For evolutionary psychiatrists, psychologists, and others interested in sociophysiological integration.

ASCAP

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"*We are surrounded by social processes like fish are surrounded by water.*"
NickAllen[1]

Across Species Comparison and

Newsletter Aims
•A free exchange of letters, notes, articles, essays or ideas in brief format.
•Elaboration of others' ideas.
•Keeping up with productions, events, and other news.
•Proposals for new initiatives, joint research endeavors, etc.

ASCAP Society
Mission Statement
The society represents a group of people who view forms of psychopathology in the context of evolutionary biology and who wish to mobilize the resources of various disciplines and individuals potentially involved so as to enhance the further investigation and study of the conceptual and research questions involved. This scientific society is concerned with the basic plans of behavior that have evolved over millions of years and that have resulted in psychopathologically related states. We are interested in the integration of various methods of study ranging from cellular processes to individuals in groups. The ASCAP Newsletter is a function of the ASCAP society.

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CONTRIBUTING TO THE NEWSLETTER

The ASCAP Newsletter welcomes contributions. The best way to submit one is sending it on a 3.5" high density disk (IBM compatible preferred) and mail along with a hard copy to Dr. Russell Gardner, Jr. or Dena Stringer, UTMB-Graves Bldg (D-28); Galveston, Texas 77555-0428. Your disk will be returned after your contribution has been published. Disk may be sent in ASCII form or in a word processing program such as Word Perfect, and Microsoft Works/Word.

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Concerning paleobiology, sociophysiology, interpersonal and group relations, and psychopathology

ADDRESSED TO & FROM

HARVEIAN BASIC SCIENCE

Thank you Russell Gardner for your fine article "Sociophysiology at a scientific meeting" *(ASCAP* 1995;8(3), 12-19). The erudite yet playful tone, is good fun. It is, for me, pleasant to read ASCAP and see mentioned three significant teachers Hannah and Antonio Damacio and Nancy Andreasen. It is especially interesting to see them cited in ASCAP since none of these remarkable academics has (yet) to take up evolutionism as strongly as is warranted by the thrust of much of their research. For example, though Damacio's book *Descartes' Error* is superb, it has been justly criticized (by Michael Gazzaniga no less writing in a recent *Natural History*) for an inexplicable lack of Darwinian perspective. All in good time, one supposes. If and when they turn their interests to Darwinism look out!

I must also take the unusual step to remind our fair editor that his reference to a "Harveian" basic science is wrong. No, not in its substance, I have had more that one fine chat with him in which we shared our admiration for Harvey as well as for the concept of a "Harveian" foundation for psychiatry. It was wrong merely with respect to the attached first name "Thomas". Allow me to take this opportunity to remind readers of Harvey beyond merely pointing out a typographical error. William Harvey (1578-1657) was the English physician who discovered the true nature of blood circulation through the vessels via the pumping mechanism of the heart as described in his landmark 1628 book *De Mortu Cordis et Sanguinis in Animalibus.* His less noted 1651 book *Exercitationes de Generatione Animalium* is perhaps of more immediate interest to evolutionists.

Harvey was educated at the King's School of the Canterbury Cathedral and went on to Gonville and Caius College, Cambridge, where he took his BA in 1597. Caius College, by the way, the first college in either Oxford or Cambridge to have a strong association with the study of medicine and also the first to have allowed neoclassical architecture to supplant Gothic. Dr. Caius, a renaissance master of the college and himself a physician, designed a remarkable neoclassical gate to the college. But Harvey himself was to find his medical feet beyond Cambridge.
After taking his doctorate of medicine in Padua he settled in London. Soon he was admitted to the Royal College of Physicians and affiliated with St. Bartholmew's Hospital. He was later named 'physician extraordinary to the King' and was in attendance at the death of James I (sponsor of the famed biblical translation). The new monarch, Charles I, appointed Harvey his personal physician. Charles, for all his well chronicled foibles, must be counted as an early supporter of ethology as he assisted in the placement of deer in the royal parks to facilitate Harvey's studies of large animal behavior and physiology. The partnership of King and Physician was irretrievably severed in the course of the English Civil War when Parliament found Charles guilty of high treason. Charles was beheaded and - if readers will forgive the reach for a strained pun - not even Harvey's knowledge of the blood and vessels of circulation could stem the King's acute exsanguination. Harvey's influence on the course of medical history has proved more durable and, to my Cromwellian spirit, more laudable.

Daniel Wilson
Ohio USA

REACTION TO THE BIG FIVE

I was interested in your reprinting Tim Miller's article about the big five *(ASCAP,* January 1995), because I have just sent off my draft chapter for Robert Plutchik's book and the chapter is about fitting the ten DSM-IV personality disorders into the interpersonal octagon. I know that the big five is attracting a considerable literature but I find it a most unsatisfactory classification. I would like the reference to assertion that the interpersonal circle is a subset of the big five. I would certainly not consider the interpersonal octagon to be. For

one thing, four of the big five, neuroticism, agreeableness, openness to novel experiences and conscientiousness, are intrapersonal rather than interpersonal qualities. That only leaves our old friend extraversion to carry the whole interpersonal load, and that leaves a lot to be desired. I presume that the five factors are really five bipolar dimensions, which creates ten opposite attributes, so that accounts for introversion as well. I would have written a response to the article, but I am a bit pressed for time at the moment. Meanwhile I would like to bring my own theoretical system to Tim Miller's attention.

John Birtchnell
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WHAT TO DO I
(from E-Mail)

People are on the look-out for danger, and for problems with resources. It seems to me that they cannot be otherwise. This couple in their early fifties have raised their kids, sold the family business, and need to find new targets for their efforts. He is stylistically laid back, but has to struggle fiercely (and successfully) to make a go of the business. Now he struggles with (gasp!) Golf. Their resources are in the millions. She worries that they will not have enough—which naturally, hurts his feelings. They are developing new enemies—each other.

Of course, there is always more, but it seems to me they face a Darwinian dilemma. Born to struggle, and good at it, they are on easy street and can't stand it. It seems to me that in fundamental dynamic ways people must have their enemies and work their jobs. Without'em, they will lash around, and bite those most close. All healthy people must find appropriate enemies, worthwhile cause.

Traditional psychotherapy assumes, it seems to me, that people can be rid of, at least, their enemies. But, in the past (1900-1970) the rule in expressive psychotherapy was practice to locate enemies in childhood, in the personal past... Bad Idea. More recent schools of therapy like the family therapies redirect striving toward the world outside the family—a sensible move. If you are engaged in the world you will have no problem locating threats and enemies...

