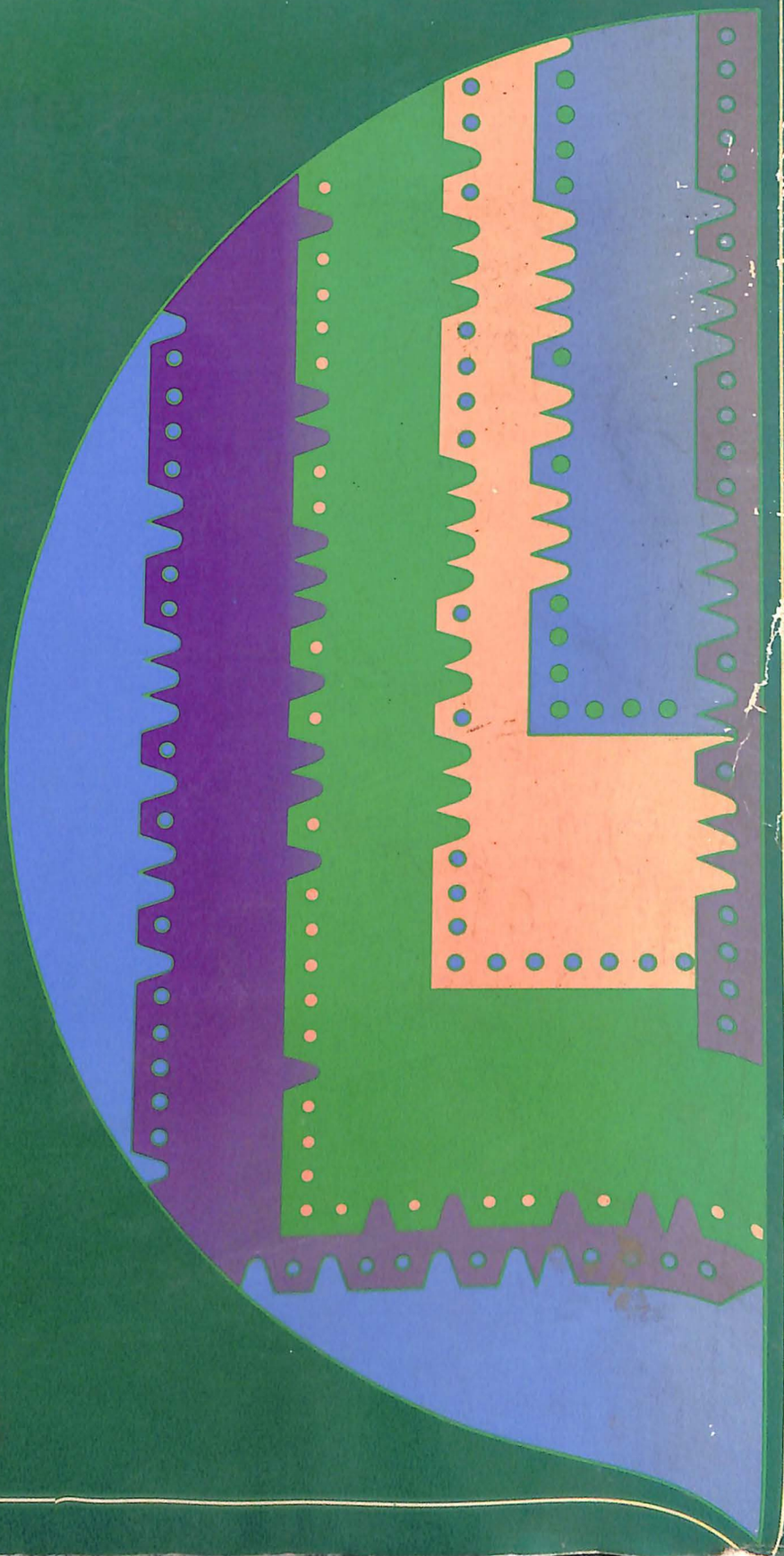
Laboratory Manual for Introductory Sociology

A Data Card Approach

Robert Sokol



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LABORATORY MANUAL FOR INTRODUCTORY SOCIOLOGY

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A DATA CARD APPROACH

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A Data Card Approach

Contents

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The data used in Assignments 1 and 9 have been kindly supplied by the National Opinion Research Center of the University of Chicago. Permission to use these data does not necessarily signify the Center's approval of the manner in which they have been used here.

Data for Assignment 2 as well as several quotations appearing in this assignment come from "The Function of Male Initiation Ceremonies at Puberty" by John W. Whiting, Richard Kluckhohn, and Albert Anthony, as published in *Readings in Social Psychology,* 3rd ed., E.E. Maccoby, T.M. Newcomb, and E.L. Hartley, eds. Copyright 1947, 1952, © 1958 by Holt, Rinehart and Winston, Inc. Reprinted by permission of Holt, Rinehart and Winston, Inc. Permission to use the data in Assignment 2 on transition ceremonies, sleeping arrangements, and the postpartum sex taboo has kindly been granted by John W.M. Whiting and Holt, Rinehart and Winston, Inc. This permission does not necessarily signify their approval of the manner in which the data have been used. In Assignment 2, the data on male solidarity for 54 societies have been supplied by Frank W. Young. His permission to use these data does not necessarily signify his approval of the manner in which they have been used.

James A. Davis kindly consented to the reprinting of the table of Q values and their suggested verbal interpretations appearing in Assignment 4.

Certain data used in this publication (in Assignment 5) were derived by the author from a punchcard file furnished under a joint project sponsored by the U.S. Bureau of the Census and the Population Council. This project contained selected 1960 Census information for a 0.01 percent sample of the population of the United States. Neither the Census Bureau nor the Population Council assumes any responsibility for the validity of any of the figures or interpretations of the figures published here.

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I am indebted to the Literary Executor of the late Sir Ronald A. Fisher, F.R.S., to Dr. Frank Yates, F.R.S., and to Oliver & Boyd Ltd., Edinburgh, for permission to reprint Table 4 from their book *Statistical Tables for Biological, Agricultural and Medical Research.*

In Assignment 10, the panel data on undergraduates have been kindly supplied by William S. MacNaughton. His permission to use these data in no way signifies his approval of the manner in which they have been used.

To the Student

Early in your course in introductory sociology or social science you will read about how people learn to live in their societies. The process by which one learns about his culture or subculture is called socialization, and the data card technique is designed to provide you with some socialization into the discipline of sociology. You will have a chance to observe some of the objectives of the field of sociology and to learn about some of its limitations and methods.

The data card technique will be a failure if it does not involve you in the process of testing sociological ideas, does not get you to put your ego on the line as you make testable predictions of the behavior of human beings, does not stimulate you to wrestle with a reinterpretation of a fallen prediction, and does not give you a feeling that sociological propositions can be reliably studied with empirical procedures.

The ten laboratory assignments in this manual deal with several basic ideas in sociology, such as social norms, role conflict, socialization, class status and alienation, group cohesion, differential birth rates, urbanization, group prejudice, and attitude change. Appropriate data collected by professional sociologists have been punched into the set of 200 data cards you will use in completing the assignments. With edge-punched cards like these, it is unnecessary to have electronic data processing or computer equipment, so you will not be frustrated by machine malfunction and limited access to the machines. You can analyze your data cards anytime and anywhere.

The data card technique will not make you a neophyte sociologist, but you should develop a sound impression of the field of sociology by testing some of its propositions with actual data from the U.S. Census, national attitude surveys, a study of small groups, a four-year panel study of undergraduates, and ethnographic and other cross-cultural studies. To give you still more direct exposure to sociology, you are asked in the last few assignments to design and analyze mini-projects with data provided by a national survey and a panel survey of undergraduates.

Since the process of data analysis is part of the subculture of sociology, your socialization experience involves learning about the simple procedures of cross-tabulation and the techniques for employing elementary quantitative measurements. Although important for the full use of the assignments, the statistical techniques are kept to a minimum and used only to illustrate the connection between your data and the inferences you make from them.

My minimum hope is that by using this manual and the data cards you will derive a sense of the importance in sociology of the inseparable relationship of theoretical ideas and the data that test them. As a maximum, I hope you will become so involved in the material that you will enjoy the satisfaction of a correct prediction and the agony of a good idea gone down the drain. Before you launch off let me cite an old saying from Nacirema: good luck, have a ball, and enjoy the sociological scene.

LABORATORY MANUAL FOR INTRODUCTORY SOCIOLOGY

NAME _____ SECTION _____ DUE ON _____

ASSIGNMENT 1

The Use of Data Cards in Analyzing a Social Norm

INTRODUCTION

In the first data card assignment, you are to become familiar with the simple methods of sorting the data cards that accompany this manual. You will also construct several simple statistical tables involving the cross-tabulation of three pieces of information found on the data cards, information that is related to several central ideas in sociology.

Examine several of the data cards and you will see that the printing on all the cards is identical and that there are holes opposite the printed information. However, each card is unique by virtue of the pattern in which the holes are notched open. Different types of information are notched into the cards for the various assignments. In Assignment 1, each data card stands for an individual who was interviewed in a nationwide public-opinion survey conducted by the National Opinion Research Center of the University of Chicago. Your deck of 200 data cards thus represents a cross-sectional sample of white American adults in the winter of 1963–1964 and accurately reflects the full sample of 1355 whites included in the original sample.

Among the pieces of information gathered in the interview and notched into the data cards are the religion and educational attainment of the persons interviewed. With this information it is possible to compare individuals of different religions and education in regard to their opinion on certain questions.

Assignment 1 focuses on the portions of the data cards that provide information about individuals in a national survey, and other assignments will require you to use other sections of the card. In some assignments a data card will represent a country, a preliterate society, a small group, an individual in another survey, or a county in the United States. Since the data punched into one section of the card can be unrelated to that in the other sections, you can use one deck of cards to explore several different types of problems and techniques and sample many of the kinds of research that contemporary sociologists do.

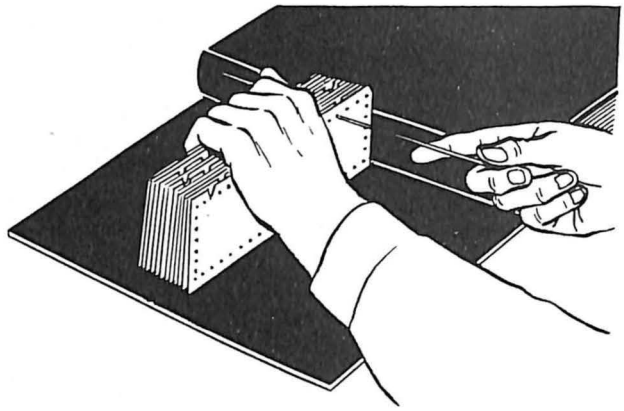
Some of the holes on the card have been notched or punched out leaving a V-shaped cut. The difference between a hole that is notched [open] and one that is left intact [closed] is important because each condition denotes a specific piece of information or code. For example, when a card is notched in position 1 [1 open], the individual in a national opinion survey who is represented by the card has not graduated from high school. If the hole is not notched [1 closed], the individual has graduated from high school and may have some college experience. Look at the other types of information on the card and see if you can understand the codes for them. All codes will be explained when they are used in each assignment.

USING THE DATA CARDS

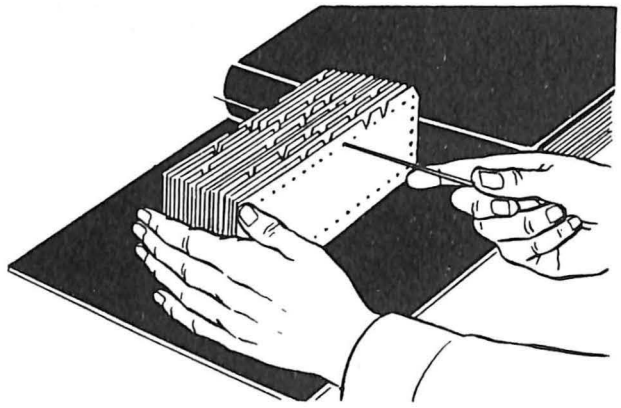
Carefully remove the data cards from their container. You will use the metal rod for sorting the cards. An additional aid for your work will be a book or notebook at least 1 inch thick, with a stiff spine that you can use in aligning and squaring the cards as you sort them. It would be wise to practice sorting the cards with only about half the deck at a

time until you are accustomed to the technique. Place about 100 data cards on a flat surface with the printed codes facing you and with the clipped or beveled corners all together. Holding the cards loosely but securely, jog them gently until they are all even and the edges are squared. Now sort the cards in the following sequence:

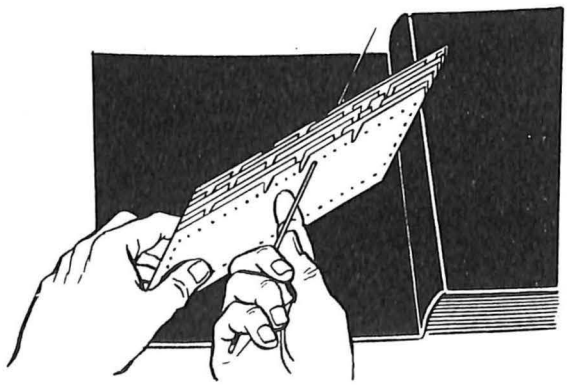
1. Push the cards up against the edge of the book and grasp them close to the card position to be sorted. For practice, choose any middle position on the top edge. Insert the sorting rod in this position until your finger on the rod is about 1 inch from the cards.



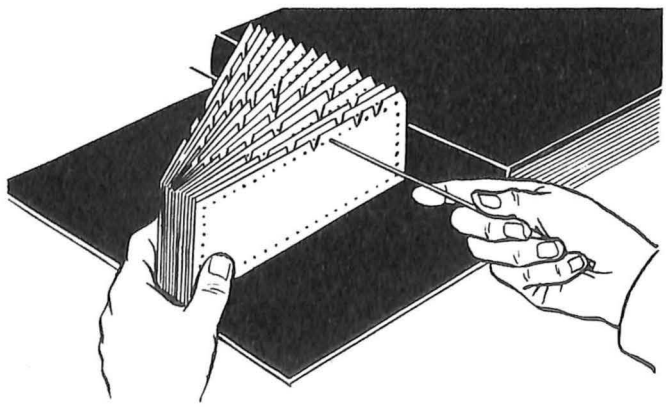
2. Keeping the sorting rod in position, move your left hand to the left end of the cards. The cards should be held by your thumb and fingers with only a little pressure.



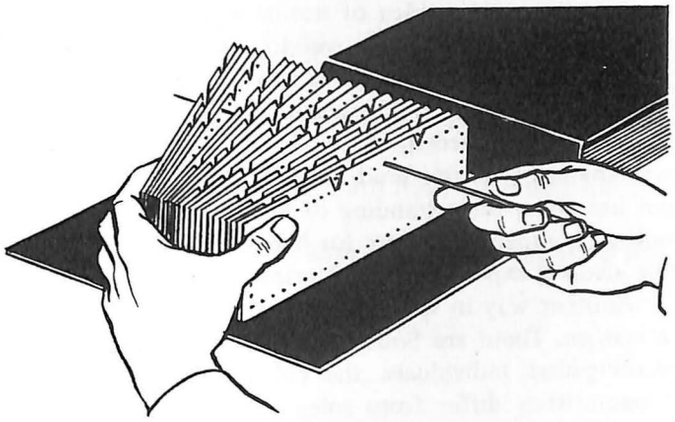
3. Move your left thumb and fingers to the lower left-hand corner of the cards, with the thumb in the front. Now, with your right hand, move the sorting rod to the left so that the cards are at an angle to the book's spine.



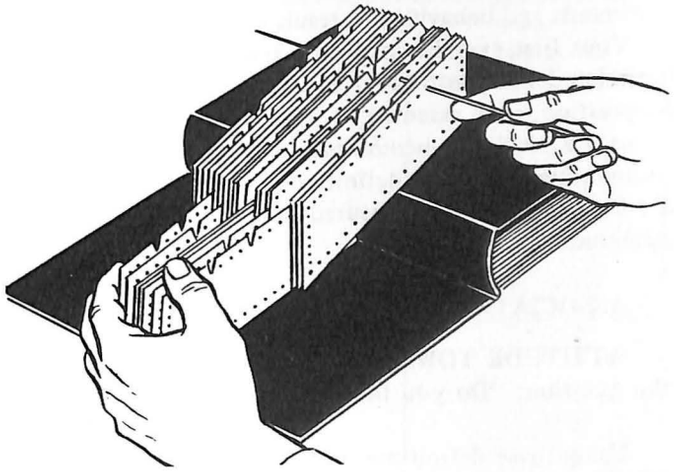
4. Take a firmer grip with your left hand on the lower left-hand corner of the cards. Now move the sorting rod to the right toward the book's spine, making the cards spread out on the rod. This fanning procedure loosens the cards and makes it easier for those with open holes to separate from those with closed holes.



