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ADOLESCENCE AND IDENTITY TRANSFORMATION:

A Cross-cultural Analysis of Puberty Initiations

by

Melanie L. Takahashi

A thesis submitted to
the Faculty of Graduate Studies and Research
in partial fulfilment of
the requirements for the degree of

Master of Arts
Department of Anthropology

Carleton University

Ottawa, Ontario

July 28, 1998

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**“ADOLESCENCE AND IDENTITY TRANSFORMATION:
A Cross-cultural Analysis of Puberty Initiations”**

submitted by Melanie L. Takahashi
in partial fulfilment of the requirements for
The degree of Master of Arts

Thesis supervisor

Chair, Department of Sociology and Anthropology

Carleton University

July 28, 1998

Abstract

A revolutionary figure in the study of rites of passage, Victor Turner demonstrated that the "liminal" or transition phase of a rite of passage, provides the key venue for initiate transformation and change. This thesis examines the liminal phase of the male and female initiation rites among the Cahuilla and Oglala Indians, to determine the relationship between the ritual intensity of puberty initiation, and the degree of intended transformational effects. It is argued that profound initiate transformation is intended in those rituals involving numerous techniques which elicit altered states of consciousness. An in-depth exploration of the neurophysiological aspects of initiation ordeals is discussed, to illustrate the role of altered states of consciousness in the invocation of transformation. It is demonstrated that gender plays a fundamental role in the nature of ritual ordeal, and the extent of intended identity transformation of a given culture. Speculative generalizations concerning youth culture in the EuroAmerican context is also discussed based on the conclusions drawn from the Cahuilla and Oglala case studies.

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Chapter 1: Introduction

...in modern man (where) collective rites no longer exist, and the problem relating to these transitions devolve upon the individual, his responsibility and understanding are so overburdened that psychic disorders are frequent. This is the case not only in childhood but also in puberty, in marriage and mid-life, at the climacteric, and in the hour of death. All these stages in life were formerly numinous points at which the collectivity intervened with its rites; today they are points of psychic illness and anxiety for the individual, whose awareness does not suffice to enable him to live his life.

(Eric Neumann. cited in Mahdi, 1997 xi)

Every culture recognizes that the human life cycle can be divided into distinct life stages. While these life stages may or may not reflect or coincide with biological changes in the body, the manner in which these life stages are determined often differ among societies and are socially constructed. Where some cultures for example designate individuals between the ages of twelve to sixteen as being adolescents, other cultures do not make this distinction and an individual may make the transition from childhood directly into adulthood at the age of twelve or there about. While these stages reflect a culture's categorization of a developmental process into culturally meaningful segments, the ambiguities that arise near the "boundaries" between periods tend to be ritually marked. One of the most common of such ritual markers are those rituals associated with the biological transformations that accompany puberty.

Rites of passage are ritual ceremonies that demarcate an individual's transition from one status in society to another. These rituals are thus present during critical transition periods of the life cycle and provide a means of dealing with the ambiguities and anxieties that confront individuals during these critical transitional stages. In many

non-western societies, the passage into adulthood is often accompanied by ceremony, initiation ordeals, and celebration, to highlight an individual's newly acquired status. Such rituals can range from initiation ordeals involving pain, physical exertion, fear, fasting, hallucinogenic drugs with the indoctrination of sacred knowledge, to ceremonies involving only one or two of such features. Never the less, initiation during this critical period is considered to be so important that the initiatory ordeals found cross-culturally are often argued to be archetypal.

In an increasingly technological society that places demands on extensive post secondary education, the boundaries that distinguish an adolescent from an adult have become exceedingly ambiguous in Western culture. Unlike other societies, a culturally recognized and sanctioned rite of passage for Western youths does not exist. As argued by Mahdi, "the need for some kind of initiation is so important that if it does not happen consciously, it will happen unconsciously, often in a dangerous form" (1987:xiii). Adolescent preoccupations with body piercing, tattooing, alcohol, drugs, sexual activity, "moshing"¹, and involvement in Goth, vampire, and Marilyn Madson subcultures, are popularized images of North American youth pop culture, which may reflect this unconscious and potentially dangerous form of initiation. Thus a consequence of initiation impoverishment may be the creation of youth subcultures whose membership often rests on various forms of initiatory ordeals. As pointed out by Stevens, the need for initiatory ordeal is so vital that archetypal symbols of initiation spontaneously appear in dreams

¹ This refers to an activity common to the rock music scene. Spectators will jump off the stage into the "mosh-pit" where they are usually caught by other spectators and are then thrown about the pit. Jumping, and slamming into others is also customary. Injuries are common.

during these life stage transition periods (1982:164). Such archetypal patterns arise not only in dreams, but are frequently enacted in youth subcultures. Experimentation with the driving forces that induce the altered mind states that are sought out in the initiation rituals of many non-western cultures, are prevalent among many adolescent subcultures.

Tattooing, body piercing, hallucinogenic drugs, the infliction of pain, extreme physical exertion, and repetitive drumming are such examples. Without the safety checks of a controlled ritual setting, ritual preparation, and the guide of elders and ritual specialists, the unsupervised adolescent quest for identity and adulthood can have severe and even fatal consequences on those "initiates" who participate. The current situation has lead many concerned parents and educators to look to other cultures who continue to initiate their youths. Most often rituals or elements from puberty initiations are appropriated from Native North American cultures and parents have the opportunity to send their adolescents to weekend Vision Quest retreats (see Foster & Little, 1987:79) or to participate in such rituals under the guise of boot-camps for delinquent youths.

Accompanying the rise of many youth programs is economic profit, and thus while the potential benefits of these programs is acknowledged, one must also research the degree of safety, the authenticity of the rituals, in addition to the training and background of those who execute them.

The purpose of this research project will be to determine the significance of the widely practised phenomenon in which individuals entering puberty undergo initiation rites-rites that may incorporate such elements as ordeals involving pain, physical exertion, fear, fasting, and the ingestion of hallucinogenic drugs, with the process of indoctrination.

An examination of the neurophysiological changes that occur during puberty, in addition to the neurophysiological effects of ordeals and their relationship to altered states of consciousness will be studied to determine if initiation ordeals and indoctrination play a role in optimizing the neurophysiological changes that correspond to puberty, and how these processes may impact identity transformation.

To gain further insight on the current EuroAmerican youth phenomenon, through the method of comparative analysis, male and female puberty rites from two Native American societies which vary in their degree of ordeal intensity will be examined, focusing on the physiological interactions and effects of the ordeal variables and their connection with indoctrination. Speculative generalizations concerning youth culture in the EuroAmerican context will also be briefly examined as it is representative of a society at the other end of the spectrum- a society where institutionalized puberty rites do not occur. From these analyses I hope to determine the relationship between the intensity of ordeals in puberty rites, and a society's intended transformational effects on initiates, and to what extent it is possible to rank order the intensity of puberty ceremonies in terms of transformation, and its intended effects. It will be hypothesized that if radical identity transformation on the part of the initiate is desired by a particular society, then the more numerous and extreme these ordeals will be.

Using the theoretical framework of biogenetic structuralism, Turner's views on liminality, and recent studies in neurophysiology, my research will involve the examination of ordeals (viewed as drivers) to determine the interaction between the neurophysiological effects which take place during initiation rites, and how these drivers influence the

neurocognitive structures which are developing during puberty. The central objectives of this research will be:

1. To determine the relationship between the intensity of ritual ordeal and a culture's intended transformational effects on the part of the initiate.
2. To re-examine Turner's work on liminality and transformation to gain further insights about the processes involved.
3. To identify the physiological mechanisms involved in ritual drivers such as ingestion of datura, physical exertion, pain, fear, fasting, heat exposure, ritual language, social isolation. How these operate alone and in combination.
4. To explore possible gender differences among societies and examine the implications of these differences and/or similarities.
5. To examine the implications of this research with respect to the EuroAmerican treatment of puberty and how identity transformation is viewed. What does it mean to have neither ordeal nor indoctrination?

Chapter 2 will present a historical overview of the theoretical paradigms which have analyzed puberty initiations, and how the study of symbolic systems in anthropology has transformed over time. Chapter 3 examines the relationship between ritual, symbol, and neuroscience, and summarizes the theoretical tools which will be employed in the subsequent chapters to analyze the Cahuilla and Oglala puberty ceremonies. The neurological changes associated with puberty will also be scrutinized to determine if there exists a neural base for these initiations. The Cahuilla and Oglala case studies are presented in Chapters 4 and 5. A neurological analysis of initiation variables and the extent of transformation is presented, in addition to intended transformation, and gender differences. Finally, by way of conclusion, Chapter 6 briefly surveys the EuroAmerican context by outlining the western psychological view of adolescent identity formation, to

determine the extent of intended transformation. The implications of a society where neither ordeal or indoctrination are institutionalized will also be discussed.

Chapter 2: Changing Conceptions of Symbol & Consciousness—The Study of Puberty Initiations

Anthropology presents its fieldworkers with a paradox. The methodological approach of participant-observation says that anthropologists should try to experience the world the way their subjects do. Yet the discipline, a Western science, tends not to take seriously accounts of mystical, transcendent experiences.

(Phillips Stevens, cited in Young & Goulet, 1994)

The ethnographic enterprise is very much influenced by the anthropologist's personal background, and the philosophical traditions from which ethnographies are launched. Consequently, there exists an intricate relationship between the examination and analysis of cultural events by anthropologists, and the production of knowledge in the form of theory and ethnography. This continuously evolving relationship is particularly relevant to the anthropological study of puberty initiations, and this has been reflected in the number of theoretical perspectives which have attempted to analyze these ritual systems. The methodologies employed today by anthropologists are fundamentally distinct from those techniques practised in the past. This has been largely due to a change with respect to how symbol and consciousness are regarded, and the dialectical relationship that exists between consciousness, symbol, and theoretical orientation. Theoretical views have a tremendous impact on the way in which consciousness is regarded, and in turn, the way in which symbols and symbolic systems are defined and examined. This chapter will provide an account of the dominant theoretical perspectives concerning puberty initiations in anthropology. To contextualize the study of puberty

initiations, emphasis will be placed on the evolution of these positions and how they have systematically influenced the definition of symbol, consciousness, and the examination of puberty initiations. Early approaches to the study of puberty rites such as the evolutionary paradigm, functionalism, and positivism will be considered. Such issues concerning the western bias towards monophasic consciousness, and the devaluation of altered mind states, will be outlined to illustrate how this has subsequently influenced the study of symbolic systems. An in depth look at Victor Turner's revolutionary approach to the study of ritual will be discussed to exemplify how his methodology, his multivocal view of symbol, and his emphasis placed on ritual context, influenced the current paradigms in the anthropological study of symbolic systems. Finally, with the changing conceptions of symbol, and the recent credence assigned to altered states of consciousness, such developing paradigms as transpersonalism and biogenetic structuralism will be explored.

2.1: Early Approaches to the Study of Puberty Rites—The Evolutionary Paradigm

The evolutionary approach was one of the earliest frameworks in anthropology which attempted to examine puberty initiations. Dominant during the early 1900's, traces of evolutionary thinking were still evident up until the 1950's. North American "salvage anthropology" lead by Boas was the most notable example, and was based on the notion that Aboriginal cultures would eventually become extinct. According to the evolutionary paradigm, all societies evolve along the same course where hunters and gatherers represent the starting point, expected eventually to "evolve" to the most "civilized" state—that of a post-industrial society. Underlying uni-evolutionary theory is the belief that all

small scale societies will inevitably vanish, to be absorbed by the West, representing the “height” of civilization. Similarly, supernatural beliefs are assumed to coincide along this evolutionary path from the “primitive” to the “civilized”, where magic becomes replaced by religion, and religion ultimately becomes replaced by science. Adhering to the evolutionary position, the author of The Golden Bough Sir James Frazer, was one of the first to examine puberty rites and described initiation as “the central mystery of primitive society” (cited in La Fontaine, 1985:20). Frazer considered initiation rituals to be religious in nature involving elements of magic and sorcery, elements which he viewed as remnants existing from a previous stage of evolution (La Fontaine, 1985:20). Because initiations acknowledging the transition to adult status for both boys and girls were documented to be the most common and prevalent among rituals, puberty initiations were believed to represent the most “primitive” form of ritual, as they encompassed a significant degree of “magic” (La Fontaine, 1985:20). Credence for the efficacy of such rituals was not acknowledged, as magic considered by Frazer to be “the bastard sister of science” (1922:57) was a crude form of implicit logic that was flawed:

The shrewder intelligences must in time have come to perceive that magical ceremonies and incantations did not really effect the results which they were designed to produce, and which the majority of their simpler fellows still believed that they did actually produce (Frazer, 1922:65).

Frazer’s framework has since been rejected on the basis that his data was unreliable and to an extent invalid. Entering the field and observing the ethnographic “other” first hand was not an employed methodology during this time, hence most of Frazer’s data was acquired through travel diaries and accounts provided by missionaries. The examination

of altered states of consciousness within the ritual framework was not included in the scope of inquiry, and little attention was paid to symbol and symbolic analysis. This was perhaps due to the constraints of secondary source information, and perhaps due to a lack of interest. It is doubtful whether ASC's would have been given any kind of acknowledgement since the ritual setting in which they occurred was regarded as invalid. Thus despite the fact that Frazer wrote twelve volumes of text which provided extensive documentation illustrating the universality of these rites across time and space, he failed to analyze any of the rituals he was describing (Gluckman, 1962:10). Suggested by Brain, this early fascination and interest in initiation rituals was presumably motivated "to instill a sense of comforting superiority in the breasts of scholars in the technologically developed countries" (Brain, 1977:191).

2.2: Functionalism and Positivism

Other early theoretical perspectives associated with anthropology were positivism and functionalism. Affiliated with this framework are the "fathers" of anthropology such as Malinowski, Evans-Pritchard, and Radcliffe-Brown. A lingering remnant from the late nineteenth and early twentieth century, the dominant paradigm during the early periods of this time was "arm-chair" anthropology. Like Sir James Frazer, researchers would study "exotic" cultures without actually observing the lives of the people they were studying for themselves. Malinowski was the first anthropologist to give up the "arm-chair" tradition, and instead advocated that anthropologists should live in the society being examined using the participant observation technique to elicit data. It was this process which

influenced the development of participant observation and the notion of ethnographic fieldwork. The functionalist approach stressed the systematic interrelated components of social structure, whose essential elements were to include: "the composition and formation of groups, the organization of economics and religion, and the distribution of authority and prestige" (Cancian, 1968:29). Thus emphasis was placed on stability within the system, and the functioning of that system within the larger order. The manner of conducting such research was carried out through systematic observation based on the scientific method (positivism). Only those phenomena which could be measured and observed were regarded as valid.

From this theoretical framework, symbolic systems were thus regarded as one component part of the overall system, whose function was to maintain the overall equilibrium and continuity of that society. In terms of analysis, the social function of these systems were emphasized, and this is illustrated by Radcliffe-Brown who states "the method of investigating rites and ritual values that I have found most profitable during work extending over more than thirty years is to study rites as symbolic expressions and to seek to discover their social functions" (1952:145). With an emphasis placed on the maintenance of societal stability, puberty initiations were thus perceived as a means of socializing young people to ensure their role as productive members of society. To provide a "moral education adapted to the requirements of life as it is lived" (Radcliffe-Brown, 1922:277). Initiatory ordeals such as circumcision, and scarification, provide the function of symbolically marking the transition into adulthood while maintaining the social order by preventing "open and violent revolt against parental authority at a time when

physical maturity would make such revolt dangerous and socially disruptive" (Whiting et al, 1958:361).

With importance being placed on social function, little attention was devoted to thorough symbolic analysis and this is reflected in the simplistic manner by which symbols were defined. Radcliffe-Brown viewed symbol as "whatever has a meaning is a symbol and the meaning is whatever is expressed by the symbol"(1952:143), and to investigate that meaning, one must examine myth where "we find that the meaning of any single rite becomes clear..." (1952:144). The way in which symbol is defined is very static, and this influenced the methodology of symbolic analyses. The multiple, ambiguous, and contradictory meanings attributed to symbols was not acknowledged. Consequently without this realization, there would be no need for the anthropologist to elicit the native's own point of view, and evidently the emic approach was scarcely practised. This is demonstrated by Evans-Pritchard who claimed "there is no need to consult specialists. There is not even need to question Azande about it...one has only to watch and listen" (1937:21). Emphasis on the etic approach could also be attributed to the fact that the functionalist importance of the social order would de-emphasize the effects ritual has on the individual, and thus the emic perspective was considered unimportant. The positivist stress on observation would also advocate a bias toward the etic approach, as personal and emotional effects on the participants are difficult to observe and measure. The significance of ritual context and the acknowledgement that symbols can change depending on the context, was also overlooked as anthropologists would often ask informants to repeat the performance to "make fuller notes and obtain explanations of

many obscure points”(Radcliffe-Brown 1922:166).

Although these theorists did not explicitly state the way in which they defined consciousness, the philosophical climate at the time did view these states as abnormal. Even today, the psychiatric paradigm views altered states of consciousness as “pathological, regressive, or infantile” (Winkelman, 1993:3). Today there is also an emphasis in the western discourse placed on consciousness being mediated by language, and analytical reasoning, (Winkelman, 1994:17), with the understanding that “physical reality is the only reality and that science is the proper mode of investigation” (Baruss, 1992:30). Thus based on the philosophical climate of the time, and the manner in which many western academics view consciousness today, it can be inferred that consciousness was understood under those same terms. Phenomena such as altered states, which could not be observed in the physical environment, or were not mediated through language and analytic reasoning skills, were most likely not deemed significant. As a result, the positivist method would not warrant the study of such phenomena, even if they were conceived to be important, and one wonders if the investigators were even aware that they existed in the first place.

Such biases are suggested in many of the classic functionalist ethnographies. Substances likely to induce altered states within the ritual context were performed by “magicians” defined by Evans-Pritchard as “any person who possesses medicines and uses them in magic rites” (1937:9), and magic as: “a technique that is supposed to achieve its purpose by the use of medicines. The operation of these medicines is a magic rite and is usually accompanied by a spell” (1937:9). Such descriptions are permeated with

ethnocentric connotations; by using the term magic to denote the process of healing, and the term magician to indicate a healer, what is implied based on the English connotation of the term magic, and spell, implies skepticism in terms of their efficaciousness. Shamanic descriptions such as “during the time that he was dead (probably a few hours of unconsciousness) he is supposed to have visited the world of spirits, and while there he saw many things and learnt much about the spirits” and “the whole thing was entirely the invention of the performer” (Radcliffe-Brown, 1922:164, 166) also illustrate the ethnographer’s skepticism of ASC’s. Similarly statements such as “I found that any attempt to study the dreams of such a people as the Andamanese is made very difficult by the fact that it is never possible to tell how far the original dream has been arranged and altered by the waking imagination”(1922:167) illustrate a bias against the existence of ASC’s. The failure to recognize the importance of dreams in terms of enriching a society’s world view is evident, as is the western bias toward the “normal” waking phase, as the ethnographer assumes that dreams can only be understood when they are re-interpreted when one is “conscious” in the waking-sense.

2.3: Psychoanalytic Anthropology & Puberty Initiations

With the popularity of the Freudian movement in psychology, psychoanalysis was adopted by a small circle of anthropologists forming the movement termed *psychoanalytic anthropology*. Puberty initiations became of particular interest; it was thought that within the ceremonials of the “primitive” operated occurrences which are generally concealed in industrial societies but occur relatively blatantly among small scale societies (Stephens,

1967:67). Principally such occurrences centre around the Oedipus complex, castration anxiety and penis envy where these ceremonies were argued to be an institutionalized neurotic symptom of the Oedipus complex (Stephens, 1967:68). Standardized ratings measuring child rearing and mother/infant bonding were tested statistically to determine the intensity of the Oedipus complex. Again, the positivist methodology is evident as it is assumed that those phenomena which cannot be measured do not exist. This kind of methodological application to initiation rites was pioneered by John Whiting who developed a set of hypotheses focusing on the function of male initiation rites. Whiting argues that "boys tend to be initiated at puberty in those societies in which they are particularly hostile toward their fathers and dependent upon their mothers" (Whiting et al, 1958:361). Societies considered to have high child dependency upon the mother were operationally defined as "societies which have sleeping arrangements in which the mother and baby share the same bed for at least a year to the exclusion of the father" (Whiting et al, 1958:365). This strong emotional dependency on the mother is argued to become incestuous at puberty and becomes apparent unless actions are taken to prevent it- male puberty initiations being the preventive measure. The Oedipus complex was also used by psychoanalytic anthropologists to explain menstrual taboos and seclusion rites for females entering puberty. Boys become in competition with their fathers for their mother, causing castration anxiety. It is this fear of blood and the mutilation of the genitalia which are argued to be the cause of menstrual taboos and female seclusion rituals because "a menstruating woman is a person who bleeds from the genitals. The sight or idea of such a person might be expected to activate the fear when it is latent" (Stephens, 1967:80).

The weaknesses of such arguments are fairly obvious. Lacking in such studies is a sensitivity for cultural diversity as one western standard of infant dependency, and castration anxiety are employed statistically. How conclusions can be drawn from folktales “high in castration-suggestive incidents” is questionable. Furthermore, a male bias in terms of analysis is apparent as there is no mention of the female equivalent to the Oedipus complex, the Electra complex, and female ceremonies are centred around the male oriented Oedipus complex. A male bias is also quite obvious in the line of argument contended by Whiting which attributes juvenile delinquency in Western society to a decrease in the authority of the father due to an increase in the egalitarian nature of male and female roles (Whiting and al, 1958:370). With these studies being holocultural in nature, direct observation and extensive symbolic analyses were not executed and consciousness and symbol are not discussed. The only mention of symbol are those “suggestive” of castration anxiety, and consciousness is discussed very generally having to do with the repressed Oedipal tendencies. Like Frazer and his colleagues, it would appear that the motivation behind psychoanalytic studies on puberty initiations, were self serving with respect to the observer’s own society. The notion of “institutionalized neuroticism” and blatant repressed tendencies among “primitives” which are otherwise masked in the West would reinforce notions of superiority.

2.4: Victor Turner: A Turning Point in the Study of Puberty Initiations

The Multivocality of Symbols

Based on the manner in which symbols were defined and symbolic systems were

studied in anthropology, Victor Turner's approach to studying symbolic systems was revolutionary. Initially, Turner was very much a product of British functionalist thought. In his first ethnography Schism and Continuity, using a functionalist approach, Turner viewed ritual as a means of maintaining societal stability and social solidarity:

Most Ndembu rituals tacitly recognize the instability of villages,
but posit the ultimate unity of all Ndembu in a single moral community...
But by and large, the function of maintaining unity of the widest social
unit, the Ndembu people, devolves mainly upon the ritual system
(Turner, 1957:290, 292).

What is striking about Victor Turner however, is the fact that he was eventually able to recognize the weaknesses of the functionalist tradition, and he gradually moved himself further away from the framework of the Manchester School (Deflem, 1994:4). Turner was able to acknowledge his bias toward ritual and knew that he would have to overcome it in order to fully understand Ndembu culture:

I was forced to recognize that if I wanted to know what even a segment
of Ndembu culture was really about, I would have to overcome my
prejudice against ritual and start to investigate it (1968:7)

As a result, Turner drastically changed the way in which he conceptualized symbols, which in turn influenced his method of analyzing them. Turner recognizes the fact that one cannot simply mechanistically decode a symbol and fully understand its meaning. Instead he emphasizes the importance of context, and the multivocality of symbols (Foster, 1990:123). The notion of context is a significant epistemological issue associated with anthropology; if one disregards the context within which a symbolic event occurs, the anthropologist can completely misinterpret the meaning of the symbol in question. Turner thus stresses the multivocality of symbols and their meanings, emphasizing that a symbol's

meaning can vary depending upon the context. In addition to the examination of the specific context in which rituals occur, (referred to as the action field context), Turner argues that symbols should also be analyzed within the context of the total system (the cultural context). This is particularly significant as often before a ritual is even performed, participants may be involved in training where cultural knowledge is first imparted by ritual specialists and elders. Preparation may also entail the avoidance of certain foods, or food altogether, sleep deprivation, or psychotropic drugs. Thus by the time the ceremony is enacted, there is much more to the ceremony than the mere enactment, and thus the cultural context leading up to the ritual is very significant. The previous schools which I have discussed totally ignored this point.