John Pearce
Cambridge

TRANSITION TIMES

I am excited about being managing editor of this interesting and fascinating newsletter. Unfortunately, I have not yet conquered the program used to create it. Therefore, a mistake happened last issue. The last few sentences of C. Reichelt's review of David Buss' book *Evolution of Desire: Strategies of Mating* were left out. (Actually they were on the bottom of the page, but in no man's land). The conclusion of C. Reichelt review of Evolution of Desire by D. Buss is *"What is the effect of immunological response? Well, despite reservations, this is a fine book about which I predict a lot of controversy. Which makes it fun.*

Lately, both R. Gardner and I have been having problems with our E-Mail which is getting straightened out - for which we are most grateful! So if you tried to send a correspondence and did not receive a reply, please resend the message.

Dena Stringer
ascap@utmb.edu

DARTMOUTH COLLEGE

Roger Masters put on a week long meeting at Dartmouth. A great pleasure to hear Bob Trivers talk for three hours. Especially enjoyed the way he thinks through and answers the question that this very mixed (in familiarity with HBES stuff) group asked. As an aside in a discussion on the increased parasite load that tropical peoples must cope with, he suggested that one source of dancing and singing might be advertising one general health (hence, freedom from parasites). All kinds of display behaviors (bird songs, sexually attractive colors, vigorous displays) are more prominant in tropical creatures.

John Pearce
Cambridge

EVOLUTION OF LANGUAGE

Last weekend we had a Birmingham group meeting down at Anthony Stevens' place in Devon,

so I am able to report some news to you. First of all, it is a really lovely place, an old house in enchanting grounds, and all on the edge of the moors.

We had three sessions. In the first, Chris Knight presented his views on the evolution of language and the development of culture. He puts a lot of emphasis on the organisation of the female members of the group, to which he thinks synchronisation of menstruation and concealment of ovulation were contributory factors. He thinks that women organised themselves to drive men out to hunt and refused sex until they were offered meat. Language was needed in both its forms for this. Manipulative language was needed to convey to the men that there was no sex without meat, and this language was loud, strident, repetitive, metaphorical and ritualised, as with other forms of manipulative communication. Then cooperative communication, or what he calls "conspiratorial whispering", was needed to organise the "sex strike" in the first place, and to ensure that no strikebreaker allowed the men to have sex and to loll about without bothering to hunt - hence the first derogatory epithet was "whore" (now often reproduced in auditory hallucinations). This seemed an interesting line of thought, and we were amazed at the paucity of available information about the synchronisation of menstruation. Is this male block?

The second speaker was Conrad Kortmulder from Leiden - a comparative ethologist working with fish. He is particularly interested in symmetry, and the various ways there are of breaking symmetry. I felt his work to be very close to my own interest in the switch from symmetrical to complementary relationships.

In the third session we returned to the two modes proposed by Chance, and discussed the paper which I have already sent you. I was not able to convince people that the relationship between an executioner and his victim could be entirely hedonic, since it did not address itself to their relative rank, which was usually accepted without question, regardless of the rather exceptional roles they both play. As a result, I am sending you a slightly amended version in which I have toned the executioner bit down, and also responded to Anthony Stevens' request that we append a statement that although the hedonic mode may be defined in terms of competitive behaviour, it is typified by affiliative behaviour. Apart from these minor points, we now have agreement on the text of my paper, so I hope it will be possible to put it into ~~*ASCAP*~~ after David Stevens' historical review. It would be very useful to get comments from readers, particularly from those in different disciplines such as social psychology, to say how the mode concept compares with their own theoretical schemes.

I've just got back from a meeting of the Association for the Study of Animal Behavior in Leiden (Holland) on "Behavioral mechanisms and evolution". No earth-shattering new ideas, but it is a beautiful place, cobbled streets lining canals - Antonia and I hired bikes and cycled everywhere.

Before going to Holland I had a meeting with Michael Chance and Dave Stevens about the two modes. We plan to make four consecutive contributions to ASCAP - the first is a historical survey of the idea by Dave Stevens, the second an essay on definition by me, the third will be a paper by Dave relating the two modes idea to other theories of social interaction, and the final one will be a conclusion by Michael himself, in which, among other things, he will discuss Boehm's concept of counter-dominance. We are thinking of making this exposure in ASCAP a trial run for a paper in *Behavioral and Brain Science.*

John Price
England

2ND ***ANNUAL AARON T. BECK ASCAP AWARD***

Dr. Beck was most pleased with the first iteration of the competition and has given the green light for a second.

He stipulated that "clinical problems" should be in the theme and The Beck Award Committee headed by Mark Erickson is working on a more detailed version of it. I'm sure they would be interested in suggestions. Let us know.

R. Gardner

ARTICLE:

by R Gardner
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On a vision of Sociophysiology

The sessions at the Santa Barbara meeting (June 27, 1995) were interesting and exciting for the participants. On reviewing my notes, however, as I have promised last issue to do, I realized that the basic paradigms and foci of study for most participants though interesting to me were also quite different from my own. For instance, mismatch theory holds interest for many (behavioral patterns derived during the era of evolutionary adaptedness (EEA) produce what we call pathology in the present time) and computational algorithms were an integrating effort by the Beck Prize winner. My differences created some problems: for instance, a prolonged debate behind the scenes and at the business meeting had to do with whether the word 'evolution' should be prominent in our name or banner. I was opposed to this (the wind would go out of my editorial sails should that happen) and because I feel so strongly, I prevailed. But my review caused me to realize that I had not done an adequate job of explaining the position that fueled my opposition.

First, to the extent that evolution conveys the sense of the tinkered history of organisms, I have no problem (and that *is* a usual use of the term when reviewing the pages of *Nature* and *Science).* My trouble comes when the word evolution implies circular reasoning and the adaptationist assumption. I cite *Darwin's* objection to the word evolution, which did not appear in the first five editions of his *Origin of Species;* the term 'Darwinian evolution" would in fact make his coffin restive. His problem with the word was that it implied perfection, like the evolution of a perfect flower blossom. The idea that natural selection would eventuate in perfect forms was one to which he strenuously objected, contrary to the major contribution that his thinking and research made.

Of course, these troubles typify discussions that are (1) not data-based, and (2) the levels at which mechanisms operate (cells and molecules) are far from the behavioral level. Much more desirable for me is actual contact with potential genome-neural-behavioral-analysis. The history of the organism must reside in the genome, become actuated in some way in the body, especially the brain, and result in behaviors that are of course shaped by the environment, but with constraints. How does one find opportunity for such study? One such opportunity would be at hand were there were a naturally occurring genomic deletion syndrome nevertheless resulting in survival on the one hand, and characteristic rigid behavior patterns on the other hand. The experimental paradigm would consist in filling in the neural and other blanks between these two anchors points. Such syndromes exist (Prader-Willi, Angelman and Fragile X syndromes are examples) and I have had the great privilege of studying people with the Prader-Willi Syndrome (PWS) for the past several years.

