

Biological Bases of Personal Relationships: the Contribution of Classical Ethology

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Classical ethology, as represented in the works of Konrad Lorenz, John Bowlby and Robert Hinde, may give an important theoretical contribution to relationship research. Lorenz discussed group processes and interpersonal relationships and he emphasized that personal relationships and bond formation are closely related with aggression. Bowlby tried to integrate concepts and methods from psychoanalysis and classical ethology. Hinde tried to integrate our knowledge about human relationships based in some principles of classical ethology. The investigation of ontogeny, evolution, function and causation is still important for relationship research. Classical ethology, together with recent developments in Behavioral Biology, can supply a broad biological basis for relationship research, however, the ethologically oriented attitudes concerning systems theory, description, classification, theorizing and integration of knowledge are probably the most important contribution of classical ethology to relationship research.

Index terms: Interaction. Lorenz, Konrad. Bowlby, John. Hinde, Robert. Classical ethology. Human ethology.

As Bases Biológicas do Relacionamento Interpessoal: A Contribuição da Etologia Clássica. A Etologia Clássica, presente nas obras de Konrad Lorenz, John Bowlby e Robert Hinde, pode representar uma importante contribuição teórica para a pesquisa do relacionamento interpessoal. Lorenz discutiu processos grupais e relações interpessoais e enfatizou que as relações pessoais e a formação de vínculo estão intimamente relacionadas à agressão. Bowlby procurou integrar conceitos e métodos da Psicanálise e da Etologia Clássica. Hinde procurou integrar o conhecimento sobre relações humanas com base em alguns dos princípios da Etologia Clássica. A Etologia Clássica, ao lado de desenvolvimentos recentes na Biologia Comportamental, pode fornecer uma ampla base biológica para a pesquisa do relacionamento, contudo, as atitudes etologicamente orientadas referentes à teoria de sistemas, descrição, classificação, teorização e integração de conhecimento são provavelmente a contribuição mais importante da Etologia Clássica para essa área de pesquisa.

Descritores: Interação. Lorenz, Konrad. Bowlby, John. Hinde, Robert. Etologia clássica. Etologia humana.

The biologically oriented research about animal and human behavior in the last decades has advanced in several aspects. ethology, Sociobiology, Behavioral Ecology, Neurophysiology, Behavior Genetics are some of the areas that contributed to the advance of our knowledge about social processes and interpersonal relationships. This paper aims at discussing the contribution of classical ethology to relationship research in the works of Konrad

Lorenz, John Bowlby and Robert Hinde. Issues related to social and personal relationships are also present in the work of other ethologists (such as Eibl-Eibesfeldt and Karl Grammer).

Konrad Lorenz

A critical analysis of the conceptual framework of Konrad Lorenz's work (Garcia & Otta, 2002; Garcia, in press) has identified six large conceptual areas: a) philosophical and scientific fundamentals; b) behavioral organization and dynamics; c) behavioral evolution and modification (learning); d) social

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behavior; e) cognition, emotion and values; and f) man – nature, society and culture. Concerning social behavior, the author discusses social organization, group processes and interpersonal relationships, communication, reproductive behavior (sexual behavior), emotion, social life, aggression (including human aggression), militant enthusiasm and the control of aggression (inhibition and moral).

In his first writings, Lorenz already presented some relevant ideas related to relationship research. In an important article (Lorenz, 1970), originally published in 1935 (dedicated and influenced by Jakob von Uexküll), the conspecific is considered as the eliciting factor for social behavior patterns. Lorenz, in this work, presents a series of data about the behavior of birds in relation to their conspecifics or companions (a peculiar role which the conspecific plays in the bird's environment). He, then, attempts to reconstitute the role performed by the companion, as an eliciting factor for responses related to a single functional system. The author classifies the companions (attached to overall functional systems) as parental companion, infant companion, sexual companion, social companion and sibling companion.

Lorenz begins his considerations discussing the idea of 'object' in the environment and its implications. According to the author, object-directed instinctive behavior patterns are elicited by a small selection of the stimuli from a perceived object. In the article, he considers the 'object' as an individual of the same species. According to Lorenz, for most birds, the conspecific represents, within each functional system in which it appears, a reciprocating or separate object in the environment.

The "innate schema" is considered of great importance in responses which have a conspecific as object. In this case, both the evolution of the innate releasing schema and that of the relevant stimulus-key occur within the same species. So, instinctive behavior plays an important role in the behavior directed to conspecifics: "With instinctive behavior patterns directed towards a conspecific, there is an opportunity for maximal specialization of releasers and the corresponding innate schema-

ta, so that under natural conditions consistent response towards the object is just as effectively ensured as would be achieved by subjective understanding of the objective identity of the object" (Lorenz, 1970, p. 245).

According to Lorenz, 'innate schemata' and the process of imprinting interact in the determination of the characters of the conspecific acting as a companion to the bird within a particular functional system. Besides imprinting, there is always an innate framework to permit the incorporation of the releasing schemata to be acquired. The interplay between the innate companion schema and object-imprinting, however, differs from species to species. This initial approach to different kinds of inter-individual behavior in birds, in which the author still uses the concept of 'innate schema', integrates instinctive behavior and imprinting as important factors.

