DOCUMENT RESUME

ED 102 489 CG 009 592

AUTHOR	Spanier, Graham B.; And Others
TITLE	Marital Adjustment Over the Family Life Cycle: The Issue of Curvilinearity.
SPONS AGENCY	Denison Univ., Granville, Ohio.
PUB DATE	Oct 74
NOTE	41p.; Paper presented at the Annual Meeting of the National Council on Family Relations (St. Louis, Missouri, October 1974); Hard copy not available due to reproducibility of original document
EDRS PRICE	MF-$0.76 HC Not Available from EDRS. PLUS POSTAGE
DESCRIPTORS	*Adjustment (to Environment); *Comparative Analysis; Data Collection; *Family Life; Human Living; *Marriage; *Research Design; Research Projects
IDENTIFIERS	*Locke Wallace Marital Adjustment Scale

ABSTRACT

Marital adjustment over the family life cycle is reexamined using data from probability samples of married couples studied in coordinated research projects in three different states--Iowa, Ohio, and Georgia. A total of 1,584 respondents completed the Locke-Wallace Marital Adjustment Scale and responded to questions about stage of the family life cycle. Techniques of curvilinear data analysis (orthogonal polynomials and eta, the measure of curvilinear association) are used to examine the findings of some previous studies which imply that a curvilinear or second order (or higher) polynomial function describes the relationship. The implications and utility of this technique are discussed. Data from the three samples is analyzed separately for males and females. The state of knowledge about marital adjustment over the family life cycle is assessed. (Author)

ERIC

ED102489

BEST COPY AVAILABLE

MARITAL ADJUSTMENT OVER THE FAMILY LIFE CYCLE: THE ISSUE OF CURVILINEARITY*

Graham B. Spanier**

The Pennsylvania State University

Robert A. Lewis***

The Pennsylvania State University

Charles L. Cole****

Denison University

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

BEST COPY AVAILABLE

*Paper presented at the annual meeting of the National Council on Family Relations, St. Louis, Missouri, October, 1974. The Ohio data were collected under a Denison University Research Foundation Grant #C-69-171. The authors wish to acknowledge the assistance of Donald Cower, Michael A. Cech, Kathleen Krebs and John C. Wright, who served as research assistants on the Ohio project, and Catherine McClennon, who assisted with the Georgia project.

**Graham B. Spanier, Ph.D., Assistant Professor of Human Development, Division of Individual and Family Studies, The Pennsylvania State University, University Park, Pennsylvania, 16802.

***Robert A. Lewis, Ph.D., Associate Professor of Human Development, Division of Individual and Family Studies, The Pennsylvania State University, University Park, Pennsylvania, 16802.

****Charles L. Cole, Ph.D., Assistant Professor of Sociology, Department of Sociology, Denison University, Granville, Ohio, 43023.

CG 009 592

Best Copy Available

BEST COPY AVAILABLE

ABSTRACT

Marital adjustment over the family life cycle is re-examined using data from probability samples of married couples studied in coordinated research projects in three different states--Iowa, Ohio, and Georgia. The paper attempts to provide both a methodological and substantive contribution by 1) introducing techniques of curvilinear regression and correlation data analyses to address empirically the questions raised by the findings of some previous studies which imply that a curvilinear or second order (or higher) polynomial function describes the relationship between marital adjustment and stage of the family life cycle, and 2) using these techniques to examine our collective data from 1584 respondents who completed the Locke-Wallace Marital Adjustment Scale and responded to questions about social and background variables and stage of the family life cycle. While demonstrating that the techniques of analysis presented are appropriate and necessary to answer the research question, our substantive findings lend only limited support for the previously implied significance of curvilinearity. It is suggested that authors of previous studies supplement these findings by reanalyzing their data and that future studies employ these more appropriate methods rather than the traditional analysis of variance model with its assumption of linearity.

10/1/74 IFS 5382:GS

ERIC

BEST COPY AVAILABLE

INTRODUCTION

The quality of the marital relationship over the course of the family life cycle has commanded great interest among family researchers since the first study of marital adjustment by Hamilton (1929). Rollins and Feldman (1970) have provided data which suggest a curvilinear relationship between marital satisfaction and stage of the family life cycle. Their study used cross-sectional data obtained through an area probability sample of 799 middle class residents in Syracuse. The method of data collection was a self-administered questionnaire combined with personal contact. More recently, Rollins and Cannon (1974) used similar measures to study a non-probability sample of 489 married Mormons.

Rollins and Feldman (1970) identified a dozen other studies which have attempted to assess the relationship between marital satisfaction (or similar concepts) and stage of the family life cycle using a variety of techniques and measures (Hamilton, 1929; Bernard, 1934; Burgess and Cottrell, 1939; Lang, 1953; Bossard and Boll, 1955; Blood and Wolfe, 1960; Gurin et al., 1960; Pineo, 1961; Luckey, 1966; Paris and Luckey, 1966; Marlowe, 1968).[1] As Rollins and Feldman pointed out, these studies have reached a variety of conclusions. Most researchers agree that there is initially a decrease in marital satisfaction or adjustment during the early years of marriage, particularly evident following the birth of the first child. The speed and intensity of this decline in satisfaction, however, varies from study to study.

In the middle and later stages of the cycle, the evidence is less clear. Whereas some studies suggest a continual decline (Blood and Wolfe, 1960; Pineo, 1961; Paris and Luckey, 1966), many others propose a leveling

BEST COPY AVAILABLE

off followed by an increase in the later stages. Rollins and Cannon (1974) have provided new evidence that there are methodological weaknesses in the original Blood and Wolfe measures, thus providing still more powerful evidence that the alleged curvilinear relationship found by other researchers using measures such as the Locke-Wallace Marital Adjustment Scale or the Rollins-Feldman measures of satisfaction may more accurately reflect the modal relationship.

The purpose of this paper is to reassess the increasingly popular notion that there exists a curvilinear relationship between marital adjustment and stage of the family life cycle. We shall attempt to test this notion by using methods and measurement techniques which are similar to those employe' by Rollins and Feldman (1970) and other studies, but techniques of data analysis which are more appropriate to the research problem.

We will suggest that conventional analysis of variance techniques are not suitable for addressing the question of curvilinearity and its significance, but only the question of the significance of differences in marital adjustment between stages of the family life-cycle. Analysis of variance allows the researcher to reject the null hypothesis of no differences in stage means, if at least one pair of stages (or sample means) is unlikely to have come from the same population (Kohout, 1974). Moreover, linearity is an underlying assumption in analysis of variance.[2] A significant "*F*" value thus indicates little about curvilinearity or monotonicity. In previous studies of marital adjustment and satisfaction over the family life cycle, curvilinearity has been assumed incorrectly on the basis of a visual scan of the data.

