8-1989

Cultural Performance and Differential Fitness in a U.S. University Population

Hector N. Qirko

To the Graduate Council:

I am submitting herewith a thesis written by Hector N. Qirko entitled "Cultural Performance and Differential Fitness in a U.S. University Population." I have examined the final electronic copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Arts, with a major in Anthropology.

Michael H. Logan, Major Professor

We have read this thesis and recommend its acceptance:

Fred Smith, Jan Simek

Accepted for the Council:
Carolyn R. Hodges

Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

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CULTURAL PERFORMANCE AND DIFFERENTIAL FITNESS IN A U.S. UNIVERSITY POPULATION

A Thesis

Presented for the

Master of Arts

Degree

The University of Tennessee, Knoxville

Hector N. Qirko

August 1989

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ACKNOWLEDGEMENTS

This thesis has benefitted greatly from the help provided by a number of individuals. Martha Masengill, as Assistant Vice-Chancellor for Alumni Affairs, University of Tennessee, was kind enough to provide a computer print-out of 400 U.T. alumni names, along with their current addresses, without which the study contained herein would not have been possible. She also made helpful suggestions regarding the survey instrument utilized. Julian Ray acquainted me with the use of computer hardware and software, including the SAS programs utilized for data analysis. He patiently endured hours of what must have seemed very silly questions, for which I am very grateful.

I was fortunate to have serving on my thesis committee Drs. Fred Smith and Jan Simek. I am grateful to both for their careful reading of thesis drafts and their probing questions and insightful comments, the results of which are a much improved final product.

To my thesis chairman, Dr. Michael Logan, I owe thanks on at least three levels. In the first place, while it is almost obligatory to state in acknowledgements such as these that the work could not have been completed without an individuals's help, in this case it is certainly true. The term "cultural performance" is not mine, it is Dr. Logan's. The theory behind it has been hammered out by both of us over the past two years, and continues to be today. While

the ultimate responsibility for this thesis, with all its flaws, certainly belongs to me, the ideas contained within must be seen as a collaboration, one which I might add has been, to me at least, of the most enjoyable and exciting kind.

To Dr. Logan I am also indebted for his thorough and patient editing, to which must be attributed any good writing which has found its way into this work. Thirdly, and perhaps most importantly, it is his example as a cultural anthropologist that I have learned the most from, and am most grateful for.

Finally, I would like to dedicate this work to my wife Sandra and my son Matthew, both of whom sacrificed a great deal so that it could be completed.

ABSTRACT

The notion of "cultural performance" is proposed as a theoretical paradigm for the cross-cultural understanding of the relationship between cultural and biological goals. The concepts of conformity and manipulation are discussed, and literature is cited in support of the notion that performing a cultural script, regardless of its nature (thus accounting for the persistence of "neutral" and even maladaptive traits), is adaptive in a Darwinian sense. Lastly, a study is presented in which an attempt has been made to support the hypothesis that cultural performance is adaptive. Former students of the University of Tennessee (class of 1965) were questioned regarding their cultural performance, which was operationalized in terms of participation in group activities and a "sense of belonging", or conforming, to the group. This information was compared to the students' biological performance in terms of somatic and reproductive fitness. Results suggest that there is a relationship between the two variables, as those who "performed" better averaged greater sexual access while at the university and higher realized fertility in subsequent life history.

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CHAPTER I

INTRODUCTION

In the last decade there has been a serious attempt on the part of anthropologists to utilize principles of evolutionary biology for understanding human cultural behavior. Inspired by the work of Hamilton (1964, 1963), Wilson (1975) and Alexander (1979), among others, anthropologists such as Chagnon and Irons (1979) and a new generation of students they have helped instruct (Borgerhoff Mulder 1987a; Betzig 1986; Turke 1984), have begun to successfully correlate human cultural behavior with individual somatic (pertaining to maintenance of the phenotype) and reproductive success. There are still problems, however, to be resolved in this endeavor. For example, one might ask which aspects of cultural behavior are of primary importance; how should investigators approach this kind of research in the face of cross-cultural variability; and will such correlations be found in modern populations in demographic transition (Betzig 1988; Borgerhoff Mulder 1987a, 1987b; Gray 1985; Flinn and Alexander 1982)? Additionally, a more general problem persists involving the reluctance of social scientists, including the majority of cultural anthropologists, to accept the input available from what is often seen as an inappropriate paradigm in the realm of human social

behavior, i.e., evolutionary biology (Alexander 1988, 1987, 1979; Chagnon 1987; Blute 1979).

As Borgerhoff Mulder has expressed it, "there is a clear need to provide some form of independent assessment of cultural goals, to support the argument that cultural success is a proximate means of achieving high reproductive success" (1987a:618). This thesis adds to the literature which attempts to demonstrate the utility of evolutionary biological theory in the analysis of cultural behavior, and hopefully will contribute to filling the need described above by proposing a theoretical concept, "cultural performance" (Logan and Qirko 1989), which should be helpful in dealing with problems of cross-cultural variability in cultural goals. Briefly stated, the term cultural performance describes a postulated human predisposition to conform to and manipulate cultural trait complexes. In a very real sense, then, each individual "performs" by manipulating traits to maximum biological advantage.

The problem of testing for biological performance in modern and/or monogamous societies (Vining 1986) is also addressed by means of cultural performance theory and by the presentation of several indirect measures of reproductive success.

Additionally, with the use of original data, the hypothesis that individuals who perform better culturally are rewarded biologically in terms of increased somatic and

reproductive success is tested. Questionnaires, which were sent out to four hundred University of Tennessee alumni, class of 1965, generated data on a specific operationalization of the concept of cultural performance. When correlated with data regarding individual real and potential reproductive fitness, results show that there is indeed a statistically significant relationship between cultural and biological performance for the data in question. Although more complete and systematic studies are required, this study establishes that there is clearly a basic link between cultural performance and reproductive success in the modern setting.

As the literature on culture goals and reproductive success has thus far failed to introduce notions of cultural performance which transcend specific cultural orientations, and has also had difficulty with tests of biological fitness in modern industrialized nations, this study is particularly relevant at this time. The theory of cultural performance is shown to have utility in that it can be universally applied, and in that it directs the focus of inquiry away from status and/or wealth as the sole indicators of individual cultural success. Additionally, as evidence is presented in defense of the presumption of genetic foundations for cultural performance behavior, the emphasis is placed on ultimate human cultural capacities rather than on more proximate mechanisms. As the ability to succeed culturally must be a

product of selection (if it indeed correlates to differential biological success), a focus on ultimate genetic capacities is of prime importance.

More generally, as Lumsden and Wilson (1981:345) have stated, "human nature may be simpler and more transparent than we thought...". Attempts are beginning to be made to understand complex phenomena, both biological and physical, in terms of simple underlying rules (see Gleick 1987 and "chaos" theory), and this thesis is an attempt to contribute to that general orientation.

Chapter II, then, will establish and define the basic concepts involved, in both biological and cultural terms. Chapter III deals with a review of the literature, focusing on the recent contributions of evolutionary biological theory to an understanding of human social behavior. The use of evolutionary theory in cultural anthropology is similarly discussed. A specific test of the cultural performance approach is presented in Chapter IV, while Chapter V deals with the relevance of the present study and the utility of the concept of cultural performance. In this final chapter concrete recommendations for future, more detailed research are presented as well.

CHAPTER II

CONCEPTS AND TERMINOLOGY

A. Evolutionary Biology

"Just as a fast deer is fitter than a slow one, so the fast herd is fitter than the slow one. But according to [George C.] Williams, the fitness of the group is a mirage. It is a reflection of something real--namely, the fitness values of individuals in the group. It fosters an illusion--namely, that selection works for the good of the group, rather than for the good of individuals. This is an illusion that has tricked a number of evolutionists" (Sober 1984:3, emphases his).

Darwinian evolutionary theory rests squarely on the notion of selection. As Sober (1984) has put it, "it is remarkable that a hypothesis of such explanatory power could be so utterly simple conceptually: if the organisms in a population differ in their ability to survive and reproduce, and if the characteristics that affect these abilities are transmitted from parents to offspring, then the population will evolve" (p.22).

All that is required for evolutionary change, then, is variability within populations and transmission of that variability through succeeding generations. This is true as long as that variability takes place in realms, physiological or behavioral, which affect individual survival and reproduction. Darwin's "one long argument" in the Origin of Species (1859) was simply to establish that evolution has in fact occurred, and that it is powered

primarily by the process of selection (Maynard Smith 1982a:1).

Clearly, "the existence of variation is...a necessary condition for evolution" (Ayala 1983:2). The greater the number of genetic mutations, or heritable change in genetic material, the greater the likelihood of change in a population with respect to the frequency of a given allele. Along with the interacting forces of flow (movement of genes from one population to another) and drift (random genetic changes in small populations), the resulting variation provides the raw material upon which selection can act. Transmission, of course, involves for the most part the mechanism of reproduction.

Variation is arrived at in the context of the gene, but this information was not available to Darwin. It became apparent only upon the rediscovery of Mendel's laws in the early twentieth century. This has allowed room for the argument that, in strictly Darwinian terms, neither the unit of selection, nor the specific means of variation and transmission is important, and therefore that cultures themselves can be seen to have "evolved." After all, differential enculturation, as well as cultural innovations, do create variation in cultural traits, and the learning process is clearly a mechanism of transmission (cf. Boyd and Richerson 1985; Durham 1978; Dawkins 1976). This "co-evolutionary" approach, however, has been criticized as

based on weak analogies (Daly 1982) and fundamentally unnecessary, as "even when humans live in variously cooperative and socially complex groups they do so because, historically, group-living has enhanced the reproductive success of individuals" (Alexander 1979:65). Alexander's assumption, which underlies this thesis as well, is that cultural behavior can and must be explained in terms of individual differential fitness. However, as the term "fitness" has historically held several meanings, a brief discussion of its use here is necessary.

Williams (1981; see also O'Donald 1982) has identified three distinct uses of the term "fitness" in biological and socio-biological literature. The first is what we might call classical fitness, or Darwinian fitness. It simply refers to the rate of increase of a unit of selection. Williams argues that this unit need only three properties--a finite lifespan, its appearance in identical forms in succeeding generations, and its appearance in different frequencies in those generations. Therefore, any of a number of units of selection can be and have been identified, including "genotypes, genes, phenotypes, mating types, nucleotides, and perhaps chromosome segments..." (Williams 1981:171).

The second use of the term fitness refers more correctly to selective value, and Williams illustrates the difference between the two by utilizing the example of the sickle cell polymorphism, and "fitness values" of .85, 1.00

and .05 for genotypes AA, AS and SS, respectively. In terms of classical fitness, if equilibrium has been reached and no genotype is increasing more rapidly than another, these three genotypes have equal fitness, as do both alleles. In terms of selective values, however, they differ dramatically.

Finally, and most relevant to this thesis, a third use of the term fitness has arisen out of sociobiological literature. It represents "the lifetime contribution of a genotype to the next generation; it is an expected value. The `fitness' of these discussions is something which can change within the lifetime of an individual" (Williams 1981:172). Williams points out that some have labeled this concept "reproductive success" in order to avoid potential terminological confusion. However, this third meaning of "fitness" involves a strong somatic component, which is of necessity ignored if reproductive success is the sole criterion utilized. "Somatic effort evolves to increase residual reproductive value by rendering subsequent reproductive effort more effective" (Alexander 1987:42). While in a sense somatic and reproductive effort in the individual are opposites, as somatic effort amasses resources while reproductive effort redistributes genes, they are both ultimately linked to the fitness of individuals, as in Williams' third definition, and

"together make up the raison d'etre of the phenotype" (Alexander 1987:42).

It is this third definition of fitness which predominates in the studies which deal with correlating cultural and biological success (Chagnon 1988a; Caro and Borgerhoff Mulder 1987), although in many cases biological success is defined solely as reproductive success (Essock-Vitale 1984; Hill 1984). For the purposes of this thesis, the concept of fitness will be defined as "somatic and reproductive success," and it will be broken down into its specific components in order to compare each with variance in cultural success.

Another concept which needs to be addressed involves measures of reproductive success. While a number of researchers have found correlations between particular cultural goals--such as wealth, status, aggression, skill in hunting, etc.--and variance in individual reproductive success, (see Betzig 1988; Borgerhoff Mulder 1987a for reviews and Chapter III in this thesis), with very few exceptions such findings have been uncovered only in traditional and/or polygamous societies. As has been well documented (cf. Wrong 1980; Andorka 1978), there appears to be an inverse correlation between social and reproductive success in modern cultures, beginning in Europe and the United States in the eighteenth century and, save for the "baby boom" of 1935-1960, continuing to the present.

Investigators who attempt to correlate social and biological success face two problems in modern societies. "In the first place, the wealthier the culture, the lower the overall fertility rate of that culture. In the second place, within the wealthier cultures at least, those of higher status under-reproduce relative to those of lower status--that is, the better endowed do not translate their superior status into superior relative fitness within these cultures" (Vining 1986:177, emphasis his). As will soon be discussed, this may pertain to definitions of human "endowments," but the problem remains that real fertility measures, i.e., number of children, or even number of children who themselves reach reproductive age, cannot be expected to yield results in the modern setting similar to those in small, indigenous cultures.

