then is comparative psychology, if it is not simply learning theory and animal models of human behavior? Also, how does it differ from classical ethology and its modern counterparts? A description of my comparative psychology course will help to answer these questions.

In a broad sense, comparative psychology is concerned with how and why organisms do the things they do. I begin my course by asking the students to give up, temporarily, their identity as inhabitants of spaceship earth and pretend that they are interplanetary scientists from a distant galaxy exploring the frontiers of space. (I'm a product of watching too much “Star Trek” in my formative years.) From this attitude soon develops the realization that, to comprehend fully how and why any animal behaves in a particular way, one must explore the animal's developmental and evolutionary history, its ecological requirements, and the neural mechanisms and immediate contingencies of reinforcement or information available for processing in the environment.

We begin by exploring the things that are easiest to detect on our alien planet, the species-specific patterns of behavior that appear repeatedly in the organisms we watch. This is classical ethology, a window into evolutionary history. The similarities soon bring us to realize that behavioral differences exist between organisms that look different and, as we zoom in for a closer look, between similar organisms that have different reproductive roles and between different chronological ages in the same organism. We turn to ontogeny and find that there are numerous developmental trends and experiences that classical ethology has ignored. I point

out that we have not had to discuss the relationship between species similarities and species differences by reducing it to a nature-nurture issue (i.e., is it learned or is it instinct?). Instead, using our zoom-lens analogy to explore this alien planet, we are provided with a concrete example of the principle of emergent properties. Far out in space, using our widest angle lens, all we tend to see are the similarities, the species-specific characteristics (e.g., diurnal activities, intraspecies and interspecies aggression). When we use our zoom lens to get a closer look, we discover differences in subpopulations (e.g., early birds vs. night owls, military hawks vs. doves). With our lens set to its highest power, we find that even these categories break down into individual differences in behavior and physiology.

In comparative psychology, our telescope is a time frame with evolutionary history as the wide-angle lens and developmental history as the close-up lens. Zooming in and out, we can shift our focus from one time frame to another. This enables us to explore different controlling influences, from the broad integrated systems of ecology and evolution to the provincial and apparently deterministic world of physiology and biochemistry. In the context of evolution, we note that the internal mechanisms and ecological requirements blend to yield optimally adaptive behaviors. When this is not the case, we find that extinction is inevitable.

The consequences of altering the system are discussed for various species, including *Homo sapiens*. Applying this approach to human psychology, we recognize that although the organismic mechanisms may be considered at successively finer microscopic levels of analysis (i.e., cognitive, associative, physiological, and physicochemical), examined in each case by increasing the power of our lens, ultimately all internal mechanisms are interdependent on the system of ecological forces acting on them. Pulling back from our microscopic analysis to appreciate this ecosystems perspective, we are reacquainted with the evolutionary questions with which we started, and we begin to understand, in the framework of populations rather than types (Mayr, 1963), the nature of these alien creatures we have been watching.

The problems of defining developmental trends, internal mechanisms, ecological requirements, and evolutionary dynamics are the four fundamental issues in the study of all animal behavior (Tinbergen, 1951), including the study of humans. All modern behavioral biology and comparative psychology have adopted this point of view. Individuals may emphasize some of these issues more than others in their teaching and research, but this is usually because they tend to stress their own specific interests, because their knowledge is limited, or simply because there is not enough time in one course to cover all topics from every perspective. In my course, for example, I do not spend much time describing the physiological mechanisms and developmental processes underlying specific behavior patterns, partly because much of what we know is so tentative, partly because this material is taught in other courses, but mostly because there would not be enough time to talk about other topics that are rarely mentioned elsewhere in the psychology curriculum.

The contemporary course in comparative psychology covers topics that are familiar to most general psychologists, but there is also much that is likely to be foreign. For exam-

ple, phenomena of conditioning, imprinting, releasers, and displacement activities are typically discussed, but so are anagenesis (Demarest, 1983; Yarczower, 1984), canalization (McClearn, 1970; Waddington, 1957), optimality theory (Parker & Stuart, 1976), and causal-factor space (McFarland & Houston, 1981). Dominance, territoriality, and early attachment are familiar topics to most psychologists, but how many have a knowledge of time-sharing and dominance boundaries (Cohen & McFarland, 1979; Sibly & McCleery, 1976), evolutionary stable strategies (Maynard Smith, 1979), and marginal value theorem (Charnov, 1976)? Few psychologists know what these concepts mean, fewer still realize the significance these concepts have for comprehending all organismic behavior, and hardly any of the nonbiologically minded psychologists who dominate mainstream psychology appreciate the heuristic merit of having postulates deduced from evolutionary theory that generate testable hypotheses.