5. Release the firm grasp of your left hand and spread your thumb and fingers. This will control the cards as they become separated. Keeping the rod parallel to the table, lift the cards about an inch and then whack the cards against the book spine. Gently raise the rod, allowing the freed cards to drop.



6. The sorting rod should now be lifted higher, up over the book spine. Your left hand should be controlling the cards that dropped off the rod.



7. It may be necessary to repeat the operation two or three times to sort out all the cards that are open at that position. As you become more accustomed to the procedure and as the cards are used more, the sorting will go faster and more smoothly.

You will probably work out your own variations of the technique, but take note of these two cautions. First, always keep the sorting rod parallel with the table top. If the rod is tilted away from you, the cards will fall off the end of the rod; if the rod is tilted toward you, the cards will slide together and prevent the notched cards from dropping off.

Second, always inspect the cards visually at the position that was sorted. The cards that fell off the rod will all be notched at the sorted position, but you should make certain that no notched cards are left among the unnotched cards. Sometimes the notched cards do not fall off the rod.

8. Practice sorting the cards for about 15-20 minutes until you feel at ease in handling the cards and the sorting rod. As suggested earlier, use only half of the deck at first, but then work with the entire deck of 200 cards. After this brief session you are ready to work on the assignment.

ANALYZING A SOCIAL NORM

Basic to the study of society and social behavior is the proposition that man's behavior is in large measure shaped by the social rules of society as well as the rules of smaller groupings of people. No organized activities could be accomplished without these rules. Societies, communities, and groups are dependent upon them: the existence of a society would be seriously jeopardized should a large proportion of its members cease to behave in accordance with most of the social rules; that is, cease to conform to them. Rules even existed in the hippie communities of Haight-Ashbury in San Francisco and of East Village in Manhattan. The rules ranged from the expectation that fellow hippies would share their money and material possessions to the agreement that "you don't try to force your 'thing' on anyone else, whether he is another hippie or one of the 'straight people.' "

In many cases these social rules are quite formal, embedded in laws that are enforced by special personnel who follow specific procedures. Other rules are less formal and less rigidly enforced. These are sometimes called folkways and mores. For the sake of simplicity, all social rules will be referred to in this laboratory manual as *social norms.*

Corollary to the idea of norms as a prerequisite for social life is the proposition that when an individual is a member of some group he will to some extent be influenced by it. His participation in the group's activities, his exposure to the group's values and norms, and his social interaction with the other members of the group tend to shape his own values and behavior.

Besides membership in such specific groups as one's family or fraternity, there are other forms of social participation that also tend to affect an individual's opinions, attitudes, and values. Everybody occupies social roles and has some understanding of what kinds of behavior are socially expected of the occupant of a specific role. A mother is expected to care for her children and to have a warm and affectionate attitude toward them. A professor's role involves expectations with respect to his students, the deans, other professors, and so on.

Another way in which individuals are socially identifiable is in specific features that classify them in certain social categories. There are Southerners and Northerners, businessmen and manual workers, middle-class individuals and working-class individuals, the college-educated and those who did not attend college, and so on. These social characteristics differ from roles and from membership in small groups by not having explicit forms of socially expected behavior associated with them. They are general social categories that have some influence on an individual's sentiments and behavior as a result of the life styles, interests, and pressures associated with them.

Your first exercise involves a test of the general proposition that group or associational membership is related to (correlated with, associated with) an attitude toward interracial marriage. To formulate a specific test of this general proposition, it is essential to specify what is meant by the terms or concepts involved in the test, in this case the terms *associational membership* and *attitude toward the norm prohibiting racial intermarriage.* This procedure of formulating a working definition is referred to as operationalizing a concept, or converting a verbal term or label into a form that can be measured and researched. The operational definitions for the concepts in question in this assignment are as follows:

ASSOCIATIONAL MEMBERSHIP: Religious affiliation [card positions 2 and 3].

ATTITUDE TOWARD NORM PROHIBITING RACIAL INTERMARRIAGE: Agreement or disagreement with the question: "Do you think there should be laws against marriages between Negroes and whites?" [card position 8].

Using these definitions and the national-survey information on the data cards, you will determine whether or not there is a relationship of religious affiliation and attitude toward the normative prohibition of miscegenation. But first, you should make a prediction.

1. Basing your decision on personal experience and objective information, which of the two, Protestants or Catholics, do you expect would agree more with the above statement, that is, be more likely to support the social norm against miscegenation? Write your answer in the space below.

2. Explain the reasoning behind your prediction in the space below.

3. Test your prediction with the data cards in the following manner:
   a. Separate the Catholics from the Protestants by sorting the cards in positions 2 and 3. If positions 2 and 3 are both closed, the individual is a Roman Catholic. If either position 2 or 3 is open, the individual is to be considered a Protestant. The distinction between Baptists and other Protestants is not relevant for this assignment, but it will be for a later one.
   b. Sort the Catholics on position 8 to separate those Catholics who agree with the norm from those who disagree with it.
   c. Sort the Protestants on position 8 to separate those Protestants who agree with the norm from those who disagree with it.
   d. Count the number of cards in each of the four piles and enter the frequencies in Table 1.1.

TABLE 1.1
ATTITUDE TOWARD LAWS PROHIBITING RACIAL INTERMARRIAGE BY RELIGIOUS AFFILIATION

"DO YOU THINK THERE SHOULD BE LAWS AGAINST MARRIAGES BETWEEN NEGROES AND WHITES?"	Catholics [2 and 3 closed]	Protestants [2 or 3 open]
Yes [8 open]		
No [8 closed]		
Total in each category N =	( )	( )

EXPLANATION: Relative Numbers

An examination of Table 1.1 without further computations will not provide an answer as to whether or not your prediction is supported. The frequencies you entered in the table are *absolute figures* and are a direct result of the total sizes of each group. For example, there are several thousand male students at the Massachusetts Institute of Technology and only several hundred female students. Even if almost all of the female students said yes to our question on miscegenation, it would take only a small minority of the male students saying yes to equal the female frequency. Consequently, it would not be accurate to say that male and female students at M.I.T. are equal in their support of the norm on miscegenation, since there are many more males to begin with.

This hypothetical situation shows that comparing absolute numbers can lead to incorrect conclusions. However, it is quite simple to make meaningful comparisions by converting the absolute numbers into *relative numbers*, such as proportions or percentages. Thus we could say that 95 percent of the coeds support the norm, but only 20 percent of the male students do, or that proportionately more female than male students endorse the norm.

A proportion is obtained by dividing the total absolute number of males into the absolute number of males saying yes and by doing the same for the set of absolute numbers for the females. These proportions are rapidly converted into percentages by multiplying by 100, which is in fact accomplished by moving the decimal point of the proportion two places to the right. For example, 20/100 = .20 = 20 percent.

Why change the proportion to a percentage? Continuing with the hypothetical illustration, we are in a sense making the total number of males equal to the total number of females. This process of "equalizing" the size of our two categories is called standardizing and involves making 100 the total for the males and 100 for the females. *Percent* means *per hundred.* Thus, the 20 percent of the male students indicates that for every 100 males there are 20 who support the norm and is directly comparable to saying that for every 100 females there are 95 who support the norm. Relatively speaking, more females (95 percent) than males (20 percent) support the norm.

Since, in this assignment and in later ones, comparisons are to be made between two or more social categories or groups whose absolute totals differ, the percentage method will be primarily used. Currently, you are comparing members of two types of religious affiliation, Catholics and Protestants, of which there are more Protestants in the sample, just as there are in the total population of the United States from which the sample was drawn. As a result, direct comparisons of Protestant and Catholic attitudes on miscegenation laws are facilitated by converting the absolute figures into percentages.

For a variety of reasons, percentages in this manual should be rounded off to the nearest whole number. Thus, 20 percent was used for the male students instead of 20.4 percent. The Appendix at the end of the manual contains the percentages for all numbers from 1 to 150, eliminating the need for you to calculate and round off the percentages called for in most of the assignments.

4. Determine the percentages for the absolute frequencies in Table 1.1 and insert the percentages in Table 1.2. You might find the following steps helpful:

   a. In the Appendix, find the number that corresponds to the total number of Catholics. This is the base or denominator, which is divided into the number of Catholics saying yes to the question as well as the number of Catholics saying no. Find the number saying yes in the left column under the appropriate base (total number of Catholics) and read its percentage in the right column. Do the same for the number saying no. Enter these percentages in the appropriate boxes or cells in Table 1.2. The yes and no percentages for Catholics should add up to 100 percent. The actual total, however, may be 99 percent or 101 percent as a result of rounding the decimals to the nearest whole number.
   b. Repeat this procedure for the Protestant frequencies.
   c. In the event that you would like the computational practice and do not want to use the Table of Percentages, you can do the actual arithmetic involved with paper and pencil, a slide rule, or a desk calculator.

TABLE 1.2
ATTITUDE TOWARD LAWS PROHIBITING RACIAL INTERMARRIAGE BY RELIGIOUS AFFILIATION

"DO YOU THINK THERE SHOULD BE LAWS AGAINST MARRIAGES BETWEEN NEGROES AND WHITES?"

	Catholics [2 and 3 closed]	Protestants [2 or 3 open]
Yes [8 open]	%	%
No [8 closed]	%	%
Total in each category N =	( )	( )

5. What is the percentage of Catholics who believe there should be laws against miscegenation, and what is the comparable Protestant percentage?

   Catholics _____ %

   Protestants _____ %

6. Think of some other social norm for which you would expect greater support from Catholics than from Protestants. Explain why in the space below and at the top of the next page.

You have seen that religious affiliation and orientation may affect an individual's attitude toward social norms. But can less structured and less specific social characteristics also have an effect on sentiment formation? For example, can the position one occupies in the social structure of society appreciably determine his views on certain issues? Or, in the present context, does one's location in the socioeconomic status structure of this country influence his attitude toward the norm banning racial intermarriage?

A test of this question is facilitated by using educational attainment as an index or indicator of socioeconomic status. Generally speaking, high school graduates earn more money and have more prestigeful jobs than individuals who have not graduated from high school. This is not always true, but because the pattern is usually found in the United States and other parts of the world, it is reasonable to use educational attainment as a guide to class-status placement.

7. Basing your decision on personal experience and objective information, which of the two types of people, those who completed or those who did not complete high school, do you expect would agree more with the legal prohibition of miscegenation?

8. Explain the reasoning for your prediction.

9. Test your prediction with the data cards by first sorting for education [position 1], then separately sorting the two education categories [position 8] to get those within each category who said yes or no to the question on interracial marriage laws. Count the cards in the four piles and enter the frequencies in Table 1.3.
Place the absolute frequencies in the parentheses in the appropriate cells of Table 1.3, and similarly, record the percentages in the appropriate cells next to the percentage sign. Placing the absolute frequencies and their percentages in the same table permits the elimination of an additional table. This procedure will be followed throughout the remainder of the manual.

TABLE 1.3
ATTITUDE TOWARD LAWS PROHIBITING RACIAL INTERMARRIAGE BY EDUCATIONAL ATTAINMENT

"DO YOU THINK THERE SHOULD BE LAWS AGAINST MARRIAGES BETWEEN NEGROES AND WHITES?"	Non-High School Graduate [1 open]	High School Graduate [1 closed]
Yes [8 open]	( ) %	( ) %
No [8 closed]	( ) %	( ) %
N =	( )	( )

10. What is the percentage of non-high school graduates who believe there should be laws against miscegenation, and what is the comparable percentage for graduates?

Non-high school graduates _____%

High school graduates _____%

11. If your prediction is *not* supported by the data in Table 1.3, try to explain why. If your prediction *is* supported by the data, think of some other social norm for which you would expect greater support from more-educated individuals than from those with less education. Explain why.

12. On the basis of your analysis, which of the two characteristics, religion or education, seems to be more influential in structuring an attitude toward the social norm discouraging interracial marriages? Explain how you came to this conclusion.

NAME _____ SECTION _____ DUE ON _____

ASSIGNMENT 2

Cross-Cultural Studies of Socialization: Male Initiation Ceremonies at Puberty

In Assignment 1 you discussed the influence of social affiliations on an individual's attitude toward a specific social norm, the taboo on interracial marriages. In this assignment you will be involved in illustrating another fundamental sociological idea, namely, that a society must have a substantial proportion of its social relationships patterned, or regularly engaged in. This patterning of social interaction is necessary in order to minimize potentially disruptive behavior and the need for individuals to adjust anew to each relationship. Behavior patterns are to a great extent maintained by social norms. In turn, roles and role sets are the means by which these norms are incorporated into specific types of social relationships.

Social norms are a central part of most definitions of culture. An individual learns his culture; it is not inborn or inherited. Thus norms and values are learned, and learned to a great extent as a result of individuals interacting with other individuals. The learning of the culture of one's society, sector of society, or group is called *socialization*, and while the most intense period of socialization takes place during the first 15-20 years of one's lifetime, it is a process that continues until one dies. Individuals responsible for socializing the uninitiated are called *socializing agents* and include parents, teachers, relatives, age and sex peers, and so on.

The norms of a society or group have specific reference to social roles that define what the expected behavior is for a specific role. A college student is expected to attend classes, to listen politely if not attentively to lectures, to take and pass examinations. A physician is expected to be humanitarian in his care of patients, not to gain personal advantage from their sickness or death, to treat as confidential information concerning them. A boy is expected to learn how to "behave like a boy" and in general not act in an effeminate fashion. If he does act in a manner that might be called effeminate, he is taunted with the epithet "sissy," or in more extreme terms, "queer" or "fruit," very clearly stating that his associates do not regard him as a full-fledged male.

Role-learning is sometimes a very gradual process, as in the learning of the boy role, and at other times involves dramatic behavior on both the part of the individual learning the role and the socializing agents. An example of dramatic role-learning is the initiation practice of American college fraternities in which the pledge or candidate for membership in a fraternity will often be obliged to perform distasteful tasks as well as to swear to abide by a fraternity code of behavior. Successful completion of these rites not only makes him a full-fledged fraternity member in the eyes of the fraternity brothers, but also presumes for him a new social identification acquired through the internalization of certain norms and values.

Throughout the world anthropologists and sociologists have found many different kinds of initiation ceremonies performed in a wide variety of cultures. The initiation ceremony for boys at about the age of puberty has received a great deal of study. This ceremony frequently involves practices that by American and European standards are quite severe, such as beatings, exposure to cold, circumcision, being deprived of fluids, and so on. It is clear that societies in which these ceremonies are present seek to subject the male pre-teenager to an experience that will have some effect on him. However, the more significant question, from the point of view of understanding society and culture, is, why do these rites exist? What function, if any, do they serve for the societies that practice them, and why do some societies have them and others not?

9. Test your prediction with the data cards by first sorting for education [position 1], then separately sorting the two education categories [position 8] to get those within each category who said yes or no to the question on interracial marriage laws. Count the cards in the four piles and enter the frequencies in Table 1.3.
Place the absolute frequencies in the parentheses in the appropriate cells of Table 1.3, and similarly, record the percentages in the appropriate cells next to the percentage sign. Placing the absolute frequencies and their percentages in the same table permits the elimination of an additional table. This procedure will be followed throughout the remainder of the manual.

TABLE 1.3
ATTITUDE TOWARD LAWS PROHIBITING RACIAL INTERMARRIAGE BY EDUCATIONAL ATTAINMENT

"DO YOU THINK THERE SHOULD BE LAWS AGAINST MARRIAGES BETWEEN NEGROES AND WHITES?"	Non-High School Graduate [1 open]	High School Graduate [1 closed]
Yes [8 open]	( ) %	( ) %
No [8 closed]	( ) %	( ) %
N =	( )	( )

10. What is the percentage of non-high school graduates who believe there should be laws against miscegenation, and what is the comparable percentage for graduates?

Non-high school graduates _____%

High school graduates _____%

11. If your prediction is *not* supported by the data in Table 1.3, try to explain why. If your prediction *is* supported by the data, think of some other social norm for which you would expect greater support from more-educated individuals than from those with less education. Explain why.

12. On the basis of your analysis, which of the two characteristics, religion or education, seems to be more influential in structuring an attitude toward the social norm discouraging interracial marriages? Explain how you came to this conclusion.

NAME _____ SECTION _____ DUE ON _____

ASSIGNMENT 2

Cross-Cultural Studies of Socialization: Male Initiation Ceremonies at Puberty

In Assignment 1 you discussed the influence of social affiliations on an individual's attitude toward a specific social norm, the taboo on interracial marriages. In this assignment you will be involved in illustrating another fundamental sociological idea, namely, that a society must have a substantial proportion of its social relationships patterned, or regularly engaged in. This patterning of social interaction is necessary in order to minimize potentially disruptive behavior and the need for individuals to adjust anew to each relationship. Behavior patterns are to a great extent maintained by social norms. In turn, roles and role sets are the means by which these norms are incorporated into specific types of social relationships.