For this reason the present study attempts to measure potential, as well as actual, reproductive success, assuming that, regardless of the proximate reasons for the modern situation, individuals are still ultimately attempting, albeit unconsciously, to maximize their reproductive fitness. Betzig (1988; see Chapter III) has identified a number of such indirect measures of fitness, and it is assumed that those and other measures are useful indicators of individual variance in reproductive fitness.

The underlying premise to be tested in this study, then, is that cultural performance will correlate with

individual fitness, with fitness defined in terms of real or potential measures of somatic and reproductive success. It now remains to define cultural success in terms that provide some measure of universal utility in the face of cross-cultural variability in cultural goals.

B.Cultural Performance

"Mr. Howard sent me to the changing room to try on a suit, then again to try on another one...I was worried that he wouldn't find anything that he liked but kept my mouth shut. I understood that I was being outfitted not for pleasure but for survival, that these clothes were a finely nuanced language that the boys in my new world would read at a glance and judge me by, even as I had judged other boys by the uniforms they wore" (Excerpt from This Boy's Life, by Tobias Wolff 1989:274).

Recently Napoleon Chagnon published an article in Science (1988), in which he discussed the differential reproductive success experienced by Yanomamo males who have killed other males in warfare. These killers, referred to as unokai, are apparently "rewarded" with more wives and children than are those who have not killed. As Chagnon puts it, "the higher reproductive success of unokais is mainly due to their greater success in finding mates, either by appropriating them forcibly from others, or by customary marriage alliance arrangements in which they seem to be more attractive as mates than non-unokais" (1988:989).

Soon after the appearance of this article, John Moore (1988) gave a paper at the Plains Conference in which data obtained from the Cheyenne were utilized to counter what

Moore sees as Chagnon's underlying implication, that there is a general evolutionary trend toward a correlation between male aggression and reproductive success. Moore argues that, for the Cheyenne, it was the peace chiefs rather than the war chiefs who, for a variety of reasons, enjoyed greater longevity and thus greater reproductive fitness.

This is a case of a hypothesized correlation between biological performance and a cultural value (in this case "aggression") being challenged with cross-cultural data. While Chagnon probably assumes only that "humans strive for goals that their cultural traditions deem as valued and esteemed" (1988:985, emphasis mine), Moore has apparently assumed that Chagnon is attempting to define aggression as a cultural goal rewarded in reproductive terms for most or all tribal level societies.

Unfortunately, the confusion inherent in this particular argument can be found all across the literature that deals with cultural and biological success. Whenever an investigator begins to generalize (or, as in the case of Chagnon, is perceived as generalizing) about specific cultural traits, he or she is met with data from other cultures that contradict what was originally advanced. For example, Alexander (1979) and others (Kurland 1979) who attempted to establish the fitness-enhancing properties of the avunculate have had their data challenged with the ethnographic record (Kitcher 1987). Another example is the

famous Harris/Wilson debate (Harris and Wilson 1978), which involved the use by Harris of contrasting ethnographic data from the Nayar of India and the Bathonga of Mozambique in order to deny Wilson's claim that human behaviors are a product of natural selection (c.f. Alexander 1979:95).

The fact is that while most investigators apparently agree that cultural goals, be they aggression (Chagnon 1988), wealth (Essock-Vitale 1984; Irons 1979), status (cf Hill 1984), even hunting prowess (Kaplan and Hill 1985a, 1985b), can, under certain circumstances, be correlated with enhanced reproductive fitness, there are many different goals manifested cross-culturally, as well as within one culture. This variability, as well as the biases of investigators in defining and analyzing it (c.f. Borgerhoff Mulder 1987a), make it very difficult to imagine and establish the genetic "commands" that must be expected to exist if cultural and biological selection are indeed directly related.

It is suggested here that, although sociobiologists and "evolutionary biological anthropologists" (to use Borgerhoff Mulder's unfortunately rather awkward label) are on the right track in pursuing correlations between biological and cultural success, the latter variable must be examined and perhaps redefined in order to explain temporal, cross-cultural and intra-cultural variability. What is required is a more appropriate theoretical perspective on cultural

success than that which has been provided thus far, one that can translate simply into a heritable trait. Further, it is clear that any definition of culture that utilizes a Darwinian perspective must provide a satisfactory explanation for the existence of traits and their spread, in particular those which are traditionally thought of as neutral in terms of their effect on genic transmission (Durham 1982, Carneiro n.d.). As Daly (1982), Flinn and Alexander (1982) and others have pointed out, a "co-evolutionary" interpretation of culture, that is, one that sees cultural transmission as analogous to genetic transmission (cf. Durham 1978), is inadequate. They propose a framework for the analysis of cultural traits that allows for a single evolutionary process, rather than a continuation of the separation of nature and culture (Chagnon 1987) that is implicit in coevolutionary interpretations.

Clearly, there is a capacity for humans to learn culture, a capacity that has been established and continues to evolve through the process of natural selection (Rindos 1986, 1985). It follows, then, that those who learn their culture best frequently leave more descendants than those who do not, if indeed the first statement is to be accepted. The problem lies in that the typical operationalization of "learning culture", i.e., the acquisition of cultural goals, has not been defined cross-culturally (Borgerhoff Mulder

1988; Boone 1986; Mealey 1985; Irons 1979, etc.). As discussed above, notions of wealth, status or prestige, aggression, skill at particular endeavors, etc. are defined as cultural goals, but only in culture-specific settings.

This approach has led to two problems. First, it is difficult to generalize upon data based on culture-specific values. In this context, Moore is perfectly justified in disallowing for the Cheyenne any generalizations based on data gathered from the Yanomamo. The literature is replete with examples of interesting and stimulating correlations between social and biological behavior that, based as they are on culture-specific cultural variables, provide little more than suggestions of what ultimately motivates humans (see, for example, Betzig et al, 1988).

The second problem is that, difficult as it is to ascertain what genetic component may underlie human socio-cultural behavior, the task is further complicated by the varied and often conflicting operationalizations of cultural goals. There is clearly a need to provide not only the "independent assessment" of cultural goals Borgerhoff Mulder requests, but some generalizations about the attributes which might identify such goals cross-culturally. Part of the problem certainly involves methodology; that is, in determining that etically defined goals are consistent with emic perceptions (as Borgerhoff Mulder points out; also Irons 1979). However, these proximate goals may be as

unconscious as ultimate ones are assumed to be (Chagnon 1988:985). Since in most cases we would expect more motivations than merely "wealth" or "status" to be individual lifetime goals, especially in complex societies, the root of the problem seems to lie in an incomplete understanding of the nature of cultural goals.

Several investigators have attempted to envision simple genetic commands, or rules, that could operate as relatively straight-forward units of selection and yet account for the complexity and variability present in the cultural record. Rushton's (1987) theory of genetic similarity is one such attempt. It is basically an expansion of Hamilton's (1972, 1964) observation that some proximate mechanism for the identification of kin would need to exist if inclusive fitness theory is accurate, as it is difficult for an individual in a given species to ascertain with confidence the degree of kinship it shares with another (except mother-infant and, under certain conditions, sibling cases). Rushton's "rule" is simply that one should be altruistic toward individuals one resembles, and he cites data to support his contention that human beings are, to some extent, able to identify genetic similarity to themselves in others and act accordingly. However, as different societies practice different degrees of altruism (compare the Yanomamo and the !Kung, for example), and much altruistic behavior is apparently learned (Rushton 1980), the degree to which

Rushton's rule can be thought to be genetically determined is difficult to understand.

Flinn and Alexander (1982) have proposed that human beings have internal genetic "cues" which command them to "imitate those who are successful." Thus, what one sees in the ethnographic record, the "incredible complexity and unpredictability of human social environments" (1982:394), is in essence the phenotypic expression of these individual cues as affected by natural and social environments, by chance (or cultural drift) and, importantly, by history, or "the cumulative results of past psychological selection [of cultural traits] by other individuals" (p.394).

The trouble with the "imitate those who are successful" rule that Flinn and Alexander propose is that, unless one measures success by the number of children an individual has (which is clearly only occasionally and indirectly relevant, and circular as well), one is back to the varied cultural goals one attempts to rise above (or dig beneath). What, after all, does "success" mean?

Boyd and Richerson's "conformist transmission" (1985), although perhaps the closest to the mark, involves a rule based on a "frequency dependent bias" (p.135) to conform to the most commonly adopted cultural trait variant. In other words, individuals might "use the commonness of a variant among their models as an indirect measure of its merit" (p.206), and thus adopt it. This process assumes a "naive"

individual (one not predisposed toward the merits of one variant over another), and the means for such an individual to assess the popularity of variants and choose between them (see also Lumsden and Wilson 1981:103). Clearly, there are no "naive" individuals who can decide on the merits of traits in a cultural vacuum, as this runs counter to the dynamics of the enculturative process. After all, as pointed out by Boyd and Richerson themselves (1985:40-53), children learn a great deal of their culture by being exposed to only one variant of many traits: that of their parents.

It is proposed here that a useful paradigm might involve the visualization of cultural success as a simple rule, one which can be stated as: "conform to whatever cultural environment you are raised in, and then manipulate it to maximize your own individual advantage."

Obviously, whatever an individual's parental generation has "done" in cultural terms has been successful enough to allow for the birth of the individual in question, and thus should be replicated as quickly and efficiently as possible. However, as we are clearly endowed with the capacity to be flexible (as Daly has put it, "people are more facultative strategists than [many] models allow..." [1982:403]), we can, to some degree, manipulate our cultural environment should it be perceived to be to our advantage. Much like language, culture is that which must be learned in order to survive. While survival is of paramount importance in terms

of function, there is little intrinsic importance in its specific form. Just as there are and have been thousands of languages, each with its own phonetics, morphology and syntax, so too there are and have been thousands of cultures, each to one degree or another historically and dynamically unique, and each equally crucial for the individual born into to mimic, understand and manipulate.

In fact, it can be argued that language's "deep structure" (Chomsky 1972), whatever it may consist of (although that it is genetically based seems difficult to argue with--see Lumsden and Wilson 1981:49-52; Moskowitz 1978; Hockett 1960), is but part and parcel of the same capacity for knowledge and trait manipulation that individuals possess. Peters (1981) has suggested that the capacity for language may be based on principles of a very general nature. Furthermore, it may be possible to show that "all motor behavior is characterized by the same structural organizing principles that are evident in speech" (p.683). Therefore, just as we mimic and then creatively utilize whatever language our parental generation utilizes, we may mimic and creatively manipulate our notions of our parental generation's strategies regarding mate selection (Buss 1985), parenting (Draper and Harpending 1988), projections of ethnicity (Phinney and Rotheram 1987), etc. And just as individuals manipulate language markers in order to associate (or disassociate) themselves with membership in a

given social group (Labov 1972), so too do individuals utilize other cultural traits for advantage, one which can translate into greater somatic and reproductive success (cf. Logan and Qirko 1989).

This, then, is a view much like that of cognitive anthropology, in that "a society's culture consists of whatever it is one has to know or believe in order to operate in a manner acceptable to its members" (Goodenough, in Keesing 1974:77). However, if culture in this sense is viewed through the filter of strict Darwinian evolutionary theory, then certain individuals must "operate" more successfully in cultural terms than others, and thus enjoy increased inclusive fitness. It is also a view of culture as a complex of historical traits (as in Tylor, and Boas [Applebaum 1987], but also Gould [1985]). Some traits are clearly directly related to somatic and reproductive survival, others the result of accident, drift, diffusion, and even of directed culture change (Carneiro 1985). Yet all traits are replicated and manipulated by individuals, thus benefiting themselves and their genes as found in their relatives.

Therefore, Chagnon and Moore are both correct, as in Yanomamo culture a man who kills an enemy is "rewarded" with greater access to wives, while in Cheyenne culture the peace chiefs have succeeded in attaining the same (perhaps unconscious) goal. In both cases, the benefit goes to

individuals who have conformed to the values of their particular cultural settings to maximum advantage. Those who are "good Yanomamo", or "good Cheyenne", enjoy increased fitness. And, just as Two Leggins in the mid-eighteen hundreds invented a vision for himself (Nabokov 1967), or Senator Joseph Biden in 1987 was discovered to have invented a good grade point average for his resume, individuals can try to manipulate these cultural values for proximate (and therefore ultimate) rewards with varying degrees of success. Cultural performance, when properly executed, is typically rewarded with increased somatic and reproductive fitness (Chagnon 1988; Alexander 1987).