It is time for the architects of general psychology to recognize the field for what it really is: a broad, biologically based study of behavior as conducted by psychologists and the only field in the behavioral sciences with a unifying theoretical paradigm (i.e., the modern theory of evolution). Comparative psychologists and behavioral biologists have shared this point of view for many years. It is the basis of physical anthropology and is undergoing a resurgence in cultural anthropology (Chagnon & Irons, 1979; Washburn & Dolhinow, 1983). One can even begin to see the ripples of its reemergence in general psychology (e.g., Barash, 1982; Buss, 1984, 1985; Buss & Barnes, 1986; Cunningham, 1981; J. S. Lockard, 1980; Rushton, 1985; Staddon, 1983; see also the introductory textbook by Brown & Cook, 1986). However, a new way of thinking in mainstream psychology will be required for this paradigm to take hold. Comparative psychology can provide that framework.

The Relationship Between Comparative Psychology and General Psychology

In theory, a comparative psychology course should be no different from a general psychology course, except that the comparative course would not be focused on a single species. In fact, comparative psychology goes well beyond what is taught in general psychology. This difference extends to the variety of species and environmental contingencies studied, the kinds of questions asked, and the types of answers proposed.

Mainstream psychology virtually ignores the evolution of any behavior and the fact that behavioral abilities exist first and foremost as an adaptation to the organism's ecology. General psychology focuses almost exclusively on the immediate environmental and cognitive correlates of behavior, devoting itself to a search for the proximate mechanisms governing our actions. Textbooks and courses typically are segregated like mental faculties into sections on emotions, perception, reasoning, and personality, just as they were 100 years ago, and they try to give the impression that psychology can be arranged hierarchically in a series of building blocks progressing from physiological mechanisms

to sociocultural influences. Rarely, however, does one see a synthesis among the many pieces of information. There is simply no paradigm, no common thread, no integrated system. General psychology has yet to move significantly from the realm of qualitative metaphysics into the domain of quantitative science. It remains a descriptive discipline ripe with untestable characterizations and mentalistic hobgoblins.

Comparative psychology, in contrast, has a paradigm: the synthetic theory of evolution. It is the synthesis of the mechanistic, developmental, evolutionary, and ecological perspectives that gives comparative psychology its unique place among all the other psychologies. And it is this synthesis of the proximate and ultimate levels of causation that general psychology needs to focus on. If mainstream psychologists are engaged in a search for behavioral laws, they must begin with evolutionary law because it is the only basis from which psychologists might proceed deductively. It may turn out to be true that special laws of human behavior exist, but at best, these laws will provide information that is qualitative relative to any existing general laws of behavior. General laws are quantitative statements by necessity, though few would argue at this point that a general law will tell us everything we want to know about human behavior, or about the behavior of any other species for that matter. As general psychology moves from the descriptive to the prescriptive, it must inevitably become the total study of anything as organism does or can do. Comparative psychology attempts to do this today. Consequently, it has progressed further as a science than has general psychology.

Darwin (1859) was well aware of the importance of his theory for psychology and believed that the discipline would be "securely based on the foundation" of an evolutionary perspective (p. 373). Similarly, C. Lloyd Morgan (1894) considered virtually all the psychologists of his time to be comparative, and by the turn of the century, evolutionary thinking was pervasive throughout all psychology (cf. Angell, 1909; Baldwin, 1909; Howard, 1927). The American functionalist school at the end of the 19th century and the beginning of the 20th accorded genetics, evolution, adaptation, and development a central place in the psychology curriculum. The mind was seen as a product of evolution, and adjustment to the environment was viewed as a process of ontogenetic and phylogenetic adaptation. With the advent of behaviorism, however, many of the concerns of functionalism, including evolution, adaptation, and ontogenesis, were left behind.

We ask that today's students of mainstream psychology reacquire that evolutionary perspective so we may proceed to the development of a lawful science of behavior. The resulting behavioral science would differ a great deal from what now fills our textbooks. Yet it would bring to bear much of what is relevant from our sister disciplines in evolutionary and developmental biology, ecological anthropology, and economics. It would be counterproductive to limit either general psychology or comparative psychology to what has been traditionally psychological, as Thompson (1983) would have us do. On the contrary, the neofunctionalist perspective in comparative psychology is what general psychology should be.

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Notes

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Unnatural Selection: Comment on the "Teaching Comparative Psychology" Symposium

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In this discussion of symposium papers, I examine why comparative psychologists do not consider professional associations of psychology to represent the core of the discipline. I review textbooks in terms of their contribution to comparative psychology and argue that psychology avoids its natural epistemology, that of natural selection and ultimate causality, in preference for the meretricious offerings provided by proximate causation. I also examine why many psychologists consider evolution to be dehumanizing and state three goals for the teaching of comparative psychology:

(a) its reliance on a central epistemological premise, (b) its demonstration of the historical ways in which comparative psychology has changed our views of human behavior, and (c) its duty to compel the student and the public to examine the ethical standing and rights of animals.

It is not only curious, but inexplicable, that the single aspect of modern psychology that can boast of following a unified epistemology is that which has been driven nearest