Social norms are a central part of most definitions of culture. An individual learns his culture; it is not inborn or inherited. Thus norms and values are learned, and learned to a great extent as a result of individuals interacting with other individuals. The learning of the culture of one's society, sector of society, or group is called *socialization*, and while the most intense period of socialization takes place during the first 15-20 years of one's lifetime, it is a process that continues until one dies. Individuals responsible for socializing the uninitiated are called *socializing agents* and include parents, teachers, relatives, age and sex peers, and so on.

The norms of a society or group have specific reference to social roles that define what the expected behavior is for a specific role. A college student is expected to attend classes, to listen politely if not attentively to lectures, to take and pass examinations. A physician is expected to be humanitarian in his care of patients, not to gain personal advantage from their sickness or death, to treat as confidential information concerning them. A boy is expected to learn how to "behave like a boy" and in general not act in an effeminate fashion. If he does act in a manner that might be called effeminate, he is taunted with the epithet "sissy," or in more extreme terms, "queer" or "fruit," very clearly stating that his associates do not regard him as a full-fledged male.

Role-learning is sometimes a very gradual process, as in the learning of the boy role, and at other times involves dramatic behavior on both the part of the individual learning the role and the socializing agents. An example of dramatic role-learning is the initiation practice of American college fraternities in which the pledge or candidate for membership in a fraternity will often be obliged to perform distasteful tasks as well as to swear to abide by a fraternity code of behavior. Successful completion of these rites not only makes him a full-fledged fraternity member in the eyes of the fraternity brothers, but also presumes for him a new social identification acquired through the internalization of certain norms and values.

Throughout the world anthropologists and sociologists have found many different kinds of initiation ceremonies performed in a wide variety of cultures. The initiation ceremony for boys at about the age of puberty has received a great deal of study. This ceremony frequently involves practices that by American and European standards are quite severe, such as beatings, exposure to cold, circumcision, being deprived of fluids, and so on. It is clear that societies in which these ceremonies are present seek to subject the male pre-teenager to an experience that will have some effect on him. However, the more significant question, from the point of view of understanding society and culture, is, why do these rites exist? What function, if any, do they serve for the societies that practice them, and why do some societies have them and others not?

1. Why do you think some societies have these initiation ceremonies for pre-teenage boys and others do not?

Several possible answers to this question have been suggested in the last 10-15 years, when it became feasible to systematically analyze ethnographic accounts of a worldwide variety of societies. Your analysis with the data cards will focus on two possible explanations or hypotheses.

THE DISRUPTIVE-EMOTION HYPOTHESIS

Since man is not perfect, he has in the development of his society and culture produced contradictory, or conflicting, norms and values, which have been dysfunctional for individuals and groups. Illustrative are norms that demand an individual to behave in contradictory fashion for the same situation and that produce role conflicts. For example, at a college that employs the honor system, a student sees his best friend cheating in an examination. The honor code requires him to report his friend's deviant behavior, but the norms of friendship compete against the code's expectation and are reinforced by another norm, which urges an individual not to "squeal" on someone else.

There are, as another example, some societies in which boys develop strong attachments to their mothers, with the effect of developing tendencies toward adopting the female role or at least parts of it. At a certain age, however, this role identification and the strong dependency on mother are confronted with a new set of expectations, for the norms now prescribe a marked reduction of the son's dependency and require him to assume the male role. A striking discontinuity in the socialization of the boys in these societies then appears to take place because the early behavior expectations are opposite to those arising at puberty. These conditions may become more complicated if the boy develops hostile emotions toward his father as a result of the father's participation in the disruption of the boy's life. According to the disruptive-emotion hypothesis, male initiation ceremonies at puberty are viewed as an institutionalized response by societies toward minimizing the potential dysfunctional consequences of these socialization experiences.

The first part of this assignment deals with the hypothesis that those societies in which boys are considerably dependent upon their mothers and hostile to their fathers will have puberty ceremonies that serve to initiate boys into the more clearly defined male sex role. The consequences of these initiation rites would be to diminish the son's dependency on his mother, to reaffirm the authority of the father over the son, and to diminish the son's hostility toward his father.

In order to test this hypothesis, certain types of data are required. Whiting, Kluckhohn, and Anthony have assembled information from 54 societies around the world in order to test their interpretation. They relied on the ethnographic reports made by many other social scientists. The operational definitions which they used to make the test are based on the following assumptions:(1)*

- The assumption "that a long and exclusive relationship between mother and son provides the conditions which should lead to an exceptionally strong dependence upon the mother."

*All references may be found at the end of assignments.

- The assumption "that if the father terminates this relationship and replaces his son, there should be strong envy and hostility engendered in the boy which, although held in check during childhood, may dangerously manifest itself with the onset of puberty unless measures are taken to prevent it."

More specifically, the empirical or operational indicator for considerable dependency on the mother is exclusive bed-sharing of mother and baby son for at least one year. The indicator for the son's hostility to the father is the existence of a taboo on sexual behavior between the mother and father for at least one year after childbirth, that is, a postpartum sex taboo.

The empirical indicators for male initiation rites are more direct and apparent. An initiation ceremony will be said to exist if a society has *at least one* of the following ceremonies:

Painful hazing of the boy initiates
Genital operations, for example, circumcision
Seclusion from females
Tests of manliness

In terms of these indicators and assumptions the Whiting, *et al.* hypothesis now reads:

> Societies which have sleeping arrangements in which the mother and baby share the same bed for at least a year to the exclusion of the father, and societies which have a taboo restricting the mother's sexual behavior for at least a year after childbirth, will be more likely to have a ceremony of transition from boyhood to manhood than those societies where the conditions do not occur (or occur for briefer periods). For the purposes of the hypothesis, transition ceremonies include only those ceremonies characterized by at least one of the following events: painful hazing of the initiates, isolation from females, test of manliness, and genital operations. (2)

2. Test this hypothesis with the data cards, following the format of Tables 2.1 and 2.2.

For the tables in this assignment,
exclude all cards punched [61 open].

TABLE 2.1
MALE PUBERTY TRANSITION RITES BY EXCLUSIVE MOTHER-SON SLEEPING ARRANGEMENT

		EXCLUSIVE MOTHER-SON SLEEPING ARRANGEMENT	
		Present in Society [63 open]	Absent in Society [63 closed]
AT LEAST ONE OF FOUR TRANSITION RITES	Present in Society [62 open]	( ) %	( ) %
	Absent in Society [62 closed]	( ) %	( ) %
	N =	( )	( )

TABLE 2.2
MALE PUBERTY TRANSITION RITES BY POSTPARTUM SEX TABOO

		POSTPARTUM SEX TABOO	
		Present in Society [64 open]	Absent in Society [64 closed]
AT LEAST ONE OF FOUR TRANSITION RITES	Present in society [62 open]	( ) %	( ) %
	Absent in society [62 closed]	( ) %	( ) %
	N =	( )	( )

3. Describe what the data in Tables 2.1 and 2.2 show. Is the Whiting, *et al.* hypothesis supported?
   Table 2.1:

   Table 2.2:

EXPLANATION: Independent and Dependent Variables

In most research in the physical and social sciences there is an attempt to find the causes of specific things or processes or events. For instance, what are the causes of lung cancer, mental illness, religious prejudice, high school dropouts, urban and rural slums, riots, authoritarian political attitudes, group cohesion, changes in social institutions, and so on? It is very difficult to say with absolute certainty that one cause is the only cause of some specific effect. The physicist and the chemist have less difficulty in determining cause-effect relationships, biologists and geologists have more difficulty, and sociologists and anthropologists have the greatest difficulty. A physicist knows that heat causes molecules to react, but a sociologist is considerably less certain that religious affiliation "causes" political attitudes and behavior. Furthermore, there are times in sociological research when there is doubt as to whether A causes B or B causes A.

As a result, the social scientist prefers to think in a less deterministic fashion. What might be regarded as the causal factor in an experiment or a survey is referred to as the independent factor or *independent variable*, while the so-called effect is considered the dependent factor or *dependent variable*. A factor is considered dependent when its value, quality, characteristic, or occurrence is dependent upon the independent factor. Divorce, as a dependent factor, is in part a function of religion, the independent factor. On the other hand, one's religious preference is not determined by whether he or she has had a divorce; that is, religious belief is independent of divorce experience.

Most of the factors that are of interest to sociologists have a range of values or are measured in degrees of something. The factor of age varies from infancy to old age, income varies from zero dollars to millions of dollars, political attitudes range from radical left to radical right, and so on. Because of this varying character, the term *variable* is frequently used. Hence, too, come the phrases independent variable (the implied cause) and dependent variable (the implied effect). According to the hypothesis tested in Tables 2.1 and 2.2, what are the independent and dependent variables?

Independent variables: _____

Dependent variables: _____

Percentaging

You may have wondered in the course of percentaging in this assignment and in the last one why the percentages were computed one way rather than another. There are several ways to calculate percentages, and the way they are done depends on the question being asked, which in turn determines what base is to be used for percentaging.

Suppose a college newspaper has to be reduced in size and the editor has decided that the reduction must take place in either the coverage of sports or of social activities (dances, happenings, and so on). In order to minimize reader dissatisfaction and loss, the editor must determine whether a cutback in sports or in social-activity items will result in the least loss of readers. He decides to do some market research and sends out some qualified social researchers to interview a random sample of 200 of the readers of the newspaper. In this hypothetical illustration it is found, to nobody's surprise, that male and female undergraduates have different reading preferences. The results appear in the tables below.

TABLE 2.3

	Males	Coeds
Prefers sports news items	(90) 90%	(40) 40%
Prefers social news items	(10) 10%	(60) 60%
N =	(100)	(100)

marginals

In Table 2.3, it is evident that, of the male students, 90 percent prefer sports articles and 10 percent prefer articles about social activities. Among the coeds, 40 percent prefer sports news and 60 percent prefer social news.

The identification of the variables is clear-cut. The sex of the student is considered the independent variable, and reading preference the dependent variable. The interests of men and women differ and to a great extent determine or influence what they like to read in college newspapers. Reading preferences, however, cannot influence the physiology associated with the determination of one's sex.

The percentages in Table 2.3 reflect this concern with the influence of an independent variable on the dependent variable. The percentages are calculated within each of the categories of the independent variable. In other words, the percentages in this "cause-effect" table are calculated so that they show how the dependent variable is distributed *within* the independent variable. Thus the *marginals* or the *N*'s or total frequencies of the two categories, male and coed, in the independent variable (sex) are used as the *bases* or denominators in calculating the percentages. The column and row totals are called marginals because they occupy the margins of the table.

It is this type of analysis and this method of percentaging that are most frequently used in this manual.

However, these percentages do not help the editor answer his question of how to minimize reader loss when he has to cut back on sports or social news. His problem is, what proportion of his readers would he make unhappy if he cut back on sports news and what proportion if he cut back on social news? Table 2.4 contains the same absolute frequencies in its four cells as Table 2.3, and the variables have been placed identically. However, the editor looks at these data from a different perspective.

TABLE 2.4

	Males	Coeds	*N*
Prefers sports news items	(90) 69%	(40) 31%	(130)
Prefers social news items	(10) 14%	(60) 86%	(70)

marginals

There are 130 readers of this random sample who prefer sports news, and 70 who prefer social news. Thus the editor would make more of his readers unhappy if he reduced the sports coverage in the paper than if he reduced the social news. He therefore decides to reduce his social news until the business manager of the paper examines Table 2.4. The manager argues that curtailing the social news will lead to a reduction in the number of coed readers. In relative terms, 86 percent of those readers who prefer social news are coeds and only 14 percent are male students. Since a large part of the advertising revenue of the newspaper comes from cosmetics and ladies clothing stores, a loss of coed readers would probably result in a loss of advertisers. The editor is faced with a problem. Cutting back on social news would generally minimize reader loss, but since this loss is sex selective, he will lose out in advertisers.

You are welcome to straddle the horn of the editor's dilemma and decide what you would do, but that is not our mission here. What should be obvious to you is that in this second method of precentaging, the question of a cause-effect relationship between sex and reader preference is irrelevant. Rather the objective is to determine the composition or make-up of something, in this case, who reads sports news and who reads social news. Thus the percentaging is done *within* or *in the direction of* that variable about whose composition information is needed. The focus is on the sex distribution within the two readership types, and the marginals of the latter are therefore used as the denominators in percentaging.

Regardless of which method of percentaging is used, an important condition has to be satisfied before the percentages can be accepted as reflecting the specific characteristics of the population from which the sample was drawn. Suppose that when the readership survey was done it was decided to "oversample" the coeds in the college, and 300 coeds were interviewed instead of 100. There are good reasons sometimes for oversampling, and if correctly done there would be no jeopardy for our cause-effect analysis, but the compositional analysis would be seriously affected. To see this, examine Table 2.5.

TABLE 2.5

	Males		Coeds		N
Prefers sports news items	(90)	(43%)	(120)	(57%)	(210)
	90%		40%		
Prefers social news items	(10)	(5%)	(180)	(95%)	(190)
	10%		60%		
N =	(100)		(300)		

In the cause-effect analysis, where we used the marginals of the independent variable (sex) as the bases for the percentage, the relative distribution of sports and social news readers is the same as it was in Table 2.3: 90 percent of the males and 40 percent of the coeds prefer sports news.

For the compositional analysis, the appropriate percentages are calculated *across* rather than *within* the compositional characteristic of sex, the same as was done in Table 2.4. It is clear that the sex distribution for the two readership types is different from the distribution in Table 2.4. Now we have among the undergraduates who prefer sports news 57 percent who are coeds in contrast to the 31 percent in the "true" representative sample, and among those undergraduates preferring social news, 95 percent are coeds in contrast to 86 percent in the "true" sample. In both readership types there are absolutely and relatively more coeds than male students. Thus, the compositional picture is distorted from the "true" picture as a result of oversampling the coeds.

This sort of situation leads to the second rule in percentaging. Percentages should not be calculated *across* (in contrast to *within*) a variable if its marginals are not representative of the population from which the sample was drawn.

Summary

1. An independent variable is one that is regarded as the determinant (cause) of another variable.
2. A dependent variable is one that is regarded as the consequence (effect) of one or more independent variables.
3. A marginal is a column or row total in a statistical table.
4. First rule of percentaging: Calculate percentages in the direction of (within) the variable being studied for its effect, that is, the independent variable.
5. Second rule of percentaging: Percentages should not be calculated across a variable whose marginals are unrepresentative of the population from which the sample was drawn. In this case, percentages can only be calculated in the direction of (within) the variable whose marginals are representative.

THE MALE-SOLIDARITY HYPOTHESIS

The independent variables in this assignment, exclusive mother-son sleeping arrangement and the postpartum sex taboo, are related to the existence of male initiation ceremonies at puberty in the predicted direction. It would be easy to say now that societies practicing the mother-son sleeping arrangement and the postpartum sex taboo need to have some institutionalized procedure for reducing the tension between father and son and for dramatically reinforcing the boy's male identification. For these two family customs "cause" tension and the confused sex-role identification, which in turn "cause" the use of the initiation ceremonies to correct the situation.

Several social anthropologists have not been satisfied with this interpretation and have criticized it. Frank W. Young has questioned the underlying assumptions of the Whiting, *et al.* hypothesis. Young questions whether the emotions of childhood maintain themselves through childhood with its wide assortment of socialization experiences. Is it possible, he asks, that the two- or three-year-old boy will blame his father because he no longer has an exclusive sleeping arrangement with his mother? Young has similarly criticized a subsequent revision of the Whiting hypothesis.

Young offers an alternative explanation for the existence of the male initiation ceremonies that is based upon the need for solidarity among males in polygamous societies, where men may have more than one wife. His basic point is that the male initiation ceremony at puberty acts to dramatize the male sex-role characteristics of societies with a high degree of male solidarity. According to Young's explanation:

> . . . the function of initiation is to stabilize the boy's sex role at a time when it is particularly problematical, although not in the manner suggested by Whiting. Thus one's sex role becomes problematical insofar as its definition does not provide sufficient guidance in the diverse social interactions allowed or prescribed by society. Inasmuch as societies have a sexual division of labor and some form of marriage, a well-defined sex role becomes functionally necessary when the boy nears the threshold of participation in such social patterning. However, some societies pose still another socialization problem, which is that sex role must conform to more specific requirements imposed by a high degree of male solidarity. Such solidarity may be defined as the cooperation of the men in maintaining a definition of their situation as one which is not only different from that of women, but which involves organized activities requiring the loyalty of all males.
>
> . . .
>
> In societies with a high degree of male solidarity, stabilization of sex role is not complete until a boy identifies with the male group, since such identification is a major component of the sex role. Identification is here defined as the process of taking as one's own the cluster of social meanings held by a person or group. Identification requires first that the identifier have sufficient skill in symbolic interaction (usually not acquired until early adolescence) to comprehend the symbolic environment and, second, that he recognize that his society requires him to learn certain specific clusters of social meanings, such as those involved in one's sex role. Strength of identification is determined by the degree to which the identifier cooperates in creating and maintaining the definition of the situation and by the degree of clarity given the social meanings by the group or person generating them.
>
> Given the foregoing assumptions, it might appear that identification with a solidarity male group is easy compared to learning the relatively vague attitudes required for participation in work and the family, and hence that initiation ceremonies should be unnecessary for the more organized male structure. But the relative clarity of meanings held by the cohesive males is not apparent to the candidate. Typically, the male activities are hidden from the uninitiated. Moreover, once the meanings of the male group are accessible, internalization must be achieved rapidly and precisely. There is no long period of inculcation by way of games, sharing in sex-segregated work, or the differentiated expectations of others. Neither is there the allowable deviation that occurs in most family and work organization. Therefore the social meaning of male solidarity must be dramatized in a memorable way, and the candidate must participate intensely in the presentation. Furthermore, the rest of the community must be alerted to his new status so they can respond appropriately. What could be more impressive to both the youth and the community than to be publicly subincised or to be the center of attention of a group of village men intent upon beating him severely? (3)

Young has thus proposed a new independent variable, the existence of male solidarity. The empirical indicator for male solidarity is the presence in a society of an organization in which all adult males participate and from which females are excluded. The organization has to be well established with its own building or have a norm that its open meetings are barred to females or uninitiated boys. This information is located in data card position 65, and since Young used the same societies and classifications as Whiting, the initiation ceremonies are found in position 62.