BEST COPY AVAILABLE

Specifically, this paper reports the findings of three coordinated studies in Iowa, Ohio, and Georgia which used: 1) self-administered questionnaires combined with personal contact of the respondents, 2) the Locke-Wallace Marital Adjustment Scale as the measure of adjustment, 3) area probability samples of respondents representing the entire population of the communities in which they live, 4) husband-wife matched pairs which make male-female comparisons more reliable, and 5) techniques of curvilinear regression data analysis and measures of association for curvilinear relationships to specifically test the hypothesis that a second order or higher polynomial function more accurately describes the relationship. Unlike other descriptive data which imply significance of the curvilinearity on the basis of visual scan of a plot of the data or an "F" test for significance of difference between stage means using analysis of variance, we shall consider standard curve fitting techniques and use the correlation ratio, eta, to ascertain the significance of any deviation from a linear regression. In addition, the use of three different probability samples, controlling for gender and each studied in the same fashion, adds an additional measure of reliability to the analysis.

APPROACH TO THE PROBLEM

Rogers (1962), Hill and Rogers (1964), and Duvall (1971) have discussed the utility of viewing family-related behavior from a "developmental" framework. The present authors believe that the framework of family development has to date been most useful in the descriptive study of families over time, but the potential for a theory of family development has not yet been realized. Rollins and Feldman (1970) suggested that a dual developmental theory of marital satisfaction is needed--one which would focus on the

BEST COPY AVAILABLE

parental role of mothers and one which would focus on the occupational role of fathers.

Rollins and Cannon (1974) report, however, that a re-analysis of the Rollins and Feldman 1970 data, as well as the more recent Rollins and Cannon 1974 data indicated that the speculation about needing two different theories to explain male-female differences in marital satisfaction over the life cycle was premature. They concluded that the relationships for husbands and wives were not significantly different. Nevertheless, it is plausable that in some areas of family related values, attitudes, and behavior, different theories for men and women may be needed. Should a developmental theory of the family become utilized as extensively as structural-functional and symbolic interactionist theories, it is clear that a re-assessment of appropriate methodologies will be needed.

Most research in marriage and the family hypothesizes (whether explicitly stated or not) relationships which are linear (as differentiated from non-linear or curvilinear), monotonic, and in correlation and regression analyses, relationships which are bivariate normal and homoscedastic. Most researchers, of course, are aware that such conditions often do not apply. In the sociological and social-psychological study of developmental phenomena in the family, it is probable that many of these traditional assumptions are inappropriate. The relationship between marital adjustment and stage of the family life cycle is a case in point. Some of the previously mentioned studies imply a non-linear, or more specifically, a curvilinear relationship. A cursory examination of the marital adjustment literature suggests a quadratic (or second order polynomial) curve to describe the relationship.

BEST COPY AVAILABLE

It would seem, then, that linear correlational and regression techniques are not appropriate for assessing the developmental nature of the relationship between these two critically important variables in family research.

Blalock (1970: 312) notes that there are instances "when inspection of the scattergram may clearly indicate a nonlinear relationship or when one's theory has predicted such a relationship." Whenever such a non-linear relationship exists, he states, "the product-moment coefficient will obviously underestimate the true degree of relationship since this coefficient measures only the goodness of fit of the best single straight line."

An inspection of previous marital adjustment and marital satisfaction studies, then, suggests a curvilinear relationship of the form

$$Y = a + bX + cX^2$$

where Y represents the dependent variable, marital adjustment; X represents the independent variable, stage of the family life cycle; and a, b, and c are coefficients which specify the nature of the specific quadratic relationship between the two variables.

The primary objective of our analysis, therefore, was to ascertain whether a curvilinear relationship (such as a quadratic equation) provides a least squares regression curve which explains variance better than a linear regression line and to determine the significance of the relationship. We shall leave it to future studies to determine the specific equation which may apply.

There was clearly the option of aggregating the data from our three samples or treating each sample independently. The latter option was chosen

BEST COPY AVAILABLE

for a variety of reasons. First, there were significant between-sample differences with regard to social characteristics. It is conceivable, therefore, that the relationship between marital adjustment and stage of the family life cycle may be different from one sample to another as a result of confounding social variables. Second, by viewing each probability sample independently, potential improvements in reliability could result by comparing findings in each of the three samples. Our hypothesis, then, is that there is a significant curvilinear relationship between marital adjustment, measured by the Locke-Wallace Short Marital Adjustment Scale (1959), and stage of the family life cycle, following the typology of Duvall (1971).

POPULATION AND SAMPLING

Three coordinated studies in Ames, Iowa; Newark, Ohio; and Classic County, Georgia; were conducted during the period from the Spring of 1971 to the Spring of 1973. Each study used probability sampling techniques designed to obtain respondents who were representative of the communities from which they were selected. In each case, only intact married couples were included in the final sample. Self-administered questionnaires combined with personal contact before and after the completion of the schedule was employed as the method of data collection. Each questionnaire contained items eliciting family life cycle information, social background and demographic characteristics, and questions about the respondents' current marriage. The Locke-Wallace Short Marital Adjustment Scale (1959) was included as part of this latter category of items. The sampling techniques and data collection procedures were similar for each of the three samples.

BEST COPY AVAILABLE

Iowa

The Iowa research was conducted in Ames, a midwestern community of about 40,000, which includes a university, its students, faculty and staff, light industry, and a large number of state employees.

A stratified area probability sample was drawn from the entire community in two steps. With the aid of the state university statistical laboratory, the community was divided into residential areas, 26 of which were selected from the possible total. Clusters were stratified on the basis of selected demographic factors, primarily social class, as measured by family income and value of home. The selection was made such that the 26 clusters were representative of the total community. In addition, 4 residential areas of the university married housing community were selected, proportional in size to the tracts representing the total community.

Within each of the 30 areas, a table of random numbers was used to select households, starting at a randomly assigned corner and moving in a randomly assigned direction in the tract. A total of 500 households (2.5 percent of the total in the community) was selected, producing a theoretical maximum of 1000 married people. A household was contacted a minimum of three times and eliminated from the sample if no one was home on all occasions. Contacts were made at different times during the day. Unmarried individuals were eliminated from consideration, as were couples who were in the U.S. only temporarily for study or teaching. After adjusting for these circumstances, 794 individuals had been contacted. A final N=530 (265 couples) reflects a response rate of 73 percent. Eleven percent of those contacted refused to participate. Sixteen percent of the questionnaires were incomplete and unusable. The response rate of 73 percent was judged to be good

BEST COPY AVAILABLE

considering the sensitive nature of many of the questions asked. None of the 30 tracts alone had a high rate of refusals or incomplete questionnaires.

The procedure for collecting the data was as follows: residents of a given residential area were always contacted during the same evening. They were personally asked if they would participate by completing the questionnaire, and if they agreed, a time was set up so that the questionnaire could be picked up, the next evening in 95 percent of the cases. The respondents were assured confidentiality and anonymity both verbally and in the schedule.

