To the Graduate Council:

I am submitting herewith a thesis written by William Frank Clevenger entitled "An Analysis of Commitment to the Swimmer Role Identity." I have examined the final 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 Sociology.

Suzanne B. Kurth

Suzanne B. Kurth, Major Professor

We have read this thesis
and recommend its acceptance:

Accepted for the Council:

Vice Provost
and Dean of the Graduate School

STATEMENT OF PERMISSION TO USE

In presenting this thesis in partial fulfillment of the requirements for a Master's degree at The University of Tennessee, Knoxville, I agree that the Library shall make it available to borrowers under rules of the Library. Brief quotations from this thesis are allowable without special permission, provided that accurate acknowledgement of the source is made.

Permission for extensive quotation from or reproduction of this thesis may be granted by my major professor, or in her absence, by the head of Interlibrary Services when, in the opinion of either, the proposed use of the material is for scholarly purposes. Any copying or use of the material in this thesis for financial gain shall not be allowed without my written permission.

Signature William F. Clevenger

Date 4-25-89

AN ANALYSIS OF COMMITMENT TO THE SWIMMER ROLE IDENTITY

A Thesis

Presented for the

Master of Arts

Degree

The University of Tennessee, Knoxville

William F. Clevenger

May 1989

ACKNOWLEDGEMENTS

While completing the research and writing this paper, I was assisted by a number of individuals. I would like to thank Dr. Suzanne Kurth, my advisor and committee chairperson, for her valuable guidance while conducting this research and her professional dedication. I would also like to thank Dr. Donald W. Hastings for his helpful suggestions at various stages of the research, and Dr. Greer Litton Fox for so ably serving on my committee. I am also indebted to Dr. George O. Rogers of Oak Ridge National Laboratory for his guidance during the statistical analysis of the data and to Dr. John Sorensen of Oak Ridge National Laboratory for his patience and encouragement. A special thanks to Pat Hatfield for her emotional and technical support.

ABSTRACT

Commitment to the role identity of competitive swimmer was explored. Role identities are ranked according to past degree of self support, past degree of social support, commitment, investment, extrinsic rewards, and intrinsic rewards. People with the leisure identity of Masters swimmer were studied.

A data set collected from 497 Masters swimmers was examined. A bivariate screening of sex, marital status, parental status, age, activity interference, self support, social support, against commitment using t-tests was performed. Age, self support, and social support were included with commitment into log linear models. A model containing the interaction effects of commitment and self support, commitment and age, and the marginal effect of social support met the necessary criteria for accepting a log linear model.

Commitment to the competitive swimmer role identity was most affected by age, self support, and social support. Younger individuals were less likely to have a high attendance at swim meets than older individuals. Individuals with a high degree of self support were less likely to report attendance at a large number of swim meets.

TABLE OF CONTENTS

LIST OF TABLES

TABLE PAGE

CHAPTER I

STATEMENT OF THE PROBLEM

Contemporary social psychologists increasingly are developing and using role identity models to examine how social structures influence individuals' self perceptions and behaviors. Role identities address the relationship between self and society by showing their mutual influence.

One of the major difficulties in studying role identities is that people have different sets of identities. Focusing on people who participate in the same activity and thus share a common identity is one way to resolve the comparability of identity problem. Individuals who incorporate an activity into their everyday lives begin to perceive of themselves, and want others to view them, as people who are associated with that activity; they share a common identity.

Two methods primarily have been used in the identity literature to measure identities. One method is for people to select self descriptions from adjective pairs. The semantic differential approach allows researchers to use more advanced statistical models. The second method of measuring identity has been some variation of the Twenty Statements Test which asks people to describe who they are. The self report approach generally is limited to a qualitative description of identity structure. This research uses behavioral

measures of a specific identity. Respondents in this research are all self identified members of Masters Swimming. The purpose of this study is to examine variation in commitment to a specific role identity--swimmer, using data on Masters swimmers.

CHAPTER II

THE ROLE IDENTITY CONCEPT

Role identity ideas derive mainly from the symbolic interactionist perspective which examines the ways people shape society and the ways social structures affect individuals. Role identity theorists dismiss the concept of a single core self and instead argue individuals have multiple self perceptions that are ordered internally.

Self

William James (1890) and George Herbert Mead (1934) provide a basic orientation to the symbolic interactionists' conception of self. James conceived of the self as multifaceted. He argued that an individual has as many different selves as there are others with whom that individual comes in contact. Mead also argued that the self was multifaceted drawing on James's dichotomization of the self into "I" and "me," self as process and self as object. The conception of the self as composed of multiple "mes" is retained by contemporary symbolic interactionists who in some cases treat identities as quantifiable equivalents of "mes" (Stryker 1980).

Roles

Social roles are scripted, defined, or suggested by the society and their interactional or personal meanings are negotiated by the role performers. Basic aspects and expectations of roles are defined by social groups. How an individual performs (enacts) a role depends on situational and personal factors. McCall and Simmons (1966) argue interactive roles reflect both normative expectations and idiosyncratic ones based on interpersonal negotiations.

Symbolic interactionists view roles as less clearly defined than structural functionalists. For example, Turner (1978) emphasized the dynamic nature of roles by focusing on role negotiation (role taking and role making.) Although roles consist of expectations for behavior, role performances involve creating and modifying behavior. Individuals negotiate roles based on the situation, the responses of the other involved, and their conception of what is appropriate or inappropriate for the role they are performing. Turner's (1978) explanation of the self in terms of role performances (role person merger) is an important element in the perspective of contemporary <u>structural</u> symbolic interactionists, although various theorists use other terminology.

Role Identity

The role identity concept bridges the concepts of self and role. Theorists argue that a role identity is the product of an individual incorporating normative role expectations acquired through

interaction and socialization with his or her own definition of what it means to fill that role (e.g., Gordon 1976). Role identities are perspectives or frames of reference the individual uses when engaging in reflective thought, thus paralleling the more ambiguous "me" concept (McCall and Simmons 1966:69). McCall and Simmons' (1966:67) widely accepted definition of a role identity is how I like to think of myself being and acting as an occupant of a particular position. People have role identities for all the significant social positions they occupy, have occupied, and anticipate occupying. Classes of identities may be differentiated: sexual, ethnic, membership, political, and occupational (Gordon 1976).

Identities are social products constructed through meanings the person attaches to behaviors. Individuals validate their identities by altering role performances to conform with their role identities.