4. Using your data cards, complete Table 2.6, but first write in the space below and at the top of the next page what relationship should be observed if Young's interpretation is to be supported.

TABLE 2.6
MALE PUBERTY TRANSITION RITES BY EXCLUSIVE MALE ORGANIZATION

AT LEAST ONE OF FOUR TRANSITION RITES	EXCLUSIVE MALE ORGANIZATION: Present in Society [65 open]	EXCLUSIVE MALE ORGANIZATION: Absent in Society [65 closed]
Present in society [62 open]	( ) %	( ) %
Absent in society [62 closed]	( ) %	( ) %
N =	( )	( )

5. Describe what the data in Table 2.6 show.

One of the most difficult tasks in social research is to determine which hypothesis or interpretation is the best explanation of a specific set of facts. The problem is not unique to sociology, but is found in biology, physics, psychology, economics, and so on. For example, there are currently competing theories to explain animal behavior and heredity, just as in the past people argued such questions as whether the earth was flat or round and whether the earth revolved around the sun or the sun around the earth.

The competing hypotheses in this assignment attempt to explain the presence or absence in socialization of a form of child-rearing practice, the severe initiation rites for boys at puberty. The data support both the disruptive-emotions interpretation as well as the male-solidarity interpretation. But which of them explains the data most completely? There is no final answer to this question, because Whiting, Young, and others are trying to perfect their research techniques and to improve the ethnographic accounts from which they draw their data. However, your data in Tables 2.1, 2.2, and 2.6 can give you some insight as to which hypothesis tends to be the stronger one.

6. Carefully study Tables 2.1 and 2.6. Disregard Table 2.2 since the results are very similar to those in Table 2.1. See if there is some simple way by which you can decide whether the disruptive-emotions hypothesis is a stronger predictor of the existence of initiation rites than the male-solidarity hypothesis. Write out below what your procedure was and which interpretation you think is the best predictor. In addition, if you had to make a choice, which of these two hypotheses makes more sense to you; that is, explain why one is more creditable to you than the other.

REFERENCES

1. John W. M. Whiting, Richard Kluckhohn, and Albert Anthony, "The Function of Male Initiation Ceremonies at Puberty," in E.E. Maccoby, T. M. Newcomb, and E. L. Hartley, eds., *Readings in Social Psychology*, 3rd ed., New York, Holt, Rinehart and Winston, 1958, pp. 361, 365. Copyright 1947, 1952, © 1958 by Holt, Rinehart and Winston, Inc., New York. Reprinted by permission of Holt, Rinehart and Winston, Inc., and John W. M. Whiting.
2. *Ibid.*, p. 354. Reprinted by permission of Holt, Rinehart and Winston, Inc., and the authors. Italics in the original have been omitted here.
3. Frank W. Young, "The Function of Male Initiation Ceremonies: A Cross-Cultural Test of an Alternative Hypothesis," *American Journal of Sociology*, 67, no. 4 (January, 1962), 381–382. Copyright 1962 by the University of Chicago. Reprinted by permission of the University of Chicago and Frank W. Young.

NAME_____ SECTION_____ DUE ON_____

ASSIGNMENT 3

Social Groups and the individual

One of the basic assumptions in sociology is that a primary influence on human behavior stems from the nature of social interaction, the meaningful social contacts which function to shape attitudes, values, and behavior. Social interaction can be found in a variety of contexts, including roles, groups, secondary (special-purpose) associations, communities, and institutions. This assignment is concerned with one of these forms of interaction, the small group.

A group can be defined in many ways but its essential characteristic is a set of individuals who take one another into account and perceive an appreciable degree of some commonality.(1) The feature that a group has in common is regarded by its members as significant for their relationship to each other and to persons outside the group. Although the group members may have other characteristics in common, these are not as vital for the group's reason for existence as those features that set forth the basic commonality. For example, we are all members of a family because of common ancestry and lineage, not because we all happen to be citizens of the United States.

The classification of human groups has occupied the attention of sociologists for many years. Georg Simmel in the early years of this century wrote of the critical importance of group size for interpersonal relations. Contemporary research with small groups involves the study of *natural* groups in their usual environment, such as a family and a street corner gang, or of *contrived* laboratory groups, in which various group structures, climates, and tasks are experimentally created.

Groups have been most often characterized in dichotomies, such as "formal-informal, primary-secondary, small-large, *Gemeinschaft-Gesellschaft,* autonomous-dependent, temporary-permanent, consensual-symbiotic. Sometimes a rather different procedure has been advocated in which groups are classified according to their objectives or social settings. Accordingly, there are said to be work groups, therapy groups, social groups, committees, clubs, gangs, teams, coordinating groups, religious groups, and the like."(2)

This assignment is concerned with natural (not contrived, or experimentally created) work groups, that is, groups involved in some specific set of tasks within a larger social system. Work groups can be found in factories, business offices, prisons, and many other settings. The 200 work groups to be used here existed in three factories in Bay City, a medium-sized industrial city in Massachusetts. ("Bay City" is a pseudonym, but the city is real.) One of the factories manufactured turbines and welding equipment and was owned by a large national electric corporation. The second company produced lock and key hardware and was primarily owned by businessmen living in a neighboring city. A local family owned the third company, a paper mill.

Although 625 employees in these three companies were interviewed for about an hour each, only 549 of them actually worked in groups. The latter constituted the complete membership of 200 distinct groups. The replies these workers gave in the interviews provided the basis for measuring various characteristics of the group, such as its size and its composition. In other words, the *group* variables were determined by combining the answers of all the members of each group. There are other ways of measuring group characteristics, such as following the production levels of the various groups and tracing the actual interaction of the members in the group by observing it for a period of time, which were not used in the Bay City study.

GROUP INTEGRATION

Work groups perform certain specific tasks, and in the case of the Bay City groups the tasks ranged from assembly-line work and drill-press operations to building maintenance and office work. Obviously, the tasks are better performed when there is coordination of the actions of all group members, and coordination is to a certain degree a function of a

group's integration. A group is integrated to the extent that its roles are well defined, its morale relatively high, and a considerable degree of identification with the group is felt by its members.

The degree of integration in a group can be measured in a variety of ways. For the data card groups, two items have been combined to form a group-integration index. In the first item, the workers were asked with how many co-workers in their group they would like to be transferred to new jobs. Answers to this question presumably tapped a sentiment reflecting how cohesive the group was, for if all the members said they wanted to be transferred with all of their co-workers, this would represent evidence of high solidarity in the group. In the second item in the index, the workers were asked what their feelings were concerning the people they worked with closely on the job. Now if satisfaction with co-workers indicates favorable interaction, then the greater the number of group members expressing this satisfaction the greater is the rapport in the group. Hence, when the group's members showed a substantial tendency to want to continue working together and evinced a substantial level of satisfaction with each other, the group was classified as possessing a high level of integration. Contrawise, groups with lower levels of cohesion and satisfaction were classified as less integrated. To facilitate the discussion, these two groups will be called *integrated* and *unintegrated groups* respectively. This is an oversimplification, of course, since there was a range of degrees of integration among the groups. However, your analysis is simplified by using this dichotomous classification. The frequency of each type is:

Integrated groups	(91)	45 percent
Unintegrated groups	(109)	55 percent
N	(200)	

FACTORS ASSOCIATED WITH GROUP INTEGRATION

An important question in the understanding of group processes is what conditions seem to be conducive to the development of group integration. Why should some work groups manifest greater solidarity and satisfaction than others? In Bay City, 53 percent of the work groups at the national electric equipment plant were scored as integrated groups, 50 percent at the lock and key plant, and only 32 percent of the paper mill work groups. On the basis of this fact alone, which of the plants do you think had vigorous labor union activity?

1. If your hunch leads you to say that more union activity took place at the national equipment and lock plants, you are correct. But why should union activity be associated with greater work-group integration?

Other factors are also associated with group integration. For example, the Bay City work groups were classified with respect to the length of time they had been intact as groups and the age differences of the members. The first factor was determined as follows: If most of the members of a group had worked together for at least two years, the group was classified as an *established group*; otherwise it was regarded as a *new group*. The second variable, the group's age distribution or variation, was determined by calculating the group's mean age from the members' ages. A group was said to possess *age similarity* when the ages of its members did not deviate very much from the group's mean age. When the individual ages showed considerable variance from the group's mean age, the group was classified as having *age dissimilarity*

EXPLANATION: Mean, Median, and Modes

The term *mean* may be new to some students. Actually it is what you have been accustomed to call an average. It is the result of adding up a group of numbers and then dividing the total by the number of numbers added. Why, then, not use the term *average* instead of the less familiar *mean*?

The answer is that there are several types of averages, the most frequently used among them being the *arithmetic mean*, the *median*, and the *mode*. Each of these measurements has advantages and disadvantages, although all provide an indication of the degree of central tendency (central clustering) of a series of numbers. Thus, it is necessary to choose the most appropriate one for the problem at hand. These three measurements of central tendency are defined below.

The arithmetic mean, usually simply called the mean, is equal to the sum of all of the figures in a set divided by the number of the figures added. The symbol $\bar{X}$ is used to designate the mean. Example: The $\bar{X}$ of 10, 20, 30, 40, and 50 equals the total of these numbers divided by 5.

$$\bar{X} = \frac{150}{5} = 30$$

The chief disadvantage of the mean is its responsiveness to extreme sizes, even though there may be only one or two outsized figures in a set of numbers. Suppose, for example, you were measuring the central tendency of the personal incomes of the people in a community. Most of the incomes are around $8,000, but there are one or two individuals earning $500,000. These high incomes now pull the mean way up to, say, about $20,000, and as a result the mean will provide a distorted picture of the true income tendency in the community. It is for this reason that the United States Census Bureau does not use the mean when presenting income data for the United States. Instead, it uses the median.

The median is the middle figure in a series of figures. Half of the figures are smaller than the median and half are larger. The median for 10, 20, 30, 40, and 50 is 30. This measurement is not sensitive to extremely high or low figures since it considers each figure as a unit or a number without the weight of its size. For example, if 1000 and 2000 were included with 10, 20, 30, 40, and 50, the median value would only increase to 40.

The mode is the figure occurring most frequently in a series of figures. In other words, it is the figure with the heaviest concentration or density in the series. The mode for the series 10, 20, 30, 30, 40, 50, 1000, 2000 is 30. In contrast to the mean and the median, the mode is less frequently used in the social sciences.

2. You are to analyze the interrelationship of three variables: group integration, length of group establishment, and group age similarity. First, indicate for each whether it is an independent or a dependent variable.

   Group integration:_____

   Length of group establishment: _____

   Group age similarity: _____

3. Considering each of the independent variables separately, what do you expect to find when each is cross-tabulated with the dependent variable? In the space below, state your predictions about their relationships.

   a. New groups will be *(more) (less)* integrated than established groups. Why?

   b. Groups with members whose ages are similar will be *(more) (less)* integrated than groups whose ages are dissimilar. Why?

4. Test your predictions by doing the necessary analyses for Tables 3.1 and 3.2, using your data cards.

TABLE 3.1
GROUP INTEGRATION BY LENGTH OF GROUP ESTABLISHMENT

	New Group [20 open]	Established Group [20 closed]
Integrated groups [21 open]	( ) %	( ) %
Unintegrated groups [21 closed]	( ) %	( ) %
N =	( )	( )

TABLE 3.2
GROUP INTEGRATION BY AGE SIMILARITY IN THE GROUP

	Similar Ages [22 open]	Dissimilar Ages [22 closed]
Integrated groups [21 open]	( ) %	( ) %
Unintegrated groups [21 closed]	( ) %	( ) %
N =	( )	( )

5. In one sentence, state the relationship obtained in Table 3.1, and do the same for Table 3.2.
   Table 3.1:

   Table 3.2:

6. Group age similarity is an illustration of social homogeneity. People of about the same age will tend to have more experiences and opinions in common than those of different ages. Likewise, workers in an established group have many shared experiences in common. As a result of the relationship of these aspects of social homogeneity and group integration, what relationship would you anticipate finding if you used group sex similarity as your independent variable? Would all-male work groups be more integrated than groups containing both male and female workers? Write you answer below, giving the reasons for your prediction. Your instructor will present the relevant data in class.

THE GROUP'S INFLUENCE ON THE INDIVIDUAL

Up to this point in the assignment the focus has been on the group per se, with analysis of group properties and their interrelationship. An equally important focus fixes on the individuals who make up the group and who, it is supposed, not only influence the group structure and subculture, but are in turn influenced by being a part of a group. This section of the assignment will highlight the question: Do groups affect the individual members? Or, in what manner, if any, do the properties of a group influence the members of a group?

Small groups, particularly primary groups, are important for all individuals. They provide the relevant norms and roles, thereby providing the structure for social interaction. They can also provide emotional support for the members and hence, security from the strains that emanate from outside the group. Especially important in mass society with its huge, anonymous, and impersonal office and factory bureaucracies, primary groups offer a personal identity for the individual. There is evidence, for example, that membership in certain college campus groups tends to provide psychic support sufficient to help emotionally impaired students perform adequately in their student role. In contrast, students with the same level of emotional impairment, who are not members of these campus groups, are more apt to seek psychiatric help in the college clinic.(3) This is not to say that these groups perform therapy or that in the long run their disturbed members will have achieved better mental health than the nonmember students who sought professional assistance. Rather, the point to be emphasized is that group membership provides through friendly, concerned, and positive social interaction enough social support to give the emotionally impaired student the security he needs during a period of personal stress.

The sustaining support derived from participation in certain small groups is illustrated in many social contexts, such as the army, the family, play groups, juvenile clubs and gangs, factories, and so on. At the same time, however, through their norms and roles, groups require conformity from their members. Such social control can lead to intragroup tension and precipitate deviant behavior leading to the deviant members voluntarily or involuntarily leaving the group. This observation of group behavior underscores a basic proposition in sociology, namely, that social control, whether at the small-group level or at the level of the larger community or society, can engender conformity as well as deviance. Nor is it always possible to predict with any degree of certainty which behavior will result in a given group at a specific time and place.

With this brief background on the influence of groups on group members, let us examine the data from an actual situation in an industrial setting. No doubt you are aware from your experience that when an individual is dissatisfied with his organization or group, he may want to leave it. College students leave their college if their dissatisfaction is strong enough. Citizens leave countries. Workers leave factories.

Ever since American industry turned to mass production as its main method of production there have been signs that many factory workers have become unhappy. The unhappiness springs from their feeling of alienation, from the impersonal and often meaningless tasks they are required to perform on the production or assembly line, and from their personal insignificance in a large company. Consequently, it should come as no surprise that in Bay City, Massachuetts, industrial workers in the electric, hardware, and paper companies tend to want to leave their companies more so when they are dissatisfied with their assigned tasks then when they are satisfied with what they are doing.

The workers in the three Bay City plants were asked to describe their "feelings about the kind of work you do on your job." On the basis of the six answer choices available to the workers, it is possible to classify those who expressed some degree of satisfaction with their work and those who stated some degree of dissatisfaction. This indicator or index of task dissatisfaction is the independent variable. The dependent variable is based on answers to the question: "Do you expect to be working for the same company five years from now?" Some workers said they would stay with the same company and others said that they planned to leave. The data are presented in Table 3.3.

TABLE 3.3
WILLINGNESS TO STAY WITH COMPANY BY SATISFACTION WITH WORK ON THE JOB

	Satisfied with Work [23 open]	Dissatisfied with Work [23 closed]
Will stay with company [24 open]	(135) 82%	(21) 60%
Will leave company [24 closed]	(30) 18%	(14) 40%
N =	(165)	(35)

Percentage difference of "stayers": 82% − 60% = 22%
Percentage difference of "leavers": 18% − 40% = 22%
Total = 44%

Of those who were satisfied with their work tasks, 18 percent said they would leave in comparison to 40 percent among the dissatisfied workers. This represents a 22 percent difference "caused" by the independent variable. The percentage difference for the two top cells or boxes is also 22 percent, and thus 44 percent is the total percentage difference (regardless of sign) that can be attributed to the task-satisfaction variable.