Ohio

A stratified area probability sample was drawn from the entire community of Newark, Ohio. The community was divided into one-hundred residential areas, twenty of which were selected from the total possible. Clusters were stratified on the basis of selected demographic factors, primarily social class, as measured by median family income and value of home. The selection was made such that the twenty clusters were representative of the total community. Within each of the twenty areas, a table of random numbers was used to select households, starting at a randomly assigned corner and moving in a randomly assigned direction in the tract. A total of two-hundred and twenty households (five percent of the total in the community) were selected. A household was contacted a minimum of three times and eliminated from the sample if no one was home on all occasions. Contacts were made at different times of the day. Households occupied by single, divorced and widowed persons were also eliminated from consideration. After adjusting the sample size for the criteria of having a married couple, two-hundred and ten households were interviewed. Both husband and wife

BEST COPY AVAILABLE

were instructed to complete identical forms of the questionnaire separately without discussing their answers prior to or during the completion of the questionnaires. There was a final useable N=392, consisting of 196 matched pairs. This number reflects a response rate of 93 percent. Among ten couples in the sample, either one or both spouses refused to participate; and questionnaires from either one or both of four couples were incomplete and thus not included in the analysis.

Georgia

A systematic random sampling procedure was used in Georgia to select 652 respondents (326 matched pairs of married couples). Every fourth household of every twentieth city block (or cluster of 10 homes in the rural areas) within Classic County in Northeast Georgia was contacted a maximum of three times. Classic County encompasses a university community of 48,000 as well as outlying rural areas. The total population of the area is 68,000. Semi-structured interview and structured questionnaire data were gathered by trained male and female college students who received a four-week period of training and experience in interviewing and data collection skills.

Questionnaires were completed by husbands and wives independently. The Georgia sample differs from the previous two in that the field workers were present during the completion of the questionnaire. While one spouse was completing the questionnaire, the other spouse was being interviewed in another room in conjunction with another part of the study. This technique resulted in a longer time period necessary for data collection--two hours in the average case.

BEST COPY AVAILABLE

The final response rate for the completed questionnaires was 62 percent, which was considered adequate in light of the time demands of the interview and questionnaire schedules. This rate reflects the proportion of useable questionnaires completed out of the total of households originally selected. Households where no intact, married couple resided or where only one spouse would cooperate in the study accounted for most of the rejection rate.

Characteristics of the Samples

Table 1 about here

Table 1 lists selected social characteristics for each of the three samples. For the aggregate of 1584 respondents, there is substantial variation in social characteristics. Between-sample variation is significant in some cases. The Georgia sample had a small proportion of Catholics and a larger proportion of Protestants. The Ohio sample, which consists of a large number of working class families, has significantly more children per family and a lower median educational level. Although there are some between-sample variations, it appears that each of the samples is representative of married couples in the respective communities studied.

THE USE OF CURVILINEAR REGRESSION

Although linear regression is adequate for many scientific research problems, reality is not always so neatly ordered or characterized by so simple a relationship. In social science research, linearity is a nearly universal assumption until proven otherwise beyond a reasonable doubt. A serendipitous finding in early marital adjustment research was the "U" shaped relationship previously discussed. In this section, we shall discuss

BEST COPY AVAILABLE

some options available to researchers for dealing with hypothesized or scattergram-revealed curvilinear relationships. We shall then carry to completion, using our own data, an analysis which utilizes what we think is the most important and useful of these techniques for the study of marital adjustment.

It is, of course, incorrect for a researcher to conclude that an $r=0$ necessarily means that no relationship exists, since it is possible to have a U-shaped curve but no linear correlation. Family researchers have identified this curvilinearity in the case of marital adjustment, but have neglected the appropriate techniques of studying it. The general topic of nonlinear correlation and regression is complex. The reason for the complexity of nonlinear analysis, according to Blalock (1960: 312), "is that once we get beyond the equation of the straight line, there are numerous types of equations representing the different possible forms that nonlinear relationships can take."

One general type of nonlinear function can be represented in terms of polynomials of the *n*th degree which have equations of the form

$$Y = a + bX + cX^2 + dX^3 + \ldots + kX^n$$

Other simple types of nonlinear relationships can be transformed to permit the use of more familiar linear models. Logarithmic functions of the form

$$Y = \underline{a} + \underline{b} \log X$$

are illustrative of this process (Blalock, 1960).

In nonlinear relationships generally, then, it is possible to develop an equation which more adequately describes the relationship in question then a linear equation. It is our impression that the social science literature has few examples of any real-world relationships beyond the

BEST COPY AVAILABLE

second degree (quadratic) polynomial. There are a multitude of packaged computer programs available to deal with such problems. These programs are more typically used in the physical sciences and economics but are easily adaptable to the social sciences as well.

Orthogonal Polynomials

If the independent variable is an interval scale, the fitting of the polynomial

$$Y = a + bX + cX^2 + dX^3 + \ldots + kX^n$$

is speeded up by the use of tables of orthogonal polynomials (Snedecor and Cochran, 1967). This technique, which shall not be utilized in the present paper, consists of replacing $x^i (i = 1, 2, 3\ldots)$ by a polynomial of degree i in X. The different polynomials are orthogonal to one another. This technique allows one to check whether the addition of a higher power polynomial produces a marked reduction in the residual sum of squares. One can then find the polynomial of lowest degree that seems an adequate fit (Snedecor and Cochran, 1967; Winer, 1962).

The Correlation Ratio, Eta

The technique we shall use to analyze the data for this study is eta, a measure of association for curvilinear relationships. "The correlation ratio is a very general index of correlation particularly adapted to data in which there is a curved regression" (Guilford, 1966: 308). The specific method of determining eta and its significance is presented in Guilford (1966) and is illustrated for our data in tables appended to this paper. The correlation ratio assesses dependent variable variation about category (independent variable) means. This procedure should account for more variation than the least-squares line unless the true relationship is actually linear in form. Blalock elaborates:

BEST COPY AVAILABLE

> If the regression equation happens to be linear in form, we can expect that the [dependent variable means for each category of the independent variable] will all fall approximately on the least-squares line so that it will make little difference whether deviations are taken about the category means or the least-squares line. ...if the relationship is actually nonlinear, then for at least some of the categories the sum of squares about the category mean will be quite a bit smaller than that about the least squares line. In other words, the within or unexplained sum of squares will be minimized by using the category means, and therefore, the between or explained sum of squares will be maximized. (Blalock, 1960: 314-315)

The significance of the linearity of regression can be assessed by an F test based on an analysis-of-variance approach. The most widely used formula is

$$F = \frac{(\eta^2 - r^2)\ (N-k)}{(1-\eta^2)\ (k-2)}$$

where N = number of respondents
k = number of columns (independent variable)

The hypothesis tested is that the regression of Y on X is linear. "If the actual form of regression were linear, sampling errors would cause the means of columns to deviate only slightly from the best-fitting straight line. The sampling distribution is of these deviations of the actual means of the columns, the Y values, from the regression line." (Guilford, 1966: 314)

Eta alone assumes no particular type of curvilinear relationship, but rather has as its primary utility the possibility of specifying that a regression is clearly nonlinear. When used in conjunction with additional curve fitting techniques, the specific nature of the curve can then be specified.