Because context can change through time, Turner also believed that ritual should be studied as a time series in relation to other events, rather than as an isolated static event (1967:43). Turner felt that ritual has to be examined in its historical field-setting due to the transient nature of social life and the relationship of ritual to social processes (Boudewijnse, 1990:5), and challenged those anthropologists who interpreted ritual as static paradigms or structures (Grimes, 1995:152). This revolutionary conception of symbol in turn influenced Turner's methodology. Turner examines symbols from three different levels of meaning. The *exegetic level* is the interpretation of those individuals being studied. Turner makes an important distinction between the interpretation provided by specialists, versus that provided by a layperson and realizes the importance of obtaining interpretations from both. The fact that Turner would even consider the interpretation of the indigenous population is very significant, as it was standard for functionalist

anthropologists to rely exclusively on the etic perspective. Turner's method also has implications with respect to ethnographic authority and the position of the researcher. By obtaining the views of specialists and laypersons, there is an underlying acknowledgement that the researcher has much to learn from his/her informants, rather than the assumption that everything worth understanding can be done based on observation alone. The second level of analysis Turner looks at is the *operational level* which refers to the observable characteristics of how the symbol is used, and the third level of analysis is the *positional level* which constitutes a contextual analysis worked out by the anthropologist (1967:20). Using this methodology, the often ambiguous and complex nature of symbols becomes apparent, as Turner discovered that often contradictions exist between the operational level of data and the exegetical data. Thus often what people say about a symbol's meaning, and how it is used in a ritual setting can be contradictory.

As a result, Turner conceptualizes symbols as having the potential of being multi-dimensional, multi-vocal, ambiguous, and non-static, and his methodology reflected this view. With this new recognition of the tremendous complexity of symbols and symbolic systems, this raised methodological problems for those anthropologists who had traditionally investigated symbols from one position. It would also question those anthropologists such as Malinowski who claimed that some symbolic systems are uncomplicated, can be fully understood and easily mastered by the anthropologist:

Primitive magic-every field anthropologist knows it to his cost-is extremely monotonous and unexciting, strictly limited in its means of action, circumscribed in its beliefs, stunted in its fundamental assumptions. Follow one rite, study one spell, grasp the principles of magical belief, art and sociology in one case, and you will know

not only all the acts of the tribe, but, adding a variant here and there, you will be able to settle as a magical practitioner in any part of the world yet fortunate enough to have faith in that desirable art (Malinowski, 1954:70)

Puberty Rites--Ritual and Transformation--Liminality & Communitas

Using Arnold Van Gennep's breakdown of rites of passage and a new methodological approach to ritual, Turner took an entirely new approach to the analysis of puberty initiations. Van Gennep illustrated that all rites of passage consist of three phases: separation, transition and reaggregation (1904). The first phase is characterized by a symbolic ceremony which signifies the separation of the individual from his or her previous status in the social structure. In the transition phase, initiates are stripped of their previous identity, and pass through a period of ambiguity where they must undergo specific training, initiations, and rituals before a new status can be warranted. Having gone through these processes, the novice is then reintegrated into society in the reaggregation phase with the ascribed status having been recognized. Victor Turner focused his work on the transition phase of Van Gennep's model. He calls this the liminal phase, and argues that it is during the liminal phase, that the initiates are stripped of all points of reference which associate the individuals to their previous status and identity. "They may be disguised as monsters, wear only a strip of clothing, or even go naked, to demonstrate that as liminal beings they have no status, property, insignia, secular clothing indicating rank or role, position in a kinship system-in short, nothing that may distinguish them from their fellow neophytes or initiands" (Turner, 1969:95). Liminality then acts as a dialectic between social structure, and as such, the driving force behind ritual is the notion

of momentary freedom from social structure which is accomplished through liminality or what Turner refers to as antistructure. As the initiates learn the deep structure of society, and are together taught tribal knowledge by elders, *communitas* emerges. Contrary to structure then, *communitas* is based on status undifferentiation and equality. In essence, liminality diametrically opposes structure, and keeps social structure in check so that it is prevented from becoming overly dominant (Prattis, 1994)

What is significant about Turner's insights on structure and antistructure, was the recognition that the liminal phase represented a fundamental locale for transformation and change:

The wisdom (*mana*) that is imparted in sacred liminality is not just an aggregation of words and sentences; it has ontological value, it refashions the very being of the neophyte (Turner, 1969:103).

Turner also acknowledged the fact that this knowledge could be imparted both verbally, and non-verbally through the use of symbols so that the novice "is grown by the verbal and nonverbal instruction she receives in precept and symbol.." (1969:103). Thus unlike some definitions which view consciousness as verbal and analytical, Turner acknowledges the non-verbal nature of symbolic systems, and the symbol's ability to transform that individual. Thus Turner's work represented a critical transition period in the study of symbolic systems. Turner was a revolutionary figure whose work not only influenced the way anthropologists viewed and studied symbols, but was also a leader who had a profound effect in advancing symbolic anthropology to its current status.

2.5: Current Trends—holism, a new conception of symbol & transpersonal anthropology

Transpersonal Anthropology

Until recently, altered states of consciousness in the ritual context has largely been left out of ethnography. This has primarily been due to a western bias toward monophasic consciousness. Historically (and to some extent even today) anthropologists have had a minimal understanding of altered states of consciousness and it has been a common practice to disregard these states altogether. According to Laughlin, "...this oversight on the part of anthropologists is not accidental, but in fact is due to a bias born of enculturation to what we may call "monophasic" consciousness characteristic of EuroAmerican societies." (1996a:4) As a monophasic society, consciousness from the western point of view is oriented around the "normal" waking phase (Laughlin, 1994:18). Based on this orientation, states of consciousness uncharacteristic of the waking phase such as dreams, are not given any credence. The mere terminology in itself is ethnocentric as the term "altered" implies abnormality, and some anthropologists use "alternative" as a more culturally relative term (Laughlin, 1996b). Many societies which anthropologists examine, are polyphasic, in that these societies "integrate knowledge gleaned from experiences encountered in all phases of consciousness within a single world view" (Laughlin, 1994:18). Because of the western bias toward monophasic consciousness, a number of methodological and epistemological issues have surfaced concerning the problematics surrounding the study of symbolic systems such as puberty initiations, where the exploration of alternative states is often fundamental. A study in 1973 conducted by

Bourguignon, found that altered states of consciousness are close to being universal in human societies. In a sample of 488 societies, she found that 90% practised institutionalized forms of altered states of consciousness. With this realization Bourguignon states “we are, indeed, dealing with a matter of major importance, not merely a bit of anthropological esoterica” (1973:11) . Gradually, a number of researchers in the discipline of anthropology along with psychology and the neurosciences, have shifted from viewing ASC’s as anomalous, abnormal, or psychotic, and have since acknowledged a variety of states of consciousness. This has lead to the movement of transpersonalism, a “movement in science toward the recognition of the relevance of extraordinary experiences as data” (Laughlin, 1996b:1), and transpersonal anthropology, the study of these experiences cross culturally. Transpersonal experiences are distinct from the normal waking phase, and are described in the Journal of Transpersonal Psychology to involve:

transpersonal process, values and states, unitive consciousness, meta-needs, peak experiences, ecstasy, mystical experience, being, essence, bliss, awe, wonder, transcendence of self, spirit, sacralization of everyday life, oneness, cosmic awareness, cosmic play, individual and species-wide synergy, the theories and practices of meditation, spiritual paths, compassion, transpersonal cooperation, transpersonal realization and actualization; and related concepts, experiences and activities. (Laughlin, 1996a:1)

Although anthropologists have long been associated with an interest in practices involving such experiences (ie, shamanism, ritual), there has been a reluctance in anthropology to

report these events, and parapsychology² was the first discipline to systematically report and study such phenomena. In 1953, the president of the Anthropological Association wrote a letter to members of the association, encouraging them to become familiar with the parapsychological literature (Krippner, 1991:13). Similarly, in a paper that was given at the 1991 American Anthropological Association convention, Weiant argued:

I feel very strongly that every anthropologist, whether believer or unbelievers, should acquaint himself with the techniques of parapsychological research and make use of these, as well as any other means at his disposal to establish what is real and what is illusion in the so-called paranormal (Krippner, 1991:13).

In the mid 1970's, anthropologists and other individuals interested in transpersonal phenomena formed the journal *Phoenix: New Directions in the Study of Man* (Laughlin, 1996a:2). Independently from the Phoenix group, in 1978 the *Newsletter for the Anthropological Study of Paranormal and Anomalistic Phenomena* was created after a meeting on paranormal events held at the American Anthropological Associating meeting (1996a:2). Eventually, these two groups merged and became *the Association for Transpersonal Anthropology*, but with debates arising as to whether the association should be more scientifically oriented or humanistically oriented, the scientifically oriented division became in 1984, the *Society for the Anthropological Study of Consciousness* (1996a:2). In 1990 this particular group became a section of the American Anthropological Association, and since then has produced the journal *The Anthropology of Consciousness* (1996a:2).

²Parapsychology: the study of "those reported anomalies of behaviour and experience that appear to stand outside of the currently known explanatory mechanisms that account for organism-environment and organism-organism information and influence flow" (Krippner, 1991:13)

From the history of transpersonal anthropology, it is evident that one of the themes of the movement is holism. Many of the articles in the journal *The Anthropology of Consciousness*, are written by individuals with backgrounds in biology, psychology, and anthropology. It is also evident that many citations included in the articles are from disciplines other than that of the authors'. This notion of holism, and the merging together of academic disciplines is reflected in the theoretical framework and founders of *biogenetic structuralism*. Initially founded by C.D. Laughlin, an anthropologist with a post doctoral in neuroscience, E.G. d'Aquili, an anthropologist/psychiatrist, and J. McManus a social psychologist, the theory argues that there exists universal structures of consciousness, and that these structures are the result of the genetically predisposed organization of the human nervous system. It is thus the processes in the brain that condition culture and experience and as such, it is argued that anthropologists cannot exclude these processes in the brain from their accounts of culture.

Thus for many transpersonal anthropologists, the recognition of alternative states of consciousness has taken the view of symbol, and symbolic systems one step further from the view developed by Victor Turner. From the biogenetic structuralist perspective, symbols are understood to have the ability to penetrate the neurocognitive structures to reorganize those structures in the form of re-entrainment³. Considering symbols in this manner, ritual is then viewed as a "complex of standardized activity that may operate to *amplify* a symbolic penetration technique" (Laughlin *et al*, 1990:196). Analogous to

³ This refers to the re-organization of neural networks in the nervous system. Consciousness and its components are functions of the continuous entrainment of neural networks.

Victor Turner, this perspective recognizes ritual as a vehicle for transformation and change, however this change is interpreted biologically through the human nervous system. While the interpretation of experience may vary among individuals and across cultures, because symbols are archetypal in nature, there will be a similarity in terms of experience because of the universal structures that are present in the human nervous system (McDonald *et al*, 1989:55). Consequently, anthropologists now have a better understanding as to how symbols operate in terms of initiating transformation in the form of consciousness. As argued by Prattis, symbols “are communication vehicles that operate as pointers to the unknown, and as mediators between different levels of consciousness and reality” (1997:3).

It is apparent that the study of symbolic systems in anthropology has undergone several transformations through time. Until recently, anthropology has tended to disregard the presence and significance of altered states of consciousness. Even those anthropologists who experienced altered mind states for themselves during participant observation have been reluctant to share their experiences for fear of losing academic credibility. With the gradual acknowledgement on the part of anthropologists toward altered states of consciousness, this is beginning to change, and the once static and univocal view of symbol and symbolic systems has shifted to a recognition of the multivocality of symbols, and the tremendously complex relationship symbols possess with human consciousness and the nervous system. Anthropologists are now starting to document their own experiences with altered states encountered in the field and this is exemplified by Young and Goulet’s *Being Changed by Cross-Cultural Encounter*. Thus

the multivocal nature of symbols and the manner in which they interact with the mind and body, suggests that the experience of altered states of consciousness is a universal and inherent human capacity. While the manner in which these states are induced and interpreted are culturally determined, the ability to experience these states is supported by the nervous system. It is within this new framework that this thesis will be positioned.

2.6: Methodology & Research Design

Based on the universality of altered states of consciousness, and the neurophysiological basis for these states, Winkelman concludes that “the shamanic experience is an archetypal and psychophysiological structure and that shamanism originated from that basis” (1997:403). The universal presence of ASC’s, the shamanic techniques employed to induce these states, and the neurophysiological effects related to healing, learning, and psychological well-being, seem to imply ritual intentionality. What I mean by ritual intentionality, is the notion that these techniques reserved for the ritual setting, although seemingly incomprehensible to an outside observer, are not arbitrary and random. Rather, these techniques are efficacious in their ability to result in physical and emotional growth and healing. The same case can also be made for puberty initiations; cross culturally the prevalent use of ASC inducing techniques during puberty rituals would suggest that the initiation experience is archetypal. This is further suggested by the fact that in societies where rites of passage are not institutionalized, the initiation archetype will often appear in dreams. As pointed out by Stevens:

This need is very evident in patients undergoing analysis; archetypal symbols of initiation arise spontaneously in dreams at critical periods

in the life-cycle- at puberty, betrothal, marriage, childbirth, at divorce, separation, or death of a spouse, at the betrothal and marriage of one's children, at the approach of old age and death. (cited in Mahdi, 1987).

Analogous to Winkelman, Laughlin also emphasizes the neural basis of archetypes and argues that "as structures mediating intuitive and symbolic knowledge are undoubtedly located in the areas of the nervous system that appear to have evolved most dramatically during the course of hominid encephalization and that produce the distinctly human quality of mentation, learning, communication, and social action characteristic of our species today" (1995:23). Thus the neurognostic structures must be present before an organism can learn something (1995:24). In terms of puberty initiations, the universal tendency to initiate individuals during puberty, and the universal prevalence of ASC inducing techniques, suggests that the neurognostic structures related to initiation are in place to produce specific changes in neurophysiological functioning. Treating puberty initiations as archetypal in nature, justifies the sampling method of this research project. Through the method of comparative analysis, two case studies varying in their degree of ordeal intensity were examined to determine the relationship between the intensity of ordeals present at puberty rites, and a society's intended transformational effects on initiates. Therefore, although the Native American rituals vary in terms of the historical time frame in which they were practised, emphasis is placed on those neurognostic structures relevant to initiation and initiate transformation. Thus it should be stressed that a case is not being put forward for biological reductionism; while cultural variation does operate, as contended by Laughlin "variance should be understood as 'surface' transformations upon universal neurognosis operating in human ontogenesis" (1995:24).

The archetypal nature of these variables makes the EuroAmerican context relevant to the discussion in terms of what the implications are for those societies where rites of passage are not institutionalized, since the same neurognostic structures are present in EuroAmericans, although these structures may not be stimulated or developed.

A sample which varies in ritual intensity would ideally consist of those case studies which exemplify each possible scenario of occurring variables. Thus a male and female ritual involving pain, fear, drugs and indoctrination on the one hand, would be compared with those rituals involving case studies illustrating each possible combination of ordeals, including one where neither ordeal or indoctrination occurs. The following illustrates this kind of sampling method:

Matrix of Variables for Male & Female Puberty Rites:

Matrix of Variables for Male & Female Puberty Rites								
	P+F+D+I	P+F+I	P+D+I	P+I	F+I	D+I	I	—
Male								
Female								

(Figure 1)

P= Pain or Physical Exertion (release of endorphins in the body) ie: tattoos, piercing, prolonged dancing
 F= Fear (associated with pain but can occur with the absence of pain) ie: symbolic death, masking
 D=Drugs (specifically datura)
 I= Indoctrination (ritual knowledge) ie: sand paintings, songs, instruction from elders
 —=Neither indoctrination or ritual ordeal

There are several problems with this kind of methodology however. First, the scope of

this analysis is too extensive for an MA research project. Secondly, there are several other drivers found in puberty initiations such as fasting, sleep deprivation, prolonged heat exposure, isolation, ritual language, rhythmic stimuli, and photic stimuli, which are also prevalent in many puberty initiations. A matrix involving each possible combination of the above mentioned stimuli, with the appropriate case studies to match would be unrealistic, and again unsuitable for a Masters thesis.

Consequently, two case studies were selected where each puberty ceremony represents an example on a continuum from those rituals involving several ordeals, to those cases where puberty initiations are absent. Thus a highly intense initiatory ordeal would be one which would contain several ordeal variables, such as the ingestion of the drug datura, tattooing, fasting, physical exertion, and sleep deprivation. The Cahuilla boys puberty ceremony represents an example of such an initiation. The Cahuilla girls ceremony, although more intense than the Oglala girls ceremony would be placed toward the middle of the spectrum. The Oglala case in contrast to the Cahuilla is less intense respectively for the same genders-that is, there are less ordeals present in the Oglala boys ceremony than there are for the Cahuilla boys, and there are less for the Oglala girls ceremony, than the Cahuilla girls, however the Oglala boys initiation contains a greater number of variables than the Cahuilla girls. Thus for each case study, the male and female puberty rite can be plotted along a scale from intense initiatory ordeal, to the other extreme of initiation absence. This can then be correlated to intended transformational effects where high ordeal intensity would suggest high intended transformation, moderate intensity correlates with moderate intended transformation, and low intensity would

suggest mild intended transformation:

Plotted Scale of Initiation Ordeal Intensity:

(Figure 2)

Material concerning the Cahuilla and Oglala case studies have been based on secondary source material from the ethnographic record, and data pertaining to the physiology of drivers and the neurophysiology of puberty, have been extracted from scientific journals and texts. The correlation between the intensity of ordeal, and a society's intended transformation, in addition to the examination of gender differences, have been drawn from cosmological analyses of Cahuilla and Oglala creation stories. It is here where views concerning identity, gender roles, and rules of behaviour are frequently expressed. As pointed out by Sanday:

Creation stories contain within them a conception of the natural or initial order of things. By articulating how things are in the beginning, people supply more than a logic for sexual life styles—they make a basic statement about their relationship with nature and about their perception of the source of power in the universe. This relationship, and its projection into the sacred and secular realms, holds the key for understanding sexual identities and corresponding roles (cited in Powers, 1986:5)

To examine intended transformation in the EuroAmerican context the western view of adolescence, and what is considered to be “normal” adolescent identity formation will be briefly touched on in the concluding chapter.

Chapter 3: Ritual, Symbol, and Neurophysiology

My career focus mostly has been on the ritual process, a cultural phenomenon, more than on brain neuroanatomy and neurophysiology. But I am at least half convinced that there can be genuine dialogue between neurology and culturology, since both take into account the capacity of the upper brain for adaptability, resilience, learning, and symbolizing, in ways perhaps neglected by the ethologists *pur sang*, who seem to stop short in their thinking about ritualization at the more genetically programmed behaviors of the lower brain.

(Victor Turner, 1983:243)

Since the ground breaking work of Victor Turner, conceptions regarding myth, symbol and ritual have profoundly changed in the discipline of anthropology. The analysis of the Cahuilla and Oglala initiation rites will reflect these changes and will be theoretically drawn from Turner's concept of liminality, Laughlin's cycle of meaning, Prattis's views on ritual transformation, in addition to neurophysiological research concerning puberty and ritual. Because transformation and the variables which elicit transformation, are the central components of this thesis, the context in which the ritual occurs and its relationship to cosmology is relevant, as are the theoretical tools used to analyze those initiation variables. Laughlin's cycle of meaning allows the initiation rituals under the scope of inquiry to be placed within its broader cosmological context. Turner's work enables us to situate specifically where these transformational processes take place within the ritual setting. Finally, it is Prattis' three stage process of metaphor, vibration and form, biogenetic structuralism, and adolescent neurophysiological data which provide the analytic tools to decipher what is taking place physiologically and neurophysiologically, and how this relates to an individual's transformation. Thus the first section of this

chapter will focus on outlining Laughlin's, Turner's and Prattis' positions, with emphasis placed on the relationship between these theories. Because these theories are supported and to an extent informed by what is known about the structure and neurophysiology of the brain, the second section of this chapter will be devoted to exploring the neurophysiology of ritual, and the neurophysiology of puberty.

3.1: The Cycle of Meaning, Liminality & Transformation

The cycle of meaning is a model which illustrates the process through which polyphasic cultures integrate "knowledge, memory and experience" (Laughlin, 1997:480). Defined as knowledge about self, others, and the world in relation to the universe, cosmology plays an integral role in this model as it is the experience of mythopoeia and its' interpretation which authenticates a culture's cosmology. In Brain Symbol & Experience, (1992) Laughlin *et al*, outline three classes of knowledge that individuals can possess about the cosmos. The first level of knowledge is referred to as *belief*: this represents the most common and rudimentary form of knowing, where knowledge about the cosmos is informed through experiences described by others rather than through direct personal experience. The second level of knowledge, *understanding*, occurs when symbolic expression of the cosmos begins to be discerned founded on direct experience. It is at this point where "the cosmos appears to be a total system of knowledge, rather than bits and pieces of memorized material" (1992:228). *Realization* represents the third level of knowledge and it is during this level that the cosmos is described as becoming "*real*". Characteristic to this level is the experience of altered states of consciousness and

“real”. Characteristic to this level is the experience of altered states of consciousness and profound transformation on the part of the individual. The cycle of meaning thus illustrates an individual’s potential development of belief, understanding, and realization, where knowledge must go beyond belief and understanding in order for the cycle to complete itself. Because mind states other than what monophasic cultures would label as the “normal waking phase” are fundamental to the levels of cosmological understanding, this explains why this model is identified with polyphasic societies. It is during ritual enactments that control over the presence and quality of an altered state of consciousness is actively sought (Laughlin, 1997:478). Credence to these mind states is given and thus polyphasic societies are those cultures which “integrate knowledge gleaned from experiences encountered in all phases of consciousness within a single world view” (Laughlin, 1997: 479).

The Cycle of Meaning:

(Figure 3)

Thus according to this model, myth and ritual are examples of mythic expression or mythopoeia, and mythopoeia is an expression of a culture's cosmology. It is such processes as ritual and shamanic interjection which initiate discourse with altered states of consciousness, memories, and direct cosmological experience. In this manner, a society's worldview is described as being "vivified and verified" (1997:481). A feedback system, the cycle of meaning is easily disturbed and can cease to "verify and vivify" a culture's cosmology. Shamans and elders may die before ritual knowledge can be passed down to future generations, ritual enactments may be banned, or the younger generation may choose to adhere to a different world view (Laughlin, 1991:230). Change however, is not always negative as verification of cosmology can also be enhanced by new interpretations by shamans, new experiences by participants, or traditional knowledge may be integrated with other world views (1991:230-31).

Thus the exploration of altered mind states is an essential part of the entire process as direct experience of cosmology takes place in addition to verification of cosmology. As pointed out by Laughlin, initiation rituals exemplify the extent to which some cultures will go to ensure the experience of altered states in their members and that "the experiences encountered during these procedures in turn reify the society's multiple reality cosmology" (1991:481). By analyzing the mechanisms which operate during the process of initiation, the role of these rituals within the cycle of meaning becomes apparent. To allow an individual's cosmological knowledge to transcend past the level of belief to the level of understanding and realization, transformation and entry into the sacred realm must occur. It is at this stage in the cycle of meaning that Victor Turner's contribution becomes

particularly relevant.