Identity Hierarchies

Theorists argue role identities are arranged hierarchically; individuals cognitively order their sets of identities. According to McCall and Simmons (1966) role identities are ordered in a prominence hierarchy , the ideal self, and a salience hierarchy, the situational self. Stryker (1980) proposes only a salience hierarchy.

In their role identity model McCall and Simmons (1966:263-266) propose six dimensions that determine the internal ranking of importance of the identities. These dimensions are: (a) past degree of self support, (b) past degree of social support, (c) past degree

of commitment, (d) past degree of investment, (e) past degree of extrinsic rewards, and (f) past degree of intrinsic rewards.

Self support is the degree to which an individual supports his or her own imaginative view of identity (McCall and Simmons 1966). Social support is the extent to which one's view of self has been supported by relevant others such as peers, relatives, friends, or experts. Commitment is how deeply an individual has staked himself or herself to the particular contents of a role identity. Investment refers to the resources spent in establishing and maintaining an identity. Extrinsic gratifications are what tangibles (e.g., money or prestige) a person gains from a role identity; intrinsic gratifications are the pleasurable feelings produced from having done something (e.g., sexual pleasure or body tone).

Commitment

Commitment is the most frequently studied dimension of role identities. McCall and Simmons (1966) define commitment as the degree to which an individual has tied his or her self esteem to an identity. Stryker (1980) treats commitment to an identity as the costs to an individual of having the identity or not having relationships based on other identities. Commitment to one identity is at the cost of the opportunity to develop another identity. Commitments are dependent on the structural aspects of the society which determine a person's opportunities (Stryker 1980).

Leisure Identities

People have multiple role identities. Some of these identities individuals are almost forced to have, although they have some control over the content of those identities.

Leisure activities offer the opportunity to study roles and identities which involve some freedom of choice. Kelly (1983) applied role identity ideas to the study of leisure behavior and, using McCall and Simmons' (1966) work, defined role identity as how a role is enacted or a style of behavior. Kelly (1983) examined leisure identity sets and argued for the significance of their place in a person's hierarchy of identities.

Leary, Wheeler, and Jenkins' research (1986) contrasted personal identities and social identities. Individuals with a personally based set of identities are people who give greater attention to emotions and feelings. Socially based identities are those in which people are more concerned with their social reputation or their attractiveness to others. (These concepts parallel McCall and Simmons' (1966) ideas of intrinsic gratifications and extrinsic gratifications.) Leary, et al. (1986) reported on two different identity studies.

The first study focused on occupational identities rather than leisure identities. Leary, et al. (1986) suggested people would pursue activities that provide support for their identities based on the salient aspects of those identities. Individuals who were personally or internally oriented would prefer occupations that would

provide intrinsic rewards; persons who were socially or externally oriented would choose occupations with extrinsic rewards. Subjects received a job preference questionnaire which contained socially and personally oriented occupations and were asked to rate the attractiveness of each job. Next, the Aspects of Identity Questionnaire (AIQ) required responses on 21 different attributes reflecting a personal versus a social orientation. Finally, subjects rated 20 personally or socially oriented job characteristics. The subjects' ratings of job characteristics reflected the degree to which their identities were defined by their personal versus social orientations.

The second study (Leary, et al. 1986) examined the social versus personal identity orientations and recreational behavior. Subjects were selected who were engaging in one of six physical activities: running, swimming, tennis, softball, basketball, or volleyball. Personal sports are those sports engaged in alone; team sports are social sports. Subjects rated 4 socially oriented reasons and 4 personally oriented reasons for participating in sports, and then reported the frequency with which they participated in 12 sport activities. These subjects also completed the AIQ. Findings suggested that the two types of identities, personal and social, were associated with the predicted sets of reasons for participating in sports.

Role Identity Measures

Researchers have measured role identities and their dimensions, particularly commitment, in a variety of ways. Self report of the most important identity was used by Jackson (1981). Subject's self report of the most important identity is influenced by the subject's current situation or involvement and is not an accurate measure of that person's level of commitment. For example, people at work might report the worker identity as the most important to them; people at home might report one of their family identities as the most important; and students in a classroom might report the student identity as their most important identity.

A semantic differential procedure also has been used to measure commitment (Burke and Tulley 1977). This technique is more a measure of an individual's personal psychology or emotional reaction to a word pair than a measurement of commitment. How a person responds to a set of adjective pairs is also influenced by the situation and events immediately prior to taking the test.

The semantic differential technique was used by Hoelter (1983) to measure commitment, salience, and role evaluation by creating scaled measures. Support was found for salience being positively affected by the degree of commitment to a role, and the degree to which the role was positively self evaluated.

The measures of commitment with the most face validity have been behavioral measures. Callero (1985) used the number of times individuals donated blood as a measure of the person's commitment to

the blood donor identity. Although this measure is reliable, the identity of blood donor is probably not a very strong one for most people. Time spent in a role or resources spent in a role also have been used as behavioral measures of commitment (Stryker and Serpe 1982; McGuire and Dottavio 1987).

Amount of time and money expended may measure activity involvement or commitment to leisure (McGuire and Dottavio 1987). Researchers found an increase in the amount of time or money available to a person engaged in a leisure activity was correlated with an increase in the amount of time and money spent doing the activity.

Variation also has existed in how identities were selected for study. First, some researchers have examined the broad range of identities individuals have (Thoits 1983). Second, other researchers focus on a single identity common to a group of people (Burke and Tully 1977; Callero 1985).

The relationship between the number of identities individuals have and stress responses was examined by Thoits (1983) using panel (longitudinal) data from the New Haven community survey. She tested the identity accumulation hypothesis which proposes that the greater the number of identities a person has the better that person can handle stress up to a certain point. Identity accumulation was the sum of social positions held by individuals. Individuals who reported more identities had less psychological stress. The New

Haven data were not collected with the purpose of studying role identities. This approach to studying identities is quite limited.

A measure of commitment to assess the importance of different identities within the self and to measure the hierarchy of sets of identities for the individual was developed by Jackson (1981). Subjects ranked the importance of various identities on a scale from 0 to 100. Next, subjects used a 23 item scale (Commitment Index) to rate their most important identity and their least important identity. Identities that were ranked similarly showed similar scores on the Commitment Index.