BEST COPY AVAILABLE

FINDINGS

Table 2 about here

Using the procedure for determining the significance of eta (the correlation ratio) outlined above, we find only limited support for the interpretation of curvilinearity. Table 2 presents the mean marital adjustment score, standard deviation, and number of respondents by stage of the family life cycle for husbands and wives in each of the three samples. The Ohio data demonstrated a curvilinear relationship which was significant at the .05 level ($F_{6,168}=5.5$) for males and the .01 level ($F_{6,168}=20.3$) for females. The Georgia and Iowa relationships, however, were not significantly curvilinear for males or females. Although the curve of the Georgia data for both males ($F_{6,299}=1.1$) and females ($F_{6,299}=2.4$) appears to be curvilinear, the linear interpretation accounts for more variation than the curvilinear. It should additionally be noted that the Pearsonian correlation for the Georgia data, reflecting an inverse linear relationship, was -.12 for males, significant at the .05 level, and -.11 for females, significant at the .05 level. The Iowa sample elicited a more erratic pattern and was not found to be significant by either a curvilinear or linear interpretation for males ($F_{6,255}=.43$) or females ($F_{6,255}=2.2$).

Figures 1, 2, and 3 about here

BEST COPY AVAILABLE

Figures 1, 2, and 3 show the relationship for males and females in each of the samples.[3] The most consistent characteristic of previous studies in this area is the decline in marital adjustment from stage 1 to stage 3 of the family life cycle. This decline is consistent with all but the data from Iowa females. Our samples, then, demonstrate one curvilinear relationship, one inverse linear relationship, and one with no relationship at all. The inverse linear relationship found in the Georgia data is primarily due, of course, to the profound decline in adjustment over the first three stages. But it should be noted that although significant, these latter coefficients are small and account for only a tiny portion of the total variance.

CONCLUSIONS

We have attempted to account for these various relationships by examining differences in regional and social characteristics within and between the samples. In the absence of alternative interpretations it was concluded that the differences in the relationships are due to either 1) problems with the measuring techniques, 2) use of cross-sectional data or, 3) the lack of any consistent, pronounced relationship, linear or curvilinear, between marital adjustment and stage of the family life cycle for these different populations.

The evidence from our three samples leads us to conclude that the question of curvilinearity is not yet settled. Of major import in this and similar studies is the reliance on cross-sectional as opposed to longitudinal data. Perhaps controls for maturational, historical, and cohort effects would give us a clearer picture of the relationship in

BEST COPY AVAILABLE

question (cf. Lewis, 1974). The Ohio sample was significantly curvilinear and the Georgia sample displayed a tendency toward curvilinearity. The curves presented by other researchers additionally suggest this tendency. It would seem most appropriate for these researchers to reanalyze their previously collected data using the techniques of curvilinear regression presented in this paper. If this were to be done one might have a better insight into the question of curvilinearity.

The ambiguous findings from the present data, nevertheless, indicate that claims of curvilinearity in recent articles and papers may have been premature. We would speculate that the significant F tests in previous studies may be accounted for primarily by declines in marital adjustment (or satisfaction) from stages 1 to 3, as was the case in the present Georgia data. From stages 4 through 8 the trends are less clear. Whereas it is seemingly appropriate to conclude that couples report lower marital adjustment scores following birth of their first child, and continuing through the early childhood years, current evidence does not yet warrant concluding that there is a leveling off followed by an increase in adjustment or satisfaction into the later years.

Furthermore, it is possible that many of the higher marital adjustment scores reported during stages 6 through 8 reflect an increasing influence of "social desirability" response sets and the realization on the part of the spouses that the likelihood of marital failure is very low. An even more serious factor in the alleged increase in reported adjustment during the later stages of the family life cycle is the gradual elimination from the potential sample of those marriages which terminated in divorce. In

BEST COPY AVAILABLE

other words, with cross-sectional data, any increase from stages 3 through 8 needs to be corrected for the decreasing likelihood at each stage that severely maladjusted marriages, namely those ending in divorce, would be included. The absence of these marriages has the effect of increasing the mean marital adjustment scores at each subsequent stage in a cross-sectional study.

Clearly, the best solution to these problems is the collection of longitudinal data which, at the very least, follow a given couple from one stage to the next. If a sample of respondents stratified by stage in the family life cycle could be followed for at least a few years, to allow for a transition to the next stage, one might better understand the impact of each transition. Previously, such information has only been available with regard to the transition to parenthood.

One implication of this study is the realization that the traditional methods of assessing developmental phenomena in the family are often inappropriate and inadequate. We have presented a method of assessing the extent and significance of curvilinearity and have demonstrated its use in the case of research on marital adjustment over the family life cycle. The substantive findings of the present study provide only partial support for the significance of the oft implied curvilinearity. Other researchers are encouraged to reanalyze their data with similar appropriate methods to assess whether their data truly reflect a curvilinear, linear, or no relationship. Finally, several limitations in the use of cross-sectional data to assess family phenomena over time were discussed, and we have indicated how these limitations may produce erroneous interpretations of marital adjustment over time. Researchers need to be more aware

BEST COPY AVAILABLE

of these issues in the future and, where possible, attempt to deal with them in research design and analysis.

ERIC

BEST COPY AVAILABLE

REFERENCES

Bernard, Jessie
1934 "Factors in the distribution of success in marriage." American Journal of Sociology 40 (July): 49-60.

Blalock, Hubert
1960 Social Statistics. New York: McGraw-Hill Book Company.

Blood, Robert O. and Donald M. Wolfe
1960 Husbands and Wives: The Dynamics of Married Living. Glencoe, Illinois: Free Press.

Bossard, James H. S. and Eleanor S. Boll
1955 "Marital unhappiness in the life cycle of marriage." Marriage and Family Living 17 (February): 10-14.

Burgess, Ernest W. and Leonard S. Cottrell, Jr.
1939 Predicting Success or Failure in Marriage. New York: Prentice-Hall.

Duvall, Evelyn M.
1971 Family Development. 4th edition. Philadelphia: J. B. Lippincott and Company.

Guilford, J. P.
1966 Fundamental Statistics in Psychology and Education. 4th edition. New York: McGraw-Hill Book Company.

Gurin, Gerald, Joseph Verhoff, and Sheila Feld
1960 Americans View Their Mental Health. New York: Basic Books.

Hamilton, Gilbert V.
1929 A Research in Marriage. New York: Boni.

Hill, Reuben and Roy H. Rodgers
1964 "The developmental approach." In Harold T. Christensen (ed.), Handbook of Marriage and the Family. Chicago: Rand McNally. Pp. 171-211.

Kohout, Frank J.
1974 Statistics for Social Scientists. New York: John Wiley and Sons.

Lang, Robert O.
1953 "The rating of happiness in marriage." In Ernest W. Burgess and Paul Wallin (eds.), Engagement and Marriage. Philadelphia: J. B. Lippincott. Pp. 538-539.

Lewis, Robert A.
1974 "The marital disenchantment-disengagement thesis reconsidered: Dyadic maintenance among family cohorts. Unpublished manuscript.