A discussion of the theme (personal relationships) may be found mainly in his *On Aggression* (Lorenz, 1966) and *Here Am I - Where are you? The behavior of the greylag goose* (Lorenz, 1988). A central point in his discussion of personal relationships and bond formation is his proposal of a close relation between aggression and personal relationships. Lorenz discusses the bases of social life and the formation of social bonds in animals and humans. Social organization and behavior are interpreted as a structured and hierarchic system in relation to the environment, a system of dispersion forces (related to aggression) and attraction forces (related to social bonds) as the basis of social life. He proposes different kinds of social organization that appeared during evolution and discusses group processes and interpersonal relationships related to these kinds of organization. He attempts to integrate phylogenetically established trends, phylo-genetic and cultural ritualization processes, and our rational and responsible moral to explain human social behavior in an evolutionary and historical approach. He also discusses emotions and communication as part of social behavior.

A personal bond consists in behaviors revealing a mutual bonding. A community united by the bond is a group. Like the anonymous band, the group presents a general

cohesion, due to reactions provoked by the members among themselves. But, on the contrary of this, in the group the individuals react selectively to the individuality of the other.

The condition for the formation of a group is personal identification of the companion in any situation. Members keep their social role independently of place, what is individually learned. The group with social bonds appears for the first time in the Teleostei, mainly in the Cichlids, where the non aggression reminds the friendship due to the diminution of repulse, what also depends on knowledge between individuals. The possibility of getting habituated to a known conspecific is the necessary condition to form a personal bond in the phylogenesis of social behavior. The family, the cohesion of the couple devoted to the common care of a litter is the phylogenetic prototype from which results the personal bond and group formation. Individual recognition seems to be subject to selective pressure when two conspecifics cooperate in the care of young, being advantageous to the species if aggression between parents is eliminated, resting only against other individuals. Such bonds will be the basis of human society.

Due to their primitive origin and function, personal bonds make part of these behavioral mechanisms that calm down and restrain aggression. They represent the indispensable basis on which human society is built (Lorenz, 1966).

Bond formation occurs in social development. Lorenz discusses this formation in birds and mammals. In birds, there are different ways how bonds may be established. Birds may also direct their sociability and their sexual love to people who bred them and even have their bonds undone. In the greylag goose, the bond between partners becomes independent from external conditions (i.e., partners may move from a place to another without breaking bonds). In the case of dogs, social development presents an early impressionable period in which a bond with a human being may be established. A few days are enough for a dog to fix its affection unchangeably, being typical the irreversibility of the fixation of instinctive life in a defined object. In dog development, there are two occasions in

which bonds are formed: it is as if, in puberty, the dog was separated from its family, with its traditions and adopted new behavioral patterns. This also occurs in human beings as a unique phenomenon, being possible to the young, in this impressionable period of life, to devote themselves to false idols. In dogs, the exclusive affection for a person is developed and there is a transition from the young dependence related to a parent to the adult fidelity towards the leader, and this may be a human being.

Love and aggressiveness are interconnected and love depends on aggressiveness. In principle, a bond is formed as a consequence of the existence of something in common, something that must be defended against those from outside. In all these cases, aggression is necessary to consolidate the bond (Lorenz, 1966). All cases of true love contain a large part of latent aggressiveness that this bond can only hide and, at the moment such a bond is broken, hate may be generated. There is not love without aggression, but also there is not hate without love (Lorenz, 1966).

The personal bond, the individual friendship, can only be found in animals in which intra-specific aggressiveness is quite developed. The bond is even stronger in the most aggressive species. A few fishes are more aggressive than the cichlids, a few birds are more aggressive than geese and the mammal famous for its aggressiveness, the wolf, is the best and most loyal of friends. In animals which are alternatively territorial and aggressive or non aggressive and social, depending on the reproductive season, a personal bond is restricted to the periods of aggressiveness (Lorenz, 1966).

Intra-specific aggression is much older (millions of years) than personal friendship and love. There is intra-specific aggression without its opposite, love. But, on the contrary, there is not love without aggression. Hate, however, is a behavioral mechanism quite different from aggression. Hate, the younger brother of love, is always directed against an individual, exactly as love. So, it is not possible to hate without the previous existence of love and when, despite all negotiations, love is still present (Lorenz, 1966).

In aggressive animals, personal bonds have been formed during evolution when solidarity was necessary for the conservation of the species, as it is the case of litter protection. The personal bond of love may have originated from intra-specific aggression and through ritualization of an aggression or a reoriented threat. As these rites are connected to a companion, and are transformed in need as independent instinctive acts, they make the presence of partner a necessity.

The triumph call is the most important factor in the bond formation between two geese, determining the group social structure. This bond between geese is analogous to the human functions of the feelings of love and friendship. The triumph ceremony is not a consequence of love and friendship. It is the ceremony itself that unites the group members. A process of aggression may modify the goose triumph ceremony with the contribution of the aggressive drive. The bonding intensity through the triumph ceremony is proportional to the level of mutual knowledge of the partners. It is not the existence of sexual relations between partners that makes the couple cohesion of geese last for life. The existence of a strong bond brought up by triumph ceremony between two individuals prepares and activates sexual relations.