This *percentage-of-difference method* for gauging how strongly two variables are related or associated with each other is an approximation of more refined measurements of association that will be discussed in subsequent assignments.

It should be clear that when two dichotomous variables are compared, the two sets of percentage differences will be the same, except for sign, and that adding them together as in Table 3.3 is unnecessary. Thus, it is conventional when dealing with 2X2 tables to present only one percentage difference, usually for that part of the dependent variable that is being stressed. In the present case, this is the 22 percent difference for those who said they would leave the company.

The question now raised is whether the kind of group within which the individual worker performs his task will appreciably affect his attitude about whether to leave the company or not. Will worker dissatisfaction have a different consequence for the workers found in different group climates? That is, will certain group properties or characteristics alter an individual's decision to leave a company because he is unhappy with the kind of work he does?

One group property with which you are familiar is the extent of group cohesion as measured in the index of group integration used in the first part of this assignment. Should we expect the dissatisfied workers in the integrated groups to respond to their job disaffection in a different way than the dissatisfied workers in the unintegrated groups? Will the group climate of cohesion affect the dissatisfied worker in his personal willingness to leave his company?

7. What relationship do you expect to find, if any, when you relate the worker's degree of task dissatisfaction and whether he wants to stay or leave his company, for those workers in integrated groups and those in unintegrated groups? Give the reasons for your predictions.

   In the integrated groups:

In the unintegrated groups:

8. Without giving actual figures, indicate how you would translate your predictions in terms of the percentage differences you expect in the integrated groups *and* in the unintegrated groups. Compared to the 22 percent difference obtained in Table 3.3, will the percentage difference be greater or smaller within the integrated groups, greater or smaller within the unintegrated groups?

   In the integrated groups:_____

   In the unintegrated groups:_____

9. Complete Table 3.4, using your data cards.

TABLE 3.4
WILLINGNESS TO STAY WITH COMPANY BY INTEGRATION OF EMPLOYEE'S WORK GROUP AND HIS SATISFACTION WITH WORK ON THE JOB

	WORKS IN AN INTEGRATED GROUP [25 open]		WORKS IN AN UNINTEGRATED GROUP [25 closed]	
	Satisfied [23 open]	Dissatisfied [23 closed]	Satisfied [23 open]	Dissatisfied [23 closed]
Will stay with company [24 open]	( ) %	( ) %	( ) %	( ) %
Will leave company [24 closed]	( ) %	( ) %	( ) %	( ) %
N =	( )	( )	( )	( )

Percentage difference of integrated "leavers" = _____

Percentage difference of unintegrated "leavers" = _____

10. Are your predictions supported? If not, where were you off the mark?

11. How would you interpret these results, that is, give your explanation for the way the data worked out. Is there a climatic or compositional effect?

12. Describe any situation in which the group property of integration or cohesion would lead you to predict a consequence just the opposite to that noted in Table 3.4.

REFERENCES

1. Michael S. Olmsted, *The Small Group*, New York, Random House, 1959, pp. 21-22.
2. Dorwin Cartright and Alvin Zander, "Issues and Basic Assumptions," in Dorwin Cartright and Alvin Zander, eds., *Group Dynamics: Research and Theory*, 3rd ed., New York, Harper & Row, 1968, p. 24.
3. Bernard E. Segal, Robert J. Weiss, and Robert Sokol, "Emotional Adjustment, Social Organization and Psychiatric Treatment Rates," *American Sociological Review*, 30, no. 4 (August, 1965), 548-556.

NAME _____ SECTION _____ DUE ON _____

ASSIGNMENT 4

Social Stratification

The stability as well as the instability of a society are largely influenced by the distinctions of equality and inequality characterizing that society. The rewards for superior performance, achievement, and hard work motivate individuals to conform to the norms of a society and encourage the attainment of those goals which that society prizes. Money, honor and power are the basic means of reward industrialized societies use to encourage individuals to seek out and fulfill the normative obligations of certain important social roles, such as government official, engineer, physician, printer, machinist, and teacher. Yet the process of allocating rewards leads to inequality, which in turn generates dissatisfactions and social strains. Some of society's members have more money or prestige or power than other members, and the tendency is for them to perpetuate their favorable positions through future generations. In the process of consolidating their advantages, they may effectively block the disadvantaged sectors of the population from successfully achieving any of these rewards. If the blocking is accompanied by mistreatment and exploitation, the situation is conducive to the development of social tensions, which if not alleviated can lead to significant efforts to modify the social structure of that society. The contemporary scene in the United States vividly illustrates this. Black-Americans define certain aspects of the American reward system as unjustified and are seeking from the dominant white-Americans the power, the honor, and the material rewards that befit a human being in a democratic society. In many other parts of the world, as well as throughout history, money, prestige, and power hierarchies have been challenged with resulting conflict. Sometimes the resultant social change has been marked with radical social change, as in the Russian Revolution, while at other times the social transformations have been achieved more gradually, as in England.

To better understand the organization and change of societies, serious attention must be directed to studying the various dimensions of social stratification. Most recent research has concentrated on three related but distinct forms of social stratification: social class, social status (honor, prestige), and power. In the case of the power structure, the criterion for where one is situated is the amount and kind of ability he possesses to influence or compel others to do something even against their own will. In the present laboratory assignment there is no opportunity to analyze power and its correlates. However, the data cards do provide material to examine class and status.

MEASURING CLASS AND STATUS

There is some disagreement among sociologists on what is meant by class and status and often the terms are used interchangeably. By *class*, some sociologists mean a group or level of people with the same set of economic conditions, such as the kind of jobs they have and the level of their incomes. Other sociologists claim that a class is formed when a consciousness of kind or of similarity and common identification develops among those with the same economic life chances, that is, when a class consciousness emerges. Still others argue that class is based on the distinctions individuals make in their interactions with others, distinctions based on what class position is accorded to someone by others in the community, whether, for example, he is regarded by others as being in the upper-upper class, the lower-upper class, the upper-middle class, and so on. The latter approach is referred to as the *reputational method* of studying social class and status. Still another method of analyzing social class is to ask individuals where they place themselves in the class structure. This *self-placement* or *subjective method* requires individuals to indicate with which particular social class they identify. One of the more usual forms of this question in attitude surveys is: "If you were asked to use any of these names for a social class, which would you say you belonged in—the working class, the lower-middle class, the upper-middle class, or the upper class?"

In the relatively well-off Boston suburb of Winchester, the responses to this question were distributed in the following manner:

Working class	25 percent
Lower-middle class	12 percent
Upper-middle class	55 percent
Upper class	8 percent
N =	(200)

It is evident that a majority of the individuals in this sample survey place themselves in the upper-middle class. Nevertheless, more than a fourth of the sample of Winchester residents identify with the working-class category.

How close is this subjective assessment to the "objective" socioeconomic characteristics of the residents? To what extent are an individual's educational, income, and occupational achievements translated into identification with specific social-class categories? Some individuals whose incomes are low or whose occupations do not carry much prestige identify with a social class higher than common sense would prescribe, and others appear to evaluate their class placement lower than common sense would indicate. This is sometimes referred to as *false consciousness.*

There is no one-to-one equivalence of the self-placement class categories and the several measurements of socioeconomic status, nor are their equivalences among the latter. For example, who is to say that everybody who earns $8000 a year must identify with one specific class? Or that all those people who have finished high school must receive a certain pay level for a given job? There are situations in which one is not hired for a particular job unless he has attained a certain level of education, as in the teaching profession, and the more education after the Bachelor's degree the greater is the income. However, these pay scales vary from one community and region to the next. Civil service jobs also set forth education-income-occupation equivalences, but by and large the American culture does not provide for a systematic and general set of understandings about the relationship of education, occupation, and income. And when it comes to a general specification of the relationship of these socioeconomic characteristics and subjective class placement, there is much less consensus.

Nonetheless, we expect some relative similarity or congruency among these various criteria for subjective class and objective status. Accordingly, your first task in this assignment is to determine the *degree of association* of self-placement and the three socioeconomic status (SES) characteristics. You can accomplish this by cross-tabulating the self-placement data with each of the SES characteristics one at a time and noting the distribution of the percentages as you did in the preceding assignments. This task will provide you will a good impression of the nature of the relationship between self-placement and the SES characteristic but not with a measurement of the degree of association between the two. There are several ways of measuring the degree of association and determining how strongly two variables are related to each other, but the technique that will be applied by you is discussed in the following Explanation.

EXPLANATION: The Q Coefficient

The measure of association that you will use is called the Q coefficient of association. Do not look for a literal meaning for the letter Q; just regard it as the name of a set of simple operations. If these operations are followed, they will yield a number that indicates how strongly two variables are related. If the number comes out as a plus or minus 1.00 the relationship is extremely strong, but if the outcome is 0 or close to it the relationship is nonexistent. Thus the Q indicator (or coefficient) has a range from -1.00 to 0.00 to $+1.00$, and the further away Q is from 0.00 the stronger is the relationship between two variables. In other words, the larger the Q coefficient the greater the association. A full statistical interpretation of why this is the case is usually presented in courses in statistics, and should you want to read an excellent and detailed explanation of Q, consult *Statistical Reasoning in Sociology* by John H. Mueller and Karl F. Schuessler.(1)

To use the Q technique it is necessary for the two variables to be in dichotomous form, that is, each variable must have only two values. A great many of the research problems in sociology have variables that are amenable to treatment as dichotomies, for example, male-female, college-no college, white collar-blue collar, black-white, Northerners-Southerners, upperclassman-underclassman, Catholic-Protestant. Since each dichotomized variable has two values, a cross-tabulation of a pair of such variables will result in a 2 X 2 table. Another conventional way of referring to this type of table is to call it a fourfold table because it contains four boxes or cells, which are indicated as a, b, c, d, in Table 4.1. The four cells represent four distinct types of individuals: a, Catholic Democrats; b, Protestant Democrats; c, Catholic Republicans; d, Protestant Republicans. All this should be fairly obvious to you, as well as how and

why the percentages were calculated, as shown in Table 4.1. The data are from the same survey from which the stratification data for this assignment derive.

TABLE 4.1

	Catholics	Protestants
Democrats	a: 58%	b: 9%
Republicans	c: 42%	d: 91%
N =	(88)	(103)

It is evident that Catholics are much more Democratic than Protestants, or contrariwise, that Protestants are much more Republican than Catholics. The calculation of Q for this table provides us with a means to express how strongly religious affiliation and party preference are related to each other. This calculation is done simply by inserting the percentages or raw frequencies for each cell in Table 4.1 into the expression below:

$$Q = \frac{ad - bc}{ad + bc}$$

$$Q = \frac{(58)\,(91) - (9)\,(42)}{(58)\,(91) + (9)\,(42)}$$

$$Q = \frac{5278 - 378}{5278 + 378}$$

$$Q = \frac{4900}{5656}$$

$$Q = .87$$

NOTE: The numerator and denominator are identical except for the plus and minus signs. Thus the cross-products *ad* and *bc* have to be calculated only once.

A Q coefficient of .87 is very close to the upper limit of 1.0; thus this relationship of religion and party preference is regarded as very strong, much stronger than usually observed in most American surveys. Now if we examine the relationship of educational attainment and party preference for this same sample of individuals, the Q coefficient is not as high, as seen in Table 4.2 and the accompanying computations.

TABLE 4.2

	No College	College
Democrats	a: 41%	b: 17%
Republicans	c: 59%	d: 83%
N =	(111)	(86)

$$Q = \frac{ad - bc}{ad + bc}$$

$$Q = \frac{(41)(83) - (17)(59)}{(41)(83) + (17)(59)}$$

$$Q = \frac{3403 - 1003}{3403 + 1003}$$

$$Q = \frac{2400}{4406}$$

$$Q = .54$$

It is clear that the more education one has the greater the tendency to favor the Republican Party in politics. The Q of .54 is considered substantial enough to be taken seriously.

When a Q falls between .00 and .29, there is little likelihood that a relationship exists between two variables. An illustration is shown below, with the same dependent variable as before–party preference–and once again a new independent variable–sex.

TABLE 4.3

	Males	Females
Democrats	a: 33%	b: 28%
Republicans	c: 67%	d: 72%
N =	(102)	(95)

$$Q = \frac{ad - bc}{ad + bc}$$

$$Q = \frac{(33)(72) - (28)(67)}{(33)(72) + (28)(67)}$$

$$Q = \frac{2376 - 1876}{2376 + 1876}$$

$$Q = \frac{500}{4252}$$

$$Q = .12$$

It can be concluded on the basis of the three Q's that for these opinion-survey data, religion is more important in shaping political party preference than educational attainment. The latter, in turn, is more influential in shaping political party sentiment than sex, which appears to lack any influence.

It may be helpful to have a convenient means of translating a Q value into some accepted literary terminology. Accordingly, you should examine the following scheme(2) and use the conventional interpretations it presents throughout the manual.

Value of Q	*Appropriate Phrase*
+.70 or higher	a very strong positive association
+.50 to +.69	a substantial positive association
+.30 to +.49	a moderate positive association
+.10 to +.29	a low positive association
+.01 to +.09	a negligible positive association
.00	no association
−.01 to −.09	a negligible negative association
−.10 to −.29	a low negative association
−.30 to −.49	a moderate negative association
−.50 to −.69	a substantial negative association
−.70 or lower	a very strong negative association

1. Calculate the Q coefficients for the relationship of class self-placement and the three SES characteristics. Use the percentages in Tables 4.4, and 4.5, and 4.6. You will note that self-placement has been dichotomized as working class and middle class, eliminating the small number of upper-class identifiers. Some important details are thereby lost, such as the distinctions in the middle class, but the essential character of the issue in question is retained.

TABLE 4.4
CLASS SELF-PLACEMENT BY EDUCATION

SELF-PLACEMENT	No College	College
Working class	a: 44%	b: 4%
Middle class	c: 56%	d: 96%
N =	(105)	(77)

$$Q = \frac{ad - bc}{ad + bc}$$

=

TABLE 4.5
CLASS SELF-PLACEMENT BY INCOME

SELF-PLACEMENT	$0-7799 per year	$7800 + per year
Working class	a: 53%	b: 5%
Middle class	c: 47%	d: 95%
N =	(79)	(87)

$$Q = \frac{ad - bc}{ad + bc}$$

$$=$$

TABLE 4.6
CLASS SELF-PLACEMENT BY OCCUPATION

SELF-PLACEMENT	Lower-Prestige Occupations*	Higher-Prestige Occupations†
Working class	a: 52%	b: 6%
Middle class	c: 48%	d: 94%
N =	(83)	(99)

$$Q = \frac{ad - bc}{ad + bc}$$

$$=$$

*Examples of lower-prestige occupations: plumber, carpenter, store clerk, waiter, bookkeeper, mechanic.
†Examples of higher-prestige occupations: corporation executive, lawyer, physician, teacher, editor, banker.

2. Examine the three Q's.

   a. In one sentence, describe in general the outcome of the three tables. What is the prevailing tendency of the data?

OTHER CONSEQUENCES OF SOCIAL CLASS AND STATUS

Your personal experience has probably shown you how SES can influence attitudes and behavior. You have also seen some documentation in the Explanation of the consequences of varying levels of educational attainment for political sentiments.

3. List two examples of class-status related differences apparent at your college or the high school from which you graduated.
   a.

   b.

Many other examples could be cited. One of the most obvious illustrations of class-status distinctions in contemporary United States is the differences between black-Americans and white-Americans, or more accurately, Afro-Americans and Euro-Americans. Not only is the lower status of black-Americans reflected in smaller incomes and less access to higher-status jobs, but it is also evident in residential segregation, higher mortality rates, a greater frequency of broken families, and so on. Quite aside from these ethnic-status differences, other more general differential patterns exist within both these sectors of the population, such as differences in child-rearing practices, sexual attitudes and behavior, attitudes toward civil rights and liberties, and type and degree of commitment to religion. While this is a formidable list of behaviors and sentiments that are affected by class and status, by no means should it be assumed that they have always existed or that they will always continue to exist. The differences in mortality and fertility rates according to class and status, for example, show signs of decreasing in the United States as a result of the successes of public health and national medical programs as well as changes in values about family size.