While it remains to be established that those who conform are those with higher reproductive and somatic success, it does appear clear, based on studies in childhood and adult socialization and social psychology, that human beings are "programmed" to conform. Asch (1956), for example, has shown that individuals having a minority opinion tend to deny their own views and conform to group norms. Berscheid (in Aronson 1972:9) has noted that people have a tendency to explain away behavior they are not comfortable with by labelling those responsible in such a way as to exclude them from the group. Spradley (1970) reveals that the severity of sentencing for alcohol abuse is based in large measure on the image of the accused: "drunks" versus "solid citizens." Aronson (1972:15) argues that, in

our own society, where individualism is highly prized, nonconformists may be praised long after their actions, but are usually met with extreme resistance while carrying them out. Schachter (1951) demonstrated through experimental studies that individuals who conform the most to group norms are the most liked. Interestingly, in many cases it appears that "the pressure to conform to the judgements of others has little (if any) effect on the private judgements of experimental subjects" (Aronson 1972:21, emphasis his). This would suggest the element of manipulation, which is, along with conformity, a component of the notion of cultural performance, and one discussed later in this chapter. Similarly, Kiesler et.al. (1966) have shown that individuals are likely to conform, both publicly and privately, when faced with the probability that they will soon have to interact with the group. While most of the pertinent literature on social conformity pertains to western societies, it does offer support for the notion that individuals, regardless of cultural setting, are in fact "programmed to conform."

From studies of children's socialization, it appears that individuals have an innate capacity to perceive and conform to group norms. A number of researchers (Ramsey 1987; Katz 1976) have noted that children recognize group or collective behavioral patterns as early as age three or four (some arguing as early as ten months [Lewis and Brooks

1975], and perhaps even in utero). Ramsey notes that while most of the pertinent studies center around categories of race, gender and age, "some anecdotal evidence suggests that children notice concrete manifestations of cultural diversity such as clothing, foods, and eating, and, as with racial differences, then try to assimilate this information into their existing schemas" (1987:61). She adds that "it has been well documented that even at a young age, children's affective reactions to their own and other groups often reflect those of the social environment" (1987:64), and that much of what is learned is unconscious, and derived from subtle cues which include vocal inflections and body language (Hall and Hall 1987). Vaughan (1987) writes that "for the young child, sense of self defined in ethnic terms is as much a question of what one wishes to look like as what one actually looks like. Young children are sensitive to the existing social structure, to the nature of majority-minority relationships, and to existing privilege" (1987:81). This apparently involves reflections of racist and sexist attitudes of the parental generation as well, as young girls at certain ages value their own gender less than they do that of boys, or than boys do their own (Katz 1987). Other studies have shown that young minority children "misidentify" themselves as members of the majority group (cf. Aboud 1987). Importantly, it is not merely

identification with a preferred group that is learned early, but a dislike for other groups as well (Aboud 1980).

Clearly, children learn much more than language from the parental generation, and they learn quickly and easily. Boyd and Richerson (1985) review familial data from a variety of studies and find that children tend to mimic parental occupations, political and religious views, fears, notions of self-esteem, abusive behavior and attitudes on a wide range of other topics. Additionally, as we are reminded in Cavalli-Sforza et.al.'s seminal paper on cultural transmission (1982), individuals do not learn solely from their parents. Boyd and Richerson similarly review studies dealing with horizontal or oblique transmission and find that a broad group of cultural values are passed on by peers, teachers, employers, etc. Much of this clearly occurs by "observational learning" on the part of individuals, and not conditioning, as "one cannot keep people from learning what they have seen" (Bandura 1977, in Boyd and Richerson 1985:43). Identification with and conformity to the group, which is evidently prized in the adult, is a process begun in infancy and reinforced throughout a lifetime.

However, individuals also manipulate cultural traits to maximize individual advantage. "Children initially learn from others what group they belong to; however, as they get older, they become aware of options in the extent to which they behave as, and consider themselves to be, members of an

ethnic group" (Rotheram and Phinney 1987:15). This quote suggests the rather obvious point that mere conformity is not solely sufficient for human survival. Children are also predisposed to recognize and absorb subtle cultural elements in order to label themselves and others, and some of these elements or traits can be manipulated. While the proposition that these manipulations lead to increased biological success remains to be established, it gains considerable support from the fact that humans are indeed strategists. Barth (1969), for example, established that culture is in fact marked by definitions which "are not necessarily built on empirical facts" (p.120), and which can be manipulated according to circumstance. His work with the Pathan and neighboring groups in Pakistan shows that ethnic groups are superficially distinguished by cultural traits, such as language, clothing, rules of inheritance, etc. Depending on the situation, however, individuals will manipulate those traits to maximum advantage. Barth makes it clear that an individual will choose "to embrace the identity that makes his situation most tolerable" (1969:125), and that "in most situations it is to the advantage of the actors themselves to change their label so as to avoid the costs of [economic and social] failure..." (133). In other words, ethnicity is manipulated for individual gain (see also Hicks 1977).

Other examples of cultural manipulation can be found wherever the process of acculturation takes place.

Individuals belonging to subordinate groups will often adopt traits associated with the superordinate group whenever possible and convenient (Herskovits 1945; Redfield et.al. 1936). Such trait manipulation is clearly seen in such countries as Guatemala, where individuals can in fact completely "pass" into one group from another, based solely on changing linguistic and behavioral mannerisms (see Chapter V). What is apparently important is individual assessment of the native group and its relationship to other groups. As Rosenthal (1987:178) suggests, "any study of the link between ethnicity and adjustment needs to take into consideration not only the internal boundaries imposed by the ethnic group, but also group members' perceptions of their group's status and function in the majority culture. It is reasonable to hypothesize that when their ethnic group is held in low esteem by the dominant group, individuals may adopt a less positive attitude to their groups and hence their identification with [the dominant] group could be attenuated". Similar evaluations of "self" occur in all areas of social life (Goffman 1959).

Interestingly, biologically-oriented anthropologists have begun to be concerned with manipulation of cultural rules and its consequences. Chagnon (1988b) discusses a tendency among Yanomamo males to manipulate female kinship classification in order to "create" more potential mates. In the same volume, Irons suggests that more studies of this

kind are necessary, and that attention to rules will shed light on how they are "created, manipulated, used and modified, and how individuals do these things to achieve proximate goals that make evolutionary sense" (1988:313).

The underlying paradigm proposed, then, is that humans are endowed, through the process of selection, with minds that are equipped from infancy to assimilate entire cultural trait complexes, regardless of the specific content of these complexes, and to conform to and manipulate these complexes to personal advantage. It is further hypothesized that those best able to conform and manipulate will be "rewarded" with increased somatic and reproductive success.

CHAPTER III

REVIEW OF RELEVANT LITERATURE

"Curiously, the reservations many of us in social anthropology have about the utility of biological models reflect in an uncanny way the theme that pervades the myths of tribesmen: Men are part of Culture and apart from Nature. Why is it so difficult, even repugnant, for humans to admit that they are as much a part of Nature as they are a part of Culture?" (Chagnon 1987:474).

There has been a revolution in evolutionary biology in the last thirty years. The fundamental premises of Darwin, as well as the work of the "modern synthesists" such as Dobzhansky, Mayr and Simpson, who showed that Darwin and Mendel supplied enough firepower to explain all evolutionary processes (Maynard Smith 1982a:3; although see Gould 1982, 1980), have been augmented theoretically by the likes of Lack, Trivers, Williams, Hamilton, Dawkins and many others. This "newest" synthesis has made it possible to begin to understand, in Darwinian terms, even the most complex (read "social") of human behaviors. Notions of human selection at the group level and true altruism, both of which have been at the root of most cultural anthropological theory, have been shown to be unnecessary and relatively easily replaced with a paradigm based on individual selection and inclusive fitness (Alexander 1987, 1979; Turke 1984).

Lack (e.g. 1954), primarily through his work with various bird species, found that what might be perceived as altruistic behavior by individuals on behalf of the group,

such as their keeping clutch sizes down so that overall populations would remain at acceptable levels (Wynne-Edwards 1962), could be explained in terms of parental investment, establishing that individuals might in fact be utilizing a strategy to maximize, rather than minimize, reproductive fitness. His work established that population regulation could be (and should be) explained in terms of individual rather than group selection, and the implications for human populations are clear (Alexander 1979:28; see also Hinde 1982).

Williams (1957) and Hamilton (1966), in their attempts to understand decay (senescence) and death, established that both of these processes could be explained in terms of individual selection and maximized fitness. Rather than empirical evidence against individual selection (as one would assume selection to favor longer life-span in individuals), they point out that senescence can be seen as a consequence of the accumulation of genes that function to an individual's advantage before or through the reproductive age, but that carry deleterious effects which appear later in life, effects that would accordingly not be selected against. Similar arguments have been persuasive in regard to male/female differential mortality (Alexander 1987).

The concept of parental investment (Trivers 1971), and expanded versions such as that encapsulated by Dawkins' "altruism investment" (1976:133), have been utilized to

effectively explain conflicts between offspring and siblings, offspring and parents, and even male/female reproductive strategies as consequences of individual struggles for survival and subsequent reproduction.

Finally, notions of inclusive fitness (Hamilton 1964), or kin selection (Maynard Smith 1964), provide a framework for the explanation of true altruism (as opposed to the use of the word in biological and sociobiological literature to discuss seemingly altruistic behavior--see Maynard Smith 1982b), and for the dismissal of "good of the group" notions related to most altruistic acts. The idea is simply that altruistic behavior will be selected for, even if leading to the altruist's death, if it contributes to the survival of more specific genetic material than is lost in that individual. Therefore, as relatives share differing proportions of the same genetic material, even cooperative and altruistic behavior that reduces individual fitness will be selected for if the behavior (or the genetic programming underlying the capacity for that behavior) enhances the fitness of relatives. Nepotism and reciprocity can also be explained in terms of genetic fitness (Trivers 1971), and Maynard Smith has suggested that "most analyses of social behavior suggest that both kin selection and mutualism are relevant" (1982a:183).

It is clear, then, that the "group" of importance in evolutionary terms is that which is made up of closely

related individuals, or of those perceived as being related. Selection should therefore be thought of as operating at the level of the individual, and sometimes even at the level of the "selfish gene" (Dawkins 1976) and its copies wherever they appear (although see Maynard Smith 1982b and the confusion regarding the term "group selection"). It is clear too that, notwithstanding a great deal of controversy as well as constructive debate, evolutionary biology has provided a framework for understanding all behavior, even human, no matter how complex.

However, things are not quite that simple. Attempts in cultural anthropology to understand complex human behavior by means of the concept of culture have followed another path, one based on an understanding of evolution as a process very different from that formulated by Darwin and subsequent contributors. The revolution in evolutionary biology, as well as the Darwinian precepts underlying it, have for the most part been ignored in the discussion of that "extra-somatic" means of adaptation known as culture (White 1949:364). Until very recently, anthropological evolutionary paradigms have been based on the Spencerian notion that societies are analogous to organisms, characterized by directional change from the simple and undifferentiated to the more complex and specialized (Bohannan and Glazer 1973:3-5; Carneiro 1974).

At the same time that evolutionary biologists began to fine-tune the theoretical underpinnings for examining complex social behaviors at the individual (or even sub-individual) level, cultural anthropologists were establishing parameters for the study of culture in terms of a kind of group selection removed from, and even opposed to, Darwinian evolutionary theory. Culture was primarily seen to be "a supra-biological, extra-somatic order of things and events, that flows down through time from one age to the next... " (White 1949, in Bohannan and Glazer 1973:336). It is safe to say that for the most part cultural anthropologists have viewed culture as a phenomenon uniquely human and removed from any direct connection to individuals striving for reproductive success. White's position, while labelled "neo-evolutionism" to signal a return to the "evolutionary" positions held by nineteenth-century anthropologists such as Morgan and Tylor (Applebaum 1987:31-36; Garbarino 1977:88), was so only in the sense that it represented a return to the notions of Spencerian evolution, or rather the observation that social groups "evolve" from simple undifferentiated forms to ones more complex and organized (Godfrey 1985). This is essentially analogic evolutionary theory, in that society is treated as an organism which, as it becomes more differentiated functionally and structurally (or, as Spencer has said, as the population "augments, [and] divisions and subdivisions

become more numerous and more decided..."[in Bohannan and Glazer 1973:7]), is seen as more advanced, more evolved (Applebaum 1987). White's emphasis on the symbol, and on the premise that "culture is explainable only in terms of culture" (Kaplan and Manners 1972:45), as well as his use of harnessed energy as a measure of cultural advancement (1949), clearly demonstrate both the uniqueness imparted to human beings in evolutionary terms and the directional evolutionary mechanisms assigned them. Few would argue that the pattern of human history is reflective of a trend toward the more complex, although Carneiro conveniently dismisses any change that does not lead toward increasing complexity as "...just that--change--and nothing more..." (1987:756). Neither would many find cause to argue with that pattern as it is manifest in the rest of the biological record (Gould 1985). In terms of process, however, such observations are but the first step, and it is Darwinian selection which provides the necessary explanatory framework (Godfrey 1985).

Likewise, the levels of socio-cultural integration of Steward (1955), and Sahlins and Service (1960), are broad and generalized statements of the evolution of the group and have little to say about the individual within, and his or her kin, as a unit of selection. Ironically, while Steward reacted to White's evolutionary scheme as "too broad to be useful for explanation" (Garbarino 1977:89), the same can be said of Steward's multilineal evolution. His emphasis on

culture "core" elements (or those most directly related to the way cultures adapt to or make use of their environment) assumes selection at the level of the group only. Thus, while it is true that through the work of Steward, White and others "evolutionary theory became respectable again in American anthropology" (Applebaum 1987:200), it was Spencerian, or analogic evolutionary theory, that, like that of the nineteenth-century evolutionists, became an acceptable paradigm.