As noted in the last chapter, Victor Turner concentrates his work on Van Gennep's transition phase which he calls liminality, arguing that it is during this phase that initiates are stripped of all points of reference which relate them to their previous status and identity. Thus liminality is understood to represent more than an attempt to differentiate initiates from non-initiates, but rather represents a locale for transformation and change. Positioned in opposition to the structure of society which is based on rules, hierarchy and constraints, liminality represents the exact opposite and is thus described as anti-structure. To foster transformation, participants must first be liberated from the conditioned constraints of social structure and the secular realm, so that essentially "the neophyte in liminality must be a *tabula rasa*, a blank slate, on which is inscribed the knowledge and wisdom of the group.." (Turner, 1969:103). It is thus this knowledge and wisdom which subsequently transforms the initiate:

The arcane knowledge or "*gnosis*" obtained in the liminal period is felt to change the inmost nature of the neophyte, impressing him, as a seal impresses wax, with the characteristics of his new state. It is not a mere acquisition of knowledge, but a change in being (Turner, 1987:11).

Thus there are several processes in puberty rites which facilitate the stripping away of an individual's identity, to enable direct cosmological experience which operates as the driving force behind transformation. It is these anti-structuring mechanisms which can be linked to neurophysiological changes in the brain. As pointed out by Lex, "Embedded in rites of passage (and rites of intensification) is the deliberate goal of change in neurophysiological functioning" (1970:141). Processes which facilitate the stripping away

of identity in addition to changes in neurophysiology can include the symbolic death of the initiate⁴, the ingestion of hallucinogenic drugs, the induction of pain⁵, fasting, and physical exertion to the extreme. Secular language prohibition and the learning of a special ceremonial language spoken only during the ritual context is another anti-structuring device which not only operates to strip away the former identity, but allows the initiate to experience that culture's cosmology.

The emphasis Laughlin places on the shaman's role before the initiate encounters direct experience is evident in liminality, as the neophyte's behaviour during this phase is described by Turner as being "passive or humble" where participants "must obey their instructors implicitly, and accept arbitrary punishment without complaint" (Turner, 1969:95). Thus it is the shaman or the elder which supervises and guides the entire initiation process. Also evident in liminality is how the cycle of meaning is vulnerable to change. Turner argues that a key characteristic of liminality is experimentation, spontaneity and play:

In short, parts of liminality may be given over to experimental behavior. I mean here by "experiment", any action or process undertaken to discover something not yet known, not scientific experimentation nor what is based on experience rather than theory or authority. In liminality, new ways of acting, new combinations of symbols, are tried out, to be discarded or accepted (Turner, 1977:40).

Novel experiences encountered during liminality can thus feed back into the cycle of

⁴ Initiates may be placed in pits in the ground or caves, they may be naked, and/or painted white to symbolize the death of childhood.

⁵ A variety of methods exist but pain is often induced through scarification, tattooing, or circumcision.

meaning to alter cosmology, mythic expression, and shamanic interpretation. This again supports Laughlin's contention that cosmology and the cycle of meaning are continuously in a state of flux.

While Turner can be credited for placing emphasis on the liminal stage as the primary locale for transformation, he remained vague in reference to the specific mechanisms involved which elicit transformation during liminality, and failed to examine what makes the newly imparted tribal knowledge so powerful in its ability to communicate change in the very being of those participating in the ritual. It is here that Ian Prattis's views on how symbols operate is valuable. Influenced by Jung, Turner, Campbell, Levi-Strauss, and his own phenomenological experiences, Prattis views symbols as being overwhelmingly complex and multi-dimensional. Because symbolic meanings are archetypal, he argues that different people can experience symbols in similar ways, but it is the level of meaning which can differ because a symbol can "change meanings as individuals engage more deeply with that symbol in an ongoing phenomenological relationship" (Prattis:1997:206). For Prattis, ritual represents an enactment of mythology and it is the archetypal symbols within the ritual context, which activate the deep unconscious structures in the human mind (1997:207). Thus symbols are initially localized in the mind, they are then expressed in myth, and through ritual enactment, individuals are able to experience the symbol in a much more profound manner. Through this process the universal structures in the mind are brought to the level of personal experience, and a better understanding of the human mind is achieved.

Prattis contends that it is through the process of metaphor, vibration and form, that

specifically enables transformation to occur. Metaphor, referring to the “qualities, meanings and properties assigned to symbols” allows the “symbolic concept to register with the mind and senses”(Prattis, 1997:212). Pedagogically metaphors serve to make complex and abstract concepts more tangible and allow individuals to engage in a rudimentary dialogue with the symbol. The powerful nature of symbols cannot be experienced alone at this level however, but must go beyond metaphor to proceed to the next stage- vibration in the body. In other words, ritual enactments of symbolic metaphors initiate specific characteristics which are then experienced as a vibration, an energy surge or circulation in the body. This allows the symbol to be personally and physically experienced by the individual rather than remain as an intellectual concept in the mind (Prattis, 1997:212). What is key according to Prattis is the fundamental role of the altered state of consciousness. It is the ASC, which acts as the catalyst which launches symbolic communication from the level of metaphor, to the next level of communication- that of vibration. Prattis argues that during this level an individual will experience “an oceanic sense of interconnectedness, harmony and integration with the universe” (1997, 212). It is this process of vibration which is argued to be integral to behavioural transformation and it is at this point where the symbolic metaphor evolves into form:

When the physical experience in the body deepens and is interpreted and understood through continual ritual focus, the initiate becomes aware of differences in attitudes and behaviours, as the “numinous” qualities associated with the symbolic metaphor are eventually expressed behaviourally in terms of new and different modes of acting. The new behaviour forms are supported socially through repeated ritual enactments that entrench the qualities of the symbolic metaphor in the mind, behaviours, and attitudes of the initiate (Prattis, 1997:213).

From this three stage process, the specific mechanisms which elicit individual transformation becomes more clear. Also evident is the association of metaphor, vibration, and form, to the cycle of meaning. For the cycle of meaning to complete itself, participation with cosmology must go beyond the level of belief to the level of understanding and realization. Thus belief is imparted through the teachings of elders, the reading and memorization of sacred texts, and thus cosmological knowledge exists only at the metaphorical level representing nothing more than an intellectual construct. Fundamental to the attainment of understanding and realization (necessary to complete the cycle of meaning) is direct personal experience. It is through vibration and form that direct personal experience occurs and this in turn verifies and vivifies symbolic interaction and hence cosmology. An integral theme to both the cycle of meaning, and metaphor, vibration and form, is the role of the altered state of consciousness. It is the ASC which enables the cycle to complete itself by extending metaphor to the level of vibration and form which subsequently facilitates an individual's complete participation with cosmology. Also fundamental to these models is the presence of a compatible symbol system to enable direct experience of cosmology; in puberty initiations these cultural meanings are expressed during liminality. Because Laughlin's and Prattis's views are influenced by what is known about the brain and consciousness, neurophysiological data within the ritual context will be examined.

3.2:Neurophysiology and Biogenetic Structuralism

The hard-wired brain vs the trophic brain

In 1815, Spurzheim observed that with exercise, muscle tissues could increase due to increased blood flow and felt that this principle could perhaps be applied to the brain (Diamond, 1988:1). In 1874, Charles Darwin observed that the brains of wild rabbits were significantly larger than the brains of domestic rabbits and believed that the differences could be credited to environmental influences (1988:2). Being unexposed to the challenges and threats that face wild rabbits, domestic rabbits would not have to use their intellect as frequently and selection for a larger brain would not occur. In 1911 Ramon y Cajal argued that “cerebral exercise” could establish new connections, and more complex connections between nerve cells in the brain (1988:2), but then later pessimistically concluded that in “the adult brain, nervous pathways are fixed and immutable; everything may die, nothing may be regenerated” (cited in Stein et al, 1995:51). While the belief that environmental stimuli can change the structure and functioning of the brain is not a new idea, until recently little attention has been paid to the brain’s potential for neuroplasticity. Respect for neurophysiological explanations of learning has for the most part been attributed to Donald O. Hebb, one of the first researchers to seriously examine the brain as a trophic organ. Hebb’s famous book *The Organization of Behaviour* (1949) clearly challenged the dominant positions held by psychologists at the time who viewed the brain as rigid and hard wired, operating as a switchboard where stimulus and response connections determined behaviour (Klein, 1980:4). Hired to psychologically assess Wilder Penfield’s patients who had undergone

brain surgery, Hebb realized that the intelligence of some patients had not diminished but in some cases increased after tissue from the frontal lobes had been removed. It was the questions raised by such observations that acted as a stimulus for his later research and eventual development of a neurophysiological theory. Evident in one of his central postulates is the potential for plasticity in the brain:

When an axon of cell A is near enough to excite a cell B and repeatedly or persistently takes part in firing it, some growth process or metabolic change takes place in one or both cells such that A's efficiency, as one of the cells firing B, is increased (Hebb, 1949:62).

During Hebb's time, very little was known about neuroplasticity at the molecular and cellular levels. Hebb's theory of neurophysiology however, has inspired a renewed interest in this area of research, and now, 40 years later there is concrete physiological evidence which support Hebb's contentions about the brain. It is Hebb's theory and subsequent findings which have influenced the body of theory known as biogenetic structuralism.

Founded by C.D. Laughlin, an anthropologist who completed a post doctoral fellowship in neuroscience, E.G. d'Aquili, a neurologically-trained anthropologist/psychiatrist, and J. McManus a social psychologist, the theory argues that there exist universal structures of consciousness, and that these structures are the result of the genetically predisposed organization of the human nervous system. With Hebb's notion of the brain as a trophic organ, the human brain is not considered to be hard-wired, but rather demonstrates the potential for neural structures to develop and complexify. Thus while we are constrained by the structure and organization of our nervous systems,

at the same time there is a certain degree of plasticity in the brain which allows for neural complexification and change. From this perspective, symbols are understood to have the ability to penetrate the neurocognitive structures, and to reorganize those structures. Biogenetic structuralism then is grounded on three fundamental axioms. The first states “that consciousness is a property of the nervous system”, second, “that all of the neural structures that mediate consciousness are developed during the course of life from initial, inherited structures”, and third, “that all we can possibly mean by ‘culture’ refers either directly to neurophysiological processes, or indirectly to the artifacts and behaviors produced by those processes” (Laughlin, 1997a).

One of the key concepts in biogenetic structuralism is the conscious network. The conscious network refers to the “network of neural systems that mediates the moment-by-moment flow of consciousness” (Laughlin, 1997a). The cognized environment (E_c) consists of all the models in the brain that can potentially be entrained to and with the conscious network. In contrast to the cognized environment, the operational environment (E_o) represents the real world; this encompasses an individual’s surrounding environment, in addition to the real nature of the individual as an organism. The cognized environment is thus a product of the nervous system and unlike the operational environment, it is intentional. The neurognostic structures are the first, initial, genetically determined structures which are present in the womb; it is upon these neurognostic structures that all subsequent development is based. Neurocognitive functioning from the biogenetic structuralist perspective is based on an entrainment model. Entrainment is defined as the “linking up of neurons to form networks, and networks to form even more complex

networks and models" (Laughlin et al, 1992:52). The organization and relationship between networks can be entrained, re-entrained or disentrained:

Networks of cells communicate among themselves in a particular configuration during one moment of consciousness (they become entrained), cease communicating in that configuration the next moment (they become disentrained) and link-up in a whole new configuration the next moment (they re-entrain) (Laughlin, 1997a).

There are three categories of neural events which exemplify this entrainment model of neurocognitive functioning. Developmental plasticity refers to the anatomical changes that occur early in development (Milgram et al, 1987:7). The swelling of a baby's head indicates the rapid increase in connectivity between neural cells. At this stage the potential for plasticity is great and becomes more restricted as neurons grow. Internal factors such as chemical environment, and growth patterns, in addition to external factors mediate neural processes. Plasticity is also present with respect to synaptic connectivity as environmental factors can affect the size and number of synapses. The location of the nerve cell which receives information from other neurons is called the synapse. The intensity of neurotransmitter transference between the pre- and postsynaptic membranes can be altered so that in essence the neuron develops a memory; a frequent pattern of stimulation will release either more or less neurotransmitters based on what was taking place previously (Stein et al, 1995:37). Thus the more frequent the experience, the larger and more defined the synaptic connections will be. Another category of plasticity is anatomical plasticity which refers to changes with respect to cellular structure. Anatomical changes generally occur after the cessation of developmental growth and differentiation. Thus while few new neurons are developed after birth, the structure and

organization of neurons enormously change. Anatomical changes can include alterations of dendrites, dendritic spines, and synaptic terminals; these structural changes can be induced by neural activation produced with chemical, electrical or environmental stimulation (Milgram et al, 1987:9). Physiological plasticity refers to the third category of neuroplasticity and this is viewed as a change in level of neuronal responsiveness, threshold of firing, or activation patterns, all of which can be related to experienced events (Milgram et al, 1987:10). As the main conducting unit of the neuron, the axon communicates information by circulating an electrical signal called the action potential. It is the action potential which determines the threshold of firing and speed of firing. Action potentials can be enhanced during learning to cause a more rapid firing of neurons to result in stronger synaptic connections.

Ritual & Biogenetic Structuralism

From a biogenetic structuralist perspective then, ritual is argued to have a neural base. From an evolutionary point of view ritual is viewed to be highly adaptive, and can be traced back to our phylogenetic past. As an adaptive strategy, a driving force in ritual behaviour is what biogenetic structuralists call the “cognitive imperative”. This refers to the inherent drive that humans have to control the environment and to explain the cause of events. It was the evolution of the neural structures responsible for abstract cognition and problem solving that aided the human struggle to survive (d’Aquila & Laughlin, 1996:138). Narratives which explain cultural contradictions and uncertainties, myth becomes fundamental to the cognitive imperative, as it is myth which acts as the vehicle which explains the world and diminishes the fear associated with the unknown. By

enacting myth in the ritual context, the lesson of the myth becomes much more “real” to the participant as the myth is not only intellectually experienced, but is also physically experienced. The repetitive auditory and visual stimuli frequently present in the ritual context has been found to elicit specific responses in the sympathetic and parasympathetic nervous system in the form of autonomic nervous system tuning. Within the autonomic nervous system (ANS), are two subsystems : the sympathetic (excitation) and parasympathetic (relaxation) system. Generally when one system increases its activity, the other system decreases, however it is the learned balance of the two subsystems which is referred to as tuning (Laughlin et al, 1992:146). Ritual often facilitates the action and interaction of both the sympathetic and parasympathetic systems which can result in a profound transformation in consciousness, and even “..a reorganization of personality” (1992:147). Similarly, such drivers have also been associated with inducing both hemispheres in the brain to function simultaneously, (d’Aquili & Laughlin, 1996:142). Mind states mediated by dual hemispheric functioning, have also been linked with transformations in consciousness. Such drivers as repetitive auditory and visual stimuli, in addition to the ingestion of drugs, physical exertion, and pain, are linked to a society’s intention to control and transform the consciousness of members for specific purposes (Laughlin et al, 1992:145).

While keeping in mind the brain’s potential for neuroplasticity, ritual and the transformation of consciousness can be explained by entrainment. Neurologically speaking, what occurs during many initiation rites is the dynamic interplay between drivers such as psychotropic drugs, drumming, and pain, which operate to “penetrate to

the neurocognitive structures controlling the entrainment of phases of consciousness, and will produce (often profound) re-entrainment of those systems” (MacDonald et al, 1989:53). Therefore, it is during the liminal phase of the rite of passage where transformation of consciousness, and re-entrainment of the conscious network takes place.

Symbols are extended beyond the metaphorical level to be experienced physically. This physical experience has its base in changes in neurophysiological functioning, and it is the entrainment of the conscious network which is responsible for transformation, and for the continuation of the cycle of meaning. These mythic experiences which occur during a controlled and supervised ritual setting are interpreted in such a way to confirm and bring alive a culture’s cosmology.

Because the intensity and prevalence of initiations occurring at puberty are more pronounced during this time than any other age cohort, one of the central contentions of this research is that the timing of puberty initiations is not arbitrary. While it has been illustrated that there exists a neural base for ritual, it will be suggested that the pubescent timing and nature of these initiations also have a neural base. It is my contention that the drivers encountered during intense puberty initiations serve to optimize the neurophysiological changes that take place during puberty in the form of entrainment. Specifically, these ritualistic experiences enhance the action potential activity which causes a more rapid firing of neurons. This enhanced activity of neuronal firing results in stronger synaptic connections which in turn results in the strengthening and reorganization of neural pathways (entrainment and re-entrainment). This would not only explain the cross cultural tendency toward severe puberty initiations, but it would explain why the

inherent drive for initiation is so prevalent during the pubescent years.

3.3: The Neuroscience of Puberty

While in some cultures, puberty marks the beginning of adolescence, and in others it marks the beginning of adulthood, it is generally acknowledged that puberty refers to a distinct stage of human development characterized by rapid physical, hormonal, and neurological changes that take place between the approximate ages of ten to fifteen. In North America, the average age of onset for puberty in boys is 14.8, and in girls it is 12.6 years of age (Izzo, 1973:3). Whereas puberty is distinguished as a distinct biological developmental stage in human development, adolescence is a EuroAmerican cultural category which lacks a definite beginning or end, but the age of onset is associated with the physical changes of puberty. Adolescence is culturally treated as a transition period between childhood and adulthood where the age of cessation is related to economic independence. Due to the increasing educational requirements of a technological society, the period of adolescence in EuroAmerican society has become extended to accommodate the prolonged economic dependency of youths on their guardians, and the adolescent period can range anywhere from 12 to 20 years of age.

Among the most observable physical changes that occur during puberty are increases in height and weight, and sexual maturation. Growth spurts last on average for 2 years where height increases approximately 3.5 inches per year in girls, and about 4 inches per year in boys (Santrok, 1993:101). The increase in weight coincides with the growth spurt and on average there occurs an increase by half of the body weight (Reinis,

1980:278). In males the physical attributes marking sexual maturation include: the growth of the testicles and penis, appearance of pubic, armpit, and facial hair, deepening of the voice, and ejaculation, and in females: breast enlargement, appearance of pubic hair and armpit hair, a widening of the hips, and menstruation. (Santrok, 1993:102). It is the influx of androgens and estrogens (male and female class of hormones) which are responsible for the physical changes that occur during puberty, and control over the secretion of these hormones is regulated by the brain.

In addition to the physical changes attributed to puberty, neurological changes are also related to puberty and the adolescent years. Although it has been acknowledged for quite some time that neurological changes do occur during adolescence, little attention has been given to the specific changes that occur. This is primarily due to the fact that mortality rates for children and adolescents are fairly low and thus postmortem studies are rare. In addition, the majority of research on developmental neurology has emphasized the changes that occur during the prenatal period, and early childhood.

Increased cognitive performance during the adolescent phase seems to suggest change in neurological functioning. At the age of 12, individuals may reach Piaget's formal operational stage. The formal operational stage is considered to be the last qualitative change in cognitive development whereby the beginning of rational, abstract and symbolic thought is said to appear. Individuals are no longer limited to concrete experiences but can think in terms of the hypothetical and metaphorical, and this is illustrated by problems involving logical inference. In the type of problem if $A=B$ and $B=C$, then $A=C$, an individual during the concrete operational stage would not be able to

solve this equation without being able to visually see what objects represents A,B, and C. In contrast, a formal operational thinker can use the abstract symbols to logically deduce that $A=C$ without having to view what the letters symbolize (Santrok, 1993:120).

Problem solving also becomes more methodical and less trial and error oriented and formal operational adolescents will use strategies similar to the scientific method to solve problems. With new cognitive abilities, these adolescents are able to think about thinking, and think about the world around them and their relationship to it. The origin and meaning of life becomes particularly relevant during adolescence, a preoccupation analogous to biogenetic structuralist emphasis on the “cognitive imperative”, Peel argues that the “human urge to resolve inconsistencies and dissonances, ...is particularly strong in adolescence” (Peel, 1975:167). It is these new cognitive skills which to some extent makes many adolescents more vulnerable to depression. While it is true that hormonal and environmental factors do play a significant role in adolescent depression, the cognitive processes associated with depression such as helplessness, guilt, self-consciousness, and anxiety about the future, are cognitions that children tend to lack and from which they are therefore protected (Rutter, 1975: 136). In addition to increased cognitive ability, biologically based psychiatric disorders whose age of onset occur during adolescence also suggest the neurological changes that occur during puberty and adolescence. Seemingly, it is the neurophysiological and neuroanatomical abnormalities of the neural structures that develop or continue to develop during adolescence which seem to be linked with the etiology of schizophrenia and other such clinical disorders where the age of onset consistently occurs during adolescence.

Continuation in myelination is one neurological process which has been attributed to the improved adolescent cognitive ability. Myelin is an important structure surrounding the axon of the neuron which speeds the conduction of nerve impulses by acting as an insulator. It is the increased speed of nerve impulse conduction during myelination which is linked to the improved speed, capacity, and ability of cognitive tasks which occurs during later adolescence and early adulthood. Data now suggest that myelination of the brain does not reach total completion until early adulthood (Benes et al, 1994); (Giedd et al, 1996); (Pujol et al, 1993); (Yakovlev & Lecours, 1967). In a study conducted by Benes et al. (1994), Myelination of the superior medullary lamina along the surface of the parahippocampal gyrus increased 95% from birth to the age of 20, and the area of myelination in the fifth and sixth decades also increased by 33% and 55% (1994:480). The increased amounts of myelin staining observed in the superior medullary lamina during 10 to 19 years of age, and again during the fourth through sixth decades is argued to be related to the emotional changes which are believed to occur during these points in the life cycle. The highest degree of myelination was found to occur during the first two decades of life, and this has also been linked to the newly acquired cognitive abilities that occur during adolescence. Female subjects between the ages of 6 and 29 contained a significantly greater amount of myelin staining in the superior medullary lamina than did male subjects of the same ages. This finding supports the observation that girls generally reach emotional maturity earlier than boys, and that girls generally excel in language and reading skills earlier than boys. An increase in myelination in the superior medullary lamina also provides insights into the adolescent and early adulthood onset of

schizophrenia as it is this area of the brain which is involved in the relay of information among other brain regions which are connected with schizophrenia (1994:483).

Corpus callosum growth during adolescence is similarly linked to adolescent neuropsychiatric disorders, and increased adolescent cognitive ability. The largest tract in the human brain, the corpus callosum interconnects all the major subdivisions of the cerebral cortex and integrates the processes of the two hemispheres through the transference of information (Pujol et al, 1993:71). The corpus callosum plays a major role in “unifying sensory fields, organizing bimanual motor output, aiding memory storage and retrieval, allocating attention and arousal, facilitating language and auditory functions, and perhaps also in consciousness itself” (Giedd et al, 1996:274). Because of these functions, the corpus callosum is considered to be one of the highest order neural networks. Magnetic resonance imaging (MRI) studies indicate that the corpus callosum begins to develop approximately 8 weeks after conception and the bridging formation is complete at 20 weeks (Giedd et al, 1996:274). In a study conducted by Giedd et al (1996), the total area of the corpus callosum was found to increase from the ages 4 to 18. This increase is attributed to myelination of the corpus callosum where, by adulthood, most of the corpus callosum fibers are myelinated and corpus callosum growth decreases to eventually cease. Similarly, in a study conducted by Pujol et al (1993), the corpus callosum growth was found to persist into the early twenties. The connection between changes in the corpus callosum and improved cognitive ability, indicates to Pujol et al, that the corpus callosum is “part of the highest order-latest maturing neural network of the brain” (1993:74).

Another neurological factor which seems to give credence to increased adolescent cognitive ability is cerebral hemisphere activity. In a study by Thatcher et al (1987), EEG patterns were studied in the right and left hemispheres in more than 577 subjects who ranged in age from 2 months to early adulthood. The results suggested that the left hemisphere develops in abrupt growth spurts, while the right hemisphere changes gradually over time. The sudden left hemisphere EEG changes also coincide with Piaget's time frame of cognitive development. Analogous to this result is the result of Benes et al (1994), which found that brain weight increases during the period of adolescence. Between the ages of 0 to 5, brain weight was found to increase by 41%, increase by 5.4% between 10 to 19, followed by a 2.2% increase between 20 to 30 years of age.