Analysis of the consequences of social stratification suggests the important idea that class-status distinctions give rise to alienation, that is, to feelings of discouragement, estrangement, despair, powerlessness, and resentment. According to this view, alienation eventually arises among those in the lower social classes and is a prerequisite for the emergence of class consciousness, which in turn is a precondition for revolutionary activity to eliminate the class structure. The source for this alienation is the frustration inherent in being or perceiving oneself to be at the bottom levels of the income and occupational hierarchies. The lower classes are exploited by those who own and control the means of production and the distribution of economic rewards. The author of this theory was Karl Marx, but many others since Marx have supported all or parts of his theory. It is a difficult theory to test for several reasons, one of which is that it does not specify the particular time at which alienation and the subsequent class consciousness emerge. Furthermore, while on the surface, alienation would appear to be a simple condition to measure, in reality there is a disagreement as to what it really is or is made up of. However, since the idea of alienation is such a prominent one in sociology the balance of this assignment will be focused on at least one component of alienation, that of *anomia*. This French term refers to a sense of hopelessness, despair, and powerlessness, and an individual who is anomic would be inclined to agree with the following attitude items:

1. These days a person doesn't really know whom he can count on.
2. Nowadays a person has to live pretty much for today and let tomorrow take care of itself.
3. In spite of what some people say, the position of the average man is getting worse, not better.
4. It's hardly fair to bring children into the world the way things look for the future.(3)

If the lower-class position produces the state of mind reflected in the items above we should expect that more of those individuals in lower-status jobs and with lower incomes should possess this frame of mind than those individuals in the higher occupational and income strata. In other words, anomic feelings should inversely relate to the SES characteristics. The survey in the Boston suburb permits a test of this idea. The responses to the four anomia items

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Analysis of the consequences of social stratification suggests the important idea that class-status distinctions give rise to alienation, that is, to feelings of discouragement, estrangement, despair, powerlessness, and resentment. According to this view, alienation eventually arises among those in the lower social classes and is a prerequisite for the emergence of class consciousness, which in turn is a precondition for revolutionary activity to eliminate the class structure. The source for this alienation is the frustration inherent in being or perceiving oneself to be at the bottom levels of the income and occupational hierarchies. The lower classes are exploited by those who own and control the means of production and the distribution of economic rewards. The author of this theory was Karl Marx, but many others since Marx have supported all or parts of his theory. It is a difficult theory to test for several reasons, one of which is that it does not specify the particular time at which alienation and the subsequent class consciousness emerge. Furthermore, while on the surface, alienation would appear to be a simple condition to measure, in reality there is a disagreement as to what it really is or is made up of. However, since the idea of alienation is such a prominent one in sociology the balance of this assignment will be focused on at least one component of alienation, that of *anomia*. This French term refers to a sense of hopelessness, despair, and powerlessness, and an individual who is anomic would be inclined to agree with the following attitude items:

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If the lower-class position produces the state of mind reflected in the items above we should expect that more of those individuals in lower-status jobs and with lower incomes should possess this frame of mind than those individuals in the higher occupational and income strata. In other words, anomic feelings should inversely relate to the SES characteristics. The survey in the Boston suburb permits a test of this idea. The responses to the four anomia items

TABLE 4.5
CLASS SELF-PLACEMENT BY INCOME

SELF-PLACEMENT	$0-7799 per year	$7800 + per year
Working class	a: 53%	b: 5%
Middle class	c: 47%	d: 95%
N =	(79)	(87)

$$Q = \frac{ad - bc}{ad + bc}$$

$$=$$

TABLE 4.6
CLASS SELF-PLACEMENT BY OCCUPATION

SELF-PLACEMENT	Lower-Prestige Occupations*	Higher-Prestige Occupations†
Working class	a: 52%	b: 6%
Middle class	c: 48%	d: 94%
N =	(83)	(99)

$$Q = \frac{ad - bc}{ad + bc}$$

$$=$$

*Examples of lower-prestige occupations: plumber, carpenter, store clerk, waiter, bookkeeper, mechanic.
†Examples of higher-prestige occupations: corporation executive, lawyer, physician, teacher, editor, banker.

2. Examine the three *Q*'s.

   a. In one sentence, describe in general the outcome of the three tables. What is the prevailing tendency of the data?

OTHER CONSEQUENCES OF SOCIAL CLASS AND STATUS

Your personal experience has probably shown you how SES can influence attitudes and behavior. You have also seen some documentation in the Explanation of the consequences of varying levels of educational attainment for political sentiments.

3. List two examples of class-status related differences apparent at your college or the high school from which you graduated.
   a.

   b.

Many other examples could be cited. One of the most obvious illustrations of class-status distinctions in contemporary United States is the differences between black-Americans and white-Americans, or more accurately, Afro-Americans and Euro-Americans. Not only is the lower status of black-Americans reflected in smaller incomes and less access to higher-status jobs, but it is also evident in residential segregation, higher mortality rates, a greater frequency of broken families, and so on. Quite aside from these ethnic-status differences, other more general differential patterns exist within both these sectors of the population, such as differences in child-rearing practices, sexual attitudes and behavior, attitudes toward civil rights and liberties, and type and degree of commitment to religion. While this is a formidable list of behaviors and sentiments that are affected by class and status, by no means should it be assumed that they have always existed or that they will always continue to exist. The differences in mortality and fertility rates according to class and status, for example, show signs of decreasing in the United States as a result of the successes of public health and national medical programs as well as changes in values about family size.

Analysis of the consequences of social stratification suggests the important idea that class-status distinctions give rise to alienation, that is, to feelings of discouragement, estrangement, despair, powerlessness, and resentment. According to this view, alienation eventually arises among those in the lower social classes and is a prerequisite for the emergence of class consciousness, which in turn is a precondition for revolutionary activity to eliminate the class structure. The source for this alienation is the frustration inherent in being or perceiving oneself to be at the bottom levels of the income and occupational hierarchies. The lower classes are exploited by those who own and control the means of production and the distribution of economic rewards. The author of this theory was Karl Marx, but many others since Marx have supported all or parts of his theory. It is a difficult theory to test for several reasons, one of which is that it does not specify the particular time at which alienation and the subsequent class consciousness emerge. Furthermore, while on the surface, alienation would appear to be a simple condition to measure, in reality there is a disagreement as to what it really is or is made up of. However, since the idea of alienation is such a prominent one in sociology the balance of this assignment will be focused on at least one component of alienation, that of *anomia*. This French term refers to a sense of hopelessness, despair, and powerlessness, and an individual who is anomic would be inclined to agree with the following attitude items:

1. These days a person doesn't really know whom he can count on.
2. Nowadays a person has to live pretty much for today and let tomorrow take care of itself.
3. In spite of what some people say, the position of the average man is getting worse, not better.
4. It's hardly fair to bring children into the world the way things look for the future.(3)

If the lower-class position produces the state of mind reflected in the items above we should expect that more of those individuals in lower-status jobs and with lower incomes should possess this frame of mind than those individuals in the higher occupational and income strata. In other words, anomic feelings should inversely relate to the SES characteristics. The survey in the Boston suburb permits a test of this idea. The responses to the four anomia items

were systematically combined into a scale for all those individuals in the Winchester sample and then cross-tabulated with their education, occupation, and income. The results appear in Table 4.7.

TABLE 4.7
ANOMIA BY SOCIOECONOMIC CHARACTERISTICS

	No College	College	*Q*
Less anomic	46%	72%	−.50
More anomic	54%	28%	
N =	(112)	(88)	

	$0-7799 per year	$7800 + per year	
Less anomic	40%	70%	−.56
More anomic	60%	30%	
N =	(80)	(100)	

	Lower-Prestige Occupations	Higher-Prestige Occupations	
Less anomic	40%	70%	−.56
More anomic	60%	30%	
N =	(85)	(115)	

4. Briefly describe the nature of the data in Table 4.7, and indicate whether the alienation hypothesis is supported.

The theory also specifies that there will be some consequences flowing from alienation, such as the eventual emergence of attitudes and behavior expressive of a desire to alter the socioeconomic status quo. The alienation is supposed to provide the motivation by more clearly highlighting the haves and the have nots, thus affecting an individual's perception of the power structure in his society and leading him to want to change the existent structure. But does alienation do this? More on this question in a moment.

A central theme of American culture is the emphasis on achievement and social mobility. To be successful in most any pursuit is held up as one of the highest social values. Children are exposed to this value by their parents and teachers, Little League and Boy Scout officials, while the mass media of communication (television, movies, magazines, and so on) reinforce this aspect of socialization. Getting good grades, gaining admission to prestigious colleges, and becoming a well-paid businessman or professional are all part of the success sequence. This value is so widely accepted and implemented in behavior that some sociologists have attributed to it much of the credit in preventing the development in the United States of a significant amount of class consciousness and class politics. Americans tend to be status seekers, and so the reasoning goes, they strive to move out of their current class-status level and seek more income, more prestige, and even more power. Underlying this striving for success is the idea that the individual must do it on his own and not rely on groups and organizations to do the job for him. Thus

class-conscious-type organizations, such as many of the European political parties, have been unable to attract much support in the United States. Although the early history of the American labor union movement showed a strong focus on class issues, the larger and more enduring unions have concentrated on simple bread-and-butter issues and working conditions. American union members are more interested in their pay and their relations with their employers than they seem to be with the larger issues of class and class politics.

There are, then, two contexts within which to consider the effect of class and alienation. On the one hand, we might expect alienation (anomia, in this assignment) to foster the attitude that a change in the national power structure would be a good thing. On the other hand, we might expect no effect along these lines because an alienated individual may think in personal terms and blame himself for not being more successful. He might then, as a result, strive harder to improve his station in life or that of his children.

5. Do you think that an orientation to power or personal success will be the response of the alienated individual? That is, which do you predict will be the more likely response to alienation (anomia)—a desire to see the national power structure modified or a reaffirmation of the value of personal success. Explain.

To test your predictions, you will compare anomic and nonanomic (4) individuals within the two occupational categories to determine who is motivated to see changes in the power structure and who is inclined to be success-motivated. The latter two dependent variables are found in data card positions 14 and 17. The desire to see a change in the power structure is measured by a series of questions asked of those in the Winchester sample. They were first asked to indicate how influential or powerful various groups in this country were, and then they were asked to indicate how they would like to see these same groups lined up in influence. Thus they gave their perception of how they thought the groups were ranked in the power structure and how they personally would like to see them ranked. The differences in how they saw the groups and what they wanted are regarded as an indication of the amount of power change they desired. The greater the difference in the two sets of ranks, the greater the desire for change. Some of the groups used in constructing this index (5) were industrial leaders, military leaders, labor union leaders, political leaders, intellectuals, and businessmen.

The degree of success motivation is measured by one item asked of those in the sample. Respondents were asked to agree or disagree with the following statement: "The most important thing for a parent to do is to help his children to be more successful than he is." The individual who agreed with this statement is concerned about success, if not for himself, then for his offspring. Accordingly, agreement is defined as in indicator of success motivation.

6. Test your predictions with the data cards by completing Tables 4.8 and 4.9, entering the appropriate frequencies, percentaging them, and then calculating the four *Q*'s. You will note that the analysis of the influence of alienation on power orientation and success orientation is within two occupational categories. Thus you have an opportunity to note whether the responses to alienation are different for those with lower- or higher-status jobs.

TABLE 4.8
DESIRE FOR A CHANGE IN THE POWER STRUCTURE BY OCCUPATION AND ANOMIA

	LOWER-PRESTIGE OCCUPATIONS [12 open]		HIGHER-PRESTIGE OCCUPATIONS [12 closed]	
	Anomic [13 open]	Nonanomic [13 closed]	Anomic [13 closed]	Nonanomic [13 open]
Favors power change [14 open]	( ) %	( ) %	( ) %	( ) %
Against power change [14 closed]	( ) %	( ) %	( ) %	( ) %
N =	( )	( )	( )	( )
	Q =		*Q* =	

TABLE 4.9
SUCCESS MOTIVATION BY OCCUPATION AND ANOMIA

		LOWER-PRESTIGE OCCUPATIONS [12 open]		HIGHER-PRESTIGE OCCUPATIONS [12 closed]	
		Anomic [13 open]	Nonanomic [13 closed]	Anomic [13 closed]	Nonanomic [13 open]
"THE MOST IMPORTANT THING FOR A PARENT TO DO IS TO HELP HIS CHILDREN TO BE MORE SUCCESSFUL THAN HE IS."	Agree [17 open]	( ) %	( ) %	( ) %	( ) %
	Disagree [17 closed]	( ) %	( ) %	( ) %	( ) %
	N =	( )	( )	( )	( )
		Q =		*Q* =	

7. What relationships do you observe in Tables 4.8 and 4.9? Are your predictions supported?

8. In the light of the theory of alienation discussed in this assignment, explain why you think the data turned out the way they did.

REFERENCES

1. John H. Mueller and Karl F. Schuessler, *Statistical Reasoning in Sociology*, Boston, Houghton Mifflin, 1961, chap. 9.
2. Used with the kind permission of James A. Davis, who presented the scheme in his lectures at the University of Chicago and Dartmouth College.
3. This is a modified version of Leo Srole's Anomia Scale discussed in "Social Integration and Certain Corollaries: An Explanatory Study," *American Sociological Review, 21*: no. 6 (December, 1956), 709-716.
4. The correct designations are "more anomic" and "less anomic," because attitude scales reflect relative degrees of an attitude and for the most part these scales do not provide the means to make simple categorical distinctions. However, for reasons of clarity in presentation, categorical distinctions will be used in this assignment as well as in others.
5. This index is an extension of one used by Irving Goffman in his paper, "Status Consistency and Preference for Changes in Power Distribution," *American Sociological Review, 22*: no. 3 (June, 1957), 277-278.

NAME _____ SECTION _____ DUE ON _____

ASSIGNMENT 5

Studies in Population: Natural Increase, Migration, and Differential Fertility

The study of population and its components is important for a full understanding of social organization and culture. For example, attitudes about population pressure and overpopulation are based on certain values that specify in general terms what is good and bad for society. Too many people help to create food and health problems; too many people in a specific area (high population density) are associated with problems of housing, transportation, education, employment, and so on. The composition of the population in terms of age, ethnic background, and socioeconomic status provides other dimensions by which to note the influence of population on society and contrariwise. Often attributed to population size and/or density is the power to create political instability and wars. Of greater accuracy, however, is that international problems are more influenced by political and economic values and interests while population may act as an important contributing factor. Japan went to war with the United States in 1941 not because of a high population density, but rather as a result of political and economic considerations. To be sure, Japan would not have been as able militarily were it not for its large reservoir of young men as well as the substantial proportion of its people living in cities, which facilitated technological development and the production of instruments of war.

A basic requirement for a society's continued existence is the replacement of society members who die. It can be a problem if more persons are dying than are being born. This natural decrease, if continued for several generations, would have numerous consequences for the society, the most essential of which is the threat of its extinction. Since the function of population replacement is so important for the survival of societies and smaller social organizations as well, the sociologist is very interested in the means utilized to avert the problem of population depletion. Actually, in the second half of the twentieth century the problem for most parts of the world has been real or potential overpopulation rather than underpopulation.

Not only are birth rates studied from the point of view of population replacement, but also because fertility behavior reflects the values and attitudes prevailing in the society's culture. Why do some societies have higher birth rates than others? A question of this sort has many answers, some dealing with attitudes toward children, family size, socialization, religious attitudes, literacy, political goals, and economic ambitions. Illustrative of this question are the reasons for the existence of a higher birth rate in India than in the United States. The Indian culture emphasizes the *extended-family* organization, in which there are several female adults to help care for the children, in contrast to the contemporary American emphasis on the *restricted conjugal* or *nuclear family*, with the main burden of child-rearing placed on the mother. The Indian economy is an agricultural one, which has traditionally relied on manpower rather than machinery, whereas the opposite conditions prevail in the United States. The study of fertility patterns thus has intrinsic significance for the study of human society.

SELECTED FEATURES OF THE UNITED STATES POPULATION

In 1967 the population of the United States reached 200 million, making it one of the more populous countries in the world after China, India, and the Soviet Union. Some areas of the country have grown in population size and others have declined. Florida and California, for example, had considerable increases in population between 1950 and 1960, while West Virginia and Mississippi experienced decreases. There are a variety of reasons for changes of this sort.

1. Can you suggest two factors to account for the loss of population by West Virginia and Mississippi between 1950 and 1960?
   a.

   b.

Population growth (or decline) is a function of four factors: births, deaths, immigration, and emigration. A population's size changes as a result of the difference between births and deaths added to the difference between in-migration and out-migration. The difference between births and deaths is called *natural increase* and the difference between the in-flow and out-flow of migrants is called *net migration*. Knowing the statistics for natural increase and net migration makes it possible to determine the size of a population for any period of time. This is illustrated in the following simplified expressions for the population change in Illinois from 1950 to 1960.

Population in 1960	=	Population in 1950	+	Natural Increase During 1950-1960	+	Net Migration During 1950-1960
Population in 1960	=	8,712,000	+	1,245,000	+	124,000
Population in 1960	=	10,081,000				

From 1950 to 1960 there were 1,245,000 more births than deaths in Illinois and about 124,000 net in-migrants, which when added to the population for 1950 results in a population of 10,081,000 people. The actual census count for the state in April, 1960, revealed that the population was somewhat over 10 million, which is the result obtained with the simple formula.

It is apparent from these figures that the gain in population size during the 1950s was overwhelmingly achieved through natural increase rather than migration into the state. This pattern of growth does not necessarily apply to other states. Table 5.1 contains several types of statistics, which facilitate the study of the effects of natural increase and interstate migration for the changes in the populations of the forty-eight coterminous (i.e., Alaska and Hawaii are excluded) states from 1950 to 1960.