In terms of classical fitness (Williams 1981; Darwin 1859), there is no restriction on which unit of selection to utilize. This has allowed for the use of the species (c.f. Gould and Eldredge 1977), population, individual, and even the genetic material within the individual (Dawkins 1976). In cultural anthropology, however, it has for the most part been the cultural unit or group which has been seen as evolving, whether in a Darwinian or Spencerian sense. Likewise, it has been that group which has been seen as adapted or not, again regardless of the various ways in which the concept of adaptation has been utilized in the literature (Caro and Borgerhoff Mulder 1987; Bargatzky 1984; Alland and McCay 1973).

Aside from the Spencerian/Darwinian debate, the problem with the anthropological neo-evolutionary outlook is that it ignores or de-emphasizes the role of the social environment as it pertains to the individuals born into it, and through

which individuals must make headway in order to survive and reproduce. Ironically, as previously discussed, it is those anthropologists with a paradigm most removed from the Darwinian one, the symbolic anthropologists (Geertz 1973; Goodenough 1961), who most directly acknowledge the social environment and its effect on the individual. Symbolic anthropology is based on the premise that "members of a society share a system of symbols and meanings called culture...[and]...must have some notion of what other people in their community believe, some expectation of what their reaction to others will be and others to them, so as to be able to interact and communicate" (Applebaum 1987:482; see also Keesing 1974). One must simply replace the more proximate "meaning" all individuals are assumed to be seeking with the ultimate goals of individual survival and reproduction.

The cultural materialism of Marvin Harris (1979) appears to come the closest in anthropology to the exploration of Darwinian mechanisms in culture (prior to Chagnon and Irons, as will be seen), as it is the most explicitly scientific in its attempt to explain what determines culture and even "what determines whatever determines culture" (Lett 1987:91-92). However, its weakness in Darwinian terms is that it "takes economic or `productive' ends as ultimate rather than as means to the end of reproductive success" (Alexander 1987:26, see also

Adams 1981). Alexander equates this logic to that of arguing that humans are interested in sex because of the pleasure associated with it and not because of its reproductive value. Clearly this view does not explain why pleasure exists. However, the facts that it is only through sex that children can be born, and that only through children can human beings survive as a species, can explain why human beings might be genetically encouraged to have sex by finding it pleasurable (Alexander 1987:26). Alexander goes on to say that "Harris' analysis suggests that we will always end up doing those things that are beneficial to us, regardless of environmental change; evolutionary theory from biology does not, and it can be uncannily predictive about the kinds of errors we will make" (1987:29). Additionally, the paradigm of cultural materialism is hindered by many methodological problems, ones largely operational in nature (cf. Adams 1981).

Inspired by the work of Alexander (1987, 1985, 1979), Wilson (1975) and others, there has been a movement in cultural anthropology in the last decade toward reconciling notions of evolutionary biology with theories of culture and human social and cultural behavior. In 1979 Chagnon and Irons edited Evolutionary Biology and Human Social Behavior, clearly the first important volume dedicated to the testing of modern evolutionary biological theory in the socio-cultural realm (Betzig 1988:5; Turke 1984). Since then a

number of studies emerged wherein biological performance (i.e., somatic and reproductive success [Alexander 1987:41]) is compared to social success. Several important questions have been addressed, including whether the winners of social competition enjoy correspondingly higher mating and reproductive success. Betzig (1988:5) states that "evidence from a large and growing number of studies suggests that they do, at least in traditional groups." "Winning" is of course subject to cultural definitions, and studies have established positive correlations in regard to wealth (Borgerhoff Mulder 1987a; Irons 1979), rank and prestige (Hill 1984), aggression (Chagnon 1988a), despotism (Betzig 1986) and other behavioral traits, including even hunting prowess in band-level groups (Kaplan and Hill 1985a).

Other researchers working in non-traditional societies have found many similar correlations. Hughes (1986), for example, found that seventeenth-century England landowners enjoyed higher reproductive success than did the merchant class. Investigating in more recent times, Essock-Vitale (1984) found a correlation between higher fertility and wealth among Fortune 500 members, as compared to the general American population.

Additionally, "dominance, status and wealth have all been positively associated with a variety of mechanisms promoting men's reproductive success, including number of serial or simultaneous conjugal unions, number of reported

extra-marital liaisons, age at first marriage or reproduction, spouse's age at first reproduction, interbirth intervals, longevity, offspring survival and probability of cuckoldry" in both traditional and modern societies (Betzig 1988:5). Clearly, evidence is being amassed from a variety of sources that reveals basic links between biological performance and culturally determined behavior.

There are, however, several problems with the research done in this area. One of these has long been associated with biological interpretations of social behavior, particularly since the publication of E.O. Wilson's Sociobiology (1975) and the subsequent explosion of sociobiological analyses and anthropological criticism (Rindos 1986; Harris 1979; Sahlins 1976). It involves the charge of reductionism, which states that attempts to assign complex social behaviors to genetic coding are overly simplistic (Hinde 1987). "Genetic determinism" is a similar, often heard charge (Lewontin 1979). Attempts have been made to assign behaviors like altruism to genetic coding (Harpending 1979; Wade 1980, 1978; Cavalli-Sforza and Feldman 1978; Hamilton 1964), but even when discussed in terms of polygenic models (Yokoyama and Felsenstein 1978), such attempts have been sharply criticized as deterministic and reductionist (Alexander 1987). However, as Alexander points out (see also Daly and Wilson 1988:8), "reductionism" is in a sense a meaningless term, as all scientific

analysis is, by definition, reductionist, and "evolutionary reduction, when it is successful and accurate, tends to deepen our understanding of all of our immediate and primary behaviors, motivations and emotions because their evolutionary significance and the involved compromises are almost never a part of our conscious knowledge before we pursue them deliberately" (1987:19).

Still, when one examines sociobiological literature on, for example, the avunculate (Barash 1979; Kurland 1979; Dawkins 1976; Alexander 1974), and the prediction that "...in a society with a high degree of marital infidelity, maternal uncles should be more altruistic than `fathers,' since they have more grounds for confidence in their relatedness to the child" (Dawkins 1976:115), it is easy to understand the reductionist charge and the accompanying lack of confidence on the part of social scientists in sociobiological predictions. Even a cursory review of the ethnographic literature (Aberle 1962; Basehart 1962; Gough 1962) establishes that for many of the groups with the avunculate, strong paternal ties do exist in economic, legal and affective realms, thus suggesting (as cultural anthropologists certainly do) that the avunculate, while directly related to the inheritance of power and wealth, may not be at all related to the inheritance of genetic material.

Another problem has to do with confusion regarding many of the key concepts utilized by those engaged in biologically-based explanations for human behavior. As previously discussed, Williams (1981) has pointed out that the term "fitness" has come to carry at least three different meanings in the literature. Likewise, "adaptation" can be defined in several ways (Caro and Borgerhoff Mulder 1987; Brandon 1984; Alland and McCay 1973), and as anthropologists tend to utilize significantly different meanings for the terms than do biologists, there is the potential for a great deal of confusion. Clearly, even "evolution" is a term with several meanings, and traditionally the meaning utilized by anthropologists and that of biologists has been radically different (Blute 1979; Dole 1973).

From the perspective of traditional anthropology, there are other charges which can be leveled against the sociobiological approach. These include its overly impressionistic, metaphorical and analogical character, its use of informal speculation based on little data, vague concepts and uncalled for jumps across time and space. (Rindos 1986; Wheeler 1986; Sahlins 1976).

There are several problems within the framework of evolutionary biological anthropology as well. Borgerhoff Mulder (1987a) has pointed out that, in attempting to correlate cultural and reproductive success, identifying

cultural goals (i.e., "success") can be problematic. Clearly emic and etic problems in interpretation do surface (Gray 1985). Additionally, "it may not be legitimate to assume that cultural goals are shared by all members of the community, particularly in complex societies" (Borgerhoff Mulder 1987a:618). Such problems are only magnified in the face of cross-cultural variation.

Other problems include measures of fitness (even if definitions have been agreed upon), as well as the usual problems associated with obtaining information from human subjects--memory of life history data, bias (including gender bias on the part of investigators) and informants' withholding of sensitive information pertaining to reproduction, such as promiscuity, infanticide, etc. (Borgerhoff Mulder 1987a; 1987b).

Betzig (1988) similarly discusses difficulties involved in measuring reproductive success, bias in terms of male competition versus female choice (as little has been done regarding female competition--but see Hamilton 1984), and cultural variability. Additionally, humans may not be optimizing their fitness at all, as it cannot always be assumed that natural selection has optimized the mechanisms that lead to behavior (Gould and Lewontin 1979), and because human beings now live in environments very different from those in which they are supposed to have evolved (Alexander 1988; Mazur 1983).

By means of the concept of cultural performance, this thesis attempts to address some of these difficulties: in particular, the problem of cross-cultural variation in goals, which investigators have described as one of the most important problems facing those who would correlate cultural and biological success (Betzig 1988; Alexander 1987; Borgerhoff Mulder 1987a). It is clear that some theoretical framework for the analysis of cultural diversity is required if a true integration of biological and cultural evolutionary theory is to be achieved. The illustration of the avunculate (and there are others--see the Marvin Harris and E.O. Wilson debate over genetic determinism [Harris and Wilson 1978]) highlights the fact that the multitude of cultural behaviors that exists and has existed through time cannot be expected to be found reduced to coding in the gene, or in a polygenic unit, even if these behaviors are directly related to the survival and reproduction of individuals. Additionally, the changes in environments brought about so quickly by human groups, as well as their effect on selection processess, must be understood, unless one is to assign selective value to every human endeavour regardless of its long-term effect.

Rindos (1986, 1985) has suggested a focus on the evolution of open-ended behavior, through a gene or cluster of genes for certain learning capabilities, such as flexibility and a capacity for choice and change. This

plasticity, however, must be understood in terms of selection at the individual level within populations if it is to be subject to Darwinian evolutionary processes in anything but a rhetorical way. Otherwise, we are left essentially where we began, i.e. that culture is understandable only within the social setting, and that evolution of culture is independent of, and only analogically (or in a "co-evolutionary" sense) linked to, biological evolution, subject to its own rules and leading to its own unique outcomes (see, in biology, Boyd and Richerson 1985; in cultural anthropology, Adams 1981; Durham 1978; in archaeology, Dunnell 1984, 1980).

The notion of cultural performance is therefore an attempt to understand human behavioral plasticity in terms of individual fitness. A capacity to conform and manipulate culture, like language, can be expected to be genetically based. Such a generalized capacity is also capable, along with environmental and historical factors, of accounting for the tremendous variability in cultural patterns seen in the ethnographic record. The specific study which follows is an attempt to operationalize that capacity to conform and manipulate, and test its potential relationship to individual somatic and reproductive success.

CHAPTER IV

METHODOLOGY AND RESULTS

A. Methodology

The present study is an attempt to test the hypothesis that relative success at cultural performance, which, as described previously, is based on the notion that persons conform to, and manipulate, cultural traits, will significantly correlate with variance in somatic and reproductive success. While a number of studies have, with varying degrees of success, linked fitness with cultural behavior, their focus has always been value specific (e.g. wealth and status). None to date, however, has looked at the broader issue of individuals performing (1) a wide set of culture-specific values, ones holding for the society into which the individual is born. Additionally, the problems encountered by investigators in the area of realized fertility in modern industrial level societies suggest that more indirect measures of fertility should be utilized, the assumption being that, at this time in human history, part of the cultural performance values associated with modern nations involves a decrease in realized fertility (see Chapter V).

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1 The term "performance" will occasionally be utilized as shorthand for "cultural performance", and should not be confused with the "performance theory" of Turner (1982).

After obtaining proper approval under the "human subjects" compliance area of the Office of Research Administration, University of Tennessee, four hundred questionnaires were sent to University of Tennessee alumni, class of 1965. The students' names were obtained with the approval of the University of Tennessee Office of Alumni Affairs, and were randomly generated from alumni files, along with current addresses. Questionnaires (two hundred each to males and females) were sent with a cover letter (Appendix A) requesting information on a former student's "total educational experience" (i.e., academic achievement plus social life and extra-curricular activities), and explaining that due to the personal nature of some of the questions, names should not be included in the returned questionnaire. All material was sent on Department of Anthropology, University of Tennessee letterhead. Self-addressed, stamped envelopes were included to encourage responses.

The questionnaire was designed to generate information pertaining both to cultural performance for the time individuals were enrolled in the university, and to real and potential reproductive success (see Appendix B). Additionally, questions were asked regarding subsequent events in the life history of individuals that pertain to somatic and reproductive success.