Jackson (1981) focused on correlating the measurement of identity commitment to identity hierarchy. She developed a Social Identity Questionnaire (SIQ) to measure the hierarchies of her subjects. The SIQ defined seven categories of role identities: associational, kinship, occupational, peer, recreational, religious, and romantic for her research subjects. Subjects received several examples of identities that could be included in each category, and then chose the identities that described them. The problem with this approach is that choices are rather forced.

Other researchers focused on a specific identity. Stryker and Serpe (1982) used survey data to examine the religious identity. (The religious role presumably was not complicated by interactions with most other roles.) Commitment, identity, and role performance were measured. Commitment and identity salience were measured as the allocation of time given to the role. Commitment also was defined as

the relationship to others formed as a function of the occupancy of a particular position or role. A six item scale measured commitment. Salience was measured by a two item index that ranked religion in relation to other roles. Religious satisfaction and presence of other roles also were measured. The independent variable was time spent engaged in the religious role.

Stryker and Serpe (1982) proposed the higher the commitment: (a) the higher the identity salience, (b) the higher the time spent in role, and (c) the higher the religious satisfaction. They also proposed: (a) the higher the identity salience, the higher the religious satisfaction, (b) the higher the religious satisfaction, the higher the time spent in role, and (c) the presence of other roles (parental, spousal, worker) would be inversely related to the salience of the religious identity. The results were significant for all of these hypotheses, except the higher the commitment, the higher the religious satisfaction. (Religious commitment increases with age and decreases with income.)

Other researchers also have examined single identities using scaled measures. Burke and Tulley (1977) used a semantic differential procedure to discover the direction of responses to gender identity items. Discriminant function analysis was used to find the weights to apply to various items. The researchers claim their procedure eliminated stereotypical conceptions and achieved a valid measure of gender identity.

As mentioned in the discussion of behavioral measures, Callero (1985) examined the narrowly defined identity of blood donor. His sample included two groups of individuals: those who were consistent blood donors, and those who had given blood only once or twice. Individuals who consistently donated blood were defined as having a blood donor identity. Those who had given only once or twice presumably did not have such an identity. For Callero (1985) salience was measured by a 9 point scale of statements relating to the person's feelings on giving blood.

Masters Swimmers

People who participate in Masters Swimming can be assumed to hold the role identity of competitive swimmer. Participants in this organization are a good population to use to study commitment to a leisure identity.

The Masters swim program began with Dr. Ransom J. Arthur, a Navy Medical Corps officer who had coached numerous Navy swim teams. The first Masters Championships in Amarillo, Texas was sponsored by John Spannuth, a the Director of the Amarillo (Texas) Aquatic Club and President of the American Swim Coaches Association, in May of 1970. Fifty swimmers attended this four day event and later returned home and informally organized local master swimming programs. In 1971, Masters Swimming joined the National American Athletic Union (AAU). An independent Masters Program was formed in 1980, the Masters Swimming Corporation, when the AAU disintegrated. Finally,

in 1982, Masters Swimming was organized into the current U. S. Masters Swimming, Inc. (USMS) (McEvoy 1985).

One of the stated purposes of the Masters Swimming program is to encourage adults to participate in a physical fitness program in order to gain physical and mental health benefits as well as compete with other adults in the same age-sex groupings. Membership in Masters Swimming has been open to anyone over 25 years of age. Competitive groups consist of five-year age intervals, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65-69, 70-74, 75-79, 80-84, 85-89, and 90 years of age and older. Swimming competition consists of specialized swimming events at local, regional, national, and international meets. Participants at a meet have submitted their fastest time for a particular event to be seeded or ranked. Those who achieve the fastest times in the qualifying rounds of competition compete in a final event to determine the event winner (McEvoy 1985).

CHAPTER III

METHODS

This research focused on a single leisure role identity, competitive swimmer. Attention was directed to identifying a behavioral measure of role identity commitment. Finally, correlates of commitment were explored.

Questionnaire

The questionnaire used in this research was developed by Donald W. Hastings and Suzanne B. Kurth of the University of Tennessee, Department of Sociology (Appendix). The 60 questions asked respondents for information on background characteristics, family exercise patterns, competitive swimming histories, training practices, and reasons for swimming. A set of questions on the instrument examined self perceptions, commitment, self support, social and family support, and investment (of time, effort, and money).

Sample

Sample Selection. A convenience sample was generated. The sample of 497 respondents was collected in two stages. First, 363 questionnaires were completed by individuals participating in the U. S. Masters Long Course National Championship Meet at The Woodlands,

Texas, August 21-24, 1987. Second, 134 questionnaires were completed by members of various local clubs who did not attend the national meet.

Sample Characteristics. Information about sample characteristics was obtained from several questions. The sample had 285 or 57.3 percent males and 212 or 42.7 percent females (Question 2). Ages of respondents (Question 1) ranged from 25 to 80. The average age of the sample was 44.4 years while the median age was 41 years. The majority (63.6 %) were married with 16.9 percent single, 17.1 percent divorced, and 2.2 percent widowed (Question 4). More females than males were not married. The sample was highly educated (Question 5) with 13.9 percent reporting some college or less, 34 percent college degrees, 15.1 percent some graduate school, and 37 percent graduate degrees. Occupation was obtained using U. S. census categories (Question 7). Over half (53.9 %) were employed as professionals, 18.1 percent as managers, and 3.8 percent as sales workers. Of the remaining respondents, 8.2 percent were homemakers, 6.4 percent were retired, and 4.8 percent were not employed or provided no information.

Women in this study were typically younger than the men and less likely to be married or have children. They also on average reported more support from their families for their swimming activities.

Variables

Demographic Variables. Age. Respondents were asked to indicate their age as of their last birthday (Question 1). Sex. Respondents self-reported themselves as male or female (Question 2). Marital Status. The respondents categorized themselves as single (never married), married, separated, divorced or widowed (Question 4). Parental Status. The respondents were asked how many children they had. Response choices were 0 through 5 or more (Question 8).

Social Support. One of the underlying dimensions of identity prominence proposed by McCall and Simmons (1966) is past degree of social support. Respondents indicated, using three forced choices, what their immediate family members (Question 17), and their coworkers (Question 52) thought of their swimming activity. The response choices were ordered. In addition, questions were asked to indicate the amount and type of involvement with other swimmers (e.g., question 35 asked about socializing away from the pool).