The intent of this chapter was to create a dialogue between ritual, symbol, and neural science. The cycle of meaning was examined to situate ritual enactment within the broader cosmological context. Turner's concept of liminality was relevant to the discussion as it has been illustrated that it is during liminality that biological, psychological, and neurophysiological transformations are believed to occur. Biogenetic structuralism helps to bridge the gap between the hard sciences and the social sciences by providing the theoretical tools to examine symbolic events from a both a neurological and a cultural perspective. Finally, because this research is focused on puberty initiations, the neurological changes that are associated with puberty provides a neural base for these initiations, and provides insights to the consistent timing of such rituals. The increase in myelination along the hippocampus that occurs in the second, fourth and fifth decade, and the associated emotional changes, not only suggests answers to the prevalence of the

puberty life crisis rituals, but provides insights to those life crisis rituals which occur during mid life. The popularized notion of the mid life crisis may indeed emanate from these myelination changes and this may be why life cycle rituals during mid life and puberty are so prevalent. Therefore in essence, initiation variables may not only play a role in reorganizing the neural structures of the brain, but the timing of these rituals in tandem with such variables, may play a role in optimizing the corresponding neurological changes that accompany puberty to enhance cognitive and emotional development.

Chapter 4: Cahuilla Puberty Initiations

Let us mark and remember this fact, which is as it were a fundamental motif, documented in every kind of initiation: the experience of initiatory death and resurrection not only basically changes the neophyte's fundamental mode of being, but at the same time reveals to him the sacredness of human life and of the world, by revealing to him the great mystery, common to all religions, that men, with the cosmos, with all forms of life, are the creation of the Gods or of Superhuman Beings

(Mircea Eliade, 1958:19)

The puberty initiations practised by many Aboriginal tribes in Southern California during the nineteenth century have been recognized as highly elaborate ceremonies known to last for several days, and to involve the entire community. Among the Cahuilla Indians, practices such as the administering of *toloache*, the hallucinogenic drug *datura*, body piercing, tattooing, fasting, ritual dancing, seclusion, "ant ordeals", and overnight burials in heated pits, have both fascinated and puzzled anthropologists. It is well documented in the ethnographic record that occasionally initiates who ingested *datura* were killed from the drug, yet despite the risks, *datura* use for young boys continued to play an integral role in these ceremonies until the late 1800's when the Cahuilla Indians were subjected to cultural and religious persecution. Cahuilla children were not permitted to speak their Native language and were sent to English schools, Indian agents made every attempt to prevent the people from attending ceremonies, the implementation of reservations broke up Cahuilla clans and lineages, and the mission to Christianize the Cahuilla began (Bean et al, 1989:93). All of these events together played a role in eliminating the male and female puberty initiations, in addition to other traditional

ceremonies. Consequently, the disappearance of the male and female initiation rites was not the result of ritual inefficacy, and intentionality must have been relevant to these ceremonies. The participation of the neophyte's lineage in the ceremony, the months expended on initiate training, and the time invested on drug and food preparation emphasize the seriousness of these rites.

The significance of these practises will be examined in this chapter through an analysis of each initiation variable for both the boy's and girl's rite of passage. Ritual intensity will be based on the analysis of neurological and physiological changes that are likely to occur for each variable, and how this relates to altered states of consciousness. Based on these neurological analyses, the probable degree and nature of neophyte transformation will be discussed. Because the central question of this research rests on the relationship between ritual intensity and transformation, with intended transformational effects, the cosmology of the Cahuilla will be discussed. Because these puberty rites were practised more than a hundred years ago, emic perspectives which would shed light on intended transformation do not exist. Furthermore, ethnographic accounts of these rituals were recorded by anthropologists during a time when the exegetical interpretation was not considered valuable. Consequently, the closest way to evaluate intended transformation is to examine Cahuilla cosmology. As illustrated by the cycle of meaning, ritual is an extension of cosmology; to gain some understanding of symbolic intentionality, cosmological research represents a viable alternative to emic interpretations.

Section 3.1 and 3.2 of this chapter will therefore be devoted to a description of the boys and girls initiation ritual, followed by a neurological and physiological analysis of

each initiation variable in section 3.3. Section 3.4 will discuss the degree of male and female neophyte transformation in the form of autonomic nervous system tuning. To integrate the extent of neophyte transformation with intended transformation, section 3.5 will be devoted to a discussion on Cahuilla cosmology. The implications of gender differences will also be addressed.

4.1: Boys Puberty Ceremony

Otherwise known as *Manet* or *Hemvachlowin*, the boys puberty ceremony among the Cahuilla was an elaborate ritual which involved the entire community. The ceremony itself would last for several days but preparation for the ceremony began weeks in advance, while psychological preparation would begin many years prior. Based on ethnographic reports, the determining age for initiation did not appear to be a fixed one. Male elders would meet before the rite of passage to decide which individuals needed to be initiated. One of Hoopers' informants recalls ages ranging between ten and eighteen (1920:345). According to Strong, these ceremonies "occurred once every few years when the occasion demanded it, or when there were several boys to initiate" (1929:174). Thus the irregularity of the ritual explains the tremendous age range within initiate cohorts. These ceremonies had a dual purpose: the most obvious was to initiate boys, but *Manet* was also held as a prayer when food and water were scarce, or when disease was prevalent (Strong, 1929:174). According to Bean however, the boys puberty ceremony was conducted when food resources were plentiful due to the enormous feasts that were required to accompany the ceremony (1972:142). It is probable that when food was

scarce, a more modest version of the boys puberty ceremony was conducted when the intent was for prayer, but when famine was not a factor, the sole purpose was to initiate boys and the ritual would be accompanied by elaborate feasts.

Although accounts of these ceremonies are vague, incomplete and varied, a common element in all ethnographic descriptions of the Cahuilla and surrounding tribes is the ingestion of the drug datura. The datura complex used for ritual purposes was common throughout the California and South Western regions of the United States (Jorgensen, 1980:291). Different names given to the boys puberty rite such as “*the jimsonweed drinking boys initiation*”, and “*the jimsonweed or toloache cult*”, seem to reflect the key role of datura use. According to Strong, the term *Manet*, reflects the importance of datura as the translation for *Manet* among the Mountain Cahuilla clans is “grass that could talk” (Strong, 1929:174). Prior to the ceremony, male elders would gather datura plants and cook them preparing them into a liquid form. Pre-initiation and pre-datura ingestion preparations included secluding the novices in a “brush enclosure outside the ceremonial house, made especially for this purpose” (Hooper, 1920:346). The boys were to remain in this enclosure for approximately one week where they were prohibited from interacting with anyone. The boys were fed twice a day where food taboos were adhered to as the boys were prohibited from eating anything containing salt or grease (1929:346).

The ingestion of datura seemed to occur after a period of both fasting and food taboo. Perhaps these dietary restrictions were regarded as a means of purification to prepare for the ingestion of the sacred drug. Specific reports of datura use are sketchy

since the ritual was enacted over a century ago. Even the accounts gathered by such ethnologists as Kroeber, Strong, and Hooper, are based on the recollections of individuals whose participation in the ritual had occurred fifty to sixty years prior. One such informant account of ritual datura use is described by Hooper:

On the fourth night, the boys were brought out. The decoction made from the jimson weed was then given to them by some old man who knew exactly how much they could stand, according to their age...The other old people sang while this drink was being administered. As soon as the boys had taken it they would begin to dance, but would shortly become very dizzy. They were then all put in a dark corner. It is asserted that drinking this decoction made the blood and mind clearer. The old people continued dancing around the fire. They encircled it three times and then sat down. At a signal from the leader, they made a queer grunting sound three times, then motioned upwards with the head and hands three times, expelling the breath each time. Right after that, the medicine men among them jumped up and ran into the fire, trying to stamp it out with their bare feet. They say this did not burn them. By the next night, the bad effects of the narcotic had worn off and the boys usually felt about normal (Hooper, 1929:346).

A detailed description of datura use is also presented by Strong:

The *net* prepared the jimsonweed, "cooking it" (meaning probably drying it), and ground it up in a small ceremonial mortar called *takic*, with a small pestle called a *paul*. Water was added and the liquid was then put in a red pottery bowl called *tsnut kumuismul*, and the *paha* gave each boy a swallow. The men in the *wamkic* then took each boy by the waist and danced around the fire led by the manet dancer. All were naked, and according to Alec Arguello old people sometimes fell into the fire in the excitement but were not burned. The novitiates became unconscious and were left in the dance house all night. The next afternoon they were taken out of the dance house and hidden in a secluded canyon by the *paha*. Here they were taught songs while at night for one week they danced every evening. The jimsonweed however was drunk only once. The drinking of the jimsonweed produces visions, but no special dream cult or interpretation is remembered by modern informants. One northern Mountain Cahuilla informant said that if any boy saw in his dreams an animal that spoke to him, bad luck for his relatives would result. A southern Mountain Cahuilla informant said that boys at this time

“had dreams like pualet (shamans)” and that anything seen in the vision was their “spirit or friend.” Since it is fifty or sixty years since this ceremony took place among the Mountain Cahuilla it is not strange that the details are vague (1929:174-175).

During these weeks of initiation the cohort of initiates would be taken to private locations to be trained. The boys would learn how to create sand paintings which reflected Cahuilla cosmology, they were tattooed, pierced, forced to run great distances, and were deprived of sleep (Bean, 1989:72). Dance was also an important part of the toloache ceremony for both participants and spectators. From Hooper’s account it is evident that dancing was an important element of the ritual while under the influence of datura. It was not only integral for the initiates, but elders and clan members who attended the ritual were expected to participate in the dance. Hooper’s informant recalls that each night initiates were taught songs, and dances by elders. They would also learn how to use the gourd rattle as a rhythmic accompaniment to the dances. Among the southern Mountain Cahuilla a fire dance would take place to commemorate the conclusion of the toloache ceremony. Men and women would gather around a large fire singing and dancing. The dance would work up to a climax when the men would begin to stamp the fire out with their feet and hands, often becoming unconscious from the heat, while women and children surrounding the fire would sing and chant songs. The ceremony would close when the fire was eventually extinguished (Strong, 1929:176-177).

The infliction of pain during this time is also a consistent theme of the boys puberty ceremony. The boys would undergo tattooing, and their ears and nasal septum would be pierced (Bean, 1972:143). Among the northern Mountain Cahuilla and the Luiseno

Indian clans, the puberty ceremony was said to end with an ant ordeal called *hemuniwe* or “*stinging ants ceremony*”. Ants were collected and put in a large pit in the ground and naked initiates would roll into the pit and the ants would be wiped off with nettles when they came out. Kroeber provides a detailed description of the ant ordeal among the Luiseno:

The boys were laid on ant hills, or put into a hole containing ants. More of the insects were shaken over them from baskets in which they had been gathered. The sting or bite of the large ant smarts intensely, and the ordeal was a severe one, and rather doubtfully ameliorated when at the conclusion the ants were whipped from the body with nettles (1925:672).

4.2: Girls Puberty Ceremony

In comparison to the toloache ceremony, less is known about the girls puberty ceremony and ethnographic discrepancies are significant. According to Strong, the girls initiation rite ceased approximately the same time as the boys in the 1880's (1929:172). Hooper however contends that the ceremony for girls was conducted up until the late 1920's (1929:347). Unlike the boys ceremony where large cohorts of boys were initiated, generally Cahuilla girls were initiated alone. This could be due to the fact that the actual onset of puberty for boys is ambiguous, whereas for girls the onset of puberty is acknowledged when menstruation begins.

The ceremony would begin by placing the girl in a large hole in the ground that was “several feet deep and long enough for the girl to recline in” (Hooper, 1929:347). Stones were heated by fire and were placed in the ground with the girl, or a fire was built in the pit and then extinguished when heated. According to Strong, girls would remain in these heated pits for the entire duration of the ceremony, but Hooper claims that the girls

would remain in the pit only during the night. In both ethnographies however, singing and dancing around the pit by clan elders was said to take place. During this three day period the girls would fast, only being permitted to drink a herb tea. Food taboos were observed six months after the ceremony where ingestion of salt and cold food was avoided. Prior to first menstruation and during the ceremony, girls were instructed in the appropriate codes of behaviour that they would be required to follow each month during menstruation.

According to Hooper, women could not eat meat, fruit or salt and could drink warm water only. Drinking and bathing in cold water was also prohibited. Girls were not to scratch any part of their bodies with their fingers, and pregnant and menstruating girls were not permitted to witness games involving gambling (1929:348). The way the ceremony was concluded varied across different clans. In some clans the girls were painted red, given tobacco to eat and were taught rock paintings (Strong, 1929:173). In some cases the puberty rite was concluded by the girls being tattooed on the chin before being removed from the pit (Hooper, 1929:347).

All of the aforementioned descriptions for the boys and girls puberty ceremony refer to the liminal phase of the initiation rites. The nakedness described by Turner to symbolize the "betwixt and between" nature of this phase is present in both the boys and girls ceremony. In addition, male and female neophytes are guided through the initiation by elders and ritual specialists, and must obey them implicitly. Most striking however, are the number of mechanisms known as drivers which play a role in profound identity transformation. Whereas anthropologists in the past have tended to interpret the ingestion of drugs, fasting, sleep deprivation, pain infliction, and prolonged heat exposure, as tests

which symbolically acknowledge the newly acquired adult behaviour, based on what is known today about the way in which symbols can operate on the brain and body, it appears that these kinds of intense ordeals are intended to do much more than prove initiate strength and bravery. I believe that these initiation procedures operate rather to induce specific neurophysiological, neurochemical, and neuroanatomical effects. When these effects are combined with cosmological indoctrination (learning sand paintings, lineage history, sacred chants, dances and songs), this kind of ritual arena is conducive to direct cosmological experience. In essence, such practices as the ingestion of datura, the fasting, the dancing, the rattles that accompany the dancing, the infliction of pain in the form of tattooing, piercing, ant bites, and prolonged heat exposure, together operate (using Turner's words) to "refashion the very being of the neophyte" (1969:103). The number and nature of these drivers would suggest that initiate "refashioning" is profound, particularly for the Cahuilla boys. How this "refashioning" occurs, and to what extent, will be dealt with in the next two sections.

4.3: Neurological and Physiological Analyses of Initiation Variables

Datura

Among the Indians of the Southwest, the sacred importance of datura is reflected by the fact that it is the most commonly used plant administered to produce hallucinations (Shultes, 1991:106). While the majority of datura ingestion is reserved for shamans, among the Chumash, the Luiseno, Cahuilla, and Algonkians, datura was historically administered to boys during the puberty ceremony. In most cases the drinking of toloache occurred only once in an individual's life time unless that individual later became a

shaman. The significance of the ingestion of such a powerful hallucinogenic drug during this particular period of the life cycle becomes clear when the neurological effects of the drug are examined and related to how these effects interact with the ritual setting of liminality.

Species in the genus *datura* can include: *datura certocaula*, *datura ferox*, *datura innoxia*, *datura metel*, *datura quercifolia*, *datura stramonium*, *datura tatula*, *datura wrightii*, *datura alba*, and *datura fastuosa*. Common names associated with the plant can include: thornapple, devil's apple, devil's weed, Jamestown weed, jimson weed, stramonium, devil's trumpet, angel's trumpet, toloache, stinkweed, sacred datura and loco seeds. These plants are located in the tropical regions of the world but the greatest variety of species grow in Mexico and Central America. In the New World and in Asia, ritualistic use of the plant dates back at least 3000 years (world seeds, 1998). The seeds and flowers of the *datura* plant, are the most frequently used for ritual purposes but the roots and leaves may also be prepared. Among the Indian tribes of Northeastern North America, *D.stramonium* was employed in adolescence rites (Schultes, 1977:38) All species of *Datura* contain alkaloids, particularly atropine, hyoscyamine, and scopolamine. The total alkaloid content of the plant is considered high, ranging between 0.25% and 0.7% (Hall et al, 1977, 312). *Datura* has the effect of stimulating the central nervous system where symptoms can include an increase in heart rate, fever, memory disturbance, dryness of the mouth and throat, hallucinations, and prolonged sleep accompanied by vivid dreams. When severe intoxication occurs, paralysis, convulsions and death may result. In terms of *datura* use among the Cahuilla, it is difficult to determine what part of the *datura* plant

was employed, and how much. What is evident however, is the careful manner in which the datura decoction was prepared. It was noted by one of Hooper's informants that each initiate was given a different amount according to size and age, thus it is reasonable to assume that prolonged sleep and hallucination would be the outcome rather than death and paralysis (although occasionally deaths were reported).

One characteristic which makes datura appropriate to the liminal phase, is its ability to alter memory functioning. For transformation to take place, the previous identity must be stripped away; this could certainly be facilitated by stripping away parts of the initiate's memory. According to Eliade, in tribal and secret society initiations, the initiate must forget his past life. He states that in "many places, when the novice returns to the village he acts as if he had lost his memory and has to be taught all over again to walk, eat, dress" (1964:65). Although Eliade does not refer to datura use in this passage, the above described behaviour is similar to behaviours that have been observed after datura ingestion. Scopolamine, an alkaloid constituent of datura has the ability to impair memory function, specifically the storage and retrieval of new and recent information. While confusion and impairment of recent information would make sense in terms of achieving the desired initiate quality of the "blank slate", the inability to recall events that took place while under the influence of the drug after it wears off is puzzling. If direct cosmological experience is desired, it would seem important that those ritual experiences be remembered. This is not always the case however; in some instances information is not transferred from one phase of consciousness to another. This is what occurs when an individual is unable to recall a dream- a common occurrence in

monophasic cultures where the contents of dreams are considered unimportant. Occasionally however, information is transferred from one phase of consciousness to another, but this transference occurs at the level of the subconscious and thus the individual is simply unaware of the transferred information. This process is referred to as blocked cross phase transference and is described by Laughlin:

Conditions might prevail that block awareness of information so that the neural structures mediating awareness are never entrained to those mediated relevant cognitive material. This obstruction does not necessarily mean the transference of information has not taken place, but if it has, the transference is at the subconscious level. (1992:156).

What Laughlin is referring to is the possibility of discontinuity of experience which is often a consequence of ritual. Cross-phase transference refers to the process of transferring information between different phases of consciousness, and the points of neural transformations between phases are called warps (Laughlin, 1992: 140-150). Information must move across a warp in order to pass to another phase. When this occurs, reentrainment must take place across warps. Blocked cross-phase transference thus occurs when the reentrainment needed for cross-phase transference is reduced thus blocking the passage of information (1992:154-55). The ingestion of psychotropic drugs is an example of such a condition that can block transference, as significant reentrainment takes place but the neural structures are not entrained to the extent required during the warp, and the information is not remembered during the next phase. What is critical to keep in mind however, is that information is blocked from awareness. As Laughlin points out, the information may be transferred at the subconscious level. This is likely to occur during some ritual settings and it makes sense. It could be the case that in order to

preserve the intense awe and reverence for the experiences encountered during these states, awareness must remain within the sacred realm rather than the profane. It is not uncommon during these kinds of rites of passage for initiates to learn secret languages and songs which are exclusively reserved for the ritual setting. In some cultures it is considered a taboo to discuss, look at, create, or wear a symbol considered to be sacred as it loses its power to transform when it becomes habitual. This may have been the case among the Cahuilla. Blocked phase transference would certainly indicate the tendency for vague informant descriptions of the toloache ceremony, and sustaining the experience at the subconscious level would ensure secrecy and maintenance of the numinous qualities of the ritual.

Another characteristic of the drug which indicates its relevance in the liminal phase is its ability to produce submissive behaviour. In recent decades, the drug has been implicated in sexual assaults and thefts because of datura's association with memory impairment and submissive behaviour in victims (Ardila & Moreno, 1991:236). In the ritual setting, submissive behaviour is demanded of initiates and is crucial in ensuring ritual completion. This submissive behaviour is the result of scopolamine action on the amygdala which is associated with the control of aggressive behaviour (Ardila & Moreno, 1991: 242). Thus not only does toloache play a role in stripping away the previous identity of the initiate, but it also renders the neophyte in a state of submission to elders and ritual specialists. This willingness to cooperate makes such initiation ordeals as fasting, physical exertion, and ant ordeals all the more likely to transpire successfully.

The hallucinatory effect of the drug, seems to be a key characteristic which has

made it a desirable and respected component of the puberty ritual. Those drugs known to produce visionary experiences produce slow wave, high-voltage synchronous activity in the hippocampus thereby synchronizing the cortex and rendering parasympathetic dominance (Winkelman, 1997:400). Specifically the firing of the serotonergic systems are inhibited resulting from changes in serotonin levels causing synchronous discharges in the temporal lobe limbic structures (Winkelman, 1997:400). The cells regulating the visual cortex are then inhibited leading to visual region hyperactivity and continued visionary experience (Winkelman, 1997:400). Hallucinogenic drugs such as datura are commonly used by shamans to induce what Eliade has coined the state of "ecstasy". Eliade argues that the mastery of this state is a defining feature of the shaman:

Nevertheless, the shaman remains the dominating figure; for through this whole region in which the ecstatic experience is considered the religious experience par excellence, the shaman, and he alone, is the great master of ecstasy. A first definition of this complex phenomenon, and perhaps the least hazardous will be shamanism=*technique of ecstasy*. (1964:4).

Considered to be a visionary state, the shaman undertakes a journey where his soul leaves the body and travels to heaven or the underworld where he encounters and communicates with supernatural beings. For Eliade, this experience is a universal psychological experience which is part of the human condition (Price-Williams, 1994. 3). Although the shamanic trance can be induced without the use of hallucinogenic drugs, (drumming, fasting, dancing, the infliction of pain), according to ethnobotanist Terence McKenna, "...none of these methods is as effective, as ancient, and as overwhelming as the use of plants containing chemical compounds that produce visions" (1992:6).

Among the Cahuilla, datura use was generally reserved for shamans with the exception of the boys toloache ceremony. It seems clear that the datura decoction was perhaps the most efficient and dramatic means to induce a religious experience par excellence, particularly among young inexperienced initiates. Lacking the shamanic mastery of altered mind states, initiates may not have produced the desired visionary experiences if exposed to drumming and other ordeals alone. Datura consequently, may have been the most efficient means of ensuring a visionary experience among initiates, an experience perhaps comparable to that of the shaman. The visions encountered would enable the boys to establish a powerful connection with Cahuilla cosmology:

When one considers that datura results in mental images of tremendous intensity, it is no wonder that a Cahuilla boy after his first vision under its influence became a firm believer in mythic traditions. Datura enabled him to glimpse the ultimate reality of the creation stories in the Cahuilla cosmology. The supernatural beings and aspects of the other world that he had been told about since childhood were now brought before his eyes for the ultimate test-his own empirical examination. He had seen them. They are real (Bean & Saubel, 1972:62)

With respect to Laughlin's cycle of meaning, datura seemed to play a fundamental role in facilitating the direct experience of cosmology, and the verification and vivification of cosmology. The profound intensity of this encounter also seemed to establish a life long connection with cosmology. Kroeber discusses this connection in an account of datura among the Luiseno administered during a similar toloache initiation:

It [datura] produces visions or dreams as well as stupor; and what the boys see in their sleep becomes of lifelong intimate sanctity to them... It is certain that a special individual relation of a supernatural kind is believed to exist forever after between the dreamer and the dream (1925:670).

Thus experience of cosmology goes past the level of belief and understanding to the level of realization. What is frequently observed from individuals who encounter these visionary numinous experiences is a profound behavioural change. This has been witnessed in a variety of experiences ranging from those initiate shamans who go through the process of symbolic death and resurrection, to those who encounter near death experiences. What is taking place in these observable behavioural transformations is the physical experience of symbols being communicated from the level of metaphor, to the level of vibration, and finally to form (Prattis, 1997).