Cultural performance was operationalized in two ways. The first of these involved participation on the part of individuals in group activities at the university (see Appendix B for specific information on scoring). Such activities included living in dorms and fraternities, membership in various clubs and organizations, attendance at parties, etc. It was assumed that those who participated in more group activities than others were more successfully performing in the sense discussed: that is, in conforming to and manipulating the traits most valued in American society in general and in college in particular.

Additionally, information was requested regarding academic achievement (i.e., grade point average). As several investigators have pointed out (cf. Gray 1985; Irons 1979), some of the problems with attempting to ascertain cultural goals involve confusion between etic and emic categories. Achievement at a university is associated, at least in part, with academic success, and it was necessary to be able to compare the effects of cultural performance as operationalized above to a more traditional indicator of cultural success.

The second section of the questionnaire was designed to obtain information directly pertaining to an individual's personal feeling of conformity, or a sense of belonging to the group. In other words, the goal here was to obtain an emic assessment of satisfaction with the university

experience in terms of the traits examined in this study. It was assumed that those most satisfied with their experience in terms of group conformity were performing best.

Points were given on the basis of how respondents answered questions. Total scores were taken as an assessment of individual cultural performance. As will be discussed, results were totaled in several ways in an attempt to obtain the most reliable indicators of performance.

The rest of the questionnaire consisted of questions having to do with somatic and reproductive success. Individuals were asked questions pertaining to both their experience at the university itself and subsequent life history events. In terms of the university experience, questions dealt with frequency and ease of dating, number of individuals dated, sexual activity, etc. In the realm of somatic fitness, questions dealt with personal and career connections, health, and stress. In terms of subsequent life history, questions involved choice of marriage partners and number of marriages, divorces and children. In regards to the somatic component, questions involved health, stress, and income.

The rationale for the variables regarding reproductive success was that, aside from the rather obviously appropriate measures of number of children and degree of sexual activity, information regarding facility in meeting members of the opposite sex, frequency in dating, number of

different individuals dated, marriage patterns, etc., has a direct bearing on mate location and selection, which in turn are assumed to be acceptable indicators, albeit indirect ones, of reproductive success.

The variables regarding somatic success were chosen based on the underlying assumption that, in evolutionary terms, individuals must live long and relatively healthy lives if they are to find mates and reproduce, as well as to successfully bring their offspring up to their own reproductive age. Therefore, income was seen as a measure of somatic success, and not as a variable pertaining to cultural goals, in that it, to a certain extent, determines the ability of individuals to successfully fulfil the biological requirements just mentioned. Following Colby (1987), health status was seen as a measure of somatic success, and levels of stress were similarly treated.

The questions that make up each component of the questionnaire, and the scoring system to be utilized, were devised based on a series of discussions with the thesis committee chair. Several versions of the questionnaire were prepared over a period of two months, and questions were included or withdrawn based on their applicability, sensitivity and clarity. Relevant literature was reviewed, and Colby (1987) proved particularly useful in that a questionnaire therein dealt with attempts to correlate cultural values with ones pertaining to somatic well-being.

In Colby, "adaptive potential" (a blend of "adaptivity", altruism, and creativity) was found to correlate with biocultural success, measured by "its best predictor, longevity", and itself tested for via Cohen and Hoberman's 1983 Inventory of Physical Symptoms (Colby 1987:880-883). Although Colby's variables were felt to be somewhat ill-defined and cumbersome, the study did attempt to find a connection between general cultural capacities and individual somatic success, and therefore his survey instrument was particularly relevant.

The content of the survey instrument was also discussed with other committee members. Moreover, several colleagues and friends examined the finished questionnaire for clarity and ease of completion.

The scoring system was similarly arrived at through discussion with the committee chair, and "trial" data were invented with which to test the tallying of results (see Appendix B for scoring details).

The returned questionnaires were examined so that those not properly filled out could be eliminated. Descriptive statistics were generated in order to obtain a general picture of the sample population. Based on range, performance scores were divided into three equal categories, and these were classified as "High Performance Index", "Medium Performance Index" and "Low Performance Index". These groups were then further broken down into male and

female subgroups and analyzed with respect to somatic and reproductive data. By comparing variable means for each group and subgroup, a descriptive assessment of the relationship among the test variables was obtained. The Kruskal-Wallis analysis of variance by ranks was utilized to assess the significance of mean differentials (Silk 1979:192-198).

Data from returned questionnaires were coded and entered into a Lotus spread sheet, allowing for the entry of both qualitative and quantitative data. It must be pointed out, however, that all data were coded numerically with the exception of current occupation and degree major, both of which were of only peripheral interest in this study. After eliminating questionnaires deemed unsatisfactory for analyses (e.g., "returning" students many years older than the average and individuals who were already married when entering school), the remaining questionnaires were coded onto a SAS file. Through the use of the University of Tennessee Vax system statistical analyses were conducted on the file with the use of SAS procedures. Assisting in the area of computer analyses was Julian Ray, Research Associate for the Transportation and Operations Research Group, Oak Ridge National Laboratories, Oak Ridge, Tennessee. SAS User's Guide (1985) and User's Guide: Statistics (1985) were utilized as reference volumes.

The statistical treatment consisted of Spearman Rank correlations for all variables (Ott et.al.1983; Silk 1979). The independent variables in these correlations were the "performance index", or the total cultural performance scores in both categories discussed above, and the grade point average, so that, as previously discussed, another plausible measure of cultural success could be utilized.

B. Results

Of the 400 questionnaires sent out, 129 were returned completed. This number was reduced to a total sample size of 113 after 16 individuals were judged to fall outside of the targeted sample, due to either being returning students, and therefore significantly older than the general age parameters expected (one individual was as much as twenty years older), or to having been married prior to entering school. Individuals who married while in school were judged to be a part of the sample population (but see Chapter V for some comments).

The average age of the sample was 45.78 years, which is consistent with a college graduating class of 1965. There were 52 males and 61 females. The average household income was $78,400, with a range of $15,000 to $250,000. The average grade point average was 2.92.

Some questionnaires contained missing values pertaining to the performance index and were not utilized. The number of complete questionnaires for the performance index was 86. Attempts were also made to obtain more sensitive performance indexes by utilizing additional data pertaining to the number of years individuals were involved in specific activities, but this increased the number of missing values, and therefore reduced the sample size to 47 individuals. It was felt the benefits of the larger sample size outweighed the small loss in sensitivity. Many individuals chose not to answer the questions pertaining to number of years involved in activities or they misinterpreted the requests to do so (see Appendix B).

Another attempt was made to increase sensitivity by turning missing values to zeros, which would increase the sample size to 113. Although this would not affect the first section of the questionnaire (on participation in group activities), it would affect the score on the second section (on individual assessment of conformity) to some degree, and was therefore not utilized. The mean cultural performance index score was 30.69 (N=86), with a low of 9 and a high of 53 (the total possible range ran from 0 to roughly 60, depending on number of additional activities listed by individuals). Using those figures the total sample was evenly divided in three: those in the "Low Cultural Performance Index" group defined individuals with scores

less than 24 (N=22), "Medium Cultural Performance Index" as those with scores 24 to 38 (N=44), and "High Cultural Performance Index" as those with scores greater than 38 (N=20). These groups were then further divided by gender.

Table 1 shows a comparison of means of the three performance groups in terms of indicators of reproductive success for males. Those in the "High Performance" group averaged the greatest ease in meeting, and dating (both in terms of frequency and number of different individuals), members of the opposite sex. The "High Performance" group also averaged the most frequent sexual activity, as well as the largest number of different individuals dated. As can be seen, the "Medium Performance Index" group means were consistently higher than those for the "Low Performance" group and lower than those for the "High Performance" group.

The remaining variables in Table 1 deal with subsequent life history events. Here, interestingly, there appears to be a clear relationship between the performance scores and indicators of reproductive success. Those in the highest groups, (i.e., those "best" cultural performers), were more likely to have married individuals that attended the same university and/or individuals they met while in school. The most startling and potentially significant figures, however, involve number of children. Those in the high performance group averaged .23 more children than those in the medium

TABLE 1- Means for reproductive variables related to cultural performance (P.I.) index scores.

Variables	LOW P.I. (N=10)	MED P.I. (N=23)	HIGH P.I. (N=8)	p*
MALES				
1) Ease in Meeting Opp.Sex..	1.40	2.78	3.37	.0027
2) Dating Frequency.....	1.33	2.65	3.37	.0013
3) Sexual Activity.....	.05	1.09	1.75	
4) # of Individuals Dated...	3.33	6.87	23.37	.0050
5) Marriage to U.T. Grad....	.20	.62	.62	
6) Marriage While at U.T....	.30	.62	.62	
7) Number of Children.....	1.90	2.13	2.87	

*= Utilizing Kruskal-Wallis analysis of variance. NOTE: Means of variables 1,2,3 based on 0-5 scoring, 0="never", 5="very frequently". Means of variables 5,6 based on 0-1 scoring, 0=is not married, 1=is married.

group, and .97 more children than those in the lowest group. (It must be pointed out, however, that for this and several other variables the hypothesis that the difference in means between groups is due to chance could not be rejected). As will be discussed later, this is a rather remarkable finding given the well-documented trend in wealthy, monogamous societies to reduce and stabilize birth rates (cf. Vining 1986).

Table 2 utilizes the same comparison of means to analyze variables pertaining to somatic success. There appears to be a relationship between performance scores and ability to make friends while at the university. In terms of subsequent life history, the likelihood of maintaining friendships with those met in school appears linked to

TABLE 2- Means for somatic variables related to cultural performance index (P.I.) scores.

Variables	LOW P.I. (N=10)	MED P.I. (N=23)	HIGH P.I. (N=8)	p*
MALES				
1) College Friends, then...	.30	1.78	1.75	.0007
2) College Friends, since..	2.60	3.17	3.37	
3) Career Connections.....	1.30	1.26	2.25	
4) Stress After U.T.....	2.60	3.77	3.62	
5) Present Income.....	74.4	77.2	101.1	.0431

*= Utilizing Kruskal-Wallis analysis of variance. NOTE: Means of variables 1,2,3 based on 0-5 scoring, 0="never" or "none", 5="frequently" or "many". Var. 4 in thousands.

performance as well. Perhaps the most significant finding in this area, though, is that the average present household income goes up in each group, with a mean of 74.4 thousand dollars for the "Low Performance Index" group, 77.2 thousand for those who scored in the medium performance group, and, significantly, up almost 18 thousand dollars to 101.1 thousand in the high performance group. Interestingly, although stress while in school was not found to relate to the performance index, stress in subsequent life-history does appear to go up along with the performance scores.

Based on the preceding data, it can thus be stated that males who scored highest in the performance index were also the most successful in terms of both direct (number of children, sexual activity) and indirect measures of reproductive success, as well as indirect measures of somatic success. If one accepts the performance index as an

appropriate operationalization of cultural performance, this analysis provides an indication that cultural performance may indeed be a valid theoretical tool with which to better understand the relationship between cultural behavior and biological fitness.

The same analysis for the female portion of the sample reveals much weaker patterns of relationship (see Table 3). In terms of somatic variables, only friendship while attending the university, and stress in subsequent life history, appeared to be related to the performance index. In the reproductive realm, it was found that the means for number of individuals dated and ease in meeting members of the opposite sex did go up in each performance group, while dating frequency did show a substantial mean increase in terms of low and medium performance groups. In all other categories, however, no clear pattern of relationship could be detected. Apparently there is a significant difference in the relationship between performance and fitness indicators with regard to gender. As will be discussed later, sociobiological predictions with regard to male versus female reproductive strategies are likely to be relevant here (see Chapter V).

In order to support the observations just described, attempts were made to find statistically significant correlations between the performance index and the variables pertaining to somatic and reproductive success. Table 4

TABLE 3- Means for somatic and reproductive variables related to cultural performance index (P.I.) scores.

FEMALES Variables	LOW P.I. (N=12)	MED P.I. (N=21)	HIGH P.I. (N=12)	p*
Somatic component:				
1) Friendships at U.T.....	2.58	3.09	3.50	.0094
2) Stress After U.T.....	2.21	2.09	2.58	
Reproductive component:				
3) # of Individuals Dated....	5.00	9.47	12.08	
4) Ease in Meeting Opp. Sex..	2.08	2.67	3.08	.0165
5) Dating Frequency.....	2.25	3.19	3.17	.0165

*= Utilizing Kruskal-Wallis analysis of variance. NOTE: Means for all variables based on 0-5 scoring, 0="none" or "never", 5="many" or "frequently".

shows the results of Spearman Rank correlation calculations for the data. It was found that there were statistically significant correlations between the performance index and data pertaining to indirect measures of reproductive success. While some correlations are for the most part weak ones, many are statistically significant at the .05 level. It is clear that cultural performance for males is related to individual success in meeting and dating females, as well as to marrying individuals met while attending school.

Again we find substantial differences with regard to gender, as no statistically significant correlations could be established for females in terms of friendship since leaving school, sexual activity or marriage patterns.

TABLE 4- Performance index and measures of somatic and reproductive success.