It is possible to establish bonds between man and animal. Lorenz reports his bond with a bitch that, just before separation, was depressed and did not leave him, reaching the despair, almost neurosis, when his departure was arriving. The separation led to insubordination and refusal to obey. Mental suffering changed its personality, before docile. After his return, the cause of the mental trauma was removed without apparent consequences. In another occasion, he reports the bond formed between a strange dog and his children, made possible due to a previous bond with similar children, whom the dog adored. For this reason, the dog established this bond with his two children. The relationship between a human being and the animals he breeds to eat is contradictory. In the case of farmers, the relationship between man and animal follows almost ritual patterns, a kind

of routine to set man free from moral responsibility or remorse feelings. Morally, it is worse to twist the neck of an acquainted goose than to shoot a wild goose.

Dog's fidelity stems from the maintenance of the bonds that keeps the young dog close to its mother (the adult dog conserves juvenile characters) and the bonds that keep the wild dog linked to the leader and from the affection between the group members. The juvenile dependence of wild animals is identical to the social bonds which tie most dogs to their owners. Friendship rarely occurs between animals of different species due to problems of language, due to the absence of an innate comprehension of the expressive movements of other species. This exists only between man and animals.

Some kinds of dogs remain dependent of their owners for life, just like young wild dogs concerning the older ones. Owning a dog with a personality that reflects ours gives us a feeling of balance and interior satisfaction. The choice is based in a personal sympathy for similar characteristics. Canine love comes from two different sources: from affection of a wild dog in relation to the pack leader (that the domestic dog transfers to the owner) and from a permanent state of joviality, proper of domestic animals, which expresses itself in the affection that the young wild animal feels about its mother and that the domestic one maintains for life, bonding the animal to its owner.

The choice of the object of social and sexual behavior includes hereditary and learned factors. Even birds (jackdaws) may take human beings as objects of social behavior due to individual experience. However, in human species, as in the majority of mammals, the object of sexual love must be recognized by hereditary signals.

There is a balance between the forces attracting and repelling two animals, being "impossible to discuss the force of attraction involved in the formation of bond without also considering the repelling effect of aggression" (Lorenz, 1988, p. 195). The dispersion of animals of the same species has survival value.

A peculiar relationship exists between bond formation and aggression. Apparently, there is survival value for individuals of a species to repel others, as they distribute uniformly in the available habitat. Aggression, besides territoriality it engenders, is one of the most important mechanisms to the dispersion of living organisms. According to Lorenz, we know many animal species in which individuals only repel one another and do not show bond formation of any kind. But, we do not know any animal species that forms bonds but lacks completely the aggression required to dispersion (Lorenz, 1988). This series of Lorenz's remarks about personal relationships reveals his concern about this research area.

John Bowlby

John Bowlby's work is marked by his efforts to integrate psychoanalysis and ethology. Bowlby (see Garcia, 2003), initially based on Freudian concepts, has been influenced by classical ethology and developed a theoretical system where ethological concepts and methods are clearly present. In his work, he proposed new theoretical advances and methodological procedures, such as the importance of observation of the first years of life of the child prospectively and the comparison with animal behavior, influences which may be directly traced to classical ethology. Bowlby's work is a good example of the contribution of classical ethology to relationship research. The separation of mother and child has received a remarkable place in his conceptual framework usually named as "Attachment Theory". The mother-child separation may have different consequences, from depression and suicide to acts against the family (negligence) and against the society (criminality, delinquency, drug addiction). The author also discusses preventive measures, especially the non deprivation in childhood of a stable maternal figure besides measures to avoid the psychopathogenic influence of parents and suggestions for therapeutic practice. In Psychotherapy, he endorses the work with the family, the recovering of information about the concrete conditions of

the initial relationships with parents and the re-elaboration of present relationships in light of previous relationship with attachment figures. Bowlby and Hinde have influenced each other and Lorenz and Bowlby met in a work group organized by the World Health Organization in the 50's.

Theoretical influences: between psychoanalysis and ethology

Bowlby was influenced by Freud, Lorenz, Tinbergen, Hinde (ethology) and even Piaget. Theoretically, Freudian concepts are the starting point for Bowlby, but he also shows interest in Development psychology, Comparative psychology and Animal ethology.

Bowlby was introduced to psychoanalytical practice by an analyst of Kleinian orientation. However, his basic referential framework is the work of Sigmund Freud and not Melanie Klein. Even after getting closer to ethology, Bowlby maintains his favorable opinion regarding psychoanalysis and Freud's work as the best theory ever written about the affective side of the human species. In ethology, he becomes acquainted with the studies about animal behavior of Konrad Lorenz and he also suffers the influence of Robert Hinde. The idea of imprinting, studied by Lorenz is, from the standpoint of the development of Attachment Theory, a central concept. The influence of ethology is wide and reaches his conceptual framework (his considerations about evolution and adaptation, for instance, are influenced by ethology). ethology also influences his epistemological attitudes (the way he formulates his concepts, compares man and animals, utilizes the comparative method), as well as the concern with direct observation of the effects of separation and not only the retrospective research.