2. Before you inspect the table, list at the top of the next page the three states that you believe had the largest increases in population and the three that had the smallest increases in population during the 1950s.

States with Largest Increases

1. _____
2. _____
3. _____

States with Smallest Increases (or Decreases)

1. _____
2. _____
3. _____

3. In order to check on your judgments, you will use Table 5.1 to compute the total change in population from 1950 to 1960 for each of the forty-eight states. Carefully read Table 5.1, noting that the numbers (not the percentages) are in thousands. For example, in columns A, B, and C, Maine is recorded as having a population of 969,000 in 1960, and 224,000 births and 102,000 deaths in the period 1950-1960. Column D will be calculated by you to determine the ability of each state to reproduce itself by natural means during the ten-year period. The amount of natural increase for Maine has been entered in Column D. Follow the same procedure for the balance of the states. When you are finished, come back and do question 4.

4. Migration in this assignment is defined as a change of residence from one state to another between 1950 and 1960. Size was estimated by the United States Bureau of the Census. In column E you will note that some states, such as Maine, had a minus net migration, while others had a plus net migration, as in the case of New Hampshire. For each state in Table 5.1 add the net migration figure to the total natural increase and enter the sum in column F. When you are finished, there should be three states that had a total negative increase, or in other words, whose total populations decreased between 1950 and 1960. When you are finished, do questions 5 and 6.

5. Examine your results in column F and *list below* those three states whose populations increased the most and the three states which increased the least. Check to see if the predictions you made earlier are supported.

States with Largest Increases		*States with Smallest Increases (or Decreases)*	
Rank	Net Change	Rank	Net Change
1. _____	_____	1. _____	_____
2. _____	_____	2. _____	_____
3. _____	_____	3. _____	_____

6. Was the way in which the three fastest-growing states made their increases the same or different? Indicate what you believe are the reasons for the existence of these growth patterns—why did some states change in one way while other states changed in another way?

TABLE 5.1

VARIOUS DEMOGRAPHIC MEASUREMENTS FOR THE FORTY-EIGHT COTERMINOUS STATES OF THE UNITED STATES

State	A Population April 1, 1960 1000s	A Rank	B Births 1950–60 1000s	C Deaths 1950–60 1000s	D Natural Increase 1950–1960 [B – C] 1000s	E Net Migration 1950–1960 1000s	E Rank	F Total Net Change in Population 1950–1960 [D + E] 1000s	G Proportion of Employed Persons in White-Collar Jobs in 1960 %	G Rank	H Proportion of Families with Incomes Under $3000 in 1959 %	H Rank
NEW ENGLAND												
Maine	969	36	224	102	122	–67	30	+55	35.4	39	22.8	22
New Hampshire	607	44	126	64	———	+12	20	———	36.4	37	15.3	38
Vermont	390	46	93	42	———	–38	25	———	37.8	31	23.1	21
Massachusetts	5,149	9	1,088	534	———	–96	32	———	44.1	10	12.4	45
Rhode Island	859	39	179	85	———	–26	24	———	38.0	30	16.8	32
Connecticut	2,535	25	509	215	———	+234	7	———	43.9	11	9.8	48
MIDDLE ATLANTIC												
New York	16,782	1	3,404	1,661	———	+210	8	———	46.9	3	13.8	44
New Jersey	6,067	8	1,195	541	———	+578	3	———	44.9	7	11.4	47
Pennsylvania	11,319	3	2,440	1,144	———	–475	48	———	39.5	27	16.8	33
EAST NORTH CENTRAL												
Ohio	9,706	5	2,222	869	———	+407	4	———	40.0	25	15.7	36
Indiana	4,662	11	1,092	425	———	+61	16	———	37.4	33	17.9	29
Illinois	10,081	4	2,216	971	———	+124	11	———	42.3	16	15.0	41
Michigan	7,823	7	1,928	631	———	+155	10	———	40.1	24	15.7	37
Wisconsin	3,952	15	925	355	———	-53	29	———	37.0	34	17.4	30
WEST NORTH CENTRAL												
Minnesota	3,414	18	823	293	———	–98	33	———	41.0	21	21.4	24
Iowa	2,758	24	641	271	———	–234	40	———	36.8	36	25.3	19
Missouri	4,320	13	952	454	———	–134	36	———	40.0	26	27.0	17
North Dakota	632	43	170	52	———	–105	34	———	34.8	40	28.8	13
South Dakota	681	40	183	60	———	–95	31	———	34.0	43	33.5	10
Nebraska	1,411	34	336	133	———	–117	35	———	38.6	29	26.1	18
Kansas	2,179	28	515	197	———	–44	27	———	41.8	18	22.3	23
SOUTH ATLANTIC												
Delaware	446	45	102	37	———	+63	15	———	43.2	12	16.0	35
Maryland	3,101	21	683	246	———	+321	6	———	45.9	5	15.2	40
Virginia	3,967	14	945	312	———	+15	19	———	50.0	1	27.9	16
West Virginia	1,860	30	474	172	———	–446	47	———	40.4	22	32.6	11
North Carolina	4,556	12	1,156	334	———	–328	42	———	36.4	38	37.2	7

TABLE 5.1 (CONTINUED)

State	A Population April 1, 1960 1000s	A Rank	B Births 1950–60 1000s	C Deaths 1950–60 1000s	D Natural Increase 1950–1960 [B – C] 1000s	E Net Migration 1950–1960 1000s	E Rank	F Total Net Change in Population 1950–1960 [D + E] 1000s	G Proportion of Employed Persons in White-Collar Jobs in 1960 %	G Rank	H Proportion of Families with Incomes Under $3000 in 1959 %	H Rank
South Carolina	2,383	26	676	188	____	–222	39	____	30.5	46	39.5	3
Georgia	3,943	16	1,030	319	____	–212	37	____	29.6	47	35.6	8
Florida	4,952	10	916	352	____	+1,616	2	____	42.5	14	28.4	15
EAST SOUTH CENTRAL												
Kentucky	3,038	22	766	283	____	–390	44	____	34.1	42	38.0	6
Tennessee	3,567	17	852	302	____	–274	41	____	34.8	41	38.3	5
Alabama	3,267	19	851	277	____	–369	43	____	33.7	44	39.1	4
Mississippi	2,178	29	638	206	____	–433	46	____	29.2	48	51.6	1
WEST SOUTH CENTRAL												
Arkansas	1,786	31	470	161	____	–432	45	____	32.6	45	47.7	2
Louisiana	3,257	20	884	261	____	–49	28	____	37.8	32	35.6	9
Oklahoma	2,328	27	521	207	____	–219	38	____	42.4	15	31.0	12
Texas	9,580	6	2,436	689	____	+121	12	____	41.1	20	28.8	14
MOUNTAIN												
Montana	675	41	171	62	____	–25	23	____	39.5	28	20.2	27
Idaho	667	42	170	51	____	–40	26	____	36.9	35	20.8	26
Wyoming	330	47	84	25	____	–20	22	____	40.3	23	16.5	34
Colorado	1,754	33	401	136	____	+164	9	____	46.4	4	18.3	28
New Mexico	951	37	276	58	____	+52	17	____	44.4	9	24.4	20
Arizona	1,302	35	303	80	____	+329	5	____	42.9	13	21.3	25
Utah	891	38	247	55	____	+9	21	____	45.1	6	14.7	42
Nevada	285	48	59	20	____	+86	14	____	41.3	19	12.4	46
PACIFIC												
Washington	2,853	23	631	243	____	+87	13	____	44.8	8	15.3	39
Oregon	1,769	32	384	152	____	+16	18	____	42.0	17	17.0	31
California	15,717	2	3,140	1,151	____	+3,142	1	____	47.3	2	14.1	43

Source: U.S. Bureau of the Census, *Current Population Reports*, Series P-25, No. 304, "Revised Estimates of the Population of the United States and Components of Population Change: 1950 to 1960," Washington, D.C.. GPO, 1965, Table 4, p. 12, and U.S. Bureau of the Census, *U.S. Census of Population: 1960*, vol. I, *Characteristics of the Populations*, Part I, United States Summary, Washington, D.C., GPO, 1964, Table 106, p. 249.

CORRELATES OF MIGRATION

It is evident that migration into and out of a state is quite important for the state's total population size. Between 1955 and 1960 more than 14 million Americans moved to different states, and almost the same number had moved to a different county within the same state.(1) And if those who moved to another house within the same county are added to these 28 million migrants, the total moves in this five-year period include slightly more than 50 percent of the total population. It has been estimated that, in a lifetime, each American will move on the average ten times, with a third of these moves into another county or state.(2) Thus the population of the United States is a very mobile one.

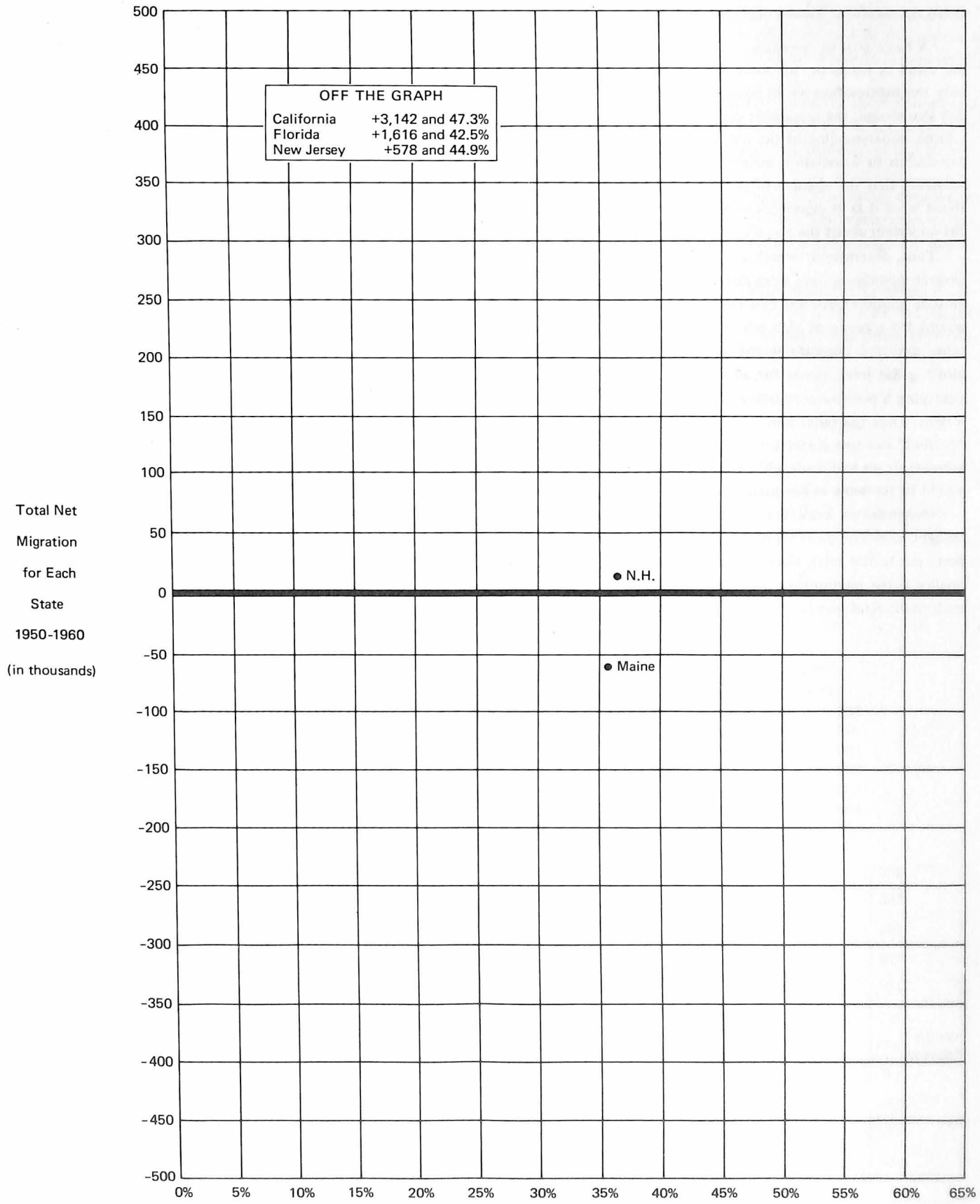
Why do Americans move so much? Are there types of people who tend to move more than others? From where to where do they move? And why do they move? The second part of this assignment focuses on the last question. As you might suspect, there is an assortment of reasons why an individual or a family decide to move to another part of their state or to another state. They may be looking for a house that better suits their needs or a better school system in which to enroll their children. Some may be seeking a warmer or drier climate or are desirous of moving out of cities and into more rural environments. Upward social mobility or the hope for it is often associated with a move to a more prestigious community. Another reason for moving may be the attempt to escape from institutionalized discrimination, as some Southern blacks have tried to do, while some whites move as a result of their own prejudice when blacks move into their communities. Still another reason is the lack or decline of economic opportunity for those in the labor force, and contrawise the growth or existence of economic opportunities in another area may attract people. In some measure, some of these factors often act simultaneously in motivating an individual or a family to pick up roots and settle elsewhere.

Generally, these factors can be classified as *pushing* some people out of an area or as *pulling* them there. In the following analysis you will examine one factor that appears to push people out of an area and one factor that may serve to pull people to an area. The pull factor will be the amount of employment in desirable jobs existing in a state, and the extent of poverty in a state will be the push variable.

For this assignment, the operational definition of a desirable job is a job that is essentially white-collar. More often than not white-collar jobs in the United States are accorded more prestige than blue-collar jobs. This generalization is well documented, in the United States and other countries.(3) To be sure there are some blue-collar occupations (e.g., toolmaker) that are accorded higher social status than some white-collar occupations (e.g., store clerk), but by and large those occupations that are professional, managerial, clerical, and sales have more prestige than the so-called manual or blue-collar occupations. Since this is the case, it might be hypothesized that areas having business and industry with relatively high proportions of white-collar-job opportunities would tend to attract workers, that is, to pull workers from areas in which the proportion of white-collar jobs would be low. More concretely, would New York, with about half of its employed workers in white-collar jobs, tend to attract workers from Georgia or South Carolina where less than a third of the workers are in white-collar jobs? The data in Table 5.1 do not facilitate a direct answer, but they do provide the means to test the more general question: Do states with a higher proportion of their workers involved with white-collar jobs attract more migrants from other states than those states with lower proportions of white-collar workers? The idea to be tested, then, is that a positive relationship exists between net in-migration and the percentage of workers who are white-collar; that is, the greater the percentage of white-collar workers the greater the in-migration. The independent variable is the percentage of white-collar jobs in a state, and the dependent variable is net migration into the state.

In order to determine whether this hypothesis is supported by the data for 1950-1960, a *scattergram* or *scatterplot* will be constructed using the two relevant figures for each state. In Figure 1, you will note that the independent variable of percent in white-collar jobs is located on the horizontal line or axis and that the dependent variable of net in-migration is located on the vertical line or axis. The scattergram is constructed by taking the two values of a state and placing a dot at the point where they intersect. For example, Maine had a net migration of *minus* 67,000, that is, 67,000 individuals left Maine without being replaced by in-migrants from other states. Find the zero point on the vertical axis, and then move down until you come to −67,000, which will be found between −50,000 and −100,000. At this point, move to the right until you come to 35.4 percent on the horizontal axis. This is the percentage of Maine's workers who are in white-collar jobs. You will note a dot at the point where the −67,000 and the 35.4 percent intersect. This dot represents the *joint frequency* or *double entry* for Maine of its net migration and percentage who are white-collar workers. The joint frequency for New Hampshire has also been plotted. Plotting the joint frequencies for the 48 states will provide a graphic picture of whether or not the two variables are correlated with each other.

7. Using the data (not the ranks) in columns E and G of Table 5.1, plot the joint frequencies of all the states in Figure 1. Note: Just plot the joint frequencies with dots, do not indicate the names of the states. Maine and New Hampshire are indicated for purposes of illustration only.



Percent of Employed Persons in Each State in White-Collar Jobs in 1960

FIGURE 1.

EXPLANATION: Measuring Positive and Negative Correlations

A basic goal of scientific research is to be able to predict or at least estimate the value or frequency of one factor by referring to the value or frequency of some associated factor. This is by no means the only objective of science, but predicting something, with only the information about something else to go by, is an important part of the scientific process. It is important because, armed with this knowledge, the researcher comes closer to knowing something about the cause and effect of the two factors, thus arriving closer to a fuller understanding of the nature of their relationship. For example, as you are probably aware, extensive research has shown a high correlation or association between cigarette smoking and lung cancer among men. Now, while there is substantial agreement among scientists that the chances of getting lung cancer for males increases the more they smoke cigarettes, scientists are in less agreement about what it is in cigarettes or in cigarette smoking that leads to lung cancer. They are convinced of the existence of the correlation but uncertain about the specific cause-effect process.