Question 60 asked respondents to indicate how important (very important, important, undecided, unimportant, very unimportant) various reasons for swimming were to them. These reasons: to feel good, to release tension, to get away from work pressures, to win, to excel, to achieve meet goals, to improve my skills, to learn new techniques, to become a better coach, to look better, to "slow down" physical loss due to aging, to get stronger, to become aerobically fit, to control weight, to lose weight, to gain weight, as part of a physical therapy program, to get a chance to travel, to have fun, to

meet new people, to be with friends, because it's more enjoyable than other forms of exercise, because it's easier on the joints and body than other exercise, because I like water, because I do better at swimming than other forms of exercise, because I can do it by myself, also measure the personal reasons versus social reasons for swimming. The responses to be with friends, to meet new friends, to have fun, and to get a chance to travel, are measures of degree of social support.

Self Support. Another of McCall and Simmons' (1967) dimensions underlying identity prominence is past level of personal or self support. Also in Question 60 respondents were asked to rate the importance of various reasons to swim which reflect self support. The responses to win, to excel, and to achieve meet goals are measures of degree of self support.

Self support and social support factors were obtained from a factor analysis of the items in Question 60 (Hastings and Kurth 1988). The factor structure suggests that these concepts are not opposite extremes of the same dimension but are separate concepts. The items used to form these variables are not correlated to each other.

Commitment. Before analyzing the data, several behavioral measures of commitment seemed feasible. One was based on national meet participation. The sample had a natural division into two groups: individuals who attended the national swim meet from various swim clubs around the country and swimmers who answered the

questionnaire after it was taken back to their home bases by their coaches. Those who participated in the national swim meet might have a stronger sense of the swimmer's identity and, therefore, a higher commitment to that identity than those individuals who did not participate in the national meet. Of the 497 persons in the sample, 363 respondents (73%) participated in the national meet, 134 respondents (27%) did not (Question 30).

Another potential commitment measure was the number of years spent as a competitive swimmer. The number of years could have been obtained from question 19 (age when swimmer started to swim competitively) and question 22 (years away from competitive swimming). The number of years would have required standardization as the percentage of a person's life spent as a competitive swimmer, for some of the respondents did not have the opportunity to engage in Master Swimming at age 25 because it did not begin until 1971.

Two other questions provided potential measures of commitment. Question 18 asked respondents to indicate whether or not swimming had interfered with their families' daily schedule. The number of meets the person attended in a year (Question 29) was another behavioral measure of commitment.

Several other questions addressed commitment and Stryker's (1980) conception of salience: the number of years each respondent was active as a Masters swimmer (Question 27), the number of yards the person spent training (Questions 42 and 43), the number and type

of workouts, and the amount of money spent attending meets (Question 58).

Activity Interference. Following Stryker's (1980) opportunity cost argument, the impact of one identity on other identities should be measured. Question 47 asked respondents to indicate how frequently swimming interfered with several activities using the responses "rarely," "occasionally," "often," and "does not apply." The activities were: family leisure, visiting with relatives, work related social activities, overtime work, club, community activities, visiting with friends, and pursuing hobbies. Those who responded "often" or "occasionally" indicated more activity interference than those who responded "rarely."

Other. Other items examined the individual's orientation to swimming: the swimmer's perception of his or her ranking as a Master Swimmer (Question 28) and the swimmer's satisfaction with his or her training performance (Question 45).

Data Analysis

Several data analysis procedures were considered: chi square contingency tables, analysis of variance, regression and log linear analysis. The relationships among numerous variables were explored using chi square. On the basis of those results a number of variables were eliminated from the study. Some were dropped because they exhibited insufficient variation, others because they were

highly skewed. Yet other variables were dropped when no significant relationships with commitment measures were obtained.

Analysis of variance also was used. Its use required treating ordinal data as interval. Very little variation was explained so another analytic technique was sought. The variables were analyzed using dummy variable regression analysis. Again, very little variation was explained, i. e., R^2s were very low. The types of data (predominantly categorical) collected made log linear analysis the most appropriate analytic procedure.

Comparison of results obtained from various analyses resulted in the selection of a direct behavioral measure of commitment--number of meets attended per year. Due to the overlap of some definitions of commitment and salience, salience was not used as a variable in any analysis.

CHAPTER IV

FINDINGS

Based on the results of earlier analyses and theoretical arguments, variables examined for possible inclusion in log linear models were sex, age, activity interference, marital status, social support, self support, and commitment. Sex, age, marital status and parental status are demographic representations of central roles and possibly identities. Activity interference, self support, and social support are other theoretically important concepts that may affect commitment (Stryker 1980; McCall and Simmons 1966).

Activity interference was a summed measure of the frequency of the interruption of activities associated with other roles by swimming activities. Marital status was recoded into married and not married. Parental status was derived from the question asking how many children a respondent had, by recoding the responses into having children and not having children. Commitment (the dependent variable), measured by the number of meets attended per year, was recoded into high (6 or more meets per year) and low (5 meets a year or less).

Self support and social support were summed from questions related to reasons to swim. The reliability tests on the two scales reported in Table 1 indicate that they are satisfactory scales.

Table 1 -- Reliability Test of Social Support and Self Support Scales

Scale	Cronbach's Alpha Coefficient
Social Support	.8
to be with friends	
to meet new friends	
to have fun	
Self Support	.7
to win	
to excel	

Bi-variate Screening

A bivariate t-test screening was used to find which of the variables significantly affected commitment. The results of the bivariate screening are reported in Table 2. The percentages indicate the sample was reasonably distributed on the characteristics tested. Variables which were significant at the .001 level or more were age, social support, and self support. These three variables had the most robust effects on commitment. Sex, marital status, parental status, and activity interference did not pass the bivariate screening (showing significant differences on the number of meets attended per year).

Modeling

Interval variables were recoded for inclusion in the log linear models because log linear models require categorical data. Age was recoded into 25 to 35, 36 to 45, and 46+ years of age. These age groups generally parallel adult life cycle stages. Individuals in the 25 to 35 age range typically are in the initial phases of familial and occupational careers; individuals 36 to 45 years of age have established families and occupational careers; and individuals in the 46+ years of age are in the latter phase of occupational careers or are retired.

The summed measures of social support and self support were recoded to produce nearly equal distributions. Social support was

Table 2 -- Bivariate Test of Commitment

Variables	Commitment % High	% Low	Mean High	Mean Low	T Value[a]	Prob
Dichotomous						
Marital Status					1.62	.106
Single	52.7	47.3				
Married	45.0	55.0				
Sex					.94	.348
Female	45.1	54.9				
Male	49.5	50.5				
Parental Status					.50	.616
No children	49.3	50.7				
Children	46.9	53.1				
Interval						
Age			46.7	42.1	-3.77	.000
Social Support			1.49	1.63	3.01	.003
Interference			1.97	1.93	-.44	.661
Self Support			1.37	1.58	4.62	.000

[a] Pooled variance estimate.

recoded into low and high (5 or less and 6 or more.) Self support was recoded into 4 or less and 5 or more.