What is important to consider is that the drug alone is not responsible for direct cosmological experience. This is where teens and “new agers” who are eager to experience altered states of consciousness often fall into trouble; not taking into account the rich symbolic fabric whereupon the drug is ingested, some individuals from monophasic cultures have attempted to attain states similar to the shaman on their own, and end up in the hospital or become psychologically traumatized from a “bad trip”. What must be emphasized is the context in which the drug is ingested. During the ritual setting the initiate is not only exposed to a powerful hallucinogenic drug, but he is also exposed to a complex symbol system whereby all activities are closely monitored by ritual specialists. What is important to consider is that the drug datura in tandem with other variables such as drumming, chanting, and dancing, together work to shift consciousness to the desired mind state. Thus before examining how neurocognitive functioning and structuring is altered, the mechanisms associated with other relevant drivers will be reviewed.

Repetitive Rhythmic Stimuli: Auditory Driving

Repetitive rhythmic stimuli has been identified with trance or vision states in the ritual setting. Needham observes that rhythmic stimuli are frequently associated with the transition phase of rites of passage and comments "Why is noise that is produced by striking or shaking so widely used in order to communicate with the other world?" (cited in Lex, 1979:122). Repetitive drumming, rattles, or rhythmic chanting is known to induce neurophysiological changes in the brain. In experiments conducted by Neher (1961) (1962), beats and rhythmic pulses characteristic to ceremonials were examined to determine the relationship between rhythmic stimuli and physiological response. Neher found that responses to drumming were similar to those responses induced from photic stimulation. The predominant changes include activation of alpha and theta brain waves indicated by subjects' EEG. This process, where the firing rate of nerve cells in the brain are increased in frequency is referred to as auditory driving. Neher argued that these effects on the central nervous system could be elevated by accompanying rhythms which support the principal rhythm. Thus repetitive rhythmic dancing could function as an accompanying rhythm making individuals even more susceptible to auditory driving. Neher also argued that these neurological responses are also increased by "stress and exertion, with resulting adrenaline secretion, also by hyperventilation and hypoglycaemia" (Jilek, 1982:329). During these experiments, subjects reported to encounter "fear, astonishment, amusement, back pulsing, muscle tightening, stiffness in chest, tone in background, rattling, visual and auditory imagery (Neher, 1961: 450-51).

Among the Cahuilla, the gourd rattle was frequently used as a rhythmic

accompaniment to ceremonials. During the toloache ceremony the rattle was used by both spectators and initiates for singing and dancing. Described by Strong, the rattle "called mauulepuc, was made of an incised gourd filled with palm seeds. There was a wooden handle attached and the whole was carefully painted" (1929:117). An accompaniment to dance, auditory driving may have been heightened during the ceremony as the rhythmic motor movements would reinforce the central rhythm of the rattles. The dancing was vigorous where initiates would dance continuously for several hours throughout the evening. It is likely that adrenaline secretion resulting from physical exertion could have been a factor in the ceremony thus increasing neurological responses. Another auditory driving reinforcement outlined by Neher and relevant to the Cahuilla boys puberty initiation is hypoglycaemia which can result from fasting. According to Strong, for a period of five to six days, initiates were secluded during the day and would sing and dance at night. For the duration of this period the boys were expected to fast and were permitted to drink only water (1929:117). Thus considering the presence of rhythmic stimuli, and the reinforcing factors during the toloache ceremony, it is conceivable that auditory driving would have occurred thereby inducing an altered state of consciousness.

Prolonged Exposure to Heat

In the girls puberty ceremony, initiates were placed in underground heated pits. Lacking information on the extent to which these pits were heated, it is difficult to determine whether the pits were heated to keep the girls warm and comfortable at night,

or whether the pits were heated to the extent similar to a sweat lodge. Hooper does not comment on the possible discomfort of the heated pits suggesting that the stones were placed to keep the girls comfortable at night. Storm however alludes to potential discomfort by stating that the “girls were ‘baked’ in the pits for a three-day period”. It is possible that extreme exposure to heat was the case and it may have been enough to induce ASC, particularly because of the fact that prolonged heat exposure was accompanied with fasting. Resulting would be endogenous opioid secretion, and a synchronous slow wave EEG.

Ritual Dance & Ordeal: Endogenous Opiate Activation & Photic Stimulation

In 1980, a conference titled “Shamans and Endorphins” was held in Montreal to determine the potential role of endorphins in producing the altered state of consciousness known as ecstasy or trance. Interdisciplinary in approach, papers were delivered by neurochemists, neurophysiologists, anthropologists and psychologists in an attempt to open the lines of communication between the hard and social sciences. After reviewing the multiple perspectives presented on shamanism, neurophysiologist James Henry came to the following conclusion:

The conference organizers brought us together, though, to talk about shamans and to talk about endorphins. It was hoped that something might come of it. After seeing the evidence presented by the anthropologists, it seemed to me quite reasonable to consider the possibility that endorphins may indeed be at least one link in a chain of events that brings about states of altered consciousness, in the present context, trance or euphoric states (1982:396).

Since that initial conference, the dialogue between the hard and natural sciences has continued such that researchers now have a better understanding concerning the

relationship between endorphin production and ASC, and, under what conditions endorphins are likely to be released. An endogenous opiate, endorphins act on the hypothalamus to induce a diminution of fast brain wave frequencies, and an increase in delta/theta waves (Winkelman, 1997:400). During conditions of physical exertion and psychological stress, endorphins are secreted from the pituitary to produce the symptoms of euphoria and analgesia- conditions cross culturally characteristic to many ritual environments.

Vigorous physical activity has been monitored in laboratory settings to record the rate and amount of endorphin release, in addition to potential alterations in consciousness. In a study conducted by Colt et al. (1981), a positive relationship was found between physical exertion intensity, and amount of endorphin release. In a "mild" run where athletes could run at their own pace (6.4-12.8km), 45% of the long distance athletes were found to have increases in endorphin concentrations, whereas, 80% of the runners had endorphin increases in a "strenuous" run of the same distance (Harber & Sutton, 1984:158). Examining possible gender differences, Rahkila et al. (1987) found significant increases in endorphin production following vigorous exercise for both men and women where secretion increased as the exercise became more intense. Introspective accounts by subjects to validate the occurrence of an altered state has also been sought out by researchers. The following example illustrates a personal description of both analgesia and euphoria induced under the condition of intense physical exertion:

Thirty minutes out, and something lifts. Legs and arms become light and rhythmic. My snake brain is making the best of it. The fatigue goes away and the feelings of power begin...Then sometime into the second hour

comes the spooky time. Colors are bright and beautiful, water sparkles, clouds breathe, and my body, swimming, detaches from the earth. A loving contentment invades the basement of my mind, and thoughts bubble up without trails...A cosmic view and peace are located between six and ten miles of running (Morgan, 1984:94).

With reference to the boys puberty ceremony, it is probable that endorphin secretion due to intense physical exertion would have been a factor during liminality. Not only were the initiates made to run long distances during the day, but at night they would participate in dances. The latter in particular would have been particularly conducive to the induction of altered states as several other driving variables were present to enhance neurophysiological changes, such as rhythmic accompaniment, singing, and fasting. Although it is not stated specifically how long initiates were expected to dance, Bean claims that the dances would last for several hours (1989:72). In terms of dance participation by spectators, Hooper claims that while the boys were in seclusion, "the old people danced all night" (1929:346). It appears that ritual dancing in this case was vigorous enough to induce the secretion of endorphins comparable, and perhaps even greater, than the levels experimentally induced in laboratories. Evidence that would suggest the presence of endorphin secretion is a reduced sensitivity to pain; it has been noted that often these ceremonial dances were concluded by having the participants extinguish the fire with their bare feet and hands. Both Hooper (1929) and Strong (1929) claim that according to their informants, individuals were not burned suggesting the analgesic effects of endorphins.

In addition to vigorous physical exertion, the endorphin producing mechanism can also be stimulated by psychological stress. In the study by Rahkila et al. (1987), a

significant increase of endorphins was not found for those subjects who ran outside, whereas those subjects who ran on treadmills did have a significant increase. The authors attribute this difference to psychological stress; the subjects who ran outside described the experience as "pleasant", whereas running on a treadmill inside a lab was considered somewhat stressful (1987:454). Soldiers during combat have been known to become euphoric and tolerant to wounds after being exposed to extended psychological and physical stress (Henry, 1982a:234). Psychological stress or "artificial threat situations" may arise naturally in the form of nightmares, hallucinations, and psychoses, but can also arise during ritual through the manipulation of ritual specialists (Prince, 1982:415). Puberty initiations are particularly charged with tension and anxiety; initiates anticipate and prepare for the event months in advance knowing that they must successfully complete pain ordeals, fasting and other hardships to earn acknowledgement of a new status. Many cultures also go to tremendous lengths to produce situations which will scare and traumatize initiates into cognizing that they are in a life threatening situation. Psychedelic plants are frequently used in this way and become particularly frightening when the user is a neophyte (Prince, 1982:417). There are two types of terror associated with psychedelic use: those monster-like hallucinatory images, and the "terror of impending ego dissolution" (1982:417). Drum and dance trance states may also produce tremendous anxiety, particularly for the neophyte (1982:417). Under these kinds of anxiety producing environments, the experienced terror and stress may suddenly change to euphoria and calm. Prince argues that this sense of tranquillity is frequently associated with the notion of supernatural intervention and refers to this as the omnipotence

manoeuvre (1982:418). According to Prince, the omnipotence manoeuvre may also occur in near-death experiences. Newberg and d'Aquili have examined the neural activation of certain archetypes that are involved in the Near Death Experience-a phenomenon associated with a profound transformation of consciousness. The authors contend that in some instances, the perception of being in a life threatening situation, or the perception of death alone may be sufficient to trigger a N.D.E. (1994:4). The perception of impending death is suggested in many ethnographic accounts involving puberty ordeals where psychological stress is profound. Eliade's description of the Pangwe initiation has some common elements to the Cahuilla toloache initiation. Noteworthy are the efforts taken to provoke absolute terror in the neophytes:

On the day of the festival they [the initiates] are given a nauseating potion to drink, and any novice who vomits it up is chased through the village with cries of "you must die!" The novices are then taken to a house full of ants' nests, and are made to remain inside it for some time, during which they are badly bitten; meanwhile their guardians cry, "You will be killed, now you must die!". The tutors then lead the novices to "death" in a cabin in the jungle, where, for a whole month, they will live completely naked and in absolute solitude (Eliade, 1994:31-32).

Consequently, during the male and female puberty ceremonies, the symbolic representation of death may go beyond the level of the metaphorical, penetrating into the body (vibration) eventually resulting in radical transformation (form). It is this process which underlies those healing systems where ritual is integral. According to Prattis, "the N.D.E. moves the focus of energy away from the body's survival, and redirects it to the collective unconscious, a realm of consciousness that very little attention is paid to in the ordinary waking state" (1997:184) Transformation for boys would be particularly acute

due to the presence of both physical exertion and psychological stress. Although physical activity is not a factor for the girls ceremony, enough psychological stress could have been present to elicit endorphin secretion. Thus the tattooing, piercing, ritual dancing, the ant ordeal, and the hallucinations produced by datura ingestion are certainly factors which would encourage neophyte trauma, the perception of death, and subsequently endorphin secretion and male neophyte transformation.

In addition, the opioid role during liminality also plays a key role in *communitas*. Examining the function of opioid secretions from a psychobiological perspective, Frecska and Kulcsar (1989) argue that activation of the opioid system during ritual can enhance the establishment of social bonding and cohesion. This argument is founded on studies which suggest that during socially stimulating conditions such as play, the opioid system is activated, and during conditions of social isolation, the opioid system remains inactive and the analgesic effects of the opioid morphine is reduced (1989:74-75). The authors contend that the relationship between bonding and opioid secretion is bidirectional, such that opioid secretion activated from the drivers associated with analgesia and euphoria can enhance social bonding, while at the same time, "opioid-mediated euphoric and trans-like states are enhanced by social affiliation" (1989:79). This relationship may provide insights to the Cahuilla puberty rites and some of the differences between the male and female ceremonies. In the case of the boys toloache ceremony, several cohorts of boys are initiated together as suggested by the age range discussed by Strong. The shared sense of invisibility and the shared sense of ordeal in the form of *communitas* may serve to heighten the experience of ASC and neophyte transformation. At the same time, the presence of

numerous intense ordeals known to elicit ASC, may also play a role in intensifying *communitas*. This bidirectional relationship also emphasizes the importance of communal participation. In both the male and female puberty ceremonies, communal participation in the form of singing and dancing is present, implying that social bonding and ASC may be enhanced to re-experience the verification and vivification of cosmology, and to encourage continued transformation. In the girls ceremony, the social isolation, the lack of group initiation, and the lower number of ritual drivers may suggest that transformation and *communitas* for Cahuilla girls is less significant as it is for the boys. These gender differences will be addressed however in the final section of this chapter.

In addition to endogenous opioid activation, ritual dance can also produce photic stimulation caused by "visual flicker effects due to shifts in ocular focus and the movement of dancers between an individual and a light source" (Lex, 1979:123). The effects are similar to those resulting from rhythmic stimuli: alpha and theta wave activation and auditory driving.

Fasting & Sleep Deprivation

Fasting has the ability to both induce and enhance an altered state of consciousness. Nutritional depravity can cause physiological imbalances making individuals susceptible to trance states (Winkelman, 1986:179). As already stated, hypoglycaemia a consequence of fasting, has the ability to intensify auditory driving produced from repetitive rhythmic stimuli, and increase susceptibility to parasympathetic dominance and cortical synchronization (1986:178). Research on patients with anorexia and rats deprived of food have suggested that concentrations of opioid activity becomes

elevated in various brain regions. Lee and Spector (1991) measured opioid levels in the cortex of rats deprived of food for four days. Levels of morphine and codeine showed no signs of increase after one day of fasting, however on the second day, opiate alkaloids increased by 700% and remained elevated after three days and decreased after four days (1991:647-48). The correlation between ASC and opioid secretion has already been discussed, but interestingly fasting occurs for both the boys and girls puberty rites for the approximate period of three to four days. Nutritional deficits are also associated with hallucinations and changes in cognitive and emotional functioning (Winkelman, 1997:399). Sleep deprivation also invokes the pattern of high voltage slow wave EEG, synchronous activity, and parasympathetic dominance (Winkelman, 1974:176).

4.4: ANS Tuning, Transformation, & Puberty

It is through the process of autonomic nervous system (ANS) tuning, that profound neophyte transformation occurs. Such ritual processes as drumming, dancing, fear, fasting and hallucinogenic drugs play a key role in retuning the autonomic nervous system. Within the ANS are two subsystems: the sympathetic (excitation) and the parasympathetic (relaxation) system. The systems are reciprocal so that when one system increases the other system decreases, however it is the learned balance of the two subsystems which is referred to as tuning (Laughlin *et al*, 1992:146). Sympathetic system stimulation leads to ergotropic activation which is characterized by desynchrony of EEG, accentuated sympathetic responsiveness, and an increase in striated muscle tone (Gellhorn, 1969:94). In contrast, parasympathetic system stimulation results in trophotropic activation characterized by synchronic EEG, increased parasympathetic

responsiveness, and muscle relaxation (1969:94).

A three stage process, tuning occurs when the balance between the ergotropic/trophotropic system shifts due to trophotropic stimulation, ergotropic stimulation, or through central nervous system lesions (Gellhorn & Kiely, 1972:401). The first stage is characterized by activation in one system with a simultaneous decrease in the other system. After continued stimulation of the activated system, a point is reached where the inactive system ignores responses that would otherwise elicit a reaction and a response is instead elicited from the opposing activated system. If stimulation of the activated system continues, both the ergotropic and trophotropic systems become activated and it is the simultaneous sensitization of these two systems which result in shifts in consciousness and even "a reorganization in personality" (Laughlin *et al*, 1992:147). Lex suggests that the efforts paid to ritual procedure and performance are necessary to stimulate the appropriate neurophysiological centres thus shifting the trophotropic-ergotropic balance (1979:143). During this third stage of tuning, entrainment and re-entrainment of the neural network takes place as a new level of ANS balance is achieved. The extent of transformation will depend on the number and nature of drivers present in the ritual which have the ability to activate the simultaneous discharge of both systems. The following chart lists the drivers present in the boys toloache ceremony highlighting the physiological, neurophysiological, and tuning effects that are likely to occur.

Cahuilla Boys Puberty Rite:

Ritual Ordeal (Drivers)	Somatic Effects & ASC	Neurological Effects	Neural Effects Enhanced when combined with	ANS Tuning
Datura	-hallucinations -amnesia, -submissive	-slow wave EEG -synchronous hippocam. activity	-dancing -chanting -drumming	-parasympathetic activation -ergotropic tuning
Repeated Rhythmic Stimuli (gourd rattle)	-visual auditory imagery	-alpha/theta act. -auditory driving (increase firing rate of neural cells) -slow wave activity -right hemis. dom.	-dancing -singing -adrenaline -hypoglycaemia	-ergotropic activation -trophotropic tuning
Prolonged Dancing	-euphoria -analgesia -sense of cohesion	-slow wave synch hippocampal activity -delta/theta wave increase -reduction of fast wave -opioid activation -right hem. dom	-rhythmic stimuli -singing -fasting -fear	-ergotropic activation -trophotropic tuning
Singing Chanting	-ASC occurs when combined with other drivers	-slow wave synchr. activity -right hemispheric dominance	-dancing -rhythmic stimuli -fasting	-ergotropic activation -trophotropic tuning
Fasting	-hallucination -analgesia -euphoria hypoglycaemia	-opioid activation -slow wave synchronous activity	-dancing -rhythmic stimuli -fear	-ergotropic activation -trophotropic tuning
Sleep Deprivation	-fatigue	-slow wave synchronous activity -parasympathetic dom.	dancing	
Piercing and Tattoos	fear	opioid activation adrenaline	dancing rhythmic stimuli fasting	-ergotropic activation -trophotropic tuning
Cohort Initiation Community Involve.	communitas	opioid activation right hemispheric dom.	dancing rhythmic stimuli fasting fear	ergotropic activation trophotropic tuning

(Figure 4)

What is evident from this diagram is the number of drivers which can evoke autonomic nervous system tuning. Judging from the high number of drivers present, in addition to the fact that many of these drivers are combined with other enhancing variables, it is plausible that initiate transformation in this case would be significant. Trophotropic stimulation and trophotropic tuning are both likely to occur under these conditions representing a physiological attribute to which most ASC's share in common (Winkelman, 1997:397). Thus the parasympathetic dominant state is triggered through the ingestion of hallucinogens, and can be rendered through trophotropic tuning where the ergotropic system is initially activated through ritual drivers, and both systems become discharged after a given threshold resulting in relaxation, calm and synchronous slow wave hippocampal activity. A parasympathetic dominant state is also present in the girls puberty rite:

Girls Puberty Rite:

Driver	Somatic Effects & ASC	Neurological Effects	Neural Effects Enhanced when Combined with	ANS Tuning
Fasting	hallucination analgesia euphoria hypoglycaemia	opioid activation slow wavy synchronous activity	singing rhythmic stimuli fear social isolation	ergotropic activation trophotropic tuning
Sleep Deprivation	fatigue	slow wave synchr. activity	singing, fear, rhythmic stimulation	
Sensory Deprivation	relaxation	cortical synchron. slow wave	singing, fear, rhythmic stimulation	trophotropic activation
Sensory Stimulation (heat exposure)	analgesia euphoria	opioid activation slow wave synchronous activity	rhythmic stimuli singing, chanting	ergotropic activation trophotropic tuning

(Figure 5)

As compared to the boys, the degree of tuning and hence transformation for girls may be somewhat less profound. The most striking difference between the two ceremonies is the lack of toloache drinking, extreme physical exertion, and rhythmic stimuli on the part of the girls puberty rite. The most probable neurochemical reaction which could play a role in trophotropic tuning is the release of endogenous opioids resulting from fasting and sensory stimulation in the form of prolonged exposure to heat. Unlike the boys ceremony, such opioid enhancing variables as cohort initiation (*communitas*), repetitive rhythmic stimuli, and dancing are absent from the ritual drama and consequently, the degree of trophotropic tuning would be less than the boys. The effects of endogenous opioid secretion resulting from fasting and exposure to heat may also be diminished by the fact that girls were usually initiated alone rather than in cohorts and social isolation is known to decrease opioid activity. Despite this however, the fasting, the sleep and sensory deprivation, and sensory stimulation working in combination would be sufficient enough to warrant ASC induction and trophotropic tuning.

When the effects of trophotropic tuning are examined, the neural base for the pubescent timing of this type of ritual becomes apparent. As already stated, an increase in cognitive performance begins at the age of 12 and continues to develop into the mid twenties. These changes are largely attributed to a continuation in myelination, growth of the corpus callosum, and growth spurts in the left cerebral hemisphere. These neural changes that take place during puberty allow initiates to become "intellectually equipped" to cognize the rich fabric of abstract symbols that bombard them during the liminal phase. Puberty thus represents the ideal age for initial symbolic exposure because neural

structures are still developing and exposure to ritual variables which may entrain the very developing structures are likely to play a role in optimizing those corresponding neurological changes that accompany puberty. Winkelman argues that hippocampal slow wave states and limbic activation resulting from ANS tuning provide “optimal brain conditions for learning, memory, and attention..”(1997:402). The ritual timing of such ANS tuning effects coincides with the significant increases of hippocampal myelination that are known to occur during adolescence. Because it is the increased speed of nerve impulse conduction during myelination which is associated with the enhanced speed, capacity, and ability of cognitive tasks identified with adolescence, the optimal conditions for learning, memory and attention resulting from the ANS tuning initiated by a hippocampal slow wave state may also optimize myelination. Although the hippocampal slow wave state is associated with the right hemisphere, and the above mentioned mental processes are generally identified with the left hemispheric desynchronic fast wave states, there is a correlation between these slow wave states with enhanced cognitive performance under such a condition. (Winkelman, 1997:404).

The neural changes that take place during puberty may also serve to optimize emotional development by alleviating psychological stress caused from the ambiguities of biological and social change. This could explain the cross cultural prevalence of the recurring performance of transformation rituals throughout the life cycle, whether the transition in status is biologically marked such as menopause, or socially marked such as becoming an elder. This relationship between biological and social ambiguity with relief of psychological stress is considered by Lex to be a fundamental outcome of ritual:

The *raison d'être* for rituals is the readjustment of dysphasic biological and social rhythms by manipulation of neurophysiological structures under controlled conditions. Rituals properly executed promote a feeling of well-being and relief, not only because prolonged or intense stresses are alleviated, but also because the driving techniques employed in rituals are designed to sensitize or "tune" the nervous system and thereby lessen inhibition of the right hemisphere and permit temporary right-hemisphere dominance, as well as mixed trophotropic-ergotropic excitation, to achieve synchronization of cortical rhythms in both hemispheres and evoke trophotropic rebound (1978, 144-45).

The alleviation of psychological stress can be accomplished by trophotropic tuning as the resulting right hemispheric dominance is considered by Ornstein to be characterized by "perceptions of unity and holism" (Lex, 1979:144). This point is also addressed by Mandell who states: "living for days or weeks in a new background state of optimal brain function reconfigures perceptions of life, creating more positive and harmonious interpretations of the environment" (1980:435). Similarly, parasympathetic dominant states are believed to lower blood pressure, and reduce the likelihood of heart disease and hypertension (Winkelman, 1997:405). The therapeutic cathartic release of stress through the ritual process of abreaction (Gellhorn & Kiely, 1973) is also relevant in those ceremonies where communal involvement is integral. Abreaction involves the technique of renewing forgotten or repressed experiences to re-induce trophotropic tuning and subsequently reinforce neural connections that were initially formed during the puberty rite, and entrain new connections.

Thus from the examination of the Cahuilla male and female puberty ordeals, it can be assumed that based on the physiological and neurophysiological effects of these ordeals, profound initiate transformation took place. This occurred through the process

of parasympathetic dominance resulting from parasympathetic activation, and trophotropic tuning. Although transformation was perhaps greater for boys, the driving processes present in the female puberty ceremony was sufficient to induce trophotropic tuning. It is also important to note that efficacy of the ritual is enhanced due to the particular neurological developments that accompany puberty. To determine the possible degree of intended transformation, the following section will discuss Cahuilla cosmology to explore the relationship between ritual intensity and intentionality.