(Spearman Rank Correlations)

Variable	Males (p)	Females (p)	Pooled (p)
Marriage to U.T. student	* .35938 (.0210)	.06725 (.6602)	* .21281 (.0492)
Marriage to someone met while at U.T.	.25198 (.1120)	.17417 (.2525)	* .21525 (.0466)
Meeting opposite sex	* .52158 (.0005)	* .44549 (.0022)	* .48753 (.0001)
Dating frequency	* .63768 (.0001)	* .33445 (.0247)	* .48722 (.0001)
Number of individuals dated	* .60707 (.0001)	* .26005 (.0360)	* .42862 (.0001)
Sexual activity	* .42125 (.0068)	-.10169 (.5164)	.15841 (.1526)
Friends, then	* .37732 (.0150)	* .49373 (.0006)	* .43995 (.0001)
Friends, since	* .44623 (.0035)	.14021 (.2266)	* .28233 (.0088)

Note: *= statistically significant at p=.05

Additionally, even in the case of statistically significant correlations, it can be seen that they are weaker for females than for males (with the exception of the variable pertaining to friendship while in school).

Table 4 also shows correlation figures pertaining to the number of different individuals dated while in school. The performance index was shown to be linked to the number

of individuals dated, both for males and females, although again the strength of the correlations was weaker for females. Although not shown in the above figures, an attempt was made to correlate the performance index with number of children, but a statistically significant relationship one was not established.

Clearly, the statistical analyses in general support the pattern linking the performance index and measures of reproductive success. These analyses also support the observation that the correlations are, for the most part, stronger among males than they are for females.

Statistically significant correlations concerning somatic success were also sought, but with inconclusive results. No correlations could be established between increased household income and increasing performance index scores, or in terms of career connections. Similarly, the null hypothesis could not be rejected in regard to health and stress levels.

The somewhat problematic variable of friendship did prove to correlate with the performance index for both males and females. Clearly somatic success must involve some measure of being accepted by the group, and as such it is important to establish that even in non-sexual relations those who perform best are rewarded the most. The rather strong correlations found in this area are thus worth noting.

Finally, a measure of "success" in a university setting one might expect to be important, the grade point average (or G.P.A.), was examined in this study. The null hypothesis could not be rejected regarding the relationship between the grade point average and the performance index. No relationship was found between G.P.A. and measures of reproductive success. Additionally, no support could be found to contest the well documented (cf. Pollio and Milton 1986) lack of correlation between G.P.A. and subsequent income. These findings (or more accurately lack of them) suggest that while studying may be perceived by some to be the most important activity in an academic institution, it does not appear to be an emically valued trait in terms of cultural performance, nor does it affect somatic or reproductive success.

CHAPTER V

DISCUSSION AND IMPLICATIONS

A. Discussion

The results of this study clearly establish links between a specific operationalization of cultural performance and various indicators of somatic and reproductive success. Direct and indirect measures of fitness have been shown to be related to cultural performance with the use of comparison of means and correlation statistical techniques. If the operationalization of cultural performance utilized in this study, i.e. participation in group activities along with an emic assessment of conformity, is accepted as a fair one, then the results are clearly suggestive of the potential profitability of further research in this area.

Perhaps the most unexpected result is that males who "performed" the best have on average more children than those who scored lower. It was assumed when formulating this study that indirect indicators of reproductive success would be required, as a body of literature attests to a lowering and levelling out of the birth rate in wealthy, western nations (Vining 1986). While indirect measures of reproductive success should prove useful in calculating potential fitness in areas with low realized fertility, it is encouraging to find that they might not always be needed.

The mean number of children increases for each performance group, and even if further studies involving larger sample sizes produce less dramatic results, the implications are still rather profound.

Other important results involve marriage patterns. As with the case of the realized fertility figures, the dependent variables involve life history events that, for the most part, occurred after the test period, and so render causal explanations more likely. Clearly, statistical tests do not establish causality (Pelto and Pelto 1978:162), but the variables that involve subsequent life history make a more convincing case for the proposed explanations.

Therefore, it is important to note that those males who scored highest in the cultural performance index were most likely to marry another University of Tennessee student. Additionally, although the sample sizes were too small to produce a significant correlation for the male sub-group, the figure for the group as a whole shows that high performance males were also the most likely to marry someone they met in the context of their "performance", that is, while at the university. When coupled with additional variables, a clear pattern emerges: the better the performance, the more likely males were to locate and select mates. Additionally, it is those individuals who produced the most offspring.

These results are consistent with those reported in the literature. As has been discussed, reproductive fitness has been correlated with a variety of particular culture-specific values, including aggression, wealth, status, specific skills, and so forth. What is significant in this study is the concept of "cultural performance", which is defined in such a way as to allow universal applicability. It is suggested that conformity and manipulation of group norms, whatever they may be, will produce results similar to those found in this case.

In terms of somatic fitness, it is more difficult to draw conclusions. The finding that household income goes up with performance scores for males is significant. Based on this study, those who perform best appear to be rewarded generously for their efforts. That wealth is in fact a measure of somatic success is not entirely clear, however, although it has been shown in several societies, including our own, that survivorship of offspring does correlate with wealth (Essock-Vitale 1984; Irons 1979). Although there is a risk of circularity in this argument, as wealth has itself been correlated to reproductive success (Borgerhoff Mulder 1987a), it can be stated that cultural performance seems to affect one's subsequent ability to be wealthy, which in turn may affect offspring survivorship. Again, of course, other explanations are possible--for example, these high performance males may come from wealthy families, which

would accentuate their performance scores and provide them with future wealth. In any case, income is a measure of "productive" (i.e. economic) success, and productive practices have been found to be linked with reproductive ones (Betzig 1988). As Berte (1988:83) has said, "the simple reason behind this marriage of productive and reproductive concerns derives from the expectation that individuals will expend both somatic and reproductive effort towards the broader goal of maximizing inclusive fitness."

Other measures of somatic fitness were not found to correlate with cultural performance, except for levels of life-history stress, which were found to increase with performance scores.

Correlations between cultural performance and fitness measures for females were found to be much weaker than those for males. Except for the ability to make friends, ease in meeting males, frequency in dating and number of different males dated (none of which directly involve subsequent life history), correlations were not established. Although this is a reflection of American attitudes towards gender in the early Sixties, a more profound explanation may very well lie in evolutionary theory, as a body of it predicts that for females, promiscuity should be associated with decreased reproductive success. This is because in order for males to contribute to the support of dependent offspring they will require some degree of confidence in their paternity

(Essock-Vitale and McGuire 1988; Trivers 1972). As Tiger (1988:79) has argued, "the material on reproductive strategies of males and females, in other primates certainly, would allow for the emergence of differentials by sex in specializations and motivations" (See also Gaulin and Hoffman 1988). Data from a variety of cultures support the contention that, indeed, male and female reproductive strategies can be fundamentally different (Betzig et.al. 1988; Tiger 1988). If this is indeed the case, then cultural performance may have to be defined more in terms of two variant scripts, male and female, than has been done here.

In terms of the overall study, it is important to note several specific factors which suggest that correlations are likely to be stronger than reported. A number of individuals, although unmarried at the time they entered the university, were clearly already involved with members of the opposite sex, in many cases with persons they subsequently married. Due to the nature of the survey instrument these individuals were treated as part of the sample. It is likely that, as these individuals would have tended to avoid behavior which made up indicators of both cultural performance and potential reproductive success, the power of some of the correlations was reduced.

Along the same lines, it became clear that many of the students were in fact transfer students who enrolled at the university only for their last two years. If one assumes

they would have had more difficulty in participating in, and conforming to, the group, then it is likely that for this reason, again, correlations are actually stronger than reported.

Finally, and most importantly, it must be remembered that cultural performance was measured over a limited time period--roughly four years. As cultural performance must be assumed to be a life-long endeavour, certainly beginning much earlier than in the first year of college, a life history approach to both performance and fitness variables can be expected to yield the best results. For example, following Bolton's (1973) approach with aggressive behavior, emically generated lists of those most conformist in a given community, as well as those most marginal, can be generated. The two lists can then be compared in terms of indicators of somatic and reproductive success. These data can be compared to similar data from other communities as well.

Additionally, some acculturation studies have shown that those most traditional and those most acculturated within a given group enjoy better adjustment than those in transition (Spindler 1955). This corresponds with expectations based on cultural performance theory, as those who perform a script (whatever it is) will be better off than those who are unable to, in this case perhaps because there is no solid script available. The question to ask, of course, is, rather than focusing solely on psychological

adjustment, how do individuals in these groups fare in terms of differential somatic and reproductive fitness?

As shown by Posey (1989), the Kayapo Indians in the Amazon Basin are one of the very few remaining tribal groups still in the early stages of contact and acculturation. Individuals are at this point accepting or rejecting foreign cultural traits with little information regarding their original western context. For example, slides of Kayapo show individuals in wholly traditional garb carrying portable radios and wearing watches. It could be said that performances are in the earliest stages of being reworked in the face of acculturative contact. On what basis are these choices being made? What effect do these choices have on individual fitness? The costs and benefits of changes in cultural performance, as well as explanations regarding the underlying process, can perhaps be understood best in this type of setting. Steps are being taken by the author to initiate this kind of research in the near future.

B. Implications

The concept of cultural performance utilized in this study, which has been shown to be at least plausibly linked to individual somatic and reproductive success, allows for the explanation of a great deal of cultural behavior which has thus far eluded cross-cultural interpretations. One such

area is the previously discussed reduced fertility within and between modern societies. Another is the presence, in all cultures, of traits which at best appear to be selectively neutral, and which often can be shown to be detrimental to individuals exhibiting them.

As discussed previously, there appears to be an inverse correlation between social and reproductive success between and within modern populations. Several explanations have been proposed. Alexander has suggested that "socially or legally imposed monogamy is a way of leveling the reproductive opportunities of men, thereby reducing their competitiveness and increasing their likelihood of cooperativeness" (1987:71). While this is an appropriate hypothesis for understanding the rise of monogamous systems, it is clear that fertility has dropped in societies that have always been monogamous, as in Europe over the last three centuries (Hughes 1986; Vining 1986). Harris (1981) echoes many demographers (cf. Andorka 1978) in proposing that the explanation for this trend lies in the differential rural/urban expense in bringing up children. In rural settings, more children mean more individuals who can work, while in the city they mean more expense without repayment to the parents. Another possibility involves r-K selective strategies, as "even the most K-selected of animal species...[involving low reproductive rates with high parental investment]...has an intrinsic reproductive

potential r adequate to allow dramatic population increase" (Daly and Wilson 1978:283).

Other explanations include an inverse correlation between number of children and the educational level of the mother (Lopreato and Yu 1987), rank (but see Essock-Vitale 1984) and intelligence (Vining 1986). Barkow and Burley (1980) have argued that as early hominid females began to understand the process of childbirth, child rearing and their causes, a variety of biological and cultural mechanisms emerged to prevent under-reproduction (including concealed ovulation, strong sexual desire, and pro-birthing ideologies). Perhaps these mechanisms are themselves understood and their effects overcome by modern, educated women.

Clearly there is a great deal of debate over the apparent correlation between modernity and reduced fertility, as well as over its possible causes (cf. Daly and Wilson 1986; Dawkins 1986). One argument which must be kept in mind is that the "great demographic transition" (Kaplan and Hill 1986:200) can in fact be seen as but a recent dip in the fertility curve which has been rising steadily since the Neolithic (Alexander 1988:330; Mazur 1983). "Before the demographic transition...reproductive fitness appears to have been positively correlated to social status...[in the West]" (Vining 1986:169), and there is a growing number of studies which establishes a similar correlation for non-

Western groups (cf. Betzig 1988). There may be no real reason to doubt that we are witnessing fluctuations of little significance in evolutionary terms.

More importantly, at least in terms of this thesis, the inverse correlation can be at least tentatively explained in cultural performance terms. If we hypothesize that individuals have a genetic capacity to conform to the particular configuration of traits and values they are born into, there is no reason to suppose that even a value such as reduced fertility would not be conformed to. As will be discussed below, the consequences of non-conformist behavior might reduce reproductive success even more than the conformity to a low-reproduction value (in terms of mate location, mate choice, successful child rearing, etc). Significantly, Vining doubts a correlation between high intelligence and low fertility because of a data-supported tendency on the part of "high IQ persons to raise their fertility up to or near the [U.S.] national level during a period of rising birth rates and to lower their fertility to levels well below the national levels during periods of falling fertility" (1986:175). This may in fact reflect differential cultural performance among individuals.

One of the benefits of utilizing a cultural performance paradigm for culture is that it allows a framework for explaining cultural traits that apparently have no adaptive significance (in any of the senses of the word), but which

appear to be patterned in their use, as in, for example, the case of hem lines (Richardson and Kroeber 1940; see also Lumsden and Wilson 1981:170-176). Although Darwin warned that "characters and structures, which we are apt to consider as of very trifling importance, may...be acted on" by natural selection (1864:81, as seen in Carneiro n.d.), anthropologists (including Carneiro) are prone to accept this only analogically. Archaeologists tend to describe the majority of these patterned traits as pertaining to style, and even in the most recent co-evolutionary models (Dunnell 1984, 1980) are forced to make a distinction between stylistic and more functional traits (Schiffer and Skibo 1987). In cultural anthropology, "style" is more aptly described as a neutral realm, and modern anthropologists from White (1949) to Harris (1979) have been forced to separate such traits from those which more obviously enhance the survival of individuals or cultural groups. It is not difficult to discuss a stone ax, for example, in terms of adaptation or even fitness maximization (Carneiro 1979; Childe 1936), but much of culture is simply not as easy to relate to the biological human. In this respect Carneiro (n.d.:30) has remarked : "it is hard to see...how having a concept of multiple souls would be more or less advantageous to a society than believing in only one soul. The life history of the trait `multiple souls', then, would be

expected to reflect chance factors rather than selective advantage".