So an exciting Seattle, Washington, event which I attended in July involved the 17th annual meeting of the PWS Association. The syndrome, with a prevalence of 1:17,000, represents the natural experiment of a deletion on the proximal long arm of chromosome 15. It causes major organismal changes, including behavioral characteristics, but it also permits survival and people with the syndrome can live well into adulthood provided there is adequate behavior control, especially of eating, because PW patients demonstrate extraordinary push to acquire and consume food with enormous weight gain and eventual death if unrestrained. Most are obsessive compulsive in its hoarding-collecting form. They are often aggressive and temper-ridden, although they also have reduced muscle mass and hardly develop sexually. Though this is considered a retardation syndrome, their IQs often are not low enough to qualify them as such. Parents typically say they never develop stranger anxiety typical at 8 months to a year old and they never seem able to take on the responsible attitudes of adulthood.

I have constructed a 35 item PW informant behavior rating form with the help of Janice L. Forster from Pittsburgh and many others at UTMB and Texas Children's Hospital (where I attend a monthly clinic

as a psychiatric consultant for these patients and their families). The scientific advisory group of the PWSA gave their consent for my use of this form and much of my time after the preliminary scientific session was spent in the hallways asking parents and group home staff to fill out the forms. Steve Salzbacher, a psychologist from the University of Washington graciously included me on the program to discuss this project and a related project involving the use of medications.

Is this exciting for the sociophysiologist? We have here the opportunity to study what happens if a part of the genome is precisely removed, yet the organism survives; we can look at the resulting of stereotypical behaviors and examine the brain via the new imaging techniques that are emerging in both Galveston and Houston, such as functional MRI.

Questions such as, 'how does the hypothalamus drive behavior?' can be asked because hunger with unreasoning drive occurs, similar to the rats with lateral hypothalamic lesions causing great obesity. What does the hypothalamus have to do with obsessive and hoarding behaviors more generally? What other parts of the brain might be aberrant? What exactly do the missing genes code? How do their nonexpression cause the behaviors of concern? How might this information restructure our investigational questions by particular behaviors being dissected by the gene removal? This is what I mean by one version of sociophysiological science: dealing with actual sections of the genome, dealing with the brain with direct observations of it, dealing with behaviors that can be conceptualized, quantified and measured, working out theory that, yes, concerns genes that are highly conserved and ancient in their origins juxtaposed with their more recent modifications, as discussed by Finlay and Darlington in abstracts and extracts in this issue.

ARTICLE:

by D Stevens

The Essential Nature of Bimodel Theory

The significance of Michael Chance's bimodal theory is that it connects social behaviour, interpersonal perception, communication and interaction, with individual attention, cognition, mood and emotion, in a holistic framework based on sound ethological observation.

Its distinction is that, uniquely, it reveals and accounts for two modes of order or organization amongst people and other animals, each serving adaptive purposes, and differing in their fundamental principles as well as their overt character. Individuals, interacting couples, groups and societies show and embody these distinctive modes, and can switch between them.

The bimodal theory has become especially attractive in accounting for people's difficult relationships and psychological upsets, and has provoked echoes in psychotherapeutic experience, as well as deep reflections from other theories of society, psychology, physiology, and evolution. How did bimodal theory originate and develop?

Empirical basis of the theory

Observation of the inter-individual relations amongst groups of monkeys and apes, both in the wild and in captive colonies, has revealed a precise patterning in space - the relative distances and directions between individuals - and of their social attention. These observations were reviewed in *Attention structure as the basis of primate rank orders,* and interpreted within a framework of dominance relations, mainly between males; higher-ranking individuals commanded both more attention and greater distance from lower-ranking individuals.[2] Although it was recognised that ranking was only one form of relationship, the principle that the structure of inter-individual attention underlies social structure was formulated on the basis of ranked groups.

"While it is suggested that an attention structure underlies or plays a part in all the social relationships

by which an animal relates itself to others in a group, the way it operates is well illustrated by considering how it forms a framework for rank-ordered behaviour."[2,3]

Pursuing this idea through evidence from a wider range of studies and continued observation, published by Chance & Jolly in 1970 as *Social groups of monkeys, apes and men,* it became clear that the organization of social attention and behaviour could take other forms - groups could be *centric,* with their attention focused on a single individual or a central group, or *acentric,* with no one in particular commanding or attracting others' attention.[4]

These two forms of social attention structure, conceived as polar extreme examples on a continuum of different actual and potential forms, could be set against two types of social interaction, one based on aggressive threat, the other on friendly display, the former tending to violence and the latter to grooming and play. These represent two characteristically different modes of social and psychological organization for primates, and perhaps for other mammals. In this volume the two modes were first described and elaborated - the agonistic, characterised by threat of punishment, and the hedonic, characteristed by nurturant reward.
An essential characteristic of acentric attention is that, not being commanded by any individual within the group, it is free to take in activity both within the group and throughout the general social and physical environment. Acentric attention is, therefore, better able to detect important changes beyond the group, whilst centric attention limits this facility. Whilst the *agonistic* mode constrains attention rigidly and centrically within the group, the *hedonic* mode appears to distribute attention to several foci, fluidly, and not to be compromised by the dispersion of its members in time or space, or by the variety of their interests.

Development of the basic theory

This discovery prompted interest in a number of fields, and in 1976 a further collection of papers was published as *The Social Structure of Attention,* edited by Michael Chance and Ray R. Larsen. The essential nature of this linkage from an individual cognitive process of attention, through interindividual behaviour, to an explicit social structure within a group, was demonstrated in studies of monkeys, baboons, chimpanzees and human children. Theoretical comments extended the range of this initial insight to general issues of social control, charisma, political conflict, and deepened its implications for the evolution of social rules and of human psychological characteristics.

Examining the social organizations and interactions of various primate groups, Chance writes that "one is immediately struck by the unique form of chimpanzee society which has a fluid structure in which the individuals repeatedly disperse and come together again, frequently with excited sessions of mutual display acting to focus social cohesion. On these 'carnival' occasions, mutual display is interspersed with appeasement and greeting gestures, and is then followed by much varied contact behaviour which eventually becomes focussed on a single outstanding displayer. As the contact behaviour takes over and the excitement dies down, small groups or solitary animals go off to indulge various pursuits before the group as a whole reassembles on another occasion.