4.5: Cosmological Analysis

Prior to European contact, the notion of *power* among the Indians of Southern California was considered to be the drive responsible for the creation of all living things (Bean, 1976:407). Among the Cahuilla, this force was called *?iva?a* and was formed “through cataclysmic interaction of two masses of force identified with maleness and femaleness” (Bean, 1972:161). From this event arose *Mukat* and *Temayawet* the two creators who taught the Cahuilla the appropriate and inappropriate uses of *power*. It is this notion of *?iva?a* which underlies the symbolism, the procedure, and gender differences which arise in the male and female puberty ordeals. Through the process of ritual, the philosophy of *power* is experienced and becomes “real” for initiates as the symbolism of *?iva?a* shifts from metaphor, vibration and finally to form.

According to Bean, there are four philosophical premises concerning the nature of *power* in the universe. The first premise assumes that *power* is sentient and represents the principal cause for all events that take place in the universe. The second assumption is

that *power* is divided unequally throughout the three levels of the universe (the upper, middle and underworld) , and can be controlled by any living thing, or object possessing the will to act. The third postulate assumes that the universe is in a state of flux maintained by an equilibrium established relative to power, and finally, that humans are regarded as central to the interplay between *power* and balance (1976:408-409). Thus fundamental to the concept of *power*, is the notion of life's instability, unpredictability, uncertainty, and change as "Creation of the earth and life itself was fraught with indecision, mistakes, and conflicts of power between the creator brothers" (Bean, 1972:163). This ideology is reflected linguistically as the Cahuilla language is laden with phrases characterized by uncertainty, even for those events which are expressed as observably valid in Western languages (1972:163). According to Bean, from an early age, Cahuilla children were socialized to expect disaster and were psychologically prepared to deal with hardship and uncertainty (1972:164). Instability and unpredictability was also extended to the concept of *power* which was believed to have the potential to cause both prosperity and destruction, and could be orchestrated to help or hinder the Cahuilla people by those who possessed it. Ritual then became one of the means by which balance relative to power could be maintained, while at the same time provided a mechanism through which power could be obtained and strengthened by those who sought it out. With respect to ritual transformation, it can be contended that human beings like all matter are also in a constant state of flux. The profound change in being that results from trophotropic tuning reinforces the Cahuilla world view by allowing initiates to physically experience the metaphor of change within themselves. The

importance of community participation and the occurrence of transition rituals throughout the life cycle would indicate that ANS tuning and transformation is an on-going process that does not cease after puberty. It is possible that identity formation in this case is intended to be an open system, and like the universe, it is constantly changing. When the system becomes too rigid and begins to close, a rite of intensification will re-introduce uncertainty thereby continuing the process of change.

The puberty rites may have also played a key role in enabling direct experience of the negative/positive relationship of the universe. This notion of opposites deriving from the ideology of *power* and change was also a fundamental concept of the Cahuilla world view, as the Cahuilla were socialized to view individuals as "both beneficent and malevolent, and categorized as neither one nor the other unless his actions approached intolerable levels" (Bean, 1972:165). This bipolar relationship between negative and positive is reinforced in the puberty ceremonies as it is the tension between the contradictions of polar opposites which lie at the heart of liminality. This aspect is emphasized by Turner:

But the most characteristic midliminal symbolism is that of paradox, or being *both* this *and* that. Novices are portrayed and act as androgynous, or as both living *and* dead, at once ghosts and babes, both cultural and natural, creatures human *and* animal (Turner, 1977:37).

Similarly, d'Aquili and Laughlin highlight the importance of paradox in the ritual setting and argue that one of the purposes of ritual is this union of polar opposites:

Ritual aims at uniting opposites in an effort to gain control over an essentially unpredictable universe. The *ultimate* union of opposites which is the aim of all human religious ritual is the union of contingent and vulnerable man with a powerful, possibly omnipotent, force

(1975:45).

Thus liminality facilitated the direct experience of the negative/positive universe through the exposure of a ritual drama pervaded with opposites, tension, and paradox.

An examination of Cahuilla cosmology also provides a better understanding for the differences with respect to the ritual treatment of males and females. Theoretically, the limitations of Turner's concept of liminality become apparent when these gender differences are examined. According to Bynum, "Turner's ideas describe the stories and symbols of men better than those of women" (1996:74). Applying this argument to European medieval women's stories, she argues that the lives of women are less climatic than men's:

Women's stories insofar as they can be discerned behind the tales told by male biographers are in fact less processual than men's; they don't have turning points. And when women recount their own lives, the themes are less climax, conversion, reintegration and triumph, the liminality of reversal or elevation, than continuity. (1996:74).

Part of this may be attributed to the fact that for women, the boundaries between different phases in the life cycle are supported biologically by the onset of menstruation, and its later cessation during menopause. In contrast, the biological changes associated with adulthood for males are far more ambiguous; there is no one characteristic change which acknowledges a distinct physical passage into a new status. Farrer points out that because of this biological difference, puberty ceremonies for girls should be categorized as rites of intensification rather than rites of passage, because a girl becomes a woman once she begins to menstruate, and the ceremony only confirms this:

This does not deny that it occurs at a life crisis; but a girl is said to

be a woman immediately upon menstruation. She does not *become* a woman through the Ceremony; she already *is* one. Girls become women whether or not they have a Ceremony. It is possible to have a Ceremony several years after the initial menses, since a Ceremony makes one a better woman (Farrer, 1987:258).

It would make sense then that initiations for boys be more dramatic due to the absence of obvious biological cues which would accent the transition. This difference is also acknowledged by Guedon, who points out that among the Dene, whereas men “work at their own transformation through rituals, ‘quests’ and dreams” (1997:65), women go through this process on their own by menstruating (1997:43). Among the Cahuilla, these biological differences between males and females influence the nature of the initiation rites. Girls are generally initiated alone since the ceremony takes place when a girl starts to menstruate. Lacking a distinct physical signal of adulthood, large groups of boys whose ages range, are initiated together in large groups, and the drivers present for boys are more numbered and more dramatic.

Psychologically, it has been argued that women develop a continuous sense of self, whereas men raised by women must “undergo one basic reversal (i.e., from wanting to “be” their mothers to acceptance of being fathers” (Bynum, 1996:79). This inherent psychological dichotomy is also reflected ritually; just as boys are forced to separate and reintegrate with their fathers, the processual drama of male rituals reflects the pattern of separation, margin and transition. Liminality in this ritualistic sense therefore, cannot always be universally prescribed to women because the ambiguity between phases is not always present. Bynum further argues that the characteristic role reversal attributed to liminality is also more applicable to men. Turner suggests that liminality or antistructure,

diametrically opposes societal structure; it is the tension between structure and antistructure which allows a society to function. An extension of liminality is Turner's notion of *communitas* which represents the opposite of structure. This is where role reversal takes place during liminality, when neophytes become the power elites, and those who ordinarily possess power become temporarily subordinate. At a broader level, this dichotomy is extended to males and females; coinciding with the assumption that women are subordinate to men, it is also assumed that during ritual, men portray women, and women take on the role of men. According to Bynum however, gender role reversal for women does not always take place:

But medieval women do not describe themselves as men as a way of asserting either humility or spiritual prowess. Women either describe themselves as truly androgynous (that is, they use male and female images...) or as female (bride, lover, mother) (1996:77).

By claiming that "A model which focuses on this need for release as *the* ultimate sociopsychological need may best fit the experience of elites" (1997:81), Bynum alludes to the fact that liminality and *communitas* are psychologically more appropriate for men. This may be why *communitas* is generally absent from female puberty rituals, and why those anti-structuring mechanisms (drivers) which instigate neophyte transformation, are less numbered in female rites. Instead, Bynum suggests that the symbols present in women's stories, operate as an acceptance and continuance of their role as women (1996:81). This argument can also be extended to women's ritual.

According to Powers "myths and rituals related to female puberty in general and to menstruation in particular are aspects of the same phenomenon, which emphasizes the

importance of the female reproductive role" (1980:54-55). Powers contends that historically, anthropologists have tended to attribute menstrual taboos, and menstrual seclusion ceremonies as a symbol of woman's "defilement and degradation" (1980:56). Instead, she argues, that these ceremonies tend to reinforce a connection with the supernatural. In contrast to Bynum, she argues that liminality is present for women, but like Bynum, she emphasizes the notion of continuity in a woman's life cycle by pointing out that a woman is in a constant state of ambiguity throughout her reproductive years:

If the liminal state is sacred, we may conclude that the female's entire reproductive stage is also sacred, because during this time the woman is in a continuous state of ambiguity, that is, if she does not reproduce, she menstruates, if she does not menstruate, she reproduces (1980:65).

This connection between femaleness and the sacred is also emphasized by Ramanujan concerning Indian myths:

The males take on female personae...Before God all men are women. But no female saint, however she may defy male-oriented relational attitudes, takes on a male persona. It is as if, being already female, she has no need to change anything to turn toward God (cited in Bynum, 1996:85).

The Cahuilla case also supports the aforementioned claims. The female reproductive role is reinforced, as is the innate connection between femaleness and the supernatural. In addition, the numerous drivers present for the boys ceremony suggests that male role reversal operates as a means of acquiring dialogue with, and the possession of supernatural power.

To reiterate, *power* was considered by the Cahuilla to be the underlying force from which all beings were created. This powerful force has the potential to be both beneficial

and harmful, and any living being may possess it. The distribution of *power* however is unequal and evolves around a hierarchy. Humans are considered to possess more power than plants and animals, but even within the human species differential access to *power* exists. Some individuals are naturally born with it, others have the ability to seek it out, and in some cases, *power* being sentient can seek out an individual (Bean, 1976:416). It is this differential access and distribution of *power* which is key in discerning some of the gender differences with respect to the puberty rite. According to the Cahuilla creation myth, *Mukat* and *Temayawet* were the creator beings that formed from the collision of two enormous masses of *?iva?a*. Whereas *Temayawet* used his *power* inappropriately, his brother *Mukat* used the force correctly and thus became the principal creator of the universe (Bean, 1972:161). Thus there exists an intricate relationship between the force of *power* and the ability to create: those beings which have the ability to create possess more *power*, however this power must be used appropriately to ensure a state of balance in the universe and prevent catastrophe. If *power* is identified with the ability to create life, and women are identified with the ability to create life, then by deduction it can be assumed that women are associated with *power*. If we scrutinize the gender differences in the male and female puberty rite, underlying the ritual process is the relationship between women and the possession of power.

There existed several procedures which enabled individuals to be more susceptible to the procurement of power. According to Bean, some of these techniques included "the use or combined use of hallucinogenic plants, the handling of power-containing objects, and various forms of sensory deprivation or acts designed to concentrate attention, such as

meditation, fasting, imposed periods of sleeplessness, isolation, induced sweating, listening to music, singing, drumming, chanting, and hyperventilation" (1976:414). Interestingly all of these techniques are present in varying degrees in the male and female puberty rites, however there is a strikingly higher number of these techniques present in the male puberty ritual. Datura was considered to be an extremely efficient method upon which *power* could be drawn because it altered the individual's perception thus increasing the ability to perceive sources of power (1976:414). The fact that datura ingestion was exclusive to males during puberty ordeals, and the number of ritual drivers for boys outnumbered those present in the girls rite, would suggest that a greater degree of ritual drama and technique is necessary for the male acquirement of *power*. These gender differences also suggest that women are the bearers of inherited *power* because of their ability to create, and men must therefore go to greater lengths to seek out the acquisition of *power*. The nature of the female puberty ordeal also reinforces the differential access to *power* between the genders.

The Cahuilla believed that *power* became turbulent and potentially dangerous during times of life crises (Bean, 1976:415). Because ritual was considered to be the method to keep dangerous *power* in check, it is not surprising that such circumstances as puberty, menstruation, birth, menopause, and death were accompanied by ritual. Most of these life crises are associated with women (birth, menstruation, menopause) and in the case of menstruation, the potentially dangerous accumulation of power develops monthly. It is perhaps for this reason that the female puberty rite, pregnancy, and menstruation, adopted the form of ritual seclusion; women during these crises were feared due to the

negative potentialities of their acquired *power*, and seclusion became ritualized to alleviate possible threats to the community. This ritualized seclusion however should not be interpreted as a means of diminishing the inherent female access to *power*. Rather, the nature of ritual procedure during seclusion would indicate that efforts are taken to maintain *power*, to even accumulate more *power*, but at the same time to ensure appropriate use of *power* so that possession of it can be secured. As indicated in the Cahuilla creation myth, *Temayawet* lost his ability to create because he used the force of *power* incorrectly thus destroying the balance. Because ritual represented a venue for equilibrium, restoration, and maintenance, the ritualized seclusion of women during menstruation may have served to keep *power* in check so that access to it would not be taken away. At the same time, the implementation of fasting and food taboo would also serve to increase susceptibility of *power* access. This would particularly be the case for the female puberty rite where such techniques as fasting, heat exposure, sleep and sensory deprivation would make girls more open to the acquirement of *power*.

Thus it is clear that the ritual drivers present during the male and female puberty ceremony, have the potential to alter neurophysiological functioning such that a parasympathetic dominant state is induced. Through this process of trophotropic tuning, entrainment and re-entrainment of the neural network results in profound initiate transformation. At the same time, these neurological changes may serve to optimize the neurological developments that take place during puberty. Ritual intentionality in terms of transformation and gender differences, are supported by the Cahuilla world view through the concept of *power*. This fundamental philosophy which emphasizes instability,

uncertainty, paradox, and change, is directly experienced by novices through the physical experience of the symbolic metaphor. Insights into the intentionality of the gender differences are also provided by the concept of *power*. The nature of female seclusion, and the reduced number of ritual drivers imply that women were equated with *power*, and were thus feared. At the same time, such practices as fasting, sleep deprivation, and heat exposure, also suggest that the maintenance and procurement of female *power* was intended, since these drivers are sufficient to produce a slow wave, synchronous, parasympathetic dominant state, and tuning of the autonomic nervous system.

Chapter 5: Oglala Puberty Initiations

In the cosmology it is woman whose social transgression leads to the creation of time and space. It is woman who, bored with the natural universe, conspires with the culture hero to coax humans, her own people called the Buffalo Nation, from their subterranean world to the earth. It is she who in concert with the trickster teaches the people about culture, and it is she who suddenly then leaves them to face the vicissitudes of nature alone. Finally, it is a sacred woman who drops to earth in the form of a falling star and unites with the most virile of sacred beings, the South Wind. In the transformation of Falling Star into the Sacred White Buffalo Calf Woman, she brings to a starving Lakota nation that instrument of prayer the Calf Pipe, which along with the Seven Sacred Rites will intervene in their lives whenever they are experiencing hardship and danger.

(Marla Powers, 1986:35)

The Oglala girls and boys puberty ceremony were part of the Seven Sacred Rites given to them by White Buffalo Calf Woman. Although White Buffalo Calf Woman, the sacred pipe she gave to the Oglala as protection, and the Seven Sacred Rites, are still central to Lakota religion, the female puberty ceremony is no longer practised (Powers M.N., 1986:190). The Vision Quest, Sun Dance, Sweat Lodge, Hunka, and Ghost-Keeping Ceremony are still performed, and women are now participating in such rituals as the Sun Dance, and Vision quest, ceremonies which were once reserved only for men. Because prominence is still given to White Buffalo Calf Woman, it is likely that eventually all seven rites-including the female puberty ceremony- will be revived (Powers M.N., 1986:190). While the Oglala continue to practice ceremonials associated with the Lakota religion, they also practise Christianity. According to W.K. Powers, anthropologists have tended to view Aboriginal assimilation and the conversion to

Christianity as an inevitable process, and overlook such factors of cultural reciprocity and cultural continuity (1987:96). Instead, Powers contends that continuity and change are in essence “two aspects of the same phenomenon” (1975:xii) Thus today, most Oglalas practise Christianity, while at the same time, participate in such traditional rituals as the Sweat Lodge, the Sun Dance, Yuwipi, and the Vision Quest.

Following the same format as the preceding chapter, the significance of the male and female puberty ceremonies as they were traditionally practised will be examined through the analysis of ritual intensity, based on neurological and physiological changes. Section 4.1 and 4.2 will outline the male and female puberty ceremony, section 4.3 will briefly discuss neurological and physiological changes and the degree of male and female neophyte transformation. The central focus of this chapter will consider intended transformational effects, and gender differences, through a discussion of Oglala cosmology in section 4.4.

5.1: Boys Puberty Initiation

The Vision Quest was not exclusive to pubescent boys, but generally a male's first Vision Quest experience would occur during adolescence (Powers W.K, 1975:91). Whereas the Cahuilla boys ceremony initiated large cohorts of boys simultaneously, the Oglala Vision Quest is undertaken by one individual under the supervision of a ritual specialist. While the Vision Quest represented the pivotal process of initiation, participation in the Sweat Lodge occurred both before and after the Vision Quest. When an individual was ready to participate in a Vision Quest, he would first acquire a pipe and

find a sacred man who would be willing to support and guide him through the initiation process (1975:91). The ordeal began with the Sweat Lodge where the initiate and his relatives participated in the ceremony which was guided by the ceremonial specialist. The intent of the Sweat Lodge is to "revivify persons spiritually and/or physically" (1975:89), preventing and curing illness (Ruby, 1955:48), and generally "renews the body to life" (1955:48). The architecture of the Oglala Sweat Lodge is described by Powers:

Sixteen willow saplings, approximately one inch in diameter at the butt end, are peeled and imbedded in the ground so as to describe a circle approximately six to eight feet in diameter. The saplings are then bent over and tied with rawhide thongs to form a domoidal structure, at the centre approximately four feet from the ground to the apex of the roof. The saplings are arranged so that there are four on each side of the lodge, with an entrance on the east (1975:90).

A hole is dug at the centre of the Sweat Lodge where a fire is maintained throughout the ceremony, where heated stones are placed. Animal skins are then covered over the saplings to seal the lodge from light and air, and water is poured over the hot stones during the ceremony to create steam. Spirits are invited to enter the lodge and communication between spirits and participants is mediated by the sacred person (1975:91).

Following the Sweat Lodge, the initiate would participate in a Vision Quest which could last from two to four days (1976:92). A detailed account of the Vision Quest is reported by Powers:

The sacred person then takes the youth on horseback to a sacred hill, away from the camp, where he instructs the youth how to behave during the ordeal. The youth wears only moccasins and a breech cloth, and carries a buffalo robe and pipe filled with tobacco and sealed with tallow. The sacred person prepares the appointed place on the hill in the

following manner: A pit is dug large enough to accommodate the youth. It is covered over with brush, leaving an opening by means of which he will crawl in and spend part of the ordeal...He is told to stay in the pit, but that he may arise at dawn and go to each of the directions and pray... He may drink no water or eat any food during the *hanbleceya* (1975:92).

After the ordeal, the youth would then participate in another Sweat Lodge where the ritual elder interprets the individual's vision. The youth must accept and follow the teachings presented to him by his vision or calamity could arise to himself and family members (1975:93)

5.2: Girls Puberty Initiation

While boys could participate in a Vision Quest for the first time during adolescence, the institutionalization of the Oglala girls puberty ceremony was given greater recognition and importance. Whereas a male and his family were free to choose whether the individual would undergo a Vision Quest, Oglala females were socialized from an early age to prepare for the ceremony which would highlight a girls passage into womanhood. Called *Isnati awicalowan* which refers to the process of menstruation and ritual isolation, and also called the Buffalo Ceremony (Powers W.K, 1975:101), this ritual was performed when a female reached menarche.

A girl's participation of ritual isolation began for the first time when she began to menstruate. A tipi was constructed along the periphery of the village where she would remain secluded from the rest of the camp. During this time, she would be guided by a relative, or a highly respected Oglala elder who would teach her all of the associated duties that accompany womanhood. Ritual protocol was carefully observed as it was

believed that “the influences surrounding a young woman during her first menses had a profound effect on her throughout her life time” (Powers M.N., 1986:66). Specifically, the ceremony was performed to stress those qualities of the Buffalo and to ensure that those qualities of “chastity, fecundity, industry, and hospitality” (1986:67), be adopted by Oglala women. Similar to the construction of the sweat lodge, attention to was paid to detail:

The lodge was erected with its doorway toward the east...When the lodge had been erected the young woman’s father made an altar between the *catku* (Place of honor-the west) and the fireplace (which was the centre of the tipi). He then placed the following ritual paraphernalia in the lodge: a buffalo skull with horns attached, a pipe, tobacco, a wooden bowl, sweet grass, sage, an eagle plume, a fire carrier dried chokecherries, dried meat, a drum, two rattles, a breechclout, and a new dress for the young woman (1986:67).

Both men and women were invited to participate in the puberty ceremony, however menstruating women were prohibited from attending the ritual to prevent sacred ritual objects from being contaminated (1975:102). The ritual was conducted by the medicine man who wore only a breechclout, leggings, moccasins, a buffalo headdress, a buffalo tail, and his face and body were painted red (1986:67). The medicine man would smoke the pipe and while the pipe was passed around, he painted the right side of the buffalo skull red, and painted a red stripe along the forehead region of the skull (1986:68). The skull’s nasal cavity was filled with sage and the medicine man would blow smoke into the cavities to symbolically induce life to the skull (1986:68). The girl was lead into the tipi where she would be guided by the sacred person:

He then instructs the girl to be industrious like the spider, silent and wise like the turtle, and cheerful like the meadowlark. If she heeds

those words, men will pay bride-price for her and she will bear many children. The sacred person then cautions her about evil influences. He tells her that she is now a buffalo cow and he is a bull. The singing begins, and he dances toward her, lowing like a bull during the rutting season. As he dances up to her, he sidles up to her just as buffalo do in their mating ritual. Each time he sidles up to her, the girl's mother places sage under her arms and in her lap. The sacred person then places the bowl filled with water and chokecherries on the ground and tells the girl that this is a buffalo watering hole on the prairie, whereupon the girl bends over and 'drinks from it in imitation of a buffalo (1975:102).

The young woman would then remove her dress and place it over the buffalo skull. She would then put on her new dress and her mother would style her hair in the way adult Oglala women wore their hair (falling in front). The medicine man would then paint the girl's hair part with red ochre, and paint her forehead similar to that of the skull. The ceremony concludes when the girl leaves the lodge as a woman and a feast is held to celebrate the girls passage into womanhood.

5.3: ANS Tuning & Transformation

Many of the drivers present in the Oglala puberty rites have been outlined in detail in the previous chapter, thus a neurophysiological analysis of only those drivers which are not present in the Cahuilla case study will be currently discussed. For the boys rite, the Sweat Lodge plays a significant role in preparing the initiate for the ANS tuning which is most likely to occur during the Vision Quest due to the presence of variables conducive to altered states of consciousness, and parasympathetic dominance. During the Sweat Lodge, prolonged heat exposure to the skin causes parasympathetic blocking of sympathetic activity at the surface. Because the surface capillaries are the only place

where the sympathetic nervous system innervates without intervention from the parasympathetic system, this means that to open up the peripheral blood vessels and capillaries for the purposes of sweating, requires global parasympathetic blocking of the sympathetic system to dilate the vessels and capillaries. This is almost universally experienced as “purification” and “cleansing” to the spirit and mind where an overall feeling of relaxation and clarity arises due to parasympathetic dominance. As such, when performed before a ritual, the sweat lodge becomes a venue for spiritual preparation, by placing the individual in a state receptive to the inculcation of sacred knowledge, and other subsequent drivers. This clarity is crucial as stillness of the mind is a prerequisite to a visionary experience (Lyon, 1991:23). After the Vision Quest, the Sweat Lodge is repeated to ensure that the initiate’s vision is properly interpreted through the guidance of a ritual specialist. The individual’s state of relaxation, clarity, and focus established from prolonged exposure to heat, makes full appreciation and understanding of the vision more likely to occur.