For fitted marginal notation M represents the number of meets per year (commitment), A the age of the respondent, S the score on social support, and P the score on self support. Examples of interaction terms are MA, SA, and MSA, representing the interaction of meets and age; social support and age; and meets, social support and age.

Log linear analysis tests the effects of the marginals of each variable (the raw effect of each variable on the distribution of the table), the direct effects of each variable on a preselected dependent variable, in this case commitment measured by number of meets attended per year, and the indirect effects of interaction terms not containing the commitment variable.

The log linear models were evaluated using three approaches: 1) comparison of the variance (R^2 analog for different models), 2) consideration of theoretical relevance, and 3) application of Bishop, Fienberg and Holland's criteria (Knoke and Burke 1980.)

The first approach focuses on the multi-variate contingency table. Log linear analysis allows for the partitioning of the total variance of the multivariate contingency table. The partitioning of variance among the terms allows testing of different theoretical hypotheses or competing explanations.

The null model (i.e., containing only a constant) represents the total variance in the contingency table with a maximum chi

square. Models can be compared with that chi square to produce the R^2 analog. The null model was used as the baseline model in this analysis.

For some analyses, interaction terms that were not significant in the saturated model were considered important enough theoretically to be included in other models. These interaction terms included commitment.

The acceptance of a log linear model for these data was contingent on the significance of the model falling between .10 and .35. Bishop, et al.'s criteria for accepting models with a significance level between .10 and .35 balances the probability of Type I and Type II errors.

The first model fitted in this analysis was the saturated model (MSPA or Model 1). Table 3 lists all the models tested in this research, the chi square associated with the model, the significance level, and the R^2 analog. Table 4 lists the most important models tested in this research and the significant lambda's of the individual parameters for the models. The four way and all three way interaction terms were not significant and were dropped in later analyses. Two way interaction terms showing no significance were also eliminated in Model 2 {MP MS MA PS SA} resulting in a X^2 of 3.55, with a probability of .981. Model 2 was rejected as outside the .10 to .35 acceptable significance level.

Table 3 -- Log-Linear Models Tested

Model		X^{2a}	DF	Sig	R^{2b}
1	{MPSA}[c]	0.00	0	1.0	100.00
2	{MP MS MA PS SA}[d]	3.55	11	0.981	99.86
3	{MP MA MS SA}[e]	7.19	12	0.845	99.72
4	{MP MA MS}[f]	13.16	14	0.541	99.49
5	{MP MA SA}[g]	17.69	13	0.170	99.32
6	{MP MA S}[h]	21.29	15	0.128	99.18
7	{MP MA}[i]	29.28	16	0.022	98.87

[a] Ljkelihood ratio chi square.
[b] R^2 Analog.
[c] The saturated model.
[d] All significant two way interaction terms.
[e] Testing effect on meets of social support/commitment.
[f] Least contributing terms eliminated.
[g] Interaction of social support and age added.
[h] Indirect effect of social support and age removed.
[i] Effect of social support removed.

Table 4 -- Five Log Linear Models of Meets (M), Self Support (P), Social Support (S), and Age (A)

	Models				
	MP MA MS SA	MP MA MS	MP MA SA	MP MA S	MP MA
Marginal Effects[a]					
M_{6+}	ns[b]	ns	ns	ns	ns
P_{High}	ns	ns	ns	ns	ns
S_{High}	.136	.134	.138	.136	nt[c]
A_{25-35}	ns	ns	ns	ns	ns
A_{46+}	ns	ns	ns	ns	ns
Direct Effects on Meets					
P_{High}	-.228	-.228	-.228	-.228	-.228
S_{High}	-.161	-.138	nt	nt	nt
A_{25-35}	-.250	-.225	-.225	-.225	-.225
A_{46+}	.209	.190	.190	.190	.190
Indirect Effects					
$S_{High}A_{25-35}$	-.164	nt	-.125	nt	nt
$S_{High}A_{46+}$	.120	nt	ns	nt	nt
Model Characteristics					
R^2 Analog[d]	.997	.995	.993	.992	.989
L R X^2[e]	7.19	13.16	17.69	21.29	29.28
DF	12	14	13	15	16
Prob	.845	.514	.170	.128	.022

[a] Values reported are lambda coefficients. The sum of the lambdas for a category must equal 0.
[b] Not significant.
[c] Not tested.
[d] Calculated as (Baseline model - Hypothetical model)/(Baseline model) where baseline contains only the intercept (i.e. a null model).
[e] Likelihood ratio chi square.

Although the interaction term MS was not significant in Model 2, it was included in subsequent models on theoretical grounds.

Model 3 {MP MA MS SA} was examined and effects which explained the least variance were dropped and the resulting model tested with a X^2 of 7.19 with a probability of .845. When MS was included in Model 4 {MP MA MS} the X^2 was 13.16 with a probability of .541 which is outside the range of acceptance. In Model 5 {MP MA SA} SA was included and MS was dropped. Model 5 had a X^2 of 17.69 with a probability of .170. This model was within the acceptable range. Model 6 {MP MA S} eliminated the social support-age effect and included only the marginal effect of social support. The model's probability level of .128 was also within the .10 to .35 range. More parsimonious models with the fewest interaction terms are preferred, so it is an attractive model. Model 7 {MP MA} eliminated the marginal effect of social support resulting in a X^2 of 29.28 with a significance level of .022. The significance level fell outside the preferred range and the model was rejected. The data were fit best by the {MP MA S} Model. All the models tested explained at least 98 percent of the variance of the table.

The frequency counts in the multivariate contingency table of meets (commitment), self support, age, and social support were mainly affected by two interactions (self support and meets, age and meets), and the marginal effect of social support. The lambda coefficients

of the terms in Model 6 explained more than 99 per cent of the variation in the table.

High social support augmented the expected cell frequency by 13.6 per cent. No other marginal effects of the model were significant at the .05 level. This suggests that there was an unequal distribution of high social support in the sample.