Because of the focal centre for group cohesion provided by the top displayer, this is a type of centric society; and it is termed hedonic to distinguish it from the baboon type, which is agonistic.[3]

Baboon societies typically show a rigid hierarchy centred on one or more powerful, threatening and violent males, with social attention commanded from the centre through aggressive display, and subordinate behaviour characterised by a process of 'equilibration' through which the balance between dominant and subordinate is maintained. This involves "constant modulation of different forms of gaze aversion ('cut-off) and submission, combined with forms of assertion and postural orientation in proximity to the centre, which do not at the same time offer a challenge to more dominant individuals."[3] The group is held together by the threat of attack from dominant individuals, should one such attempt either to displace the other, or to escape from the group; attempted escape elicits attack,

and in order to guard against this the escaper must occasionally look back, again paying attention to the dominant. Mere gaze received from the dominant during such an episode will, as the escaper approaches the implicit boundary of the group, be enough to slow it, stop it, and revert its path towards the centre. This phenomenon of 'reverted escape' is typical of the *agonistic mode,* contrasting with the freedom of individuals to drift apart within the group, and to leave it for a time, which is possible in the *hedonic mode.*

Relevance to personality and psychopathology

Chance makes explicit that these two modes have importance for individual mentality and the growth of personality, in that *"the individual's human personality is determined primarily by the qualities of his relationships with other people. This applies both to the development of the infant's character through interaction with the adults around him, and to the importance of other people - real or imaginary, past or present - in affecting the individual's behaviour in contemporary situations."*[8]

The child *"grows up possessing a referent individual who is crucial to the process of the child's personality growth.... whoever is at the focus of the child's attention.* The referent *"behaves in two antithetical ways towards the child who is thereby subjected to the behaviour of the attentional referent posessing the behavioural attributes comparable in significant respects to hedonic- and agonistic-type social relations.*"

According to this view of psychosocial development, the integration of personality proceeds through relations with others being based on mutual validation, tenderness, cherishing and respect. *"The information entering the integral personality does so consciously and through communication with others. This is clearly a constellation of mental, behavioural and emotional characteristics in all respects synonymous with the hedonic mode of social attention"* and distinct from the constellation of aggressive, dominance-competitive and individualistic rather than mutually-orientated characteristics of the agonistic mode.[3]

Indeed, according to this new formulation of human relations, "psychopathology is a derivation of agonistic relations", and the origins of any such psychopathology *"can derive from any period of the life history in which the individual experienced the hostile or denying personal relationship. The prospects for full recovery, therefore, lie not only in the contribution of loving phases experienced at any stage of life, but, most significantly, in present social relations."* This view coincided with that of the 'personal experience group movement' in emphasising that psychological therapy might succeed through and "attempt to restore behaviour to the control of the hedonic mode."

As thus formulated, Chance wrote, this "attention structure thesis is put forward to help us find out how the individual's behaviour is integrated into the structure of the group to which he belongs and how the group offers him freedom, or restricts his options; and it proposes that there are two modalities, the hedonic and the agonistic, which have exactly these opposing effects.

In doing so it proposes that these two modes call forth in the individual two essentially different and separately operable behaviour systems", and that humans may be capable of "separate operation in each mode", with corresponding group cultures affecting the way each individual participates in group activity.[3]

Bimodality, psychology, and social relations

These contrasting, but perhaps complementary, forms of social organization had parallels in the distinction between two modalities of human society, *Gemeinschaft and Gesellschaft,* first drawn by Tonnies (1887/1957), said to underly our present culture, and thus bimodal theory held out the possibility of discovering "how present day societies...form the social frameworks which either engender agonistic-type relations between people or promote their hedonic well-being."[3]

Thus, various oppositions had been indicated, revealing for the first time what seems to be a fundamental polarity expressed in successive layers of existence. Individual attention, inter-individual interaction, social behaviour, and social structure, may each and all be organised

according to the same principle. This bimodal theory, first proposed and explored in 1970, developed in 1976, came into clearer focus with the publication in 1988 of *Social Fabrics of the Mind.*

Chance's ideas had been extended both towards the biological and psychological roots of attention, including Pavlov's account of its elementary nature in cognition and learning, and Kohler's demonstrations of its importance for inventive problem solving, and he had, in 1976, already indicated, as with Freud, that biological principles and observation could form the basis for psychological theory, and so account for various forms of human psychopathology. *Social Fabrics of the Mind* extended this analysis, including papers on various forms of psychopathology from an evolutionary viewpoint and employing ethological principles emphasising the social and interactional functions and consequences for individual behaviour, cognition and affect.

Having demonstrated, through ethological observation in many domains, the validity of linking interindividual attention and social structure, *Social Fabrics of the Mind* set out to establish bimodality as a fundamental explanatory principle in social, psychological, and biological organization, and in its introduction Chance further systematically described the two modes - *agonic* and *hedonic.*

The **agonic mode** is characterized by an hierarchically-ranked social order which is rigid, maintained by threat from the dominant to the subordinates, and manifested through the attention structure. *"Higher-ranking individuals accord less and receive more attention than those lower in the social scale. In this way, channels of attention develop, binding those who accord more attention to those of higher rank so that lower-ranking individuals have most of their attention directed to those above them"*[5]

Inter-individual separation also reveals the rigid rank hierarchy, and because of the constant conflict between the tendencies to seek higher rank, and so greater access to resources, and escape, each of which, if unsuccessful, will lead to punishment, individuals in the agonic mode are perpetually in a high state of psychological tension.

This state of tension in the agonic mode results from the mutual inhibition of two behavioural tendencies - but only when ranking is at issue, and only in the agonic mode. In the agonic mode, those at the edge of the social group often wish to escape, and sometimes are presented with the opportunity, but they will be punished by the violent attention of others further up the hierarchy, or simply turned back by a powerful gaze.

"Thus, in the agonic mode, ... individuals are always together in a group yet spread out, separate from one another, keeping their distance from the more dominant ones to whom they are constantly attentive. They are ready, at an instant, to avoid punishment by reacting to those threats that are dealt out from time to time down the rank order. This they do with various submissive and/or appeasing gestures, and by spatial equilibration... which, arising from withdrawal followed by the reversion of escape, serve to prevent escalation of threat into agonistic conflict, yet with tension and arousal remaining at a high level.

The continuous high tension, without the accompanying agonistic behaviour, is the unique characteristic of this mode, for which the term agonic is reserved - as *arousal must be balanced by inhibition to preserve this state."*[5,6]

This inhibition on cognition and behaviour functions at every level of order - individual, interactional, social and cultural. Through the inhibition of actual violence, individuals are constrained in their relations within a given frame, which depends upon subtle negotiation to maintain a fragile equilibrium. When violence occurs, the agonic mode is no more. While it is maintained, however, the agonic mode circumscribes the attention of the individual, spatial and social relations with others, and the physical bounds of the group. This circumscription depends upon the threat of *down-hierarchy aggression*, and its individual psychological presence is shown in the phenomenon of reverted escape. The agonic mode is hierarchically ranked, and if you are low down and

trying to escape, it's best if you don't look back.