BEST COPY AVAILABLE

Luckey, Eleanor B.
1966 "Number of years married as related to personality perception and marital satisfaction." Journal of Marriage and the Family 28 (February): 44-48.

Marlowe, Roy H.
1968 "Development of marital dissatisfaction of Mormon college couples over the early stages of the family life cycle." Unpublished M. S. thesis, Brigham Young University.

Paris, Bethel L., and Eleanor B. Luckey
1966 "A longitudinal study of marital satisfaction." Sociology and Social Research 50 (January): 212-223.

Pineo, Peter C.
1961 "Disenchantment in the later years of marriage." Marriage and Family Living 23 (February): 3-11.

Rodgers, Roy H.
1964 "Toward a theory of family development." Journal of Marriage and the Family 28 (August): 262-270.

Rollins, Boyd C., and Kenneth L. Cannon
1974 "Marital satisfaction over the family life cycle: A re-evaluation." Journal of Marriage and the Family 36 (May): 271-283.

Rollins, Boyd C., and Harold Feldman
1970 "Marital satisfaction over the family life cycle." Journal of Marriage and the Family 32 (February): 20-28.

Snedecor, George W. and William G. Cochran
1967 Statistical Methods. 6th edition. Ames, Iowa: Iowa State University Press.

Spanier, Graham B. and Charles L. Cole
1974 "Toward clarification and investigation of marital adjustment." Revision of a paper presented at the annual meeting of the National Council on Family Relations, October, 1973.

Winer, B. J.
1962 Statistical Principals in Experimental Design. New York: McGraw-Hill Book Company.

BEST COPY AVAILABLE

FOOTNOTES

1. Previous studies assessing the quality of the marital relationship over time have used a variety of concepts to characterize the dependent variable. Rollins and Feldman (1970) used single item measures and called their dependent variable "satisfaction." Others, including the present authors, have used scales or indexes as the dependent variable and called these measures "adjustment." Rollins and Cannon (1974) utilize both "satisfaction" and "adjustment" measures. Still other researchers have used other concepts (happiness, success, etc.). In this paper, we should like to simply use the term "adjustment" since this is the concept employed by the developers of the instrument we have used (Locke and Wallace). We recognize the ambiguity which surrounds the use of these varied terms, but do not feel a detailed discussion is appropriate here. For the present, it is sufficient to think of all of these studies as investigations of the quality of the marital relationship over time. This issue is discussed in greater detail in Spanier and Cole (1974).
2. Analysis of variance can be used to assess curvilinearity if the assumption of linearity is abandoned and the method of orthogonal polynomials (discussed later in this paper) is used. This technique, used most commonly in experimental research, has been called "trend analysis," (Winer, 1962) and allows the researcher to specify the nature of the polynomial relationship in question. In the case of

BEST COPY AVAILABLE

survey research on marital adjustment over the family life cycle, however, trend analysis techniques have not been employed.

3. To facilitate future research studies which might use the same data analysis techniques, a table for each of the six calculations (males and females for each of the three samples) is appended to this paper. The tables illustrate the step by step procedures explained in Guilford (1966).

BEST COPY AVAILABLE

Table 1

SELECTED SOCIAL CHARACTERISTICS OF THREE SAMPLES OF

MARRIED COUPLES IN IOWA, OHIO, AND GEORGIA

Characteristic	Iowa	Ohio	Georgia
Number of respondents	530	392	652
Number of married couples	265	196	326
Age range	17-93	18-96	19-87
Median age	29	32	37
Median educational level	3 years college	1 year college	3 years college
Percent college graduates	25	7	53
Percent high school graduates or less	19	34	26
Mean number of children	1.7	2.75	1.9
Percent Catholic	37	26	6
Percent Jewish	7	2	less than 1
Percent Protestant	56	58	93

ERIC

BEST COPY AVAILABLE

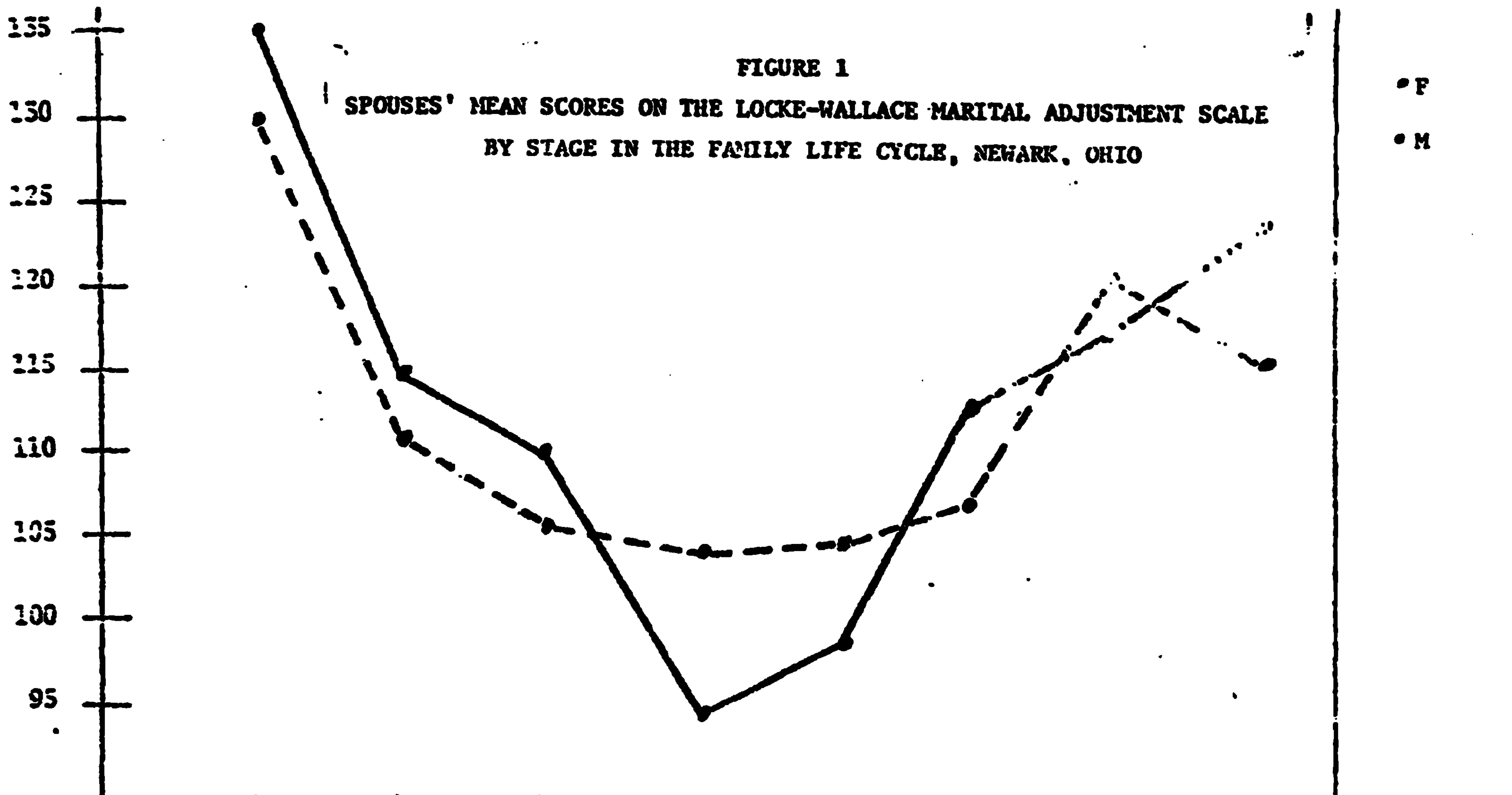
Table 2

MEAN SCORES ON THE LOCKE-WALLACE MARITAL ADJUSTMENT SCALE
BY STAGE OF THE FAMILY LIFE CYCLE AND GENDER
FOR IOWA, OHIO, AND GEORGIA RESPONDENTS