Individuals with a high degree of self support were 22.8 per cent less likely to be in the high meet attendance group. Respondents were 22.5 per cent less likely to be in the youngest age group and have a high attendance at meets; they were 19 per cent more likely to be in the older age group and have a high attendance at meets.

CHAPTER V

DISCUSSION AND CONCLUSIONS

Discussion

Role identities in part are structured by society. Possession of a specific leisure identity and commitment to it are affected by a person's age, sex, familial status, and socioeconomic status. These social statuses affect opportunities to pursue a leisure identity such as competitive swimmer.

For example, the opportunities for women to participate as competitive swimmers have not been as great as the opportunities for men. Until the 1970s women's intercollegiate athletic programs were not supported financially and socially as men's athletic programs were. Women of past cohorts did not have the athletic scholarships to continue their swimming careers' as men did.

Another example of the constraining influences represented by demographic characteristics is parental status. Women have primary responsibility for raising children, so as a category mothers traditionally have not had the time to invest in swimming as fathers have had.

Age, degree of social support, and degree of self support were responsible for the most variation in overall commitment to the swimmer identity within the sample. Age influences the amount of time a person has to devote to a particular identity, as well as the

amount of physical energy available to expend on the identity. Age often is the determinant of many of the opportunities to become involved in particular roles. Middle aged individuals have many more external constraints on their time than do older individuals.

Commitment indicates the degree to which an individual has a significant stake in a role identity. Younger people in this sample exhibited less commitment to their leisure identity than older individuals. Older individuals presumably had more leisure time to devote to swimming, and their other roles did not constrain their involvement with swimming as much.

This sample was of individuals who were self reported swimmers and, therefore, somewhat or highly committed to being a swimmer. Variations in commitment by sex, parental status, and marital status may only appear if the commitment variable has a wider range.

Participants with high self or personal support scores were less likely to compete in a high number of swim meets. Individuals who are high in self support may not perceive the need to compete as often to establish their identities as those with lower levels of self support. Past self support may explain why those with more desire to win and to excel, a high self or personal support level, did not attend as many meets. Attending the national meet and winning could have provided an adequate continuing level of self support.

Competing against others is a way of obtaining social support for a role identity. (The marginal effect of social support--

reflecting the uneven division of the sample into two social support groups--was significant, but social support did not explain very much of the variation in commitment.)

Conclusions

Research using role identity models typically has measured commitment in two ways. First, many researchers constructed semantic differential scores based on subjects' responses to sets of adjectives. They measured psychological phenomena or emotional reactions to stimuli. Second, researchers focused on identities based on a single activity.

This research expands on previous research using tangible behavioral measures of commitment by identifying an identity that is an important part of people's everyday lives. Implications from this research include focusing on an identity and seeing how other social statuses or roles affect opportunities to enact or perform in the capacity of that identity. There is variation in the dimensions McCall and Simmons (1966) proposed as underlying prominence and salience. Levels of past self support and past social support vary across individuals and within individuals. Further research should focus on fine tuning measures of self support and social support and determining how much of each is necessary for most individuals to continue to engage in an activity. This research supports role identity models and behavioral measures of commitment to specific identities.

Understanding role identities within the context of social structure is an essential task of sociology. The role identity concept can be used to examine operationally the effects of the individual on society and society on the individual. Role identities are measurable. The earlier theoretical concept of the "me" was too vague.

By focusing on a single identity, by examining how other social statuses affect that identity, and by showing the relationship of degree of commitment to a role identity, this research demonstrated the importance of exploring these concepts. Although many demographic statuses could affect role identities, for the leisure identity of competitive swimmer examined, age was the most important demographic determinant of degree of commitment. The leisure opportunities of individuals are affected most strongly by their age. Younger individuals generally have more social expectations of which roles to value. Middle aged individuals may have more demanding socially prescribed roles to fill than other age groups. Opportunities to engage in certain behaviors and to have associated identities are not the same for each stage of life. Aging produces more opportunity to engage in a leisure activity by freeing up time and energy generally consumed by other roles.

Sport researchers have developed scales to measure approaches to sport starting with three orientations: playing fairly, well and to win (Webb 1968). The components of the self support measure (to win and to excel) resemble items in measures such as Kidd and

Woodman's (1975) orientation to win (OTW). The theoretical model which generated this study and the findings produced suggest the utility of treating winning as only one aspect of personal orientation.

REFERENCES

Broadhead, Robert S. 1980. "Multiple Identities and the Process of Their Articulation: The Case of Medical Students and Their Private Lives." Studies in Symbolic Interaction, 3:171-191.

Burke, Peter J. and Donald Reitzes. 1981. "The Link Between Identity and Role Performance." Social Psychology Quarterly, 44:83-92.

Burke, Peter J. and Judy Tully. 1977. "The Measurement of Role Identity." Social Forces, 55:881-897.

Burke, Peter J. 1980. "The Self: Measurement Implications from a Symbolic Interactionist Perspective." Social Psychology Quarterly, 43:18-29.

Burke, Peter J. and Stephen Franzoi. 1988. "Studying Situations and Identities Using Experimental Sampling Methodology." American Sociological Review, 53:559-568.

Callero, Peter L. 1985. "Role-Identity Salience." Social Psychological Quarterly, 48:203-215.

Carmines, Edward G., and Richard A. Zeller. 1979. "Reliability and Validity Assessment." Sage University Paper series on Quantitative Applications in the Social Sciences, 07-001. Beverly Hills and London: Sage Pubns.

Curry, Timothy J. and Jeffery Weaner. 1987. "Sport Identity Salience, Commitment, and the Involvement of Self in Role: Measurement Issues." Sociology of Sport Journal, 4:280-288.

Goffman, Erving. 1963. Stigma: Notes on the Management of Spoiled Identity. Englewood Cliffs, NJ: Prentice-Hall.

Gordon, Chad. 1976. "Development of Evaluated Role Identities." Annual Review of Sociology, 2:405-433.

Hastings, Donald W. and Suzanne B. Kurth. 1988. "Reasons for Participating Among Masters Swimmers." Unpublished paper.

Hoelter, Jon W. 1983. "The Effects of Role Evaluation and Commitment on Identity Salience." Social Psychology Quarterly, 46:140-147.

Jackson, Shirley E. 1981. "Measurement of Commitment to Role Identities." Journal of Personality and Social Psychology, 40:138-146.

James, William. 1890. Principles of Psychology. New York: Holt, Rinehart and Winston.

Kelly, John R. 1983. Leisure Identities and Interactions. London: George Allen & Unwin.