In the **hedonic mode,** by contrast, there is no rigid hierarchy, although there are differences in status between individuals, social order and spatio-temporal relations are fluid and maintained through affiliative display and appeasement. Attention is flexibly distributed, its import non-threatening, and psychological tension is low. Furthermore, the characteristic flexibility of the hedonic mode *"is a manifestation not only of the absence of the fear of punishment in the relationship between individuals, but also of a freeing of an individual's attention from being the medium or channel of the social bond between them and the rest of society. Because it is no longer active as a bonding element, attention is freed for detailed investigations and manipulations of objects in the physical environment, thus facilitating the development and expansion of intelligence."*

Human psychological health and illness, and the importance of the bimodal approach for their study, with implications for therapy, and for psychological development, individually and through species evolution, are further addressed : "So we can see now the nature of the hedonic mode in humans - the healthy human individual has a flexibility of arousal and attention that allows time for integration of reality, inter-personal relations, and private feelings and thoughts, providing pre-requisites for the operation of a systems-forming faculty...Conversely the conditions required for preventing the operation of intelligence is the agonic mental mode, in which attention is fixed on preoccupations of security that bring about rank awareness, and when distancing and reverted escape dominate the behaviour, these perpetuate estrangement."[5]

Humans not only operate in both modes, but may switch between them, a possibility also in chimpanzees whose access to resources is artificially restricted.[7] This **bimodal switch** provides a mechanism whereby tension may be either relieved or enhanced, social relations freed or constrained, intelligent cognition of the physical and social worlds developed or supressed. Rather than take an atomistic and deterministic view of these relations between physiological, psychological, behavioural and social order, such that conditions or activity at one level are said to cause functioning or behaviour at another, Chance explicitly adopts, as the title of the book suggests, an integrative, holistic view of these phenomena: *"each mode is a property of both the social relations and of the mental structure" of individuals within a group.*[5]

Current status of Bimodal Theory

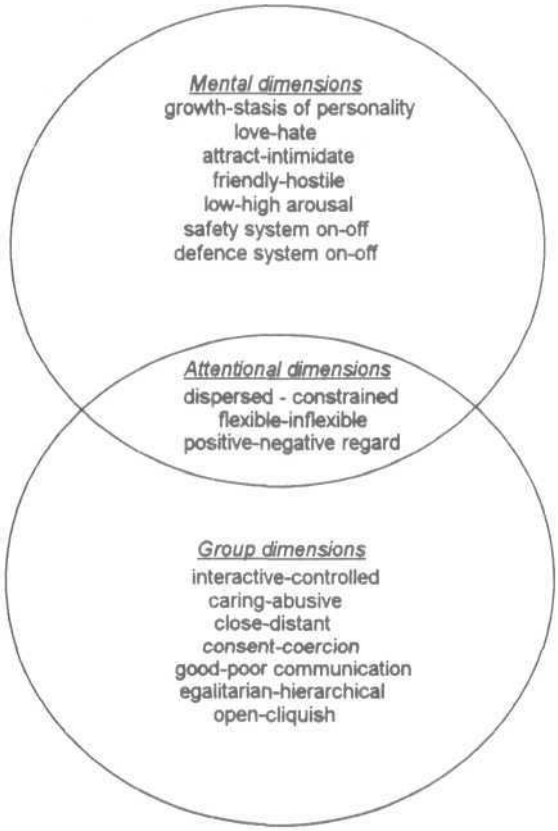
Since 1988 the theory has attracted attention from an increasingly wide range of interested parties, especially amongst psychologists, and bimodal ideas have been extended, applied, and debated, through three main fora: The ASCAP Newsletter, published monthly by Russell Gardner at the University of Texas, a special issue of the journal World Futures in 1992, and a discussion group centered around Michael Chance, meeting about twice yearly somewhere in England, and whenever possible including contributors from overseas, known as the Birmingham Group.

Following a meeting at Derby in September 1994, hosted by Paul Gilbert, it became clear that, if further development were to occur, the fundamentals of the theory should be clarified and a consensus on terms should exist. Subsequently, at a meeting for this purpose in London, hosted by David Stevens, **a** framework was developed from the issues addressed in a paper by John Price and commented upon by Michael Chance. The present paper sets out the current definition and range of bimodai theory, and forms the basis for further developments.

The fundamental proposition is that, the agonic and hedonic modes being defined as above, *"Each of the two modes is, at one and the same time, a property of our minds and the corresponding way in which we relate to those about us. Each mode predisposes us to deploy our attention in ways quite different from the other.*[8]

A number of related but non-crucial axes have been related to the two modes, and this has perhaps resulted in this essential bipolarity becoming obscured. These axes seem best applied within a small number of domains, at each of which modes

have been seen to exist. These domains are **mentality** of the individual, the process of **attention** which mediates between individual cognition and social relations, and the interindividual structure of the **group.** The axes or dimensions which appear salient in these domains, and their relations to the two modes, are as follows, the hedonic pole relating to the left-hand pole and the agonic to the right.



These relations are mapped in a Venn diagram since some are salient in more than one domain, and the holistic systems nature of bimodal theory enable similar principles to operate at different levels of complexity, with different emergent properties. In particular, all of the attentional dimensions operate also at the other levels, since attention mediates between these two domains.

Competition** in **the two modes

The question of competition and cooperation in relation to the modes is a complex one, which has been clarified through Price's proposal that competition exists in the hedonic mode, and that it is competition for positive regard or approval, in contrast to competition for control, characteristic of the agonic mode. Hedonic competition is through carnival type display, whereas agonic competition is through aggressive display. The presence or absence of agonic competition is sufficient to define the difference between the modes, whereas hedonic competition, in itself, does not fully determine the existence of the hedonic mode.

Thus, the agonic mode is present when agonic competition is occurring or is anticipated, whilst the hedonic mode is present when agonic competition is not occurring or anticipated.

This extension, with the recognition that everything in the hedonic garden is not rosy, that the consequences of failure in hedonic competition may be occurring or anticipated.

This extension, with the recognition that everything in the hedonic garden is not rosy, that the consequences of failure in hedonic competition are unpleasant, and that ostracism from an hedonic group with which one is identified, as in cased of 'voodoo Death' can be fatal, brings physcopathology within the hedonic realm, greatly increasing the power of the theory and its therapeutic value, if this proposition, like all others within bimodal theory, satisfies empirical scrutiny.[9]

Bimodal theory is now firmly established as a unique approach in evolutionary psychology with especially important value for the study of social relations and pathology; bimodal theory has been developed backward through human evolutionary time, both physically and culturally, through reference to brain anatomy, behavioural and affective correlates of strategic behaviour, and psychological archetypes. Relations have been found between the modes and human organization to our present civilizations, and as individuals, through attachment theory. It has been found useful in accounting for industrial and commercial organization and gender relations within society. Physiological, cognitive, affective and behavioral conditions have been observed, and pharmacological effects noted, disorders, and these findings gain from bimodal interpretation. The empirical basis of bimodal theory is a profound

insight into the human condition, throwing into relief our essential relations with our fellows, both human and animal, across cultures, places and aeons; as such it provokes reflections in almost every field of endeavour and enquiry. This outline may clarify its basis and current status, and so enable further development, both in theory and in practice.

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ARTICLE:

by C Crawford
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Evolutionary psychology lab group activities at Simon Fraser University

Evolutionary psychology is concerned with the stresses that existed in ancestral environments, the behavioral mechanisms that evolved to deal with them, and the way those evolved mechanisms function in our current environment. We are interested in exploring the limits of the applicability of evolutionary theory to human and animal behavior. Evolutionary psychology is environmentalist in that its focus is on adaptations that enabled members of ancestral populations of animals or humans to deal with contingencies in their environment. We are particularly interested in genetically organized life histories and tactics for implementing the life histories that are concurrently or developmentally contingent on the environment. We try to focus attention on behaviors: with low heritability, where sensitivity to environmental conditions would have been adaptive in ancestral populations, and that were closely related to reproductive function.