STAGE		IOWA			OHIO			GEORGIA		
		Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
1 Beginning Families Couples married less than 5 years with no children	♂	121.1	22.6	74	129.6	8.7	33	126.0	24.0	63
	♀	124.4	20.8	74	134.7	9.0	33	129.8	20.7	63
II Childbearing Families Oldest child, birth to 2 years, 11 months	♂	118.9	22.8	44	110.9	7.9	26	120.5	27.0	30
	♀	122.1	15.5	44	114.2	8.1	26	122.9	29.8	30
III Families with preschool Children Oldest child, 3 years to 5 years, 11 months	♂	115.9	20.9	24	105.2	6.7	16	114.5	27.9	33
	♀	125.0	16.1	24	109.9	7.4	16	116.8	28.5	33
IV Families with schoolage children Oldest child, 6 years to 12 years, 11 months	♂	118.8	19.4	41	103.9	7.6	29	115.1	22.8	46
	♀	119.4	23.6	41	94.6	8.0	29	116.1	25.6	46
V Families with teenagers Oldest child, 13 years to 20 years, 11 months	♂	125.1	18.9	33	104.3	9.1	31	112.5	21.4	32
	♀	122.0	16.9	33	97.8	10.4	31	113.7	28.9	32
VI Families as launching centers First child gone to last child's leaving home	♂	123.9	24.7	16	106.8	6.9	14	114.0	19.0	47
	♀	131.8	13.6	16	112.4	8.0	14	115.3	19.3	47
VII Families in the middle years Empty nest to retirement	♂	121.9	19.1	23	120.8	6.4	15	118.0	28.2	43
	♀	122.2	19.0	23	116.9	5.9	15	123.1	21.3	43
VIII Aging families Retirement to death of first spouse	♂	130.3	22.9	8	115.6	8.0	12	119.4	15.4	13
	♀	129.5	13.9	8	124.1	6.2	12	124.4	23.0	13
Childless families Families with no children after 5 years of marriage	♂	125.0	5.7	2	128.5	6.9	20	124.5	21.4	19
	♀	120.5	14.8	2	131.6	7.5	20	117.4	23.9	19

FIGURE 1

SPOUSES' MEAN SCORES ON THE LOCKE-WALLACE MARITAL ADJUSTMENT SCALE BY STAGE IN THE FAMILY LIFE CYCLE, NEWARK, OHIO



STAGE	1	2	3	4	5	6	7	8	CL
N	33	26	16	29	31	14	15	12	20

Wive's Scores

Husband's Scores

STAGES

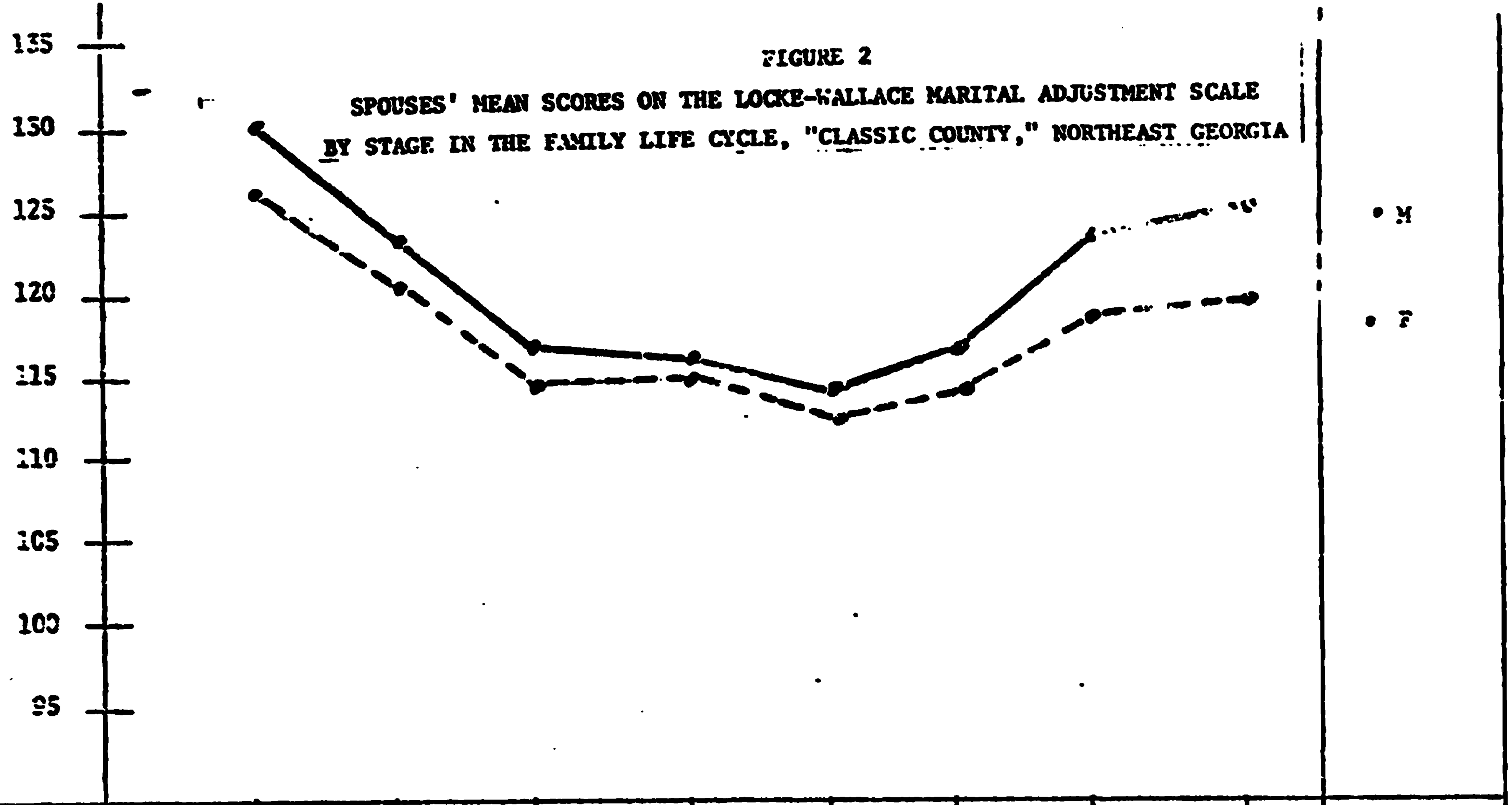
Stage 1 Beginning Family
Stage 2 Infant Family
Stage 3 Preschool Family
Stage 4 Schoolage Family
Stage 5 Adolescent Family
Stage 6 Launching Family
Stage 7 Postparental Family
Stage 8 Aging Family
CL Childless Couples