The conceptual basis, especially that exposed in "Attachment" (Bowlby, 1969), discussing the instinctive basis, is strongly influenced by ethology. The conception of instinct adopted also shows the influence of Systems Theory, what may also be seen in Tinbergen and Lorenz.

In several occasions, Bowlby analyzed and criticized psychoanalysis. Among his remarks about the discipline, Bowlby (1979) discussed the nature of psychoanalysis as an art and science. The direct observations of Ainsworth of children during their interaction with their mothers and out of the family are mentioned as a technique to obtain data indispensable for the advance of psychoanalysis. Bowlby (1981), as a scientist, criticizes the nature of psychoanalysis as a natural science. He proposes that the traditional meta-psychology should be replaced by a conceptual framework using modern concepts. According to this position, he adopts principles stemming from ethology, Control Theory and Processing of Human Information. He bases his theoretical discussion on empirical data obtained from direct observation of interactions between parents and children and analysis of patients. Bowlby (1984) criticizes psychoanalysis for never having attained adequacy concerning the requisites of a natural science, despite the intention of Freud in this direction.

Bowlby (1988) reports that, in 1951, he read with special interest an article by Lorenz (1935) about the behavior of goslings and ducklings, which indicated that a strong mother-offspring bond could develop in some animal species, what would be relevant for the human species. So, in the 50's, it is already possible to note the approximation of Bowlby in relation to ethology when analyzing the critical phases in the development of social responses in man and other animals (Bowlby, 1953). Human social responses are profoundly affected by social experiences in certain critical phases of development and these present different effects in the organization of these behaviors. The understanding of these processes comes from ethology, represented by Lorenz and Tinbergen, and from Psychoanalytical Theory. The author discusses some social responses in animals and man and lists several principles common to psychoanalysis and ethology concluding that the time is arrived to a unification of psychoanalytical and ethological concepts.

His attraction to ethological ideas appears in a paper about the ethological approach regarding the development of object relations (Bowlby, 1960). According to Bowlby, ethological

research offers to psychoanalysis, as an empirical science, a variety of new concepts to test. For instance, according to him, many neurotic and psychotic systems in humans could represent 'reactions of displacement' in a pre-symbolic level of functioning. Although this may create difficulties for many of the symbolic oral formulations of psychoanalysis, such hypothesis agrees, according to Bowlby, with Freud's conception regarding psychoanalysis as based in the study of psychological concomitants of biological processes.

His work evidences the convergence between the principles of psychoanalysis and ethology. Bowlby (1976) discussed the development of human personality in light of ethology, describing problems of human Psychopathology and the several ways the study of animals contributes to their solution. He referred (Bowlby, 1980) to the interbreeding between ethology and psychoanalysis, speaking of a psychoanalysis ethologically oriented, discussing topics such as the effects on small children of separation from their mothers, the mother-child bond and the anxiety of separation. Bowlby (1991), in one of his last papers, underlined the light brought by ethology on psychoanalytical problems. He tried to unite the insights of psychoanalysis and the concepts and methods of ethology, particularly in examining the long lasting influences on social behavior of attachment of children to their mothers.

Attachment theory: separation and loss

The conceptual organization of Bowlby's work presents a progressive evolution culminating in the volumes of his trilogy: Attachment, Separation and Loss (Bowlby, 1969, 1973a, 1973b). From a conceptual standpoint, his first most popular work (Bowlby, 1951) is much more a report with empirical data and practical suggestions, lacking a more consistent theoretical organization. In several papers, he tried to organize theoretical aspects which would be put together in the trilogy. Several of these papers have been republished in *The making and breaking of affectional bonds* (Bowlby, 1979b). In the 80's, the book *A Secure Base* (Bowlby, 1988), discussing clinical applications of Attachment Theory, tried

to transform the discoveries and theoretical contributions of Attachment Theory into a method of intervention.

The Attachment Theory advanced by Bowlby is strongly marked by functional concepts, reflecting the ethological influence. An important discussion about adaptation and adaptability is present in Bowlby's work. According to Bowlby (1969), no system may be so flexible to adapt itself to any environment. Adaptability (or the condition of being adapted) should be considered in relation to the environment in which the system evolved. So, to define adaptability, it is necessary an organized structure, a specific result to be achieved, and an environment in which the structure should achieve this result. Adaptation, on the other hand, is seen as the change process allowing a structure to get adapted. Bowlby (1969) emphasizes the concept of environment of evolutionary adaptability in which human instinctive equipment should be understood (the environment in which the human species lived for the last two million years). In this environment, behavioral patterns are expected to contribute to the individual and species survival.

Bowlby proposes the existence of a behavior of attachment (Bowlby, 1958). A child would be born with five instinctive drives: sucking, clinging, following, crying and smiling. The attachment to the mother would develop through the expression of these drives and would serve as its integrating nucleus. Based on psychoanalysis and on ethology, he develops a theory of 'attachment behavior' to explain the formation of early object relations and its dynamics (Bowlby, 1964). He states that attachment behavior is a behavioral system as distinct as feeding or sexual behavior.