There are three aspects to our current work:
1. Integrating the modern synthetic theory of evolution into psychology; 2. Studying human and animal sex allocation; and 3. Studying the evolutionary significance of human psychopathologies.

Our attempts to integrate evolutionary theory and psychology involve the following publications:
Crawford CB: The future of sociobiology: Counting babies or studying proximate mechanisms. Trends in Evolution and Ecology 1993;8:183-186.
Crawford CB: The theory of evolution: Of what value to psychology? Journal of Comparative Psychology 1989;103:4-22.
Crawford CB & Anderson JL: Sociobiology: An environmentalist discipline? American Psychologist 1989;44:1449-1459.
Crawford CB, Smith M & Krebs D (Eds.): Sociobiology and Psychology: Ideas, Issues and Applications. Hillsdale, NJ: Erlbaum Associates, 1987. A second edition of this book will be coming out next year. This work has three goals: interpreting modern evolutionary theory to psychologists, developing methods of testing evolutionary hypotheses, and integrating life history theory and cognitive psychology.

Sex allocation is concerned with the evolution of adaptations that would have enabled ancestral animals to increase their fitness through differential investment in sons and daughters. We have published the following articles in this area:
Anderson JL & Crawford CB: Trivers-Willard rules for sex allocation: When are they adaptive in humans? Human Nature 1993;4:137-174.
Crawford CB, Salter B & Jang K: The intensity of grief and reproductive value. Ethology and Sociobioloay. 1989:10:297-307.
Smith MF, Kish BJ & Crawford CB: Inheritance of wealth as human kin investment. Ethology and Sociobiology 1987;8:171-182.
Wright S, Crawford CB & Anderson JL: Allocation of reproductive effort in *Mus domesticus:* Responses of offspring sex ratio and quality to social density and food availability. Sociobiology and Behavioral Ecology. 1988:23:357-365.

In our work in psychopathology we distinguish among true pathologies, pseudopathologies, and pseudonormal behaviors. True pathologies are

conditions, such as memory loss due to Alzheimer's disease and language impairment due to brain damage, that would be deleterious in any environment. Pseudopathologies are behaviours, such as sexual harassment of women by men and anorexic behaviour in women, that could have contributed to fitness of some ancestral populations, but that because of cultural changes have become unacceptable or dangerous. Finally, pseudonormal behaviours are behaviours, such as exclusive homosexuality and the adoption of genetically unrelated children, that would have reduced fitness in an ancestral population, but that because of cultural change are now acceptable and even encouraged. Our empirical work is focused on the hypothesis that anorexic behaviour is related to ancestral behaviour for suppressing reproduction when environmental conditions for reproducing were poor, or the ability to deal with them was inadequate, but could be expected to improve. Published articles are:

Anderson JL & Crawford CB, Nadeau J & Lindberg T: Female beauty and adolescent sexuality codes. World Cultures 1994;8(1):19-23.
Anderson JL & Crawford CB: Modeling the costs and benefits of reproductive suppression. Human Nature **1992,3:299-334.**
Anderson JL, Crawford CB, Nadeau J & Lindberg T: Was the Duchess of Windsor right? A cross-cultural review of the socioecology of ideals of female body shape. Ethology and Sociobiology 1992:13:197-227.

The members of my research group are:
Charles Crawford (BA Psychology, University of Alberta; Ph D Psychology, McGill), Professor of Psychology. Research interests: Integrating evolutionary theory and psychology, the evolutionary significance of human psychopathology, sex allocation in animals and humans, human kinship recognition mechanisms.
Judith Anderson (BSc Biology, Harvard; Ph D Ecological genetics, University of British Columbia) Research Associate. Research interests: Evolution and reproductive behavior; methods for testing evolutionary hypotheses, ecological genetics, anorexia.
Ann Flood (BA University of Calgary) MA Candidate. Research interests: Anorexic behavior.
Gerald Beroldi (BS Eastern New Mexico, MA Western Michigan) Ph D Candidate. Research interests: Evolutionary psychology and psychopathology.
Tracy Lindberg (BA Simon Fraser) NSERC Scholarship student. Research interests: Evolutionary psychology.
Maria Janicki (BS Biology and Psychology, Brock University, MA Simon Fraser University) Ph D Candidate. Research interests: Evolutionary psychology, Anorexic behavior, female-female competition, male-female relationships.

There is a strong behavioral ecology group in our Biological Sciences Department. My graduate students take courses in evolutionary theory and reproductive strategies. Two of my close colleagues are Dr Birute Galdikas of the Archaeology Department, the world's leading expert an orangutan behavior, and Dr Ron Ydenberg of the Biological Sciences Department, a theoretical ecologist working on the evolution of a variety of behaviors in birds. We also have a Department of Archaeology and graduate students can take courses in that department and have contact with the faculty members in that department.

We have about 800 square feet of lab space, Macintosh IIcx and PowerMac 6100 computers that are connected to an AppleTalk network and a laser printer, and access to the technical support staff of the Psychology Department. We have a very nice cooperative research group. Our focus is on doing research and the preparation of graduate students in such a way that they can compete for tenure track academic jobs and get tenure once they have a job.

ARTICLE:

by R Gardner
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Charles Darwin and Sociophysiology

Darwin did his best to understand biological mechanisms within the body and encouraged others to do more such study. In the last words of his book on expression of emotions, he suggested that the subject of his book "deserves still further attention, especially from any able physiologist."[2] The example of able physiologist was undoubtedly Claude Bernard whose career in Paris paralleled in time Darwin's across the English Channel - they varied in age by only four years.[3] They even paralleled their illnesses. For prolonged periods both were unable to work because mysterious gastrointestinal ailments prevented it.

Earlier in his book, Darwin had referred to Bernard directly as the "great physiologist." He noted distinctions Bernard made between will and reflex and appreciated the Frenchman's conclusion that the heart and brain were highly reactive each to each other.[4] Bernard on the other hand paid little heed to descent with modification, Darwin's preferred description of what is now more known as evolution: Bernard paid attention only if something had been experimentally demonstrated.

But despite the physiologist's inattention to theory, these two great nineteenth century biologists in fact otherwise thought along very similar lines. Bernard published an 1872 article on "The function of the brain" just as Darwin entered the final stages of preparing his 1873 book at the end of which he hoped to pass the baton to physiologists. In this article, Barnard noted that the phenomena of consciousness and intelligence are dependent on the brain, which he noted to be an organ like any organ dependent on physiological conditions of the body.[5] Just as other organs had been investigated, Barnard asserted, so could the brain. He was poised to know about organs. With great success, he had found that pancreatic secretions digested fat, that the liver contained great sugar stores ready for quick action, and that the neuromuscular junction could be probed with the aboriginal poison, curare. Bernard was trained as a physician but never practiced; in his day he was criticized for abandoning the hospital for the laboratory. He rebutted that medicine badly needed to become scientific and that his activities should be commandeered for that aim. The same could be said in our present day for the basic science of psychiatry.