Kidd, Thomas R., and William F. Woodman. 1975. "Sex and Orientations Toward Winning in Sport." Research Quarterly, 44:476-483.

Knoke, David, and Peter J. Burke. 1980. "Log-Linear Models." Sage University Paper series on Quantitative Applications in the Social Sciences, 07-001. Beverly Hills and London: Sage Pubns.

Leary, Mark R., David S. Wheeler, and T. Brant Jenkins. 1986. "Aspects of Identity and Behavioral Preference: Studies of Occupational and Recreational Choice." Social Psychology Quarterly, 49:11-18.

Marks, Stephen R. 1977. "Multiple Roles and Role Strain: Some Notes on Human Energy, Time, and Commitment." American Sociological Review, 42:921-936.

McCall, George. J. T. Simmons. 1966. Identities and Interactions: An Examination of Human Associations in Everyday Life. New York: The Free Press.

McGuire, Francis A. and F. Dominic Dottavio. 1987. "Outdoor Recreation Participation Across the Lifespan: Abandonment, Continuity, or Liberation?" International Journal of Aging and Human Development, 24:87-100.

Mead, George H. 1934. Mind, Self, and Society. Chicago: University of Chicago Press.

Mutran, Elizabeth and Donald Reitzes. 1981. "Retirement, Identity and Well-Being: Realignment of Role Relationships." Journal of Gerontology, 36:733-740.

Stryker, Sheldon. 1968. "Identity Salience and Role Performance." Journal of Marriage and the Family, 30:558-564.

Stryker, Sheldon and Richard Serpe. 1982. "Commitment, Identity Salience, and Role Behavior: Theory and Research Example." Pp. 199-216 in Personality, Roles, and Social Behavior. Edited by William Ickes and Eric S. Knowles. New York: Springer-Verlag.

Stryker, Sheldon. 1980. Symbolic Interactionism: A Social Structural Version. Menlo Park, CA: Benjamin Cummings.

Stryker, Sheldon. and Anne Statham. 1984. "Symbolic Interaction and Role Theory." Pp. 311-78 in Handbook of Social Psychology, edited by G. Lindzey and E. Aronson. Reading, MA: Addison-Wesley Publishing Co.

Thoits, Peggy A. 1983. "Multiple Identities and Psychological Well-Being: A Reformulation and Test of the Social Isolation Hypothesis." American Sociological Review, 48:174-187.

Turner, Ralph H. 1978. "The Role and the Person." American Journal of Sociology, 84:1-23.

Webb, Harry. 1968. "Professionalization of Attitudes Toward Play Among Adolescents." In Aspects of Contemporary Sport Sociology: Proceedings of C. I. C. Symposium on the Sociology of Sport, edited by Gerald S. Kenyon. Chicago: The Athletic Institute.

APPENDIX

SURVEY
MASTERS SWIMMERS LONG COURSE CHAMPIONSHIPS
WOODLANDS, TEXAS 1987

This survey explores how various attitudes and social relationships enhance or limit the participation of adults in Masters swimming. Please fill out the questionnaire and return it to Judy Meyer, Masters Coach, Mission Bay or drop it in the mail. Completing the questionnaire should take approximately 15 to 20 minutes. The results of this survey will be tabulated and analyzed in aggregate form. A summary of the findings will be released in the MACA Newsletter. Your return of the questionnaire will constitute your informed consent to participate in this study.

Should you have any follow-up questions concerning this project or its findings, please contact Donald W. Hastings, Department of Sociology, University of Tennessee, Knoxville, TN 37996-0490 or call 615-974-6021.

Background Characteristics:

1. Your age as of your last birthday?_____

2. Your sex? (circle number)
   1 MALE
   2 FEMALE

4. Your marital status?
   (circle number)
   1 SINGLE -- never married
   2 MARRIED
   3 SEPARATED
   4 DIVORCED
   5 WIDOWED

5. Highest level of education you completed?
   (circle number)
   1 SOME HIGH SCHOOL
   2 HIGH SCHOOL
   3 SOME COLLEGE
   4 COLLEGE
   5 SOME GRADUATE SCHOOL
   6 GRADUATE DEGREE

6. If you are employed, your job category? (circle number)
   1 PROFESSIONAL, TECHNICAL OR KINDRED WORKER
   2 MANAGER, OFFICIAL, OR PROPRIETOR, EXCEPT FARM
   3 CLERICAL AND KINDRED WORKER
   4 SALES WORKER
   5 CRAFTSMEN, FOREMEN, OR KINDRED WORKERS
   6 OPERATIVE OR KINDRED WORKER & LABORER, EXCEPT FARM OR MINE
   7 PRIVATE HOUSEHOLD WORKER
   8 RETIRED
   9 HOMEMAKER
   0 NOT EMPLOYED-NO INFORMATION

7. Your individual income: (circle number)
   1 LESS $10,000
   2 $10,000 - 24,999
   3 $25,000 - 34,999
   4 $35,000 - 49,999
   5 $50,000 - 74,999
   6 $75,000 - 99,999
   7 $100,000+

8. How many children do you have? (circle number)
   0 1 2 3 4 5 OR MORE

15. How often do you swim with any member of your family? (circle number)
   1 OFTEN
   2 OCCASIONALLY
   3 RARELY
   4 NEVER

17. Which statement best describes how family members who live with you see your swimming? (circle number)
   1 THINK IT'S GREAT AND ENCOURAGE ME TO DO IT.
   2 THINK IT'S OKAY, BUT ONLY IN MODERATION.
   3 RESENT IT, SINCE IT TAKES ME AWAY FROM HOME.
   4 DNA-SINGLE

18. Has your family modified its daily schedule to accommodate your training? (circle number)

1 NOT AT ALL
2 SOME
3 A GREAT DEAL

IF YOU CIRCLED 2 OR 3--> Indicate in what ways.