Bowlby presents several characteristics of attachment behavior, such as: a) specificity – attachment behavior is directed to one or some specific individuals; b) duration – a bond lasts for a long time; c) intense emotional involvement in the formation, keeping, breaking, and renewal of relationships; d) ontogeny – attachment behavior develops during the first months of life; e) learning – initially, attachment behavior is mediated by simple organized responses. From the final of the first year, it becomes to be

mediated by more refined behavioral systems, cybernetically organized and incorporates representational models of the environment and of the self; f) biological function – probably protection against predators.

Attachment Theory tries to explain attachment behavior using the notion of behavioral system. The theory attempts to explain attachment behavior (its appearance and disappearance) as a long lasting attachment which children and other individuals establish with other particular individuals. Behavioral system is the key concept in the theory. It is conceived in analogy with a physiological system homeostatically organized to ensure that a certain physiological measure (such as body temperature or blood pressure) be maintained in appropriate limits. When he proposes the concept of behavioral system to explain how a child or an older person maintains a relationship with an attachment figure in certain limits of distance or accessibility, he uses well understood principles to explain a different way of homeostasis, where the limits concern the relations of the organism with a person clearly identified in the environment, and where the limits are maintained by behavioral means instead of physiological means (Bowlby, 1988).

The Attachment Theory recognizes as fundamental the existence of a strong causal relation between initial relationship (experiences with the parents) in childhood and the individual capacity of establishing affective bonds in later life. Some variations of this capacity (manifested in marriage problems and in problems with children, as well as in the neurotic symptoms and personality disturbances) may be attributed to variations in the way parents perform their roles (Bowlby, 1979b).

According to Bowlby (1988), Attachment Theory is a kind of structural theory that was developed as a theory of object relations. Bowlby proposes the existence of an internal psychological organization with a certain number of highly specific aspects, including representative models of self and attachment figure(s). The proposed theory may be seen as having the same basic properties that characterize other forms of structural theory, in this case, psychoanalysis is one of the most known variants. Historically,

attachment theory was developed as a variant of the theory of object relations.

Bowlby (1969) identified several attempts in the psychoanalytical movement to broaden or substitute Freud's model. Some of these focused on the individual trend to relate with other people, considered as a primary principle, and called models of object relations. Contributions to theories of object relations come from Melanie Klein, Balint, Winnicott and Fairbairn. Bowlby considers that his theory stems from object relations theories, but it would be based in a new kind of instinctual theory. Instead of psychic energy and its discharge, the central concepts are those of behavioral systems and their control, information, negative feedback and behavioral homeostasis. The understanding of the response of a child to the separation or loss of its mother is related to the understanding of the bond between both. In psychoanalytical writings, according to Bowlby, this theme is discussed in terms of object relations (based on Freud's Instinctual Theory, which defines the instinct object as something that enables the instinct to achieve its finality).

Bowlby (1969) based his work in a new instinctive behavior theory, so it differs from other object relations theories. He proposes that the child-mother bond results from the action of some behavioral systems having the proximity with the mother as the expected result. Attachment behavior is considered a class of social behavior as important as mating or parental behavior, with a specific biological function.

He recognizes four main approaches to explain the relationship between mother and child (Bowlby, 1959). According to Bowlby, ethology would support a wider theory of partial drive relations based in at least five child innate and adaptive patterns of behavior: sucking, clinging, following, crying and smiling. This theory (although the trends of Freud in this direction) differs from the psychoanalytical emphasis on oral experience. These child innate behavioral patterns directed to its mother have been acquired by natural selection during human evolution.

Based on evolutionary and functional premises, Bowlby (1988) gives a new interpretation of separation anxiety. The idea of function and adaptation led Bowlby (1973a) to disagree with psychoanalysts and psychiatrists concerning some important traditional hypotheses which stated that only the presence of something dangerous or harmful would create situations in which fear would be manifested by a mentally healthy person (what does not apply to separation and loss anxiety). As a consequence, fear in any other situation should be abnormal or pathological. Bowlby's evolutionary considerations make it possible to give another interpretation to fear and anxiety. Both would indicate a kind of risk. Separation anxiety is no longer an enigmatic feature, but it is considered an instinctive behavior (a basic human disposition) in response to the indication of a risk.

Attachment Theory serves as the basis for his considerations about etiology and psychopathology (Bowlby, 1977). Bowlby describes his Attachment Theory as a way to conceive the propensity of human beings to form affective bonds with particular figures and to explain the many ways of emotional distress and disturbances of personality, including anxiety, fear, depression, and emotional indifference, to which undesirable separation and loss give rise. Although Attachment Theory incorporates many psychoanalytical notions, many of its principles stem from ethology, Cognitive psychology, and Theory of Control. According to Bowlby, Attachment Theory complies with the common criteria to be considered a scientific discipline. Some common developmental patterns of personality, healthy and pathological, are described in these terms and also some common patterns of parents that contribute to them.