Emphasis on the individual may have delayed sociophysiology. So the two of them, Darwin and Bernard, felt strongly that the physiology of brain should be studied, Darwin emphasizing emotional expression. Psychiatry, the medical specialty deployed here to instruct us, hopefully, on the biology of leadership, is the one most related to Darwin's normal and abnormal emotions. For some reason, however, the emotions as communications have been less studied physiologically, than say, perception, memory or cognition, attributes generally considered reflections of the brain activity within the particular individual: I perceive, recall or think, but not necessarily with reference to another person. This contrasts to Darwin's emphasis on *expression* of emotions which implies signals to others who might understand and appreciate the expression. Darwin essentially focused upon communication amongst groupings of one or more individuals.

An emphasis on the individual rather than on individual's relationships seems to have characterized western European thought since the 12th century.[6] Medieval historian Colin Morris has combed the evidence of this and other periods and showed that beginning only then did interest arise in biography and the expression of individual characteristics in statues and portraiture *(versus* the stylized efforts of the classical Greek and Roman artists to render the idealized image); he traced the new effort to the effects of monastic seclusion on a perception of the self; the people so secluded in a highly disciplined atmosphere brought forth a Christian ideal to expunge the self of unworthy thoughts. Curiously this emphasis on the individual had little to do with the exultation of the self, but its humbling and control of

the too self-centered monk who needed, so the spirit of the age held, more of an emphasis on submission and homage to a supreme being ("Oh Lord, *I* am such a sinner") From the monasteries of France, greater sinfulness paradoxically spurred attention to the individual's exalted characteristics, as in the celebration of leader-idiosyncrasies in sculpture and painting.

Morris asserts that the invention of the individual had extraordinary impact: it seems to have been an idea that swept early Renaissance Europe - once the idea came in to the foreground, it gained tremendous momentum and reverberates still, now engaging the entire world. Now we assume biography has existed forever, and that the importance of individual expression has always been taken for granted just as now television and electricity are in the backgrounds of our lives; we require distinctive efforts at empathy to appreciate our forebears very different world.

Other eras and other cultures though equally cultured possessed different values. A quote from sophisticated Confucian China near the close of the last millenium — the period Morris pinpoints — shows that instead of will, memory, reason or perception, human relations are emphasized.[7] The quote responds to the question of *"What should be the four cardinal virtues characteristic of a gentleman of China?" Answer. "In his private conduct he was courteous; in serving his master he was punctilious; in providing for the needs of the people he gave them even more than their due; in exacting services from people he was just. I answer this question with respect."*

All the gentleman's characteristics related him to other people. The attitude omits the inner directedness, personal style, and celebration of individual prowess which spurred the Renaissance in Western Europe. But if this has been an enormous advance in the production of our modem world, its exclusive use has meant a correlated de-emphasis on the biology of our togetherness.

As true as in Darwin's time, many psyche-specialists (psychologists, psychiatrists and "mental" health workers) continue their focus on the person and the person's inner workings. To this day, there is a seeming indifference to what Darwin isolated as important to investigate as physiologically determined means of expression, parts of which are shared with other animals. Of course, reasoning, perception and memory are involved, but on inspection they are always deployed in connection to other people — as in imagination, for instance, if the other people aren't there in person. And there may be some present day payoff to emphasizing this *as well as* the individual. If we speak of physiology, this shift in focus needs to go back and forth as a matter of course, just as a moviemaker's camera can shift from a crowd to a little girl with a red coat within the crowd back to the crowd again or to the little girl, depending on the investigational need.

Darwin's emphasizing expression — and the need for physiologically examining how such communications come about — foreshadowed what we now might call a sociophysiological focus. He also emphasized that the variants of emotional expressions in remote relatives — not just primates but more distantly related mammals as well, such as dogs and cats — show similarities in such expressions. Something was inherited from our ancestors by way of communicational behavior patterns. Our four-limbed status came from our ancestors too, of course, but we take that more easily for granted. Somehow to think of our communicative bents coming from the same source is a different thing.

In summary, we need a sociophysiology that would localize its study to the interior of the individual, but with reference to that individual's relationships with others. The study will undoubtedly involve the brain extensively, but also how that individual's brain is attuned to and expressive of relationships, present, past and future. The study should take full advantage of our well developed emphasis on the individual but move beyond that to how that individual came about, not only in the present but in the ancient history of the person in his or her cells which are the product of millions of years of ancestors.

References on page 19

Kevin MacDonald: The Establishment and maintenance of socially inposed monogamy in Western Europe.

Barbara I Finlay & Richard B Darlington: Linked Regularities in the development and evolution of mammalian brains.

Letten F Saugstad: Deviation in cerebral excitability: Possible clinical implications.

Karen B Strier: Myth of the typical primate.

David Sloan Wilson: Language as a community of interacting belief systems: a case study involving conduct toward self and others.

L.A. Schepartz: Language and modern human origins

Kevin MacDonald: The establishment and maintenance of socially imposed monogamy in Western Europe. Politics and Life Science 1995;14(1):003-023.

Abstract: Although stratified societies have typically been characterized by intensive polygyny, socially imposed monogamy had developed in the stratified societies of Western Europe. Following a critical review of other theories of socially imposed monogamy, a multivariate, nondeterministic theory is developed. Within this theory, a variety of internal political processes can result in socially imposed monogany, but this phenomenon - while consistent with evolutionary theory - is underdetermined with respect to (1) evolutionary theory, (2) human nature/ nurture (i.e., the characteristics of humans), (3) external ecological variables. Data on the origins and maintenance of socially imposed monogamy in Western Europe are reviewed, indicating that post-antiquity socially imposed monogamy originated in the late Middle Ages and has been maintained since that period by a variety of social controls and ideologies, including political activities of the Christian Church and, in later periods, of women and lower- and middle-status males. As a result if institutionalized controls in reproduction, non-monogomous Western sexuality has been directed at obtaining psychological rewards deriving from evolved and motivational systems (e.g., sexual pleasure, excitement, feelings of dominance, status, or intimacy), but this non-monogomous sexuality has not typically been a major source of increased reproductive success.

Barbara I Finlay & Richard B Darlington: Linked Regularities in the Development and Evolution of Mammalian Brains. Science 1995:268:1578.

Abstract: Analysis of data collected on 131 species of primates, bat, and insectivores showed that the sizes of brain components, from medulla to forebrain, are highly predictable from absolute brain size by a nonlinear function. The order of neurogenesis was found to be highly conserved across a wide range of mammals and to correlate with the relative enlargement of structures as brain size increases, with disproportionately large growth occurring in late-generated structures. Because the order of neurogenesis is conserved, the most likely brain alteration resulting from selection for any behavioral ability may be a coordinated enlargement of the entire nonolfactory brain.