1 CHANGED MEAL TIMES
2 CHANGED SLEEPING HABITS
3 CHANGED VACATION PLANS
4 CHANGED ARRANGEMENTS FOR TRANSPORTATION
5 OTHER _____PLEASE SPECIFY

1 'YES'
0 'NO'

1-Change weekends to let me swim
2-Change all appointments
3-Spend less time with the kids
4-Take son to pool with me in summer
5-Spouse does work so I can attend meets
6-He has to feed pets and water garden
7-Changed priorities
8-Changed church time
9-Changed work time

Competitive Swimming:

19. How old were you when you started to swim competitively? _____ Yrs

22. Was there a period in your life when you stopped swimming? (circle number)

1 NO --->If No: Go to Q. 24.
2 YES -->If Yes: How old were you when you stopped and when you resumed?

_____ age stopped

_____ age resumed

24. As a Masters swimmer, the distance that I train is _____ I did when I competed prior to becoming a Masters. (circle number)

1 LESS THAN
2 ABOUT THE SAME AS
3 MORE THAN
4 DONT KNOW

25. As a Masters swimmer, my times are _____ when I competed before becoming a Masters. (circle number)

1 SLOWER THAN
2 ABOUT THE SAME AS
3 FASTER THAN
4 DONT KNOW

27. How many years have you been swimming in Masters? _____ Yrs.

28. As a Masters swimmer, what is your highest individual ranking? (circle number)

1 ALL-AMERICAN/CANADIAN
2 NATIONAL TOP TEN
3 UNRANKED, BUT I'D BE IN THE TOP 20
4 UNRANKED, BUT I'D BE BELOW THE TOP 20

29. On the average how many meets do you compete in during the year?
_____Number

30. Check [x] those meets in which you have competed:

[ ] LOCAL or REGIONAL
[ ] POSTAL EVENTS
[ ] LONG COURSE NATIONALS
[ ] SHORT COURSE NATIONALS
[ ] OPEN WATER SWIMS

1 'YES'
2 'NO'

33. When you work out, how do you typically swim? (circle number)

1 ALONE
2 WITH FAMILY
3 WITH FRIENDS
4 WITH OTHER SWIMMERS I KNOW OR A TEAM
5 SOMETIMES ALONE/SOMETIMES WITH OTHER SWIMMERS

34. How do you prefer to work out? (circle number)

1 ALONE
2 WITH FAMILY
3 WITH FRIENDS
4 WITH OTHER SWIMMERS WHO ARE AVAILABLE OR A TEAM
5 SOMETIMES ALONE/SOMETIMES WITH OTHER SWIMMERS
6 DOESN'T MATTER

35. Do you ever "socialize" away from the pool with friends who swim, swimmers you know, or team members? (circle number)

1 VERY FREQUENTLY
2 FREQUENTLY
3 INFREQUENTLY
4 VERY INFREQUENTLY

45. Are you critical of your performance when you are working out? (circle number)

1 ALWAYS
2 SOMETIMES
3 RARELY
4 NEVER

46. Do you feel at your best _____ workouts? (circle number)

1 BEFORE
2 DURING
3 AFTER

Social Support:

47. Indicate how frequently swimming interferes with each of the following activities (circle number)

1 RARELY
2 OCCASIONALLY
3 OFTEN
4 DOES NOT APPLY

ACTIVITIES	FREQUENCY			
family meals	1	2	3	4
family leisure	1	2	3	4
visiting with relatives	1	2	3	4
work related social activities	1	2	3	4
overtime work	1	2	3	4

club, community activities	1	2	3	4
visiting with friends	1	2	3	4
pursuing hobbies	1	2	3	4

49. Think about your 3 closest friends and why you like them. With them in mind, indicate how important each of the following is to your close friendships.

1 VERY UNIMPORTANT
2 UNIMPORTANT
3 IMPORTANT
4 VERY IMPORTANT

__ It's fun to be with them.
__ They accept me for what I am.
__ We share the same views about life (values and ideals).
__ We like to engage in the same activities (e.g., swimming)
__ We have known each other for a long time.
__ We pursue similar occupations.

50. If you could only engage in three leisure activities, which would you select?

1._____

2. _____

3._____

51. Recall with whom you spent the most leisure time last week. Indicate why you spent the most time with them by writing]1[in the space next to the most important reason and]2[in the space next to the second most important reason.

____ live together
____ long time friends
____ relatives
____ work together
____ swim together
____ neighbors
____ engage in same kinds of activities I do
____ had no choice

52. Which statement best describes how your co-workers see your swimming? (circle number)

1 THINK IT'S GREAT.
2 THINK IT'S OKAY.
3 THINK IT'S RIDICULOUS.
4 DON'T CARE.
5 DNA - RETIRED

57. How much money do you typically spend on swimming equipment in one year? (circle number)

1 LESS THAN $100
2 $100 TO $299
3 $300 TO $499
4 $500 OR MORE

58. How much money do you typically spend on swimming equipment purchases at a meet? (circle number)

1 LESS THAN $25
2 $25 TO $49
3 $50 TO $74
4 $75 TO $99
5 $100 OR MORE

Reasons to Swim:

59. With which statement do you most agree? (circle number)

1 THE MOST IMPORTANT THING IN SWIMMING IS WINNING.
2 THE MOST IMPORTANT THING IS TO SWIM WELL.
3 THE MOST IMPORTANT THING IS TO HAVE FUN WHEN YOU SWIM.

60. For each of the statements below write the number which indicates how important the reason is for why you swim:

1 Very Important
2 Important
3 Undecided
4 Unimportant
5 Very unimportant

__ To feel good
__ To release tension
__ To get away from work pressures
__ To win
__ To excel
__ To achieve meet goals
__ To improve my skills
__ To learn new techniques

__ To become a better coach
__ To look better
__ To "slow down" physical loss due to aging
__ To get stronger
__ To become aerobically fit
__ To control weight
__ To lose weight
__ To gain weight
__ As part of a physical therapy program
__ To get a chance to travel
__ To have fun
__ To meet new people
__ To be with friends
__ Because it's more enjoyable than other forms of exercise
__ Because it's easier on the joints and body than other exercise
__ Because I like the water
__ Because I do better at swimming than other forms of exercise
__ Because I can do it by myself

THANK YOU FOR YOUR COOPERATION.

VITA

William Frank Clevenger was born in Greeneville, Tennessee in 1953. He received his B.A. from The University of Tennessee, Knoxville, in 1984. In March of 1984 he accepted a research assistantship with The University of Tennessee, Knoxville. During 1986 he worked as a statistical analyst with the Tennessee Department of Health and Environment. Beginning July of 1987 he worked as a staff analyst for the Equal Opportunity Office with the Tennessee Valley Authority. He has also served as a computer and statistical consultant for the Energy division with the Oak Ridge National Laboratory. He is currently a senior research associate for the Energy, Environment and Resources Center at The University of Tennessee. With other researchers he has presented papers, and published articles and research reports on population projections, adolescent sexuality, and public alert systems.