Classical ethology is a conspicuous theoretical and methodological influence on Bowlby's research and theorizing.

Robert Hinde

Robert Hinde, the first student of Niko Tinbergen at Oxford, is one of the most important authors influenced by classical ethology and contributing to relationship

research. A close analysis of his work, especially his books on the subject (*Towards Understanding Relationships*, 1979; *Individuals, Relationships and Culture*, 1987; and *Relationships, a Dialectical Perspective*, 1997) reveals the strong influence of classical ethology on his work, such as the emphasis on description and the idea of levels of complexity and integration. Robert Hinde wrote several papers and books about personal relationships. In his most important work on the topic (Hinde, 1997), he discusses the central issues in the field of relationships in adulthood pointing the way towards integrating our knowledge about human relationships. The self, interactions, relationships, and groups are seen as dynamic processes in dialectical relations with each other and with the socio-cultural structures of norms, values, beliefs and institutions. His analysis takes into account about 1,600 references published in recent decades. The author introduces aspects of the self relevant to the dynamics of interactions and relationships, discusses the main characteristics of relationships, from the constituent interactions to the objective and subjective aspects of relationships. The importance of communication and personal accounts in relationships are discussed. He also discusses processes involved in the dynamics of relationship, such as the influence of individual characteristics, the influence of social factors, the role of processes of attribution, exchange, equity, interdependence and resource theories and attachment. This first part of the book is primarily analytical while the last chapters try to synthesize the knowledge concerning relationship and relationship change, from acquaintance, through development and maintenance, to decline. Finally, the author proposes routes of integration.

Three books, one aim: integration in the study of personal relationships

In 1979, Hinde stated that the study of personal relationships was the subject of several disciplines from the social, medical and natural sciences. However, integration (theoretical and empirical) between them was lacking. His aim was, then, to explore the possibility of integration of knowledge and the building of a science of personal relationships as an integrated body

of knowledge. Conceptual integration of different approaches to interpersonal relationships and integration at the practical level were to be pursued.

In 1997, the possibility of integration of a science of relationships is retaken and an integrating framework is sought. At this time, a large number of references are included in his efforts to find a route for integrating knowledge.

These books seem to maintain different levels of explicit reference to classical ethology. Using bibliographical citation as an index, it is possible to note a progressive distancing from original ethological texts. In 1979, Hinde cites four works by Tinbergen and one by Lorenz. In 1987, he mentions two works by Tinbergen and three by Lorenz. Finally, in 1997, there is the mention of only one work by Tinbergen.

Levels of complexity of relationships: systems theory

Hinde (1979) makes it clear that data about interpersonal relationships involve several levels of complexity and that additional descriptive concepts are needed at each one.

In 1987, Hinde aims at understanding the relations between biological and social factors in human behavior. He underlines the need, in the study of social behavior, of distinctions between successive levels of social complexity – interaction, relationships, and group and socio-cultural structure - as processes, with dynamic and dialectical relations between them. According to Hinde, a 'relationships' approach is important to build bridges between the biological and social sciences. He also considers that the application of biological principles to human social behavior must take into account the dialectical relations between levels of social complexity.

Hinde (1987) considers that an interaction involves a series of interchanges and the content of the interchanges and quality of behavior involved can be described. On the other side, a relationship involves a series of interactions over time between two individuals. Interactions and relationships are more than behavior, as attitudes, hopes, expectations, emotions are to be included. Due to subjective concomitants, a relationship can continue in the absence of interactions.

According to Hinde (1987), different levels of complexity in social behavior include interactions, relationships and social structure and these levels of complexity present two-way relations between them. These three levels affect, and are affected by, the socio-cultural structure and they are in dialectical relations with the environment. The dialectical relations between levels of social complexity are relevant for unifying biological and social approaches to human social behavior. So, cultural forces affect the natures of individuals, but also that the natures of individuals affect the cultural forces. He explicitly proposes the adoption of a "systems approach" to relationship research.

Hinde (1997) restates the series of levels of complexity, including processes within individuals, interactions, relationships, groups and societies, and also the context of culture and physical environment. All these levels affect and are affected by the others and each level is a complex of dialectical processes – integrated into a new reality.

Description and classification of relationships

The theme of description and classification is present in his three books. Hinde (1979) proposes that a relationship science should rest on a descriptive basis - relationships must be described and classified as a preliminary effort. This emphasis on description is attributed to biologists who study behavior (and he mentions the example of 'ethograms' which catalogue the behavioral repertoire of the species before analyzing any aspect in detail). In 1979, Hinde already starts working on a prospective science of relationships using as the starting point a descriptive basis. He considers categories of characteristics of interpersonal relationships referring primarily to their behavioral aspects. The first categories concern what two individuals do together (useful for an initial functional classification of relationships). If the initial categorization of relationships depends on the content of the interactions, a related dimension concerns the diversity of interactions within the relationship. Following these, 'how' people do things is also quite important. So, to organize the area of relationship research, he starts from the content and

quality of individual interactions. Advancing his theoretical scheme, he states that the relative frequency of different types of interactions and the way they are patterned in time in a relationship should be considered. He adds the aspects of similarity and complementarity in the behavior of the participants. The scheme proceeds towards properties of the relationship as a whole, and he finally considers intimacy, interpersonal perception and commitment, focusing primarily on affective/cognitive aspects.