The quote above aptly encapsulates the traditional anthropological perspective and highlights some of the problems identified with it. Other than perhaps in terms of group identity, a concept of multiple souls does little for a society's selective advantage. The point, however, is that a perspective focusing on the individual quickly reveals that it is to an individual's selective advantage to conform to such a belief if it is held by others the individual would need to get along with in order to survive and to reproduce. When viewed from this perspective, the concept of "multiple souls" is not neutral, as it can carry significant selective rewards.

A clear example of this point is seen in the process of Ladinoization in Guatemala (Logan and Qirko 1989). In Guatemala there exists an unusual situation in that there are two distinct ethnic groups, "Ladinos" and Mayan Indians, each with its own distinct traditions and associated cultural traits. Individuals in each group, however, are for the most part indistinguishable from each other in terms of biological characteristics. Over the course of several decades the proportion of Indians has been decreasing in relation to that of Ladinos. Early (1983, 1975, 1974) and others (Gonzalez 1986; Van Den Berghe 1968) have described the intentional adoption of Ladino lifestyles by Indians as

a major contributing factor to this change in relative populations. What Early has described as "purposeful acculturation", and Van Den Berghe as "passing", has been accorded a variety of proximate explanations, including ones political (Adams 1972), economic (Early 1983; Carter 1969) and ideological (Hawkins 1984) in nature. It can be demonstrated, however, that primary usage of Spanish, as opposed to traditional Mayan languages such as Cakchiquel and Tzutujil, wearing tailored clothing versus traditional huipiles, and a host of other material and ideational traits associated with the Ladino, as opposed to the Indian, can have important consequences on the survival and reproductive potential of individuals. Ladinos live longer than Indians (Horton 1987), are more likely to survive diseases such as influenza (Logan and Morrill 1979), and are less likely to be malnourished (GHRSP 1988:3), or be hosts to parasites (Scrimshaw and Tejada 1970). Additionally, although the Mayan crude birth rate is higher than that of Ladinos, more of the latter survive to their own reproductive ages, as nearly fifty percent of Indian children never reach the age of five (Early 1983:56,102). It is not difficult to understand why a significant proportion of Mayan Indians are manipulating cultural traits (Hawkins 1984:174; Gonzalez 1986:71) and instructing their children to do the same (Early 1980; Schwartz 1970). It is also clear that high-backed sandals, three stone cooking hearths, ritual

sweathouses and other traits associated with the Mayan lifeway are far from neutral. Rather, "these are precisely the traits that govern variance in the biological fitness of contemporary Guatemalans" (Logan and Qirko 1989:10).

While other examples of purposeful acculturation can be found (Posey 1989; Cuellar et.al. 1980; Barth 1969), the Guatemalan example is particularly clear due to the phenotypic similarity between both groups, which facilitates the ability of individuals to effectively change or manipulate their identities.

In a recent Newsweek article on the mind and how it has been shaped by selection, opposition to sociobiological notions (associated with Stephen Jay Gould) was expressed through reference to "maladaptations." "If behavior is directly governed by genetic self-interest, one might ask...why does anyone eat junk food or smoke cigarettes" (Cowley 1989:13)?.

Clearly, human beings do not always engage in actions that lead towards maximized somatic and reproductive success. In fact, even a cursory cross-cultural overview of cultural practices reveals a myriad of activities which must be said to directly reduce an individual's ability to survive and reproduce. Some, like cigarette smoking in our own society, might be said to be relatively harmless, while others, like Australian aboriginal male initiation rites (Tindale 1974), place an individual directly at the risk of

losing his or her life. These examples may be said to offer proof as to the independence of culture from the realm of biological parameters. Furthermore, it could be said that the group (which individuals are frequently ready to die for) is the ultimate unit of selection in terms of human social behavior. Inclusive fitness, while a powerful concept for the explanation of much altruistic behavior, falls short when addressing certain types of activities that clearly cannot be seen to relate to the protection of the genotype as it is found in different individuals (Barkow 1989; MacDonald 1989).

The notion of cultural performance, however, provides an opportunity for the explanation of not only neutral traits, as has been shown above, but even deleterious or maladaptive cultural practices. The logic is simply that the human mind is "designed" so that individuals will conform to group practices regardless of the nature of these practices. Here, the benefits gained by conformity outweigh those risks associated with the practices themselves. People smoke cigarettes, eat junk food, race cars while intoxicated, throw themselves off 100-foot towers with only vines tied around their ankles (CCCD 1983), subject themselves to life-threatening initiation rites involving genital flaying and burning (Tindale 1974), etc., because it is frequently to an individual's advantage to conform to the group, regardless of the immediate risks.

The total set of culture traits in a given group complex is shaped by a variety of forces, and much of cultural anthropology has been devoted to an understanding of those forces. They include environmental considerations, diffusion, chance (or cultural drift), and in many cases, rational decisions made by individuals in materialistic terms that become institutionalized (see Harris [1978] and the sacred cow of India for a good illustration). However, ultimately what is at stake is the survival and reproductive potential of individuals who, as members of our species, must be members of groups, and must be deemed attractive to other members of the group in order to survive and reproduce. This is why a specific gene for the avunculate, or for any other cultural practice, will never be found, no matter how adaptive in certain environments that practice may be shown to be (see Chapter III). The only cultural practices that should be found to cut across cultural groups are those which directly reflect human programming to maximize fitness. For example, Daly and Wilson have shown with regard to infant abuse (1985) and homicide (1988), it is step-relatives and not blood kin who are most likely to assault family members. Likewise, Buss (1985) has discussed how individuals are likely to choose as mates those most similar to themselves in a variety of respects. Kiernan asks "who remains celibate?" (1988), and finds that it is those who differ from the norm in a number of ways.

Many cultural traits may be in a very real sense "noise". In other words, variation that, although important in a variety of contexts and attributable to a variety of causes, is relatively meaningless in Darwinian terms. As alluded to earlier, the best analogy for culture as a whole is language, in that the capacity to learn and manipulate language is universal, and genetically encoded. The thousands of different languages that exist, and have existed through time, are all but manifestations of the same process, and are in and of themselves irrelevant in the broad scope of evolutionary theory. However, how well an individual learns and utilizes a particular language can be assumed to be tremendously important in terms of differential fitness.

One final implication of cultural performance theory pertains to innovation and the historical accumulation of innovations, what most anthropologists recognize as culture change. After all, if individuals are rewarded for conforming to existing cultural values and manipulating them for personal advantage, what incentive is there to dramatically alter these traits or to invent new ones? While this thesis does not explore this problem in depth, there are some points concerning this question that must be made.

In the first place, the frequency of truly original cultural elements being "discovered" by individuals has probably been overestimated (Barnett 1953). In fact, most

innovations appear to be recombinations of existing cultural elements. They are innovations occurring at a time when there is a generally felt need. For this reason it is not surprising that even what appear historically to have been dramatic innovations, discoveries or theoretical formulations, have often been the products of close races between several individuals or groups of individuals. Examples include the discovery of the structure of DNA or even the development of Darwinian evolutionary theory itself. Discoveries may also be the result of slowly developed, unconscious steps, perhaps involving generations, as apparently has been the case with plant and animal domestication (Smith 1985; Rindos 1980; Crites 1978). It is therefore difficult to determine exactly at what point manipulation ends and truly original innovation begins.

Another point is that if creativity and originality are, for whatever reasons, built into a cultural system as valued traits, then they becomes yet another value to be conformed to (Hagerstrand 1968). For example, in the realm of music, while some cultures do not encourage or even acknowledge individual authorship of compositions (Merriam 1964), others, like our own, value individual authorship and ownership of not only compositions themselves, but also arrangements and performances. In the latter case, musical genius, however striking, can be seen as a part of cultural

performance, a performance which, when successful, is frequently copied.

A third point to make concerns true innovation (whatever that may be). The paradigm of cultural performance leads one to suspect that innovations would be attempted by those with the least ability to succeed at a "traditional" script: that is, those with the least to lose by breaking new ground. In other words, individuals who, for whatever reason, are failing to conform to expected values, perhaps due to problems with enculturation, physical handicaps, luck, or those who are somehow different in mental faculties or personalities (i.e. the most marginal), would be those most willing to take the most risks. Then, when innovations have taken place, "in any local area a growing pressure on non-adopters of an innovation builds up very quickly as the number of adopters grows" (Hagerstrand 1968:176), or, in other words, there is growing pressure to conform.

Evidence does exist which appears to support this hypothesis. Anthropologists and rural sociologists have pointed out that introduced technological or ideational traits are usually picked up first by the most marginal members of communities (DeWalt 1978; Rogers and Schoemaker 1971; Foster 1967). Additionally, diffusionists argue that in traditional societies "acceptors of change are often deviant or marginal members, although the conversion of a formal leader is often sufficient to accomplish the

conversion of an entire group" (Katz 1968:178). Both of these processes can be understood in terms of individual conformity and innovation for maximized fitness. A great deal of popular literature deals with the relationship between artistic innovation and marginal or deviant personalities in western society (although see Pleasants 1955).

Finally, it must be pointed out that even the most dramatic culture change, such as a transition from hunting and gathering to pastoralism, may be explicable in terms of individuals striving for somatic and reproductive success. While it may be true, as Carneiro points out to Rindos (1985:77), that the historical pattern of culture change is directional and not random, its directionality is apparently often controlled by powerful individuals whose goal appears to be political, yet which carries ultimately reproductive rewards (Betzig 1986). Additionally, even change as dramatic as that from one level of socio-cultural integration to another can be similarly explained, as in the case of the Muskogodo of Kenya, who apparently underwent a rapid transition from hunting and gathering to pastoralism as a means for individual males to maximize reproductive success (Cronk 1989).

In summary, then, it is likely that the paradigm of cultural performance can be useful in explaining a variety of cultural phenomena and processes in terms of the

individuals attempting to maximize their own survival, physical well-being and reproductive fitness. A genetic capacity to "perform" is something easy to envision as heritable, and thus exposed to the forces of selection. This hypothesis will require further and more extensive testing, of course, but it is thought likely that, regardless of the nature of cultural traits in a given setting, those who conform to and manipulate them best will be found to enjoy greater reproductive and somatic success.

CHAPTER VI

CONCLUSION

"In my view, those who concentrate on a search for species-wide universals in behavior or morphological traits are likely to be disappointed. The number of genuinely universal traits are, I suspect, likely to run at single figures at most and probably correspond to the handful of biological `needs' like warmth, food and procreation...Beyond that, everything else is essentially a context-specific attempt to put those few universal principles into practice" (Dunbar 1988:168).

Over the period of the last twenty years a new scientific orientation has begun to emerge. Although mathematical in origin, it has begun to be applied in physics, astronomy and even biology. At its base is a reformulation of the fundamental paradigms which guide scientific inquiry. One of these traditionally held basic beliefs, for example, is that complex behavior implies complex causes. "A system that [is] highly unstable, unpredictable or out of control must either be governed by a multitude of independent components or subject to random external influences" (Gleick 1987:303).

This newly emerging scientific orientation, on the other hand, one that has been labelled "chaos theory," emphasizes that very basic rules can give rise to complex behavior. In other words, "simple processes in nature [can] produce magnificent edifices of complexity without randomness" (Gleick 1987:306, emphasis his). Therefore,

global weather patterns, for example, or the formation of snowflakes, rather than explainable in terms of complex interactions of a large number of variables, might be better understood in terms of simple processes, or rules, which generate the observed complexity. In this regard, natural selection may be the fundamental process that brings pattern to all the variability in the natural world (McCracken 1989).

It can be argued that human cultural behavior is itself a system that is "unstable, unpredictable, out of control," and one that has been explained in the past in terms of complex interactions of a multitude of factors. One need only look historically at anthropological explanations for cultural behavior and note the almost dizzying number of possible interpretations. No one paradigm has successfully displaced the others:

> "There has been a burgeoning of [anthropological] schools of thought that are all with us today--structural-functionalism, structuralism, Marxism in several different varieties, personality and culture, cultural ecology, cognitive anthropologies, neo-evolutionisms, cultural materialism, and so forth--and none is dominant. Indeed, this may just be the future condition of anthropology: a pluralistic discipline that loosely shelters a plethora of interest which lacks a center" (Murphy, in Applebaum 1987:3).

However, the "evolutionary biological anthropology" movement of recent years may very well provide that center required for a focused discipline, in that it furnishes basic natural principles that can, at least potentially,

explain human cultural diversity regardless of setting. Additionally, the increasingly clear relationship between cultural goals and individual fitness might provide the necessary explanatory link between genetically encoded rules and cultural expressions.