BEST COPY AVAILABLE

BEST COPY AVAILABLE

FIGURE 2

SPOUSES' MEAN SCORES ON THE LOCKE-WALLACE MARITAL ADJUSTMENT SCALE BY STAGE IN THE FAMILY LIFE CYCLE, "CLASSIC COUNTY," NORTHEAST GEORGIA



STAGE	1	2	3	4	5	6	7	8	CL
N	63	30	33	46	32	47	43	13	19

STAGES

Wive's Scores (solid line)
Husband's Scores (dashed line)

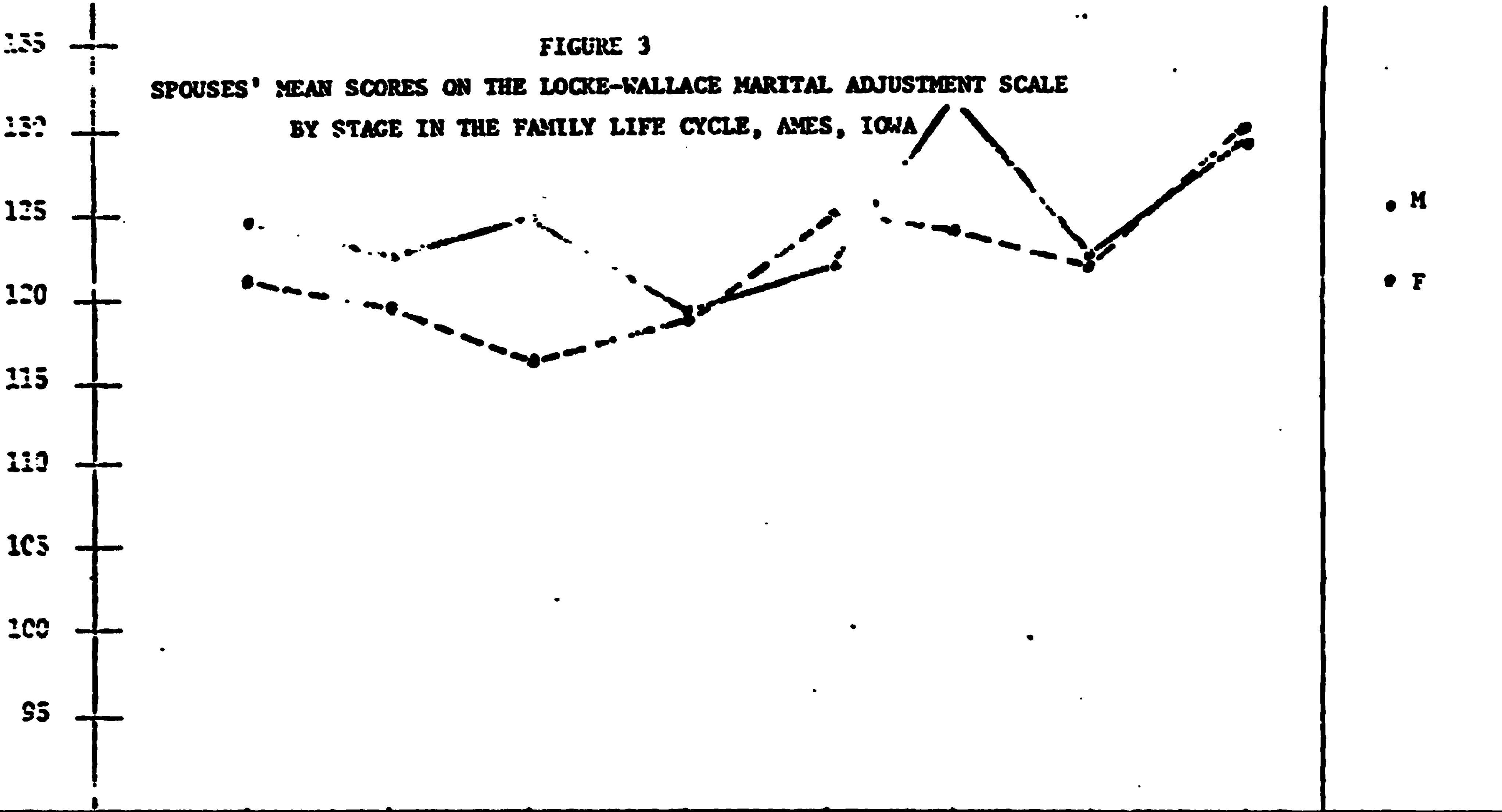
Stage 1 Beginning Family
Stage 2 Infant Family
Stage 3 Preschool Family
Stage 4 Schoolage Family
Stage 5 Adolescent Family
Stage 6 Launching Family
Stage 7 Postparental Family
Stage 8 Aging Family
CL Childless Couples

BEST COPY AVAILABLE

FIGURE 3

SPOUSES' MEAN SCORES ON THE LOCKE-WALLACE MARITAL ADJUSTMENT SCALE

BY STAGE IN THE FAMILY LIFE CYCLE, AMES, IOWA



STAGE	1	2	3	4	5	6	7	8	CL
N	74	44	24	41	33	16	23	8	2

Wive's Scores

Husband's Scores

STAGES

Stage 1 Beginning Family
Stage 2 Infant Family
Stage 3 Preschool Family
Stage 4 Schoolage Family
Stage 5 Adolescent Family
Stage 6 Launching Family
Stage 7 Postparental Family
Stage 8 Aging Family
CL Childless Couples

BEST COPY AVAILABLE

APPENDIX

Calculations for Determining Eta, the Correlation Ratio, And Its Level of Significance

Ohio, Iowa and Georgia Samples for Males and Females

ERIC

BEST COPY AVAILABLE

Ohio Males N=176

$r = -.04$

$SD_{MA} = 7.7$

(1) X' Stage	(2) n	(3) Y' Marital Adjustment	(4) $Y'-M_y$ $M_y = 112.2$	(5) $(Y'-M_y)^2$	(6) $n(Y'-M_y)^2$
1	33	129.6	17.4	302.8	9992.4
2	26	110.9	-1.3	1.7	44.2
3	16	105.2	-7.0	49.0	784.0
4	29	103.9	-8.3	68.9	1998.1
5	31	104.3	-7.9	62.4	1934.4
6	14	106.8	-4.9	24.0	336.0
7	15	1:0.8	8.6	74.0	636.4
8	12	115.6	3.4	11.6	139.2
	176			$\Sigma n(Y'-M_y)^2 =$	15528.3