Hinde (1979) starts with division of relationships by content (what people do together) and the subsequent categories are regarded as qualifying the initial classification based on content. This categorization of dimensions (categories of description at an intermediate level of analysis) of interpersonal relationships, however, may be useful to understand their dynamics. The organization proposed is clearly based on descriptive aspects towards dynamics aspects which are the final aim: "In the preceding chapters we have surveyed a series of categories of dimensions of relationships. These involved what the partners do together, how many different things they do, the qualities of their interactions, overall properties of the relationship dependent on the absolute or relative frequency and patterning of the interactions, the patterns of reciprocity vs complementary in the interactions, and aspects of intimacy, interpersonal perception and commitment. But description is only a means to an end, our long-term aim is to reach understanding of how relationships work, of their dynamics" (Hinde, 1979, p. 153).

The importance of description of relationships is restated in 1987. Hinde (1987) considers as necessary a descriptive framework for each level of complexity (to systematize knowledge). Description is considered the first step and the basis for theorization and generalization. Hinde recognizes some important groups of categories for describing relationships. These categories move from those concerned with what the individuals do together and properties of individual interactions to more global properties involving subjective aspects of the relationship as a whole.

The theoretical scheme starts from the content of relationships (what the individuals do together), then the diversity of the interactions (number of different things done together), the quality of interactions (how they do it) what may depend on the relative frequency and patterning of those interactions. Then, he discusses reciprocity (the participants do the same thing) and complementary (they do different but complementary things), intimacy (revelation of experiential, emotional and physical aspects to other), interpersonal perception and commitment (related to the continuance or optimizing of a relationship). Hinde suggests that these categories may help to order descriptive data on personal relationships and considers complete description as impracticable and unnecessary (Hinde, 1987).

A significant part of relationship research is considered to be in the descriptive level: "...the description of relationships...involves in essence the description of the interactions (content and quality), description of properties arising from the relative frequency and patterning of interaction within the relationship, and description of certain properties arising from the relative frequency and patterning of interaction within the relationship, and description of certain properties that are more or less common to some or all the interactions within the relationship" (Hinde, 1987, p. 38).

In 1997, he again states that "an integrated body of knowledge about relationships must rest on a firm basis of description and classification" (Hinde, 1997, p. 51). He, then, comments on a variety of categories of dimensions of relationships in this sense. He admits that although description should be independent of explanation, relationships are dynamic processes, so some reference to process is essential. Description should be selective. As a starting point of description he proposes what two individuals in a relationship do together. Hinde (1997) inserts verbal (including conversation) and non-verbal communication (expression of the emotions and other signals for communication) as important for relationships.

The study of dynamics of relationships and orienting attitudes from ethology

The study of dynamics (stability and change) is already present in 1979, when he discussed the 'dynamic stability' and principles likely to aid understanding of the mechanisms involved. Finally, he discusses change, considering some general issues related to the development of relationships.

In the study of dynamics of interactions and relationships we have to investigate the relation between emotions, cognitions, and behavior (Hinde, 1997), to search a better agreement over the variables assessed, the relation between them and the instruments used to assess them. It is necessary to integrate our perspectives on relationships, to see how theories are inter-related and if they are compatible.

In sum, all properties mentioned by Hinde so far for relationship research may be traceable to ethology. In 1987, Hinde mentions four orienting attitudes of ethology in the study of personal relationships: emphasis on description and classification, analysis and synthesis of the results of analysis, moving between levels of complexity, the emphasis placed on question of function, evolution, development and causation, and the sense of humility regarding the diversity of nature.

Hinde (1997) proposes "three analytical stages: the description of relationships, the specification of principles involved in their dynamics, and the recognition of the limitations of applicability of those principles" (Hinde, 1997, p. xix). Finally, based in Tinbergen (1951), he concludes that understanding requires re-synthesis of our analysis to understand the whole. He also adds the importance of not confusing description and explanation. In relationships, affective and cognitive components are as important as behavioral ones.

The structure proposed for the study of relationships, consisting of four stages, may be summarized in the following words: "The first involves description of the phenomena and the identification of characteristics in terms of which relationships would be described and differentiated. The second phase involves discussion of

the underlying processes, and the third recognition of the limitations of their relevance in relationships of different types. Since relationships are themselves processes there is inevitably considerable overlap between these phases, but all are essentially analytical – relationships are analyzed in terms of characteristics, and the characteristics are (partially) understood in terms of the processes that give rise to them...analysis is not enough and a fourth phase of re-synthesis is also necessary” (Hinde, 1997, p. 509).

The contribution of Hinde to relationship research may be considered fundamental, not only theoretically but also guiding empirical research. The orienting attitudes underlining his efforts, however, have their origin in classical ethology.