The specific nature of cultural goals, even if on one level fundamentally irrelevant to the individual, is made up of many interrelated elements crucial to the stability and survival of the group. Cultural trait complexes, then, which vary dramatically from culture to culture, are the result of processes that various anthropological schools of thought have tried to explain. Materialist needs, population dynamics, environmental and ecological factors, diffusion, chance, etc. do help determine the specific nature of cultural scripts, and must be examined and understood. However, explanations of the pattern of culture without the ultimate process can never be sufficient, and it is here that evolutionary biology has the most to offer. Blute (1979) has described socio-cultural evolutionism as "an untried theory", but that was a decade ago. Since then, much significant work has been done to erase this criticism (Irons 1988).

This thesis rests on the assumption that there is a simple, genetically transmissible "command" given to all humans. This genetic command, which underlies the vast complexity of human behavior (the "chaos"), calls for

flexibility, yet actions based on it are predictable and patterned. It determines no specific cultural traits, yet it explains their existence and perpetuation. The command is simply that humans conform to, and manipulate, that which they are born into. The mental capacities required to execute it are heritable traits, ones that are differentially selected for. The term "cultural performance" is used to describe this genetic command, and suggests the notion that individuals constantly manipulate trait complexes, or cultural "scripts," in the often unconscious pursuit of basic biological goals; notably, somatic and reproductive success.

Understood in this way, cultural performance can be tested, and tested simply: those who best conform and manipulate the cultural complex into which they are born should enjoy greater somatic and reproductive success than those less capable at performance. In other words, those perceived emically as the "best" representatives of their culture should be the ones most rewarded biologically. While this will not prove the existence of specific learning capabilities that are heritable in nature, it will go a long ways toward establishing their likely nature.

A variety of studies have shown that this is indeed the case. However, they have failed to provide a unifying theory. While many studies have demonstrated correlations between fitness and success in specific cultural goals,

there is simply too much cross-cultural variability that challenges these correlations. Aggression may work as a value for the Yanomamo, for example, but it fails for the !Kung, Hopi, Amish and many other groups.

This thesis, then, presents a test of the notion of cultural performance. By means of a comparison of individual "performance" with subsequent life history events, the hypothesis that there are links between conformity and manipulation of valued traits and somatic and reproductive success has received support. The "performance" (in terms of group conformity) of university students twenty-five years ago has been correlated to subsequent life history events that pertain to survival and reproduction.
The usefulness of potential measures of fitness has been demonstrated as well. While clearly more extensive testing is required, the results of this thesis do provide some very encouraging signs.

In addition, this thesis establishes a methodology for similar work in a variety of settings. The specific nature of cross-cultural variability can in a sense be disregarded, as long as the relationship between performance and differential somatic and reproductive success is tested. One should find results similar to the ones presented in this study in <u>any</u> cultural environment, including sub-cultures in complex societies. In an important generalized sense, then, cultural performance theory is universally applicable, and

can be used to integrate many of the studies done to date in human sociobiology.

More specific applications have to do with the focus of the theory on individual behavior. While it is easy to decry vanishing cultural variability in the face of modernization (Bodley 1982; also Cultural Survival), it is much more difficult to suggest practical means by which cultural lifeways can be protected from it. In addition, it can be argued that our species is presently involved in maladaptive behaviors that will ultimately deplete the planet's resources (Posey et.al 1984; Bodley 1982). While it may be difficult to imagine the use of performance theory in these areas, it does indeed apply. Individuals will manipulate and alter even the most basic elements of their culture if it appears in their best individual interest to do so. Preservation of cultural traditions in the face of acculturation can only be accomplished if the dynamics of the individuals who make up the groups involved are understood and dealt with. In the case of Ladinoization in Guatemala (Logan and Qirko 1989), for example, only if it becomes advantageous in terms of survival and reproduction for individuals to "remain Mayan" will they do so, regardless of the inherent qualities and richness of their cultural traditions.

On the other hand, cultural performance theory predicts that individuals will perpetuate even the most destructive

of cultural traits if, by doing so, conformity to the group will be attained. This insight and its logical consequences might be of value in the planning and implementation of programs designed to eliminate "maladaptations," from smoking cigarettes to the clearing of tropical rain forests.

Another important potential application is based on the notion that the differential "performance" of individuals might be an underlying factor in what has often been seen as essentially idiosyncratic behavior. It can be argued that failure to successfully perform is related to such behaviors as celibacy (Kiernan 1988), increased disease load (Logan 1987), and even suicide (Tiger 1988). Moreover, since cultural performance has been shown to affect somatic and reproductive success, this finding underscores the importance of reducing "obstacles" that prohibit or diminish the chances of some from participating as fully as possible in the lifestyle into which they are born (cf. Hughes 1988:132-141).

In the final analysis, however, the notion of cultural performance could represent a significant contribution because, in keeping with chaos theory, it proposes a simple, plausible cause for what is arguably the most complex and multi-faceted of all phenomena, human cultural behavior.

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APPENDICES

APPENDIX A: Cover letter

August 5, 1988

Dear U.T. alumnus:

My name is Hector Qirko, and I am a graduate student at U.T. in cultural anthropology. I have long been interested in trying to find the link between the "university experience" and subsequent life history events. In other words, how have the years you spent at U.T. affected your life after leaving school? In the past much has been made of the importance of academic performance, and, while not denying the effect of grades on employment, I am much more interested in one's total educational experience, including academics, social life and extra-curricular activities.

I would like to make it clear that this project is in no way connected with any university agency or organization. The research I am pursuing is done solely for my Master's thesis, although a copy of my results will be forwarded to various offices on campus for any input it might provide them in better assisting students in the future.

Because I am interested in identifying connections between the university experience and life histories, much of the information I am asking for is biographical, and therefore unavoidably personal, in nature. I want to make sure you understand, however, that this is a totally confidential survey, and that the data generated is to be used only in order to make statistically supported generalizations. You will find a stamped, self-addressed envelope within, and you need only fill out the questionnaire and return it.

I hope you will take just a few moments to complete the survey form. Should you wish to receive a copy of the results of my study, simply write your name and address on this cover letter and return it along with the questionnaire. Your participation in this survey is deeply appreciated.

Sincerely,

Hector Qirko
252 South Stadium Hall
Department of Anthropology
University of Tennessee
Knoxville, TN 37996

APPENDIX B: Questionnaire

NOTE: THIS IS A CONFIDENTIAL QUESTIONNAIRE--PLEASE DO NOT ENTER YOUR NAME

1.Gender:_____
2.Age:_____
3.Marital status:_____
4.Number of previous marriages:_____
5.Are you or were you married to a U.T. alumnus or student?_____
6.Are you or were you married to someone you met while you attended U.T.?_____
7.How many children do you have (whether living with you or not)?_____
8.How many times have you relocated (not within-city) since attending U.T.?_____
9.What is your occupation?_____
10.Annual household income (approximate):_____
11.Do you own your own home?_____
12.What was your grade point average (approximate) at U.T.?_____ 13.What was your major?_____

Please circle YES or NO and, if you circled YES, also circle the number of years involved in the activity.

14.While at U.T. did you belong to any scholarly organizations (for example, Phi Kappa Phi)?
NO YES 1 2 3 4 5

15.Did you belong to any academic or social clubs? Please specify_____
NO YES 1 2 3 4 5

16.While at U.T. did you live at home and commute?
NO YES 1 2 3 4 5

17.Did you live in a dorm?
NO YES 1 2 3 4 5

18.Did you live in a rental house or apartment?
NO YES 1 2 3 4 5

19.Did you belong to a fraternity or sorority?
NO YES 1 2 3 4 5

20.If you answered YES to 19, were you elected to office?
NO YES 1 2 3 4 5

21.Did you vote in general student elections?
NO YES 1 2 3 4 5

22.Were you involved in student government?
NO YES 1 2 3 4 5

23.Were you elected to office in student government?
NO YES 1 2 3 4 5

24.Were you involved in any campus religious organizations?
NO YES 1 2 3 4 5

25.Were you involved in varsity and/or intramural athletics?
NO YES 1 2 3 4 5

26.Did you have an athletic scholarship?
NO YES 1 2 3 4 5

27.Were you a dorm counselor, sophomore aid, resident assistant, etc?
NO YES 1 2 3 4 5

28.Were you in the school band?
NO YES 1 2 3 4 5

29.Were you a cheerleader?
NO YES 1 2 3 4 5

30.Did you have a job at the university?
NO YES 1 2 3 4 5

31.Did you have an outside job?
NO YES 1 2 3 4 5

32.Were you involved in the school newspaper, and/or the annual? Please specify_____
NO YES 1 2 3 4 5

33.Were you involved in any group activity not mentioned above? If so, please describe briefly and list number of years involved.

Please circle the term that best describes your answer to the questions below.

34.Did you attend parties at U.T.? NEVER SELDOM OCCASIONALLY FREQUENTLY VERY FREQUENTLY

35.Did you find it easy to make friends at U.T.? N S O F VF

36.Do you still see friends you made at U.T.? N S O F VF

37.Did you make career connections while at UT? N S O F VF

38.Did you find it easy to meet members of the opposite sex at U.T.? N S O F VF

39.Did you date at U.T.? N S O F VF

40.How many different individuals (approximately) would you say you dated while at U.T.? _____

41.Did you engage in sexual activities while at U.T.? N S O F VF

For the following questions the numbers 0 through 5 are degrees, with 0 representing "NOT AT ALL" and 5 representing "TO A GREAT EXTENT". Please circle the number that best matches your feelings regarding the question.

42.Do you feel that your participation in group activities while attending U.T. has had a positive effect on your success in life (in economic terms)? 0 1 2 3 4 5

43.Do you feel that your participation in group activities while attending U.T. has had a positive effect on your social success in life? 0 1 2 3 4 5

44.Do you feel that your experience at U.T. was stressful? 0 1 2 3 4 5

45. Would you say your life since leaving U.T. has been stressful? 0 1 2 3 4 5

46.Did you enjoy good health while at U.T.? 0 1 2 3 4 5

47.Have you enjoyed good health since leaving U.T.? 0 1 2 3 4 5

48.While at U.T. did you feel like you "belonged" (however you define it)? 0 1 2 3 4 5

THE FOLLOWING ARE OPEN-ENDED QUESTIONS (Please be as brief as possible).

49.What did you do for the two years after you received an undergraduate degree from U.T.?

50.If you could change anything about your experience at U.T., what would it be?

51.If you had children who planned to attend U.T., what would you want them to experience that you enjoyed while on campus?

52.Do you feel that many students had a richer experience at U.T. than you did?

53.To what extent do you feel you were influenced by your peers while at U.T. (in terms of dress style, smoking and/or drinking patterns, etc.)?

54.In what respects (if any) did you feel that you were removed from the mainstream while at U.T.?

55.Were you happy/satisfied with your U.T. experience?

56.Socially, did you feel confident at U.T.?

57.Concerning the number of friends you had at U.T., did you feel you had an average, more than average, or less than average number?

Please feel free to explain or expand answers to any questions above, or add anything you think may be useful--remember that I am simply trying to make connections between your experience at U.T.K. and your life after leaving the university. Thank you for your time and input.

COMMENTS:

The above was printed (with more room for answers) and sent out to 200 male, 200 female University of Tennessee alumni, class of 1965. The scoring system utilized was one point for each organization belonged to (#14-33), and one additional point for every year after the first one involved in the activity (note: the points based on numbers of years were not utilized, as many individuals left those questions unanswered and the sample size dropped accordingly). Questions 34-41 were scored as "Never"=0 points through "Very Frequently"=5 points, and questions 42-48 as written. Questions 50-75, described in the questionnaire as "open-ended", were scored from 0 to 2 points based on the degree

to which answers expressed conformity and/or group participation themes. For example, if the answer to question 50 involved a desire to have participated in more group activities, it was scored 0, while if it involved no such desire, it would be a 1 or a 2, depending specific content. While admittedly subjective, the questions were systematically and carefully scored.

The performance index was calculated by adding the scores of questions 12,14,18,22-44 (even # only),48,50,51,59,60,65,66-74. It was assumed that those with the highest scores were those who participated most in group activities and felt themselves to be the most conformist, and thus were the best "performers" in the sense utilized in this thesis.

VITA

Hector Nako Qirko was born in New York City, New York on June 21, 1953. He spent his childhood in various South American countries, and after a brief stint at Northwestern University in 1970-2 became a professional musician. Entering the University of Tennessee in June of 1984, he received a Bachelor of Arts degree (Summa Cum Laude) in Anthropology in August, 1986. In the fall of 1986 he accepted the first of three teaching assistantships at the University of Tennessee, and was awarded a National Alumni Scholarship for the academic year 1987-8. He received his Master's degree in Anthropology in August of 1989.

The author is a member of Phi Beta Kappa and Phi Kappa Phi. He will be an Instructor in Cultural Anthropology at the University of Tennessee, beginning in the fall of 1989, while continuing his studies toward a Doctorate in Anthropology.