$\eta = \frac{9.4}{22.9} = .41$ $\quad \eta^2 = .17$ $\quad \sigma_{y'}^2 = 88.2$

$r^2 = 0.0$ $\quad \sigma_{y'} = 9.4$

$$F = \frac{(\eta^2 - r^2)(176-8)}{(1-\eta^2)(6)} = \frac{.17(168)}{.87(6)} = \frac{28.56}{5.22} = 5.5$$

$F_{6,168} = 5.5 \qquad \alpha = .05$

BEST COPY AVAILABLE Ohio Females N=176

r =-.02

SD_{MA} = 7.9

(1) X' Stage	(2) n	(3) Y' Marital Adjustment	(4) Y'-M$_y$ M$_y$=113.7	(5) $(Y'-M_y)^2$	(6) $n(Y'-M_y)^2$
1	33	134.7	21.0	441.0	14553.0
2	26	114.2	.5	.25	6.5
3	16	109.9	-3.8	14.4	230.4
4	29	94.6	-19.1	364.8	10579.2
5	31	97.8	-15.9	252.8	7836.8
6	14	112.4	-1.3	1.7	23.8
7	15	116.9	3.2	10.2	153.0
8	12	124.1	10.4	108.2	1298.4
	176				

$\Sigma\, n(Y'-M_y)^2$ = 34681.1

$\sigma_{y'}^2$ = 197.1

$\sigma_{y'}$ = 14.0

$$\eta = \frac{14.0}{\text{Whole Sample}} = \frac{14.0}{21.6} = .65$$

$$\eta^2 = .42$$

$$r^2 = 0.0$$

$$F = \frac{(\eta^2 - r^2)(176-8)}{(1-\eta^2)(6)} = \frac{.42(168)}{.58(6)} = \frac{70.56}{3.48} = 20.3$$

$F_{6,168}$ = 20.3 α =.01

BEST COPY AVAILABLE

Georgia Males N=307

$\bar{X}_{MA} = 117.95$

$SD_{MA} = 24.20$

$r = -.12$

(1) X' Stage	(2) n	(3) Y' Marital Adjustment	(4) $Y'-M_y$ $M_y=118.0$	(5) $(Y'-M_y)^2$	(6) $n(Y'-M_y)^2$
1	63	126.0	8.0	64.0	4032.0
2	30	120.5	2.5	6.3	189.0
3	33	114.5	-3.5	12.3	405.9
4	46	115.1	-2.9	8.4	386.4
5	32	112.5	-5.5	30.3	966.4
6	47	114.0	-4.0	16.0	752.0
7	43	118.0	0	0	0
8	13	119.4	1.4	2.0	26.0
	307				

$\Sigma n(y'-M_y)^2 = 6757.7$

$r = -.12$ $\eta = \frac{4.7}{24.2} = .19$ $\sigma_{y'}^2 = 22.0$

$r^2 = .014$ $\eta^2 = .036$ $\sigma_{y'} = 4.7$

$$F = \frac{(\eta^2 - r^2)\ (307-8)}{(1-\eta^2)\ (6)} = \frac{(.036-.014)\ (299)}{964(6)} = \frac{6.58}{5.80} = 1.1$$

$F_{6,299} = 1.1$ N.S.

BEST COPY AVAILABLE

Georgia Females N=307

$\bar{X}_{MA}$ = 120.76

σ_{MA} = 24.66

r = -.11

(1)	(2)	(3)	(4)	(5)	(6)
X' Stage	n	Y' Marital Adjustment	$Y'-M_y$ M_y=120.8	$(Y'-M_y)^2$	$n(Y'-M_y)^2$
1	61	129.8	9.8	96.0	6048.0
2	30	122.9	2.1	4.4	132.0
3	33	116.8	-4.0	16.0	528.0
4	46	116.1	-4.7	22.1	1016.6
5	32	113.7	-7.1	50.4	1612.8
6	47	116.3	-4.5	20.3	954.1
7	43	123.1	2.3	5.3	227.9
8	13	124.4	3.6	13.0	169.0
	307				

$\Sigma n(y'-M_y)^2 = 10{,}688.4$

$\sigma_{y'}^2 = 34.8$

$\sigma_{y'} = 5.9$

$\eta = \frac{5.9}{24.7} = .24 \quad \eta^2 = .058 \quad r^2 = .012$

$$F = \frac{(\eta^2-r^2)\ (307-8)}{(1-\eta^2)\ (6)} = \frac{.046(299)}{.954(6)} = \frac{13.75}{5.72} = 2.4$$

$F_{6,299} = 2.4$ N.S.

BEST COPY AVAILABLE

Iowa Males N=263

r = .072

SD_{MA} = 21.4

(1) X' Stage	(2) n	(3) Y' Marital Adjustment	(4) $Y'-M_y$ M_y=120.9	(5) $(Y'-M_y)^2$	(6) $n(Y'-M_y)^2$
1	74	121.1	.2	.04	3.0
2	44	118.9	-2.0	4.00	176.0
3	24	115.9	-5.0	25.00	600.0
4	41	118.8	-2.1	4.40	180.4
5	33	125.1	4.2	17.60	580.8
6	16	123.9	3.0	9.00	144.0
7	23	121.9	1.0	1.00	23.0
8	8	130.3	9.4	88.40	707.2
	263				

$\Sigma\ n(Y'-M_y)^2 = 2414.4$

$\sigma_{y'}^2 = 9.2$

$\sigma_{y'} = 3.0$

$\eta = \frac{3.0}{21.4} = .14$

$\eta^2 = .02$

$r^2 = .01$

$$F = \frac{.01(255)}{.98(6)} = \frac{2.55}{5.88} = .43$$

$F_{6,255} = .43$ N.S.

ERIC

BEST COPY AVAILABLE

Iowa Females N=263

$r = .02$

$SD_{MA} = 18.9$

$\bar{y}_{MA} = 123.4$

(1)	(2)	(3)	(4)	(5)	(6)
X' Stage	n	Y' Marital Adjustment	$Y'-M_y$ $M_y=123.4$	$(Y'-M_y)^2$	$n(Y'-M_y)^2$
1	33	124.4	1.0	1.0	33.0
2	26	122.1	-1.3	1.7	10.2
3	16	125.0	1.6	2.6	41.6
4	29	119.4	-4.0	16.0	464.0
5	31	122.0	-1.4	2.0	62.0
6	14	131.8	8.4	70.6	988.4
7	15	122.2	-1.2	1.4	21.0
8	12	129.5	6.1	37.2	446.4
	263				

$\Sigma\, n(Y'-M_y)^2 = 2066.6$

$\eta = \frac{2.8}{18.9} = .15 \qquad \eta^2 = .02 \qquad \sigma_{y'}^2 = 7.86$

$r^2 = 0.0 \qquad \sigma_{y'} = 2.8$

$$F = \frac{.02(255)}{.98(6)} = \frac{12.75}{5.90} = 2.2$$

$F_{6,255} = 2.2$ N.S.

ERIC