Conclusions

We have pointed out some aspects of personal relationship research present in the work of three authors linked to classical ethology. Konrad Lorenz, one of the most important authors in the organization of ethology; John Bowlby, a psychoanalyst that has been largely influenced by ethology; and Robert Hinde, who acted as an important author in the heart of classical ethology, although he considers himself no longer as an ethologist (personal communication).

We could consider several levels of influence of classical ethology on relationship research. At first, personal relationships were already investigated in classical ethology (Lorenz, 1988, for instance). These studies may be useful as comparative resources. A second level is the introduction of theoretical and methodological aspects in relationship research (Bowlby's work is an example). The third and most comprehensive influence that classical ethology has exerted on relationship research is related not with particular data on research done, but with the orienting attitudes in three aspects: a) the conception of nature (systems theory); b) a conception of how knowledge about nature should be accomplished (description, classifica-

tion, identification of principles) and, as a corollary of these two, c) integration of knowledge, as the knowledge of different levels must be integrated. This may be considered the special contribution of Robert Hinde to the area of relationship research.

The three authors mentioned above have, each one, contributed with relationship research in different ways, although the three under the influence of ethology. We could also insert Tinbergen's work here. But, it is clear that Tinbergen is already present in Hinde's work, especially his proposition of the “four whys” (Tinbergen, 1963), research about personal relations should investigate the ontogenesis, evolution, the adaptive function and the physiological causation of behavior.

Lorenz's contribution reveals that personal relationships have always been part of ethology in empirical research (even working on bird behavior he considers their relationships, for instance in his geese) and also in his conceptual framework. His work reveals several important considerations about the evolution of personal relationships. What we cannot find in Lorenz's work is a closer relation with the area of relationship research and, especially, with literature on human relationship research.

Some notes on important points of Lorenz's work are necessary. For instance, a descriptive basis should not be considered as only behavioral data based on observation. Lorenz has never denied the importance of the subjective side of human life and even discussed cognitive, affective and motivational aspects in his work (besides moral, ethic and esthetic issues). In this sense, all kinds of data could be used to build this descriptive basis (not only what we see, but what we listen, such as verbal language). The Lorenzian man is a singular species with psychological and cultural properties.

The importance of Biology to the understanding of human behavior is not restricted to ethology. Disciplines such as Behavioral Genetics, Neurophysiology and others have helped to explain aspects of human behavior for decades. The most important legacy of classical ethology is not any particular information, but orienting

attitudes. This is most clearly observable in Hinde's work. The conception of nature (and human nature) as a system with different levels that influence each other, the way knowledge must be produced (description, systematization and proposition of principles) and an integrative attitude are all present in Lorenz's work and may be considered the theoretical nucleus of ethology as a science. Lorenz has also tried to organize a natural history of human species.

The relevance of classical ethology for relationship research rests in its structure of a biological science dealing with organisms behaving in their environment and with other organisms of the same species. ethology was an effort to give a biological interpretation of behavior of living creatures in relation with other (and not only the biological bases of behavior, as neurophysiological details could be interpreted). classical ethology, the so called "Biology of Behavior", permitted the integration of different disciplines dealing with behavior such as Neurophysiology, Ecology, Developmental Biology and so on (sometimes, people still consider a biological phenomenon as synonym of a physiological one, perhaps due to medical tradition). But, classical ethology made it possible to understand a much wider Biology of Behavior, including evolution of behavior, its 'anatomy' (the description), the functioning of the whole organism and its relations to neuro-physiological and ecological levels. ethology transferred the biological way of thinking (in its widest sense) to the interpretation of behavior and, in particular, provided orienting attitudes to personal relationship research. Obviously, the biological perspective of behavior, as represented by ethology, is not the only possible one, and it may not be considered a complete approach. However, it has proved to be an important influence on relationship research. ethology, as a "Biology of Behavior", integrated theoretically different biological disciplines in a coordinated system: from anatomy and physiology, to the body in movement as a whole, to Ecology and relations with the environment. ethology was prepared to integrate different levels of organization, as the physiological level, the individual level, the interpersonal and the group levels.

Relationship research may profit from this inspiring attitudes of classical ethology. The description of relationships, their systematization and search for explanatory principles, the relationships with lower and higher levels are inspired in classical ethology.

The most important contribution to relationship research from classical ethology is a conception of the world (formed by different levels of complexity, based on systems theory), a conception of how this world may be understood (using the successive stages of description, classification and proposition of general principles) and, finally, as a corollary of the nature of the world and directly connected with how we know it, the integration of knowledge as a necessary condition to understand a reality composed by different levels of complexity in mutual interaction. This model makes it possible not only the 'importation' of data from traditional biological sciences (such as neurophysiology and ecology) but it also serves as an orientation to theorizing and the development of empirical research in the specific area of relationship. In this aspect, the contribution of Robert Hinde is particularly important for relationship research. Based on the orienting attitudes derived from classical ethology he has contributed to the advancement of relationship research with a scheme to organize the area.

In sum, classical ethology, together with recent developments in Behavioral Biology, could not only supply an important broad and sound biological basis for relationship research, as a body of specific knowledge, but classical ethology can do much more, it may translate for relationship research the very spirit of biological research.

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