Throughout the duration of the Vision Quest, (between 3–4 days) boys are prohibited from eating and drinking. As already mentioned, this kind of nutritional deficit can cause physiological imbalances making individuals predisposed to cortical synchronization, and parasympathetic dominance. The fasting period of 3–4 days would also indicate high concentrations of opioid levels, resulting in euphoria, analgesia, and slow brain wave frequencies. At the same time social isolation, lack of environmental stimuli and motor movement, also lead to cortical synchronization and parasympathetic dominance.

Another variable which plays a critical role in neophyte transformation and the induction of ASC, is ritual language. This refers to a special type of poetic language that may be characterized by utterances of meaning, and non-meaning, used only within the ritual context. Referred to as sacred language, ritual language, ceremonial language, or vocable, little attention has been given to the specific underlying nature of this discourse. Most theoretical perspectives which have attempted to interpret the significance of sacred language in ritual, place emphasis on the claim that the knowledge of such a language plays a role in distinguishing those individuals who are part of a group or status, from those who are not (Van Gennep:1960). Other explanations view sacred language as the discourse used by past generations which has been lost in the secular spoken context, but through its continuity in ritual, functions as a means of passing down ancient traditions and knowledge systems of the past. Ceremonial language has also been linked with power where social prestige is assigned to those who master it; this is why ceremonial language mastery is frequently identified with shamans as it is this discourse which shamans may use to communicate with supernatural beings and forces. While it is acknowledged that ceremonial language serves as a method of cosmological instruction, and demonstration of ritualistic competence, the nature of ritual language suggests something further. Van Gennep was one of the first to observe that ceremonial language exposure is very common during the transition phase of rites of passage:

Especially during the transition periods, a special language is employed which in some cases includes an entire vocabulary unknown or unusual in the society as a whole, and in others consists simply of a prohibition against using certain words in the common tongue. (cited in Powers, 1986a:15).

This association with the transition phase of ritual, and the unique nature of the vocal utterances, suggests that ritual language can also operate as a driver to elicit specific changes in neurophysiological functioning. Combined with other ritual drivers, ceremonial language not only facilitates the process of stripping away all that is familiar to the initiate (structure), but it also plays a role in initiate transformation through the induction of ASC (antistructure).

Among the Plains Indians cultures, and in particular among the Oglala, ritual language is learned and performed during several ceremonials, such as the Vision Quest, the Sun Dance, and pow-wows. In some cases vocal utterances are intelligible: among the Oglala, suffixes such as *kan* may be added to secular words thus making them sacred, the pitch and intonation of common words may be altered, or the syntax may be modified (Powers, 1986a:33). Thus poetic in nature, this discourse transcends the limitations of secular language to transmit vast and seemingly instantaneous understanding of cosmological knowledge. According to Lewis, among the Ata Tana Ai, participants exposed to ritual language are described as receiving knowledge related to their clan histories and the creation of the world "in a single flash of insight and understanding.." (1988:257).

Also common are linguistic patterns which are deemed incomprehensible and meaningless (glossolalia). The fact that much of the discourse is both poetically transcendent, and unintelligible suggests that linguistically, ceremonial language is qualitatively different from secular language. Thus, although language is associated with linear reasoning, logic, and left hemispheric dominance, ceremonial language in contrast

invokes right hemispheric dominance. The speech pattern of glossolalia is generally repetitive and studies have illustrated that this speech act “predominantly emanates from the right cerebral hemisphere” (Lex, 1979:128). Particularly significant however, is the rhythmic aspect present in many forms of ritual language. Among the Oglala, ritual language is often sung or chanted to a specific pitch and rhythm, and is frequently accompanied by drumming. The repetitive quality of sacred language, the rhythmic intonation and specific pitch produce slow wave activity, cortical synchronization, and right hemispheric dominance.

The following chart lists the drivers present in the boys puberty initiation with their neurological effects:

Oglala Boys Puberty Rite:

Ritual Ordeal (Drivers)	Somatic Effects & ASC	Neurological Effects	Neural Effects Enhanced when combined with	ANS Tuning
Heat Exposure (sweats)	-relaxation -clarity	-parasympathetic dominance	-vision quest	
Social Isolation	-relaxation	-cortical synchronization -parasympathetic dominance	-fasting -sweat lodge	-trophotropic activation -ergotropic tuning
Fasting	-hallucination -analgesia -euphoria -hypoglycaemia	-opioid activation -slow wavy synchronous activity -parasympathetic dominance	-social isolation -sweat lodge	-ergotropic activation -trophotropic tuning
Ritual Language	ASC occurs when combined with other drivers	-cortical synchronization -right hemispheric dominance	-fasting -social isolation -sweat lodge	-ergotropic activation -trophotropic tuning

(Figure 6)

Thus although there are less drivers present in the Vision Quest than that present in the Cahuilla puberty rite, the paired Vision Quest with the Sweat Lodge, the food/water deprivation, and social isolation, are sufficient to precipitate a vision. Many parallels can be drawn between the Cahuilla boys ingestion of *datura*, and the Vision Quest for Oglala boys. Both toloache drinking, and the Vision Quest are regularly undertaken by ritual specialists, who possess an extensive knowledge and expertise in these areas. Both techniques produce visionary experiences resulting in slow wave, synchronic hippocampal activity, and parasympathetic dominance, and both allow initiates to establish a powerful life-long connection with their culture's cosmology. In relation to the cycle of meaning, the encountered vision plays a key role in facilitating the direct experience of cosmology, in addition to cosmological verification and vivification. As stated by one informant:

In the Vision Quest, we start out alert, conscious, watchful, ready to make contact with the Higher Power that is out there, all around us or within. The vastness of life around us helps eliminate self-centeredness. We are not doing the Vision Quest to make ourselves feel important or to be interesting to our friends but to realize the vastness of the universe and our oneness with it (McGaa, 1990:75, cited in Lyon, 1991:20).

Also significant to the cycle of meaning is the notion of shamanic interjection. The intervention of the ritual specialist in this case occurs before and after the ritual. Before the Vision Quest, the specialist ensures that the initiate is prepared, and properly guided to undertake the ordeal. After the Vision Quest, it is essential that the specialists interprets the initiate's vision during the sweat lodge. From this procedure of initiation, what is also evident is the process of metaphor, vibration, and form (Prattis, 1997). The vision quest is

not only experienced at the cellular level, but it must also be experienced behaviourally.

This last point is stressed by Powers:

A vision then is not only a blueprint for the future, but a theory about how one should live with himself and his relations and all the other creatures of the natural and cultural world...What is really important is the application of the vision to real life and the manner in which the vision can accurately predict the potentiality of the suppliant, much as a theory predicts the nature of the subject under examination. In the long run, after a series of trials and errors, what really is important is that which lies beyond the vision (1987:5-6).

Whereas participation in a vision quest was voluntary for boys, at one time all Oglala girls participated in the puberty ceremony. In comparison to the boys initiation however, the Oglala girls puberty ceremony lacks the drivers associated with altered states of consciousness. Similar to Cahuilla girls, Oglala girls were secluded and this could produce a parasympathetic dominant state. However, distinct from the Cahuilla ceremony, the period of fasting, and prolonged exposure to heat did not occur. This does not mean that female transformation did not take place. During the ceremony, the medicine man would wear a buffalo headdress, and his body and face were painted, and at the back of the headdress was a piece of buffalo skin with a tail (Powers M.K., 1986:67). Through the process of ritual masking, the powerful symbolism of White Buffalo Calf Woman, and all of the attributes of the Buffalo become symbolically experienced by initiates at the metaphorical level. As noted by Laughlin, symbols are "pregnant" with meaning and essentially "invite entrainment" (1990:189). Thus symbols have the ability to penetrate the neural network to entrain neural, endocrine, and physiological systems (Laughlin, 1990:190). What must be emphasized however, is the fact that the altered state

of consciousness represents the optimal condition for symbolic penetration (1990, 196). Even though symbolic penetration may occur through ritual masks, generally this type of masking is also paired with ritual fasting, dancing, and Sweat Lodge participation. In other words, the masking ceremony is paired with drivers which produce altered states. The fact that the mask is also worn by the medicine man instead of the initiate herself, also reduces the likelihood that symbolic penetration at the level of entrainment, or using Prattis's terms at the level of "vibration", and "form", would occur. A possible explanation for maintaining the symbol of the buffalo at the metaphorical level, in addition to gender differences with respect to the ritual treatment of Oglala boys and girls will be discussed in the following section.

5.4: Cosmological Analysis

It is evident from this case study, that Bynum's criticism of Turner can also be applied to Oglala women. That is, that the lives of Oglala women-with respect to ritual-are less climactic than men's. Again this argument can be approached from the perspective of the biological differences between girls and boys concerning puberty, and this highlights Farrer's contention that puberty rituals for girls are more appropriately characterized as rites of intensification. This is certainly the case among the Oglalas; once a girl reaches menarche, an "announcement of the girl's reaching 'womanhood' was an important ritual sponsored by her parents" (Powers M.K., 1986:66-67). Thus the Buffalo Ceremony is not really an initiation because a girl becomes a woman whether the ceremony is performed or not. The purpose of the ceremony is "to invoke the spirit of the

buffalo and thereby secure for the initiate the virtues most desired by Oglala women- chastity, fecundity, industry, and hospitality-as well as to announce to the people that the girl was now a woman" (1986:67). Thus the trials, and ordeals present in the boys initiation, are not necessarily appropriate.

An understanding of the ritual gender differences is also apparent through the mythological figure of White Buffalo Calf Woman. One of the most sacred symbols in Oglala religion is the symbol of the sacred pipe. The pipe is present in all sacred rituals and is a symbol for the Oglala universe (Powers W.K., 1975:86). The Oglala believe that the sacred pipe was a gift given to them by White Buffalo Calf Woman who told them that the pipe would protect the Oglala people from harm. Central to the ritual repertoire of the Oglala are the Seven Rites which were given and instructed to the Oglala by White Buffalo Calf woman. These rites primarily serve to "influence the supernatural beings and powers" (Powers W.K., 1975:89). What is interesting to note however, is the evident paradox present in the Seven Sacred Rites as they were traditionally practised. The majority of sacred persons in Oglala society are men, and a sacred man becomes more powerful through visions (1975:52). As such, until recently, the vision quest has been exclusive to men. Menstruating women were prevented from handling ritual objects such as the sacred pipe, and the ritual participation of women generally took place before a girl began to menstruate, and after menopause (1975:63). What is particularly paradoxical, is the notion that despite the aforementioned ritual protocol, all sacred ceremonial knowledge was imparted by a woman in her sexual prime. Again, similar to the Cahuilla case study, underlying the male and female puberty ritual practices, is the implication that

women possess an innate supernatural power and connection with the sacred realm. This point is emphasized by Marla K. Powers who argues that "the female's entire reproductive state is also sacred" (1980:65).

Thus whereas men participate in such rituals as the Vision Quest and the Sun Dance- rituals which involve numerous ordeals, drivers, and ASC- what is insinuated mythologically and supported ritually, is that women unlike men do not need to participate in vigorous ordeals which give access to supernatural power, because menstruating women are inherently powerful without these procedures. Using Turner's concept of liminality, theoretically it seems as if at the broader level men represent the structure of society and women represent antistructure. Such practices as seclusion, and female exclusion from ritual may be a method of keeping a women's inherent supernatural power in check. This may explain the use of the buffalo headdress during the female puberty ceremony. Whereas most masking ceremonies incorporate such driving practices as dancing, hallucinogenic drugs, fasting, and the actual wearing of the mask, in the female rite, the buffalo head dress is worn only by the male medicine man. This prevents the symbol of White Buffalo Calf Woman to go beyond the metaphorical level. Consequently, entrainment of the neurocognitive structure does not take place and this may be another measure taken to ensure that a woman's supernatural power is controlled.

Thus with respect to intended transformation, it appears that transformation for men is intended throughout the life cycle. This transformation is produced by rituals which incorporate those driving techniques which produce altered states of consciousness, and autonomic nervous system tuning. The fact that a Vision Quest may be repeated as a

man ages, in addition to the fact that participation by males in the Sun Dance also takes place during the life span, suggests that continued transformation in males is intended. In contrast, the transformation in girls is less pronounced due to the decreased number of drivers during the puberty ceremony, and the lack of female participation in other subsequent rituals which involve drivers. The monthly practice of social isolation would suggest that a degree of transformation is likely to occur. In terms of intended transformational effects, underlying the myth of White Calf Buffalo Woman, and the ritual protocol which excludes women from participation, it is implied that profound female transformation is not needed and therefore not intended.

Chapter 6: Conclusion--Implications for EuroAmerican Society

A secret place tucked away neatly, safe from the reach of the firemarshall and similar uninvited friends...A fantastic world filled with the unusual, the fun and the never before seen...where you can leave your worries behind and enjoy...you can play on our 25' cabin cruiser: The USS Ecstasy. Watch the creation and execution of live acid house...We will guide you away from your normal life and transplant you in a more loving, nurturing environment...We repeat, for the duration of this really goooood trip you will dance and play joyfully.

(Underground invitation to an Acid House Event)

The final section is a speculative chapter, as the primary research was focused on the Oglala and Cahuilla puberty rituals. The conclusions drawn from the previous two chapters leads me to speculate about youth culture in the EuroAmerican context. The EuroAmerican context represents a circumstance where neither ritual indoctrination nor ordeal is institutionalized. Based on what has been suggested thus far, those societies which value radical transformation during puberty, exercise initiation rituals which incorporate several methods of inducing altered states of consciousness. At the other end of the spectrum, in a context where a rite of passage is absent, it is implied that intended identity transformation is not highly valued. To explore this issue, the western view of adolescence and the psychological treatment of adolescent identity formation will be reviewed. The relationship between the cultural construction of adolescence and the treatment of identity as a cultural category will be addressed, in addition to some of the implications identified with a society in which rites of passage are absent.

6.1: Adolescence as a cultural construction--Identity as a cultural category

The period between 1890-1920 is documented in western history as the *age of adolescence*. During this time, with the impact of the industrial revolution, middle class youths were strongly encouraged to remain in school, and in some cases attend university in order to take advantage of the economic opportunities that had been created (Santrok, 1993:11). Consequently, educational institutions increased, and youth orientated organizations were created as a means of separating “adolescents” from the adult world; at the same time, psychologists, counsellors, urban reformers, and educators, began to engineer the concept of adolescence (1993:11). As a cultural construction based on the economic interests of an increasingly capitalist society, the discourse on adolescence was created to meet these demands, such that these economic interests thus shaped and defined the construction of the psychology of adolescence. As contended by Kett:

Although the architects of adolescence often announced their intention to understand and to sympathize with the problems of adolescents, a major effect of the psychological interest in adolescence after 1890 was the creation of new ways to regulate youthful behavior. Between 1890 and 1920 adolescent psychology became as much a method for controlling the behavior of young people as a tool of description and explanation (1977:238).

Consequently, part of this control was to ensure that the education system would prepare adolescents for future careers in a technological society. Subsequently, the vocational movement created by Frank Parsons came into being in the late 19th century (Kett, 1977:239). Counsellors would help youths determine their “mission in life”, based on the results of youth self analyses, and numerous aptitude tests (1977:239). From these

historical developments, the relationship between the construction of adolescence, and the western concept of adolescent identity becomes apparent; identity, like the concept of adolescence, has been treated as a cultural category. A cultural category which has reflected the economic interests of a technological society.

A dominant theme in the psychological literature on adolescence is the emphasis on identity formation. There are several definitions of identity, however a common component among definitions is the importance placed on process, and the merging together of elements to form a whole. This is illustrated in Greenacre's definition which defines identity as "...an individual or object whose component parts are sufficiently well integrated in the organization of the whole that the effect is general oneness, a unit" (Hauser & Kasendor, 1983:9). On a broader level, identity is also defined in relation to society as "the process of claiming membership in the social world, standing for something, being known for who one is" (Josselson, 1994:12). Erik Erikson's stage theory of psychosocial development emphasizes developmental change throughout the human life cycle, where each developmental stage contains a specific task which challenges individuals with a crisis. Throughout each stage, successful resolution of the impending crisis must occur to ensure healthy development. Erikson's fifth stage *Identity versus Identity confusion* is the crisis which confronts an individual during the adolescent period. Erikson's definition of a "healthy" transition from childhood to youth also stresses the relationship between youth and society:

To be fully grown in the human sense means the readiness to join not only the technology, but also certain irreversible commitments to one's pseudo species, which also means to *exclude* (by moral

repudiation, fanatic rebellion, or warfare) inimical identities and foreign ideologies (Erikson, 1966:617).

Erikson argues that when “normal” identity formation is not achieved, an identity crisis may occur. This is recognized when “the individual demonstrates doubts, regressions in behavior, and a reorganization of identity” (Mitchel, 1992:141). In extreme cases Erikson argues that the identity crisis may express itself in “withdrawal or in lone-wolf delinquency...borderline psychosis, criminality, or dangerous fanaticism” (1966:617). Thus much of the discourse on adolescent psychology is directed toward the process of identity formation, and the mechanisms which facilitate and ensure that this occurs in a “normal” manner. This interest is reflected in the numerous studies which have been designed to measure the “status” of identity. In the last ten years alone, more than 200 studies have reported to examine the measurement of youth identity (Dreyer, 1994:125). In *Interventions for Adolescent Identity Development*, a book intended for educators and counsellors to promote curriculum which encourages identity formation in youths, it is argued that successful identity achievement occurs when:

...the youth is able to make reasonable decisions and arrive at firm commitments in such areas of life as occupation, religion, and politics without being overwhelmed by the multitude of possibilities or the magnitude of the decision-making task (Dreyer, 1994:129).

Similarly, Mitchell argues that:

The minimal commitments necessary to achieve a sense of identity include a set of values and beliefs to guide one’s actions, and a set of career goals which helps to formulate one’s occupational options (1992:120).

Dreyer claims that control over the self exploration process by the school system is key in

terms of ensuring successful identity formation. What is alluded to here, is that society has a vested interest in assuring that by the time adolescents finish high-school, they are able to "claim membership in the social world", so that youths have a clear sense of who they are, what they are cognitively capable of, and ultimately what career path they will follow. Although it is assumed that as an individual matures, his or her identity will also grow, at the same time, the identity which is established during adolescence is essentially viewed as being a blueprint which "forms the framework for adulthood" (Josselson, 1994:12).

Experimentation in different recreational and intellectual venues are encouraged so that the youths will have an established career path. The problem with this kind of ideology is that identity becomes reified into an unchanging "thing-ness". The fact that it can be measured by a written test implies that the concept of identity is fixed. There is also a tremendous ambiguity with respect to self-identity and social identity. Adolescents are encouraged to establish a firm commitment to a career goal, a defined sense of what role he or she will play in society. This makes logical economic sense; youths will spend less time trying to determine a career path which will result in a decrease in government loans, and become active and productive members in society in the briefest amount of time required for that selected vocation. Today this issue is further complicated by the fact that even after committing to a vocation and receiving specialized training, employment is often difficult to obtain. With this notion of career commitment, and identity measurement, the tendency for the western concept of identity is one which completes itself, thus becoming static and fixed in time.

6.2: An Identity Crisis in EuroAmerican Youths?

In the introduction, I alluded to the fact that in those societies where institutionalized rites of passage do not occur, varying forms of initiation appear spontaneously among many youth subcultures. Lyttle and Montagne (1992), contend that movements such as the Acid House scene, operate at the physiological level to induce altered states of consciousness which play a role in autonomic nervous system tuning:

...the nature of Acid House music, especially the drumming aspect, seems instrumental in providing altered states of consciousness. In the Acid House phenomenon, the music contains a high number of beats per minute, with a percussion and synthesizer-based pop style meant for vigorous, nonstop dancing over many hours. There is also repetitive chanting, using words such as "Aciieeed." The use of hallucinogenic drugs and their effects modify and enhance some of these physiological responses...These ritual assaults can create an imbalance in ergotropic(energy-expendng) and trophotropic (energy-conserving) systems, most especially through a combination of direct autonomic system stimulation and pharmacological activation or blocking (1992:1172).

While the Acid House scene may be an extreme example, it is a musical trend and subculture which is rapidly spreading (Lyttle & Montagne, 1992:1173). Notable are the number of drivers that are common to the Acid House scene, and the Cahuilla initiation ritual, although lacking in the Acid House activities is the participation of elders and ritual specialists to oversee such uncontrolled and dangerous activities. There are also several other youth preoccupations which psychologists would also describe as "dangerously fanatic, regressions in behaviour, and reorganizations of identity". Involvement in gang initiations, religious cult affiliation, body piercing, and tattoos are such examples. These adolescent quests for identity however are deemed deviant.

In contrast, from what has been investigated in the Cahuilla and Oglala case studies, in these contexts, identity in young people is not treated as a cultural category, but is rather treated biologically in the form of entrainment of the neurocognitive structures of the brain. What is operating are two biological processes: there is the process of puberty which signals a change in status, but more significantly, there is continued myelination, and corpus callosum growth. This is where transformation rituals are the most prominent, signifying that initiation rituals are designed to maximize the biological changes that occur in the nervous system, to induce entrainment and reentrainment of the neural structures, and hence profoundly transform an individual's consciousness. In many cases, these rituals are re-enacted throughout the human life cycle at developmentally critical stages, to ensure continued transformation and growth. Identity in this sense is thus not a closed or static system, but it is rather an open system in constant flux. Unlike the western concept of identity which emphasizes commitment and rigidity, transformation rituals function to do the exact opposite. Thus whereas the western notion of the "identity crisis" is characterized by "doubts, regressions in behavior, and a reorganization of identity", it would almost seem that ritual in many cultures, function to accomplish just that. This may explain youth preoccupations with such subcultures as the Acid House movement. There may be an innate drive operating during this transition stage to enter altered states of consciousness, and an inherent drive for transformation during these states. Unlike such cultures as the Cahuilla, and the Oglala, these rituals are not guided by ceremonial specialists, they are not institutionalized, and without the safeguards of trained supervisors, such preoccupations can have severe and often fatal consequences.

6.3: Where do we go from Here?

To say that North America is a ritually impoverished culture is an erroneous statement. A multicultural society, North Americans have the advantage of being exposed to a mosaic of rich cultural traditions from all parts of the world. As such, the concept of borrowing rituals from other cultures, and adapting these ceremonies for ones' own purposes has the potential to benefit many individuals. The New Age movement is become increasingly mainstream, and Bantam Books claims that their New Age materials have increased tenfold in the past ten years (Friedrich, 1993:406). At the same time however, caution should also be exercised particularly when dealing with adolescents, as it is this age group which is most likely to seek refuge in the New Age movement. It has been estimated that as many as two to three million Americans have been involved in approximately 3000 New Age religious organizations (Whitset, 1992:363). What is significant however, is of those individuals involved, approximately 85% are between the ages of 19 and 25 (Keiser, 1987:vii). Often in an eagerness to take part in such rituals, participants fail to consider the training and authenticity of instructors, and these ceremonies can have potentially harmful effects, particularly when the symbolic material is archetypal. It is highly unlikely for example, that an individual can become an expert shaman from a weekend workshop on shamanism. One must take into account that among those societies which initiate their youth, prior to the event, an intense degree of ritual training and preparation occurs before the ritual is even enacted. Because of the extremely powerful nature of symbols, Prattis emphasizes the responsibility that rests in

the hands of anthropologists who must “clearly understand the consequences and processes of this combination and to communicate to, and educate, a wider public audience about the awesome power of rituals that activate archetypal material” (1997:223). To an extent, Ronald Grimes has taken on this responsibility by developing the Ritual Studies Laboratory at Wilfrid Laurier University. Believing that “we are a ritually disabled people” (1990a:135), Grimes experiments with cross-cultural ritual activity and investigates how these rituals operate in alternative contexts in the controlled setting of a laboratory. Grimes argues that ritual can be easily exploited and those who participate easily manipulated (1990:1350). At the same time, he argues that academics often fear ritual experience and hide behind the security of theory. By developing a venue for experimentation, Grimes hopes “for the best of both worlds- a deepened capacity for ritual experience and a heightened ability to engage in ritual criticism” (1990a:135).