Extract: If a species undergoes strong selection

pressure for the optimization of a behavioral ability that depends on the size of a localized functional system in the brain, what changes take place in the organization of the brain as a whole? Because brain tissue is metabolically expensive, the need for energetic efficiency should result in the most localized possible increase in brain volume corresponding to the behavioral adaptation. However, required computational structures or the nature of existing developmental programs could severely constrain the range of local adaptations; examples of such factors include cross-organism maturational "clocks" and trophic relations between developing organs. Gould has argued eloquently for the need to consider the roles of both specific adaptations and developmental constraints in determining the paths of evolution. Conservatism has been the emerging theme of many genetic analyses of the regulation of early embryogenesis in invertebrates and vertebrates. The study of brain specilizations among current mammals and of the accompanying alteration or stability in neurogenesis can yield a formal and quantitative understanding of the range of local adaptations permitted in basic vertebrate neurogenesis and the degree of conservation of fundamental patterns.

... For human evolution in particular, theories that start from a primary behavioral trait appear to account for human evolution many times over. Dexterity and tool use, language, group hunting, various aspects of social structure, and the ability to plan for the future have all been proposed as primary in the cascade of changes leading to the constellation of traits we now possess. The location of large primates on the neocortex curve where small relative changes in brain size are associated with large relative changes in isocortex size may explain the multiple facets and rapid rate of human evolution. The highly conserved sequence of events in neurogenesis provides a reason why selection for any one ability might cause, in parallel, greater processing capacity for all the others. This observation strengthens the case for the isocortex as general - purpose integrator that allows the organism to take advantage of the extra brain structure in ways not directly selected for during evolution.

Letter) F Saugstad: Deviation in cerebral excitability: Possible clinical implications. International Journal of Psychophysiology 1994;18:205-212.

Abstract: Schizophrenia, a chemical signaling disorder in the brain, is also a deteriorating neurological disorder. The deficit in cerebral excitability, and associated reduced synaptic density, imply a risk of cortical breakdown of circuitry accompanied by an insufficient fill-in mechanism, and persistent silent spots, but no total loss of function, only dysfunction. This is subjectively experienced as deficiencies of cognition, perception and sensorimotor phenomena depending upon localization and connections of the disconnected circuitry. Considering the adversity inherent in this neural network, both the fast Hebbian pre-post form of learning and the slow pre-modulatory coincidence form of learning are probably impaired. The use of Feed Back Loops which usually govern our behavior might also be impaired. In addition, we have to consider the daily problem of insufficient drive and motivation. Manic depressive psychosis, a chemical signaling disorder in the brain, is a true functional psychosis. The raised excitatory drive and raised synaptic density imply raised risk of uncoupling of circadian rhythms via the direct glutamatergic input to the suprachiasmatic nucleus of hypothalamus. This episodic brain stem dysfunction illustrates how a deficit in inhibition renders the brain unstable. The requirements of the fast Hebbian form of learning should easily be Met, and neither should the slow forms of learning present a problem in networks characterized by excessive density. The successful use of similar anti-depressants in dysthymia, panic attacks, seasonal affective disorder, manic depressive psychosis and eating disorders supports the notion of similar etiologies namely early maturation with excessive level of excitation: or perhaps different minor genes may be at work predisposing individuals to the separate multifactorially inherited disorders. In schizophrenia, the clinical picture is probably mainly affected by the overwhelming environmental factor: rate of physical maturation. The slower, later puberty, the lower excitatory drive and lower density of synapses give rise to a greater risk of the most severe form of schizophrenia, the non-paranoid subgroup.

Karen B Strier: Myth of the typical primate. Yearbook of Physical Anthropology 1994;37:233-271.

Abstract: Anthropological interest in nonhuman primates as models for human behavioral evolution has tended to focus on a relatively small number of species. This emphasis, coupled with a search for unifying principles that explain behavior, has led to a widespread perception of the semiterrestrial cercopithecines as "typical," and therefore characteristics of most other primates. The prevalence of male-biased dispersal and female philopatry, the use of aggression to establish ami maintain hieiarchiacal relationships, and the occurrence of sex in mediating primate social relationships are far less uniform across primates than the myth has implied, raising questions about the generality of models of primate social systems derived from "typical" primates. Acknowledging existing diversity and encompassing it in more accurate portrayals of primate behavioral ecology requires consideration of the interacting effects of phylogenetic, demographic, ontogenetic, and physiological variables.

David Sloan Wilson: Language as a community of Interacting belief systems: a case study involving conduct toward self and others.

Abstract: Words such as "selfish" and "altruistic" that describe conduct toward self and others are notoriously ambiguous in everyday language. I argue that the ambiguity is caused, in part, by the coexistence of multiple belief systems that use the same words in different ways. Each belief system is a relatively coherent liguistic entity that provides a guide for human behavior. It is therefore a functional entity with design features that dictate specific word meaning. Since different belief systems guide human behavior in different directions, specific word meanings cannot be maintained across belief systems. Other sources on linguistic ambiguity include i) functional ambiguity that increases the effectiveness of a belief system, ii) ambiguity between belief systems that are functionally identical but historically distinct, and iii) active interference between belief systems. I illustrate these points with a natural history study of the word "selfish" and related words in everyday language. In general, language and the thought that it represents should be studied in the same way that ecologists study multi-species communities.

L.A. Schepartz: Language and Modern Human Origins. Yearbook of Physical Anthropology 1993;36:91-126.

Abstract: The evolution of anatomically modern humans is frequently linked to the development of complex, symbolically based language. Language, functioning as a system of cognition and communication, is suggested to be the key behavior in later human evolution that isolated modern humans from their ancestors. Alternatively, other researchers view complex language as much earlier hominid capacity, unrelated to the origin of anatomically modern *Homo sapiens.* The validity of either perspective is contingent upon how language is defined and how it can be identified in the paleonanthropological record. In this analysis, language is defined as a system with external aspects relating to speech production and internal aspects involving cognition and symbolism. The hypothesis that complex languge was instrumental in modern human origins is then tested using data from the paleontological and archaelogical records on brain volume and structure, vocal tract form, faunal assemblage composition, intra-site diversification, burial treatment, ornamentation and art. No data are found to support linking the origin of modern humans with the origin of complex language. Specifically, there are no data suggesting any major qualitative changes in language abilities corresponding with the 200,000-100,000 BP dates for modern *Homo sapiens* origins proposed by single origin models or the 40,000-30,000 BP period proposed as the time for the appearance of modern *Homo sapiens* in Western Europe. Instead, there appears to be archeological and paleontological evidence for complex language capabilities beginning much earlier, with the evolution the genus *Homo.*

AS CITED BY...

Cover page

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