In addition to individual safety, the appropriation of rituals also has economic and political ramifications. Frequently governments will manage and profit from tourist attractions which essentially exploit the cultural traditions of minority groups, with little knowledge and respect from the rituals they are taken from. Thus realistically, the next step should be a cautious one. Because ritual is an enactment of myth, perhaps the first stage taken in the western context should be a rediscovery of western myths. Curriculum which incorporates a study of western mythology, and explores films and books which deal with adolescent transition may be more appropriate for the school system. Those guidelines outlined by Allan and Dyck (1987) are ideal for the education system. Hinkel (1987) also provides an excellent bibliography of selected films from all over the world

which reflect themes of initiation and life transitions. Outside of the institutionalized academic setting, many organizations are taking initiatives on their own to ease the transition into a new status. In Ottawa for example, the First Unitarian Congregation of Ottawa, under the direction of anthropologist Ray Robertson, has designed an initiation ritual to acknowledge the passage from childhood into adolescence. Ritual preparation involves classes throughout the term which comprises creative writing assignments of self reflection, the construction of masks, and fasting (Robertson:2). The separation, transition, and reaggregation phases are enacted where initiates during liminality are exposed to transformation symbols, dancing, masking, sensory deprivation (blindfolding), meditation, and silence (Robertson: 5-8). According to Robertson, the feedback from both participants and parents has been positive. Thus there exists an enormous potential in our society for the implementation of youth orientated rites of passage. Administered by knowledgeable, and highly trained instructors, the adolescent drive for initiation may be expressed in a safe, efficacious, and appropriate manner.

6.4: Final Thoughts

Anthropology has tended to overlook the significance of ritual drivers in the liminal setting of puberty initiations. Just as shamanism has been argued to be archetypal due to the universal practice of altered states, and the universal neurophysiological effects which take place, it should also be acknowledged, that the puberty initiation is also archetypally driven. In fact, not only are the drivers used to elicit altered states cross-cultural, and their neurophysiological effects universal, but the ritual timing of these rites

further supports the argument for a neurologically patterned base. Those processes linked to increased adolescent cognitive performance such as increased myelination, corpus callosum growth, and cerebral hemispheric growth spurts, may be enhanced by the autonomic nervous system tuning that is so prevalent in many puberty initiations. The ritually induced parasympathetic dominant state which is conducive to learning, memory, and attention, may optimally entrain those neural structures which are developing during puberty.

It has also been illustrated how liminality represents the venue for transformation, how cosmology is vivified in Laughlin's cycle of meaning, and how Prattis's process of metaphor, vibration and form operates at the neurological level. It also appears that there exists a relationship between the intensity of ritual ordeal, and intended transformation. The Cahuilla philosophy which stresses instability, uncertainty, and change is directly experienced by novices through the process of symbolic metaphor and profound transformation. In contrast, it has been argued that societies such as North America, where rites of passage are not practised, underlying this ritual absence, is the conception that rapid and profound transformation is "abnormal" in terms of development. Whereas the Cahuilla puberty initiation is designed to transform, western youth transformation is discouraged due to economically motivated factors. Another central theme from this discussion has been the position of gender and how it is intricately involved in the intentionality of transformation for girls and boys. Among the Cahuilla Indians, the connection between the feminine, the ability to create, and the concept of *power*, suggest that there exists an affiliation between women and the possession of *power*. Those driving

procedures such as datura use, fasting, drumming, and sleep deprivation, are considered by the Cahuilla to represent the means through which this *power* can be obtained. The fact that the majority of these techniques are reserved for men, reinforces the differential access to *power* between the genders, and the inherent female connection to it. This gender difference is also applicable to the Oglala case through the existing paradox between ritual protocol, and White Buffalo Calf Woman, the figure who gave the Oglala people the Seven Sacred Rites. The ritual exclusion of menstruating women, the lack of intense drivers, and the correlation between the female puberty ceremony and White Buffalo Calf Woman, imply that women possess an innate supernatural power, and connection to the sacred realm.

In addition such ritual gender differences accentuate the theoretical limitations to Turner's concept of liminality and *communitas*. The dramatic initiatory ordeals, and the resulting ritual bonding characteristic of *communitas* are generally more appropriate to male rituals. Also dispelled is the myth that female seclusion ceremonies, and exclusion from ritual procedure, signify female degradation and subordination to men.

When we compare how anthropologists once went about the study of puberty initiations, with the techniques that are now employed today, the study of symbolic systems has come a long way. From the revolutionary work of Victor Turner, the tremendous breakthroughs in neuroscience, to the dedicated group of transpersonal anthropologists who have risked their own academic careers in an attempt to experience extraordinary phenomena for themselves, fieldwork, and conceptions regarding ritual have been taken to another level. A shift in consciousness is beginning to take place

among social scientists concerning the efficaciousness of ritual and altered states. Altered states of consciousness are no longer considered to be pathological and abnormal.

Furthermore, the efficacious of these states with respect to psychological and physical healing is also being acknowledged. If this trend continues, perhaps this shift will begin to take place at a more global level. Through a rediscovery of western myths, perhaps there will come a time when the ritual enactment of these sacred texts will replace the unsupervised, and potentially dangerous youth preoccupations of initiation and the adolescent quest for identity.

References

- Allan, J., & Dyck, P.,
1987. Transition from Childhood to Adolescence: Developmental Curriculum.
In Mahdi L.C., Foster S., & Little, M. (eds). *Betwixt & Between: Patterns of Masculine and Feminine Initiation*. La Salle: Open Court
- Ardilo, A., & Moreno, C.
1991. Scopolamine Intoxication as a Model of Transient Global Amnesia. *Brain and Cognition*. Vol 15: 236-245.
- Baruss, I.
1992. Contemporary Issues Concerning the Scientific Study of Consciousness. *Anthropology of Consciousness*. Vol 3: 28-35
- Bean, J.L.
1972. *Mukat's People: The Cahuilla Indians of Southern California*. Berkeley: University of California Press
- Bean, J.L., & Saubel, K.S.
1972. *Temalpakh: Cahuilla Indian Knowledge and Usage of Plants*. Banning: Malki Museum Press
- Benes, F.M., Turtle, M., Khan, Y., & Farol P.
1994. Myelination of a Key Relay Zone in the Hippocampal Formation Occurs in the Human Brain During Childhood, Adolescence, and Adulthood. *Archives of General Psychiatry*. Vol 51:477-484
- Boudewijnse, H.B.
1990. The Ritual Studies of Victor Turner. In Heimbrock & Boudewijnse (eds) *Current Studies on Rituals: Perspectives for the Psychology of Religion*. Amsterdam: Editions Rodopi B.V.
- Bourguignon, E.
1973. Introduction: A Framework for the Comparative Study of Altered States of Consciousness. In Bourguignon, E. (ed). *Religion, Altered States of Consciousness and Social Change*. Columbus: Ohio State University Press
- Brain, J. L.
1977. Sex, Incest, and Death: Initiation Rites Reconsidered. *Current Anthropology*. Vol 18:191-208

- Bynum, C.W.
1996. Women's Stories, Women's Symbols: A Critique of Victor Turner's Theory of Liminality. In Grimes, R.L. (ed). *Readings in Ritual Studies*. New Jersey: Prentice Hall
- Cancian, F.M.
1968. Functional Analysis; Varieties of Functional Analysis. *International Encyclopaedia of the Social Sciences*. Vol 6. USA: Crosswell Collier & McMillan
- d'Aquili, E.G., & Laughlin, C.D.
1996. The Neurobiology of Myth and Ritual. In Grimes, R. (ed) *Readings in Ritual Studies*. New Jersey: Prentice-Hall, Inc.
- d'Aquili, E.G., & Laughlin, C.D.
1975. The Biopsychological Determinants of Religious Ritual Behaviour. *Zygon*. Vol 10(1): 32-59
- Diamond, M.C.
1988. *Enriching Heredity: The Impact of the Environment on the Anatomy of the Brain*. New York: The Free Press
- Dreyer, P.H.
1994. Designing Curricular Identity Interventions for Secondary Schools. In Archer (ed) *Interventions for Adolescent Identity Development*. London: Sage Publications
- Eliade, M.
1964. *Shamanism: Archaic Techniques of Ecstasy*. USA: Princeton University Press
- Eliade, M.
1958. *Rites and Symbols of Initiation*. Dallas: Spring Publications
- Evans-Pritchard, E.E
1937. *Witchcraft, Oracles and Magic Among the Azande*. Oxford: Clarendon
- Farrer, C.F.
1987. Singing for Life: The Mescalero Apache Girls' Puberty Ceremony. *Betwixt & Between: Patterns of Masculine and Feminine Initiation*. In Mahdi L.C., Foster, S., & Little, M. (eds) Open Court: La Salle

- Foster, S.W.
1990. Symbolism and the Problematics of Postmodern Representation. In *Victor Turner and the Construction of Cultural Criticism*. Bloomington: Indiana University Press
- Frazer, J.G.
1922. *The Golden Bough*. New York: Macmillan Publishing Company
- Frecska, E., & Kulcsar, Z.
1989. Social Bonding in the Modulation of Physiology of Ritual Trance. *Ethos*. Vol 17(1): 70-87
- Friedrich, O.
1993. New Age Harmonies. In Lehmann, A.C., & Myers, J.E., (eds). *Magic, Witchcraft, and Religion: An Anthropological Study of the Supernatural*. London: Mayfield Publishing Company
- Gellhorn, E., and Kiely, W.F.
1973. Autonomic Nervous System in Psychiatric Disorder. In Mendels, J. (ed). *Biological Psychiatry*. New York: Wiley
- Gellhorn, E., and Kiely, W.F.
1972. Mystical States of Consciousness: Neurophysiological and Clinical Aspects. *Journal of Nervous and Mental Diseases*. Vol 154: 399-405
- Gellhorn, E.
1969. Further Studies on the Physiology and Pathophysiology of the Tuning of the Central Nervous System. *Psychosomatics*. Vol 10: 94-104
- Giedd, J.N., Rusey, J.M., Castellanos, F.X., Rajapakse, J.C., Kaysen, D., Vaituzis, A.C., Vauss, Y.C. Hamburger, S.D., & Rapoport, J.L.
1996. A Quantitative MRI Study of the Corpus Callosum in Children and Adolescents. *Developmental Brain Research*. Vol 91:274-280
- Gluckman, E.
1962. Les Rites de Passage. In *The Ritual of Social Relations*. Ed Gluckman. London: Manchester University Press
- Grimes, R.
1990. Victor Turner's Definition, Theory, and Sense of Ritual. In Ashley, K.M. (ed). *Victor Turner and the Construction of Cultural Criticism*. Bloomington: Indiana University Press

- Grimes, R.
1990a. *Ritual Criticism: Case Studies in Its Practice, Essays on Its Theory*. Columbia: South Carolina Press
- Guedon, M.F.
1994. Dene Ways and the Ethnographer's Culture. In Young, D.E., & Goulet, J.G. (eds) *Being Changed by Cross-Cultural Encounters: The Anthropology of Extraordinary Experience*. Peterborough: Broadview Press
- Hall, R.C.W., Popkin, M.K., & Mchenry, L.E.
1977. Angel's Trumpet Psychosis: A Central Nervous System Anticholinergic Syndrome. *American Journal of Psychiatry*. Vol 134: 312-314
- Harber, V.J., & Sutton, J.R.
1984. Endorphins and Exercise. *Sports Medicine*. Vol 1: 154-171
- Hauser, S.T., & Kasendor, M.A.,
1983. *Black and White Identity Formation*. Malabar: Robert E. Krieger Publishing Company
- Hebb, D.O.
1949. *The Organization of Behavior: A Neuropsychological Theory*. New York: John Wiley & Sons Inc
- Henry, J.L.
1982. Possible Involvement of Endorphins in Altered States of Consciousness. *Ethos* Vol 10(4): 394-407.
- Henry, J.L.
1982a. Circulating Opioids: Possible Physiological Roles in Central Nervous Function. *Neuroscience & Biobehavioral Reviews*. Vol 6: 29-245.
- Hinkel, R.C.
1987. Transition Films: A Selected Filmography. In Mahdi L.C., Foster S., & Little, M. (eds). *Betwixt & Between: Patterns of Masculine and Feminine Initiation*. La Salle: Open Court
- Hooper, L.
1920. The Cahuilla Indians. *University of California Publications in American Archaeology and Ethnology*. Vol 16: 315-380.

Izzo, R.J.

1973. Physical Growth, Health, and Coordination. In Smart M.S. & Smart R.C. (eds) *Adolescents: Development and Relationships*. New York: Macmillan Company

Jorgensen, J.G.

1980. *Western Indians*. Francisco: W.H. Freeman

Josselson, R.

1994. The Theory of Identity Development and the Question of Intervention. In Archer (ed) *Interventions for Adolescent Identity Development*. London: Sage Publishing Company

Keiser, J.L., & Keiser, T.W.

1987. *The Anatomy of Illusion: Religious Cults and Destructive Persuasion*. Springfield: Thomas

Kett, J.F.

1977. *Rites of Passage*. New York: Basic Books, Inc

Klein, R.M.

1980. D.O. Hebb: An Appreciation. In Jusczyk P.W., & Klein R.M (eds): *The Nature of Thought: Essays in Honor of D.O. Hebb*. New Jersey: Lawrence Erlbaum Associates

Krippner, S.

1991. Research Strategies in the Study of Shamanism and Anomalous Experience. *The Anthropology of Consciousness*. Vol 2: 13-19

Kroeber, A.L.

1925. *Handbook of the Indians of California, Volume II*. Washington. Washington Government Printing Office

Laughlin, C.D.

1997. The Cycle of Meaning: Some Methodological Implications of Biogenetic Structural Theory. In Glazer S.D. (ed): *The Anthropology of Religion*. Westport: Greenwood Press

Laughlin, C.D.

1996. Day One: the Basic Tenets of Biogenetic Structural Theory. In *Charlie Laughlin's Home Page: Self Guided Tutorial in Biogenetic Structuralism*. Internet: <http://www.carleton.ca/~claughli>

- Laughlin, C.D.
1996a. Transpersonal Anthropology, Then and Now. *Self Guided Tutorial in Biogenetic Structuralism*. Internet: <http://www.carleton.ca/~claughli>
- Laughlin, C.D.
1996b. Transpersonal Anthropology: Some Methodological Issues. *Self Guided Tutorial in Biogenetic Structuralism*. Internet: <http://www.carleton.ca/~claughli>
- Laughlin, C.D.
1995. Archetypes, Neurognosis and the Quantum Sea. *Self Guided Tutorial in Biogenetic Structuralism*. Internet: <http://www.carleton.ca/~claughli>
- Laughlin, C.D.
1994. The Cycle of Meaning: Some Methodological Implications of Biogenetic Structural Theory. In Prattis (ed) *Culture and Symbols*. Ottawa: Carleton University Press
- Laughlin, C.D., McManus, J., & d'Aquili E.G.
1990. *Brain, Symbol & Experience: Toward a Neuropsychology of Human Consciousness*. New York: Columbia University Press
- La Fontaine, J.
1985. *Initiation*. Drayton: Penguin
- Lee, C.S., & Spector, S.
1991. Changes of Endogenous Morphine and Codeine Contents in the Fasting Rat. *The Journal of Pharmacology and Experimental Therapeutics*. Vol 257 (2): 647-650
- Lewis, E.D.
1988. A Quest for the Source: The Ontogenesis of a Creation Myth of the Ata Tana Ai. In Fox J.J. (Ed) *To Speak in Pairs: Essays on the Ritual Languages of Eastern Indonesia*. New York: Cambridge University Press
- Lex, B.W.
1979. The Neurobiology of Ritual Trance. *Spectrum of Ritual*. New York: Columbia University Press
- Lex, B.W.
1975. Physiological Aspects of Ritual Trance. *Journal of Altered States of Consciousness*. Vol 2(2): 109-121.

- Lyon, W.S.
1991. The Visionary Experience in North American Shamanism. *The Anthropology of Consciousness*. 2(1-2): 20-24
- Malinowski, B.
1954. *Magic, Science and Religion*. New York: Doubleday Archer Books
- MacDonald, G.F., Cove, J.I., Laughlin, C.D., & McManus, G.
1989. Mirrors, Portals, and Multiple Realities. *Zygon*. Vol 24: 39-64
- Mandel, A.
1980. Toward a Psychobiology of Transcendence: God in the Brain. In Davidson, J., & Davidson, R. *The Psychobiology of Consciousness*.(eds). New York:Plenum
- McKenna, T.
1992. *Foods of the Gods: The Search for the Original Tree of Knowledge*. New York: Bantom Books
- Milgram, N.W., MacLeaod, C.M., & Petit, T.L.
1987. Neuroplasticity, Learning and Memory. In Milgram N.W., MacLeod C.M., & Petit T.L., (eds) *Neuroplasticity, Learning, and Memory: Proceedings of a Symposium Held at the University of Toronto*. New York:Alan R. Liss, Inc
- Mitchel, J.J.
1992. *Adolescent Struggle for Selfhood and Identity*. Calgary: Detselig Enterprises Ltd.
- Morgan, W.P.
1984. Affective Beneficence of Vigorous Physical Activity. *Medicine and Science in Sports and Exercise*. Vol 17: 94-100
- n.a.
1998. *Datura: Datura dn Brugmansia species as Sacred Plants and Medicines*. Internet <http://b-and-t-world-seeds.com/datura.htm>
- Neher, A.
1961 Auditory Driving Observed with Scalp Electrodes in Normal Subjects. *Electroencephalography and Clinical Neurophysiology*. Vol 13: 449-451
- Newberg, A.B., & d'Aquili, E.G.
1994. Aftereffects of Near-Death Experiences: A Survival Mechanism Hypothesis. *The Journal of Transpersonal Psychology*. Vol 26: 107-115

- Peel, E.A.
1975. *Development of Intelligence and Education*. In Berenberg, S.R (ed)
Puberty: Biologic and Psychosocial Components. Leiden: H.E. Stenfert Kroese
- Powers, M.N.
1986. *Oglala Women: Myth, Ritual and Reality*. Chicago:University of Chicago Press
- Powers, M.N.
1980. Menstruation and Reproduction: An Oglala Case. *Signs: Journal of Women in Culture and Society*. Vol 6: 54-65
- Powers, W.K.
1987. *Beyond the Vision: Essays on American Indian Culture*. Norman: University of Oklahoma Press
- Powers, W.K.
1986a. *Sacred Language: The Nature of Supernatural Discourse in Lakota*. London: University of Oklahoma Press
- Powers, W.K.
1975. *Oglala Religion*. University of Nebraska Press: Lincoln/London
- Prattis, I.
1997. Metaphor, Vibration and Form. *Anthropology At the Edge: Essays on Culture, Symbol and Consciousness*. Boston: University Press of America
- Prattis, I.
1994. *Culture & Symbol* 54.334. Carleton University
- Price-Williams, D.
1994. Shamanism and Altered States of Consciousness. *Anthropology of Consciousness*. Vol 5(2): Pg 1-15.
- Prince, R.
1982. Shamans and Endorphins: Hypotheses for a Synthesis. *Ethos*. Vol 10: 409-423.
- Rahkila, P, Hakala, E., Salminen, K., & Laatikainen, T.
1987. Response of Plasma Endorphins to Running Exercises in Male and Female Endurance Athletes. *Medicine and Science in Sports and Exercise*. Vol 20: 451-455

- Robertson, R.,
The Coming-of-Age Ritual For A Growing Up Year. Ottawa: First Unitarian
 Congregation of Ottawa
- Pujol, J., Vendrell, P., Junque, C., Marti-Vilata, J.L, & Capdevila, A.
 1993. When Does Human Brain Development End? Evidence of Corpus
 Callosum Growth up to Adulthood. *Annals of Neurology*. Vol 34(1): 71-75.
- Radcliffe-Brown, A.R.
 1952. *Structure and Function In Primitive Society*. New York: The Free Press
- Radcliffe-Brown, A.R.
 1922. *The Andaman Islanders*. New York: The Free Press
- Reinis, S. & Goldman, J.M.
The Development of the Brain: Biological and Functional Perspectives.
 Springfield Illinois: Charles C Thomas
- Ruby, R.H.
 1955. *The Oglala Sioux: Warriors in Transition*. New York: Vantage Press, Inc
- Rutter, M.
 1975. Changing Patterns of Psychiatric Disorders during Adolescence. In
 Berenberg, S.R. (ed) *Puberty: Biologic and Psychosocial Components*. Leiden:
 H.E. Stenfert Kroese
- Santrok, J.W.
 1993. *Adolescence* (5th edition). Wisconsin: Brown & Benchmark Publishers
- Schultes, R.E., & Hofmann, A.
 1992. *Plants of the Gods: Their Sacred, Healing and Hallucinogenic Powers*.
 Rochester: Healing Arts Press
- Schultes, R.E.
 1977. The Botanical and Chemical Distribution of Hallucinogens. In Du Toit,
 B.M. A.A. Balkema(eds) *Drugs, Rituals and Altered States of Consciousness*.
 Rotterdam
- Stein, D.G., Brailowsky, S., & Will, B.
 1995. *Brain Repair*. New York: Oxford University Press

- Stephens, W. N.
1967. A Cross-Cultural Study of Menstrual Taboos. *Cross Cultural Approaches: Readings in Comparative Research*. Ed Ford C.S. NewHaven: HRAF Press
- Strong, W.D.
1929. *Aboriginal Society in Southern California*. Berkeley: University of California Press
- Thatcher, R.W., Walker, R.A., & Giudice, S.
1987. Human Cerebral Hemispheres Develop at Different Rates and Ages. *Science*. Vol 236: 1110-1113
- Turner, V.W.
1987. Betwixt and Between: The Liminal Period in Rites of Passage. In Mahdi L.C., Foster S., & Little M. (eds): *Betwixt & Between: Patterns of Masculine and Feminine Initiation*. La Salle: Open Court
- Turner, V.W.
1983. Body, Brain, and Culture. *Zygon*. Vol 18 no. 3: 221-245
- Turner, V.W.
1977. Variations on a Theme of Liminality. In Morre S.F., & Myerhoff, B.G. (eds): *Secular Ritual*. Amsterdam: Van Gorcum
- Turner, V.W.
1969. *The Ritual Process*. Chicago: Aldine Publishing Company
- Turner, V.W.
1968. *The Drums of Affliction*. Oxford: Clarendon Press
- Turner, V.W.
1967. *The Forest of Symbols, Aspects of Ndembu Ritual*. New York: Ithaca
- Turner, V.W.
1957. *Schism and Continuity in an African Society*. Manchester: Manchester University Press
- Van Gennep, A.
1904. *Rites of Passage*. London: Routledge & Kegan Paul
- Winkelman, M.
1997. Altered States of Consciousness and Religious Behaviour. In Glazer S.E. (ed): *The Anthropology of Religion*. Westport: Greenwood Press

Winkelman, M.

1994. Multidisciplinary Perspectives on Consciousness. *Anthropology of Consciousness*. Vol 5:16-25

Winkelman, M.

1993. The Evolution of Consciousness? Transpersonal Theories in Light of Consciousness. *Anthropology of Consciousness*. Vol 4:3-9

Winkelman, M.

1986. Trance States: A Theoretical Model and Cross-Cultural Analysis. *Ethos* 14:174-203

Whiting, J.W.M., Kluckhohn, R., and Anthony A.

1958. The Function of Male Initiation Ceremonies at Puberty. In Maccoby, E., Newcomb T., and Hartley E. (eds) *Readings in Social Psychology 3rd ed.* New York: Rinehart and Winston Inc.

Whitsett, D.P.

1992. A Self Psychological Approach to the Cult Phenomenon. *Clinical Social Work Journal*. Pg 363-375

Yakovlev, P.I., & Lecours, A.R.

1967. The Myelogenetic Cycles of Regional Maturation of the Brain. In Minkowdki, A (ed). *Regional Development of the Brain in Early Life*. Oxford: Blackwell Scientific

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