Thus, determining whether a correlation or association exists between two or more variables is a first step in testing a hypothesis. Several techniques have been designed to measure the extent and type of correlation. One of these is the scattergram, which shows the mutual relation between two factors. If, for instance you were interested in the kind of correlation that exists between height and weight for a group of high school students, you could readily determine what it is by putting height on one axis and weight on the other axis and pinpointing the height and weight for each student at that point in the diagram where the two values meet. After plotting the joint values for all the students, you would note that the dots tend to flow from left to right in an upward direction, signifying a positive correlation for height and weight, positive in the sense that as the values for height increase so do the values for weight. Thus the taller a high school student, the heavier he tends to be. Now if this was true for all the students, we would have a "perfect" positive correlation, with the dots forming a single diagonal line going from left to right. This line would show that, for each increase of an inch in height, we would expect a specific increase in weight, and the ratio of increase in inches to increase in pounds would be the same at any point along this straight line of perfect positive correlation.

However, we know that there are some tall but slim students as well as short and heavy students; thus the dots would not form a straight line. The more students there are whose height-weight combinations depart from the general pattern (i.e., the more exceptions there are to the rule), the less will be the positive correlation between height and weight, for the greater the number of exceptions, the smaller is the relationship. These two situations are contrasted with hypothetical data in the scattergrams in Figs. 2 and 3. These data are *hypothetical*—made up for the purposes of this illustration.

Weight —*pounds*		Height —*inches*	
200	140	70	58
190	130	68	56
180	120	66	54
170	110	64	52
160	100	62	50
150		60	

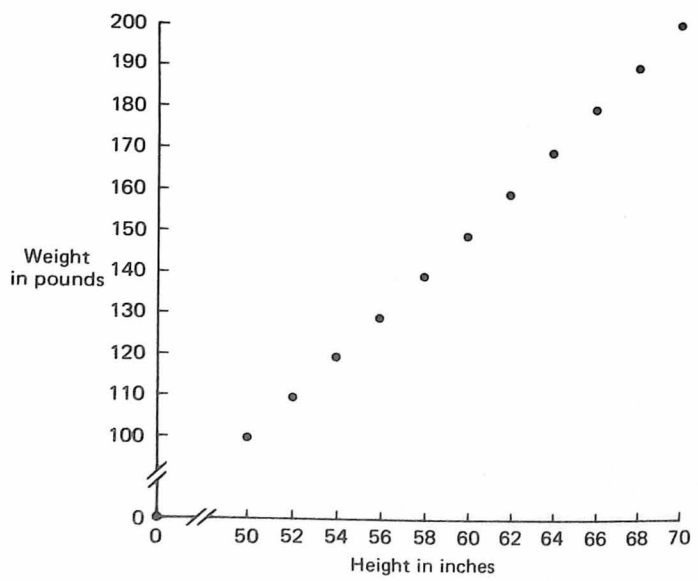


FIGURE 2. A Perfect Positive Relationship

Weight —*pounds*		Height —*inches*	
200	140	70	52
190	130	66	62
180	120	68	50
170	110	64	60
160	100	56	54
150		58	

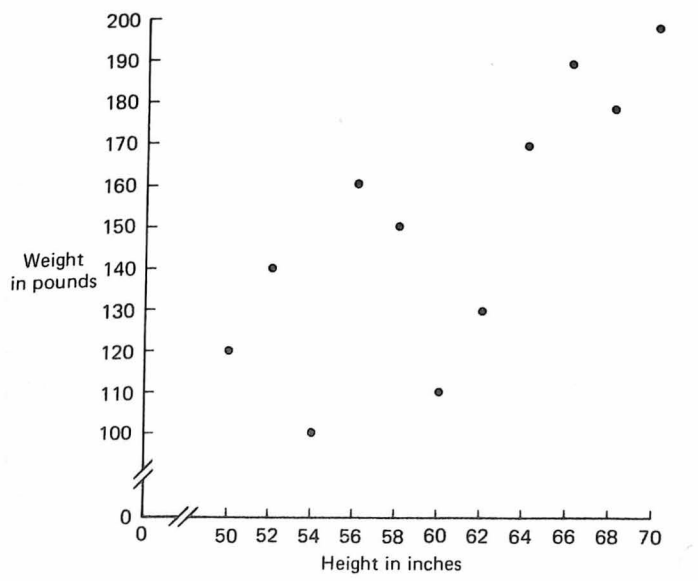


FIGURE 3. A Positive Relationship

Both Figs. 2 and 3 show a positive relationship, although Fig. 2 illustrates a perfect one. Another way to view the perfect positive correlation is to note that the least heavy student is also the shortest student, the next heaviest student is also the next in height, and so on until the last student is reached, who is the heaviest as well as the tallest of all. In other words, a *rank-order progression* exists for each of the values of weight and height.

Suppose, however, that in another group of high school students the heaviest students were observed to be the shortest ones and the lighter students the tallest ones. In this unlikely situation, how do you think the scattergram would look? In the scattergram in Figure 4, hypothetical data are plotted to portray the effect of what we would ordinarily not expect. The scattergram in Figure 5 illustrates the same tendency, but not as strongly.

Inspection of these two scattergrams shows that the dots have a downward direction from left to right. In the perfect negative or inverse relationship the heavier students are also the shorter ones, and the lighter students are the taller ones. The scattergram on the right reflects the same tendency, but there are students whose weight-height combinations depart or deviate from the imaginery line of the perfect inverse relationship.

Both scattergrams are the direct opposites of the two earlier ones, which demonstrated positive relationships. For example, in the perfect positive relationship in Figure 2, the ratio of increase for weight and height is 10 pounds to 2 inches. Each time the weight increases by 10 pounds, the height increases by 2 inches. However, in the scattergram showing the perfect negative (inverse)

Weight —*pounds*		Height —*inches*	
200	140	50	62
190	130	52	64
180	120	54	66
170	110	56	68
160	100	58	70
150		60	

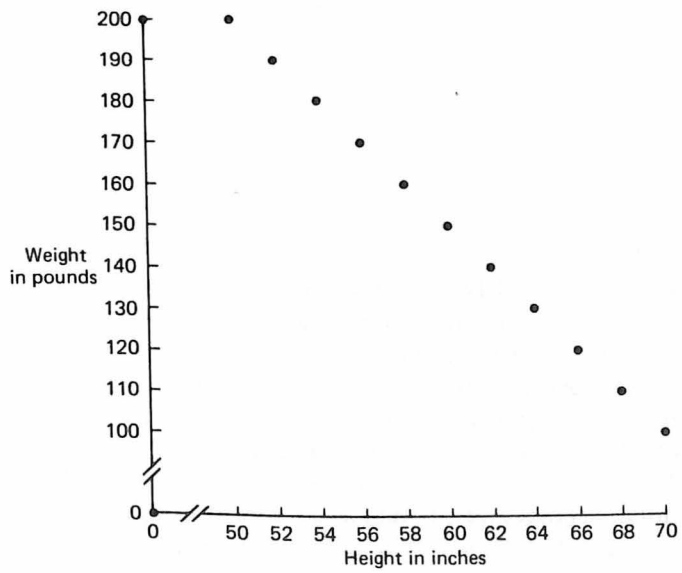


FIGURE 4. A Perfect Negative (Inverse) Relationship

Weight —*pounds*		Height —*inches*	
200	140	54	56
190	130	60	64
180	120	50	68
170	110	62	66
160	100	52	70
150		58	

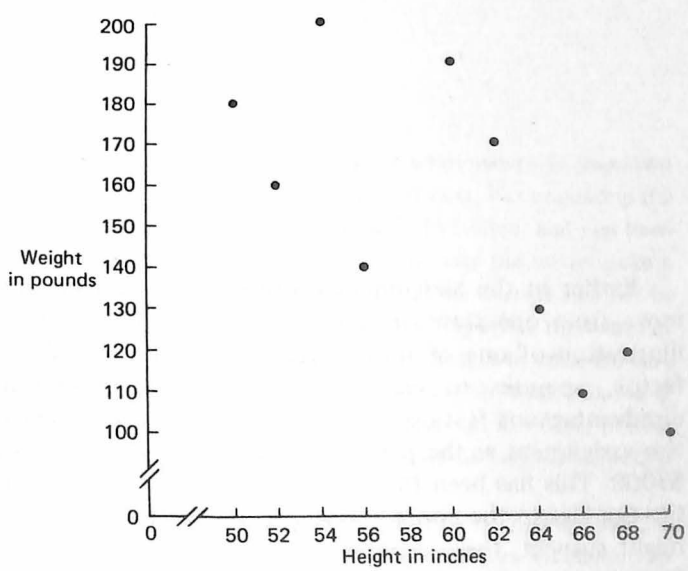


FIGURE 5. A Negative (Inverse) Relationship

relationship (Figure 4), as the weight increases by 10 pounts the height decreases by 2 inches. As one variable increases the other one decreases, which is the essence of a negative or inverse relationship.

In summary, the scattergram gives the researcher a simple means of determining whether there is a connection or relationship between two variables as measured in a population, a group of states, a series of events, and so on. The scattergram provides visual evidence of how closely the joint values approximate a perfect relationship, that is, how closely the dots cluster around the imaginery line of the perfect relationship. Furthermore, this diagram indicates the direction of the relationship, that is, whether it is a positive or a negative (inverse) one.

8. Briefly describe your scattergram in Figure 1 in terms of both the direction and extent of the correlation between total net migration and the percentage of white-collar workers in the 48 states.

9. Restate the hypothesis this scattergram tests, and indicate whether or not it is supported by the scattergram.

Earlier in the assignment a distinction was made between two general types of factors that motivate people to move from one state or community to another. The analysis associated with your first scattergram dealt with an illustration of one of these factors—the influence of a pull by one state to attract migrants. The second, the push factor, operates to encourage residents to move out of an area because it possesses some unattractive or disadvantageous features. One such push feature is the extent of poverty in a state, which is operationally defined in this assignment as the percentage of families in a state whose total family income from all sources in 1959 was under $3000. This has been the general definition of poverty used by the United States government during the 1960s. Of all the families in the entire country in 1960, 21.4 percent had total incomes under $3000 in the preceding year. As you might suspect, these economically poor families were more frequently located in some states than in others, and furthermore, what was true in 1959 and 1960 was generally also the case during the 1950s.

10. On the basis of the push inducement to migrate, what hypothesis would you formulate to predict the relationship between net migration and poverty? A one-sentence statement is all that is necessary.

11. Using the data in columns E and H in Table 5.1, plot the joint frequencies of all states using Figure 6.

12. Briefly describe your scattergram in Figure 6 in terms of both the direction and extent of correlation between total net migration and poverty in the 48 states.

13. Restate the hypothesis that this scattergram tests, and indicate whether or not it is supported by the scattergram.

EXPLANATION: The Rho Rank-Order Correlation Technique

In questions 8 and 12 you were asked to make some statement about the direction and extent of the relationships in your two scattergrams. Determining the direction involved a simple examination of the general slant of the pattern of dots, but evaluating the extent or degree of the correlation of the two variables was difficult because you had no way of measuring it. In a sense, had you been able to use a thermometer to determine how strong or weak the relationship was, it would have been an easy matter to make a statement of the extent of the relationship. Actually, such types of measurement do exist, and they all provide a single number or coefficient with a definite meaning. One correlation coefficient of this sort is based on the simple procedure of putting the values of the two variables in rank order so that instead of two sets of values there are two sets of rank numbers running from 1 to 48 in the case of the 48 states. This measurement is called the Spearman rank correlation coefficient, more often known as rho. Rho, like the Q coefficient, has a range of degrees of correlation, from -1.0 (a perfect negative relationship) to 0 (no relationship) to $+1.0$ (a perfect positive relationship). This measuring device will be illustrated using the hypothetical data on the relationship of height and weight discussed earlier.

The initial step is to attach rank numbers to the series of weights and heights. This is done by simply ranking the heaviest student 1st, the next heaviest 2nd, and so on until the lightest student, who is ranked 11th, with height similarly ranked from 1st (tallest) to 11th (shortest). After the rank orders of the weights and heights have been recorded, the rest is just an ordinary exercise in arithmetic. First, the difference in ranks for each pair of ranks is determined by subtracting one from the other. Ignore the sign in this step because in the next step each difference is squared (multiplied by itself). At this point there are 11 squared differences. These are added and the total multiplied by 6. The resulting figure is then inserted in the formula for rho and divided by $N(N^2-1)$ where N=11, the number of weight-height pairs in the sample. The quotient is now subtracted from 1.0, to at last produce the correlation coefficient. This procedure has been followed on pages 53 and 54 for the four sets of data and scattergrams of weight and height illustrated in the preceding Explanation.

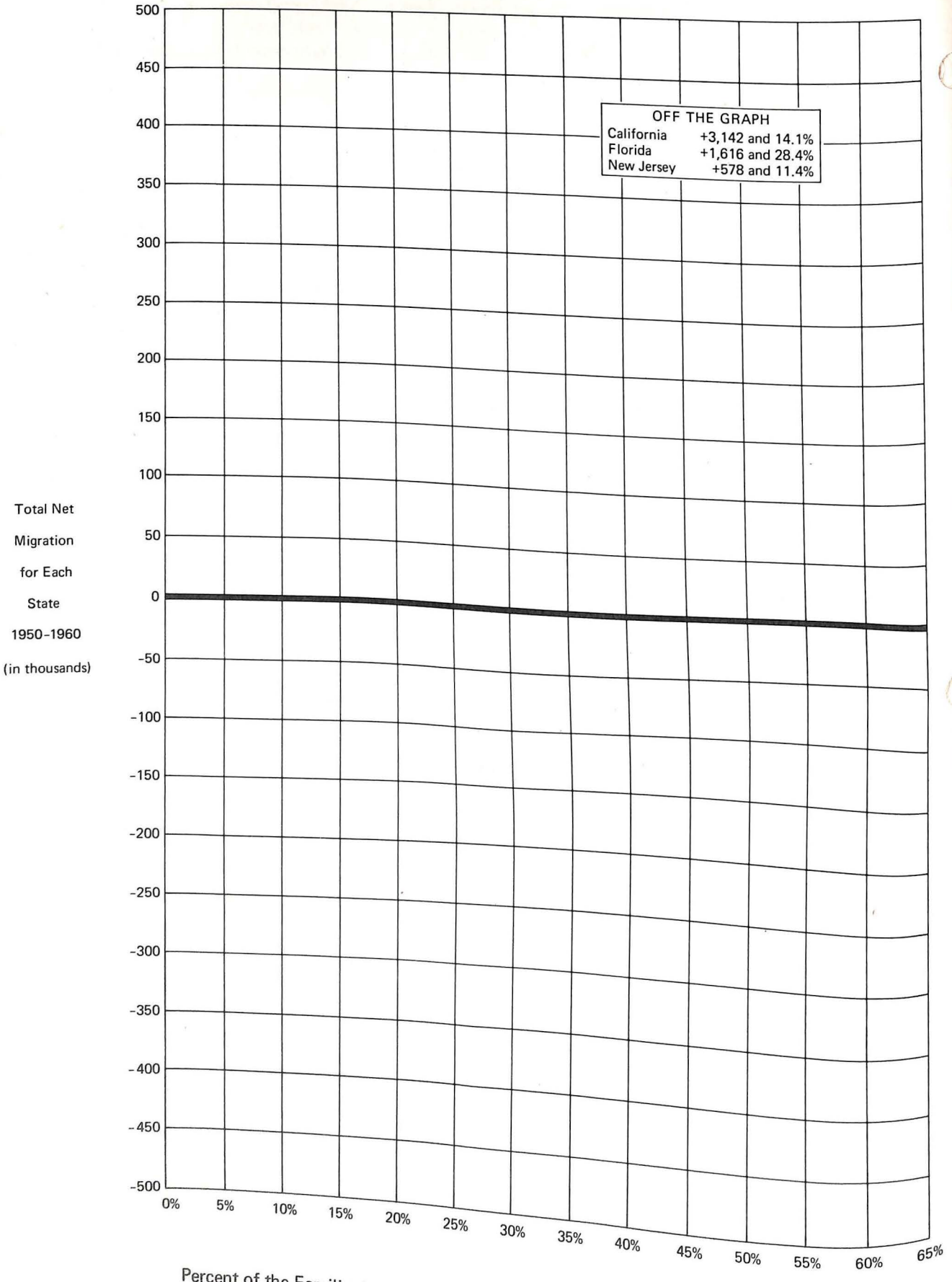

OFF THE GRAPH
California +3,142 and 14.1%
Florida +1,616 and 28.4%
New Jersey +578 and 11.4%
Total Net Migration for Each State 1950-1960 (in thousands)
500
450
400
350
300
250
200
150
100
50
0
-50
-100
-150
-200
-250
-300
-350
-400
-450
-500
0%
5%
10%
15%
20%
25%
30%
35%
40%
45%
50%
55%
60%
65%
Percent of the Families in Each State with Incomes under $3000 in 1959

FIGURE 6.

A PERFECT POSITIVE RELATIONSHIP (FIGURE 2)

Weight	Height	Weight Rank	Height Rank	Diff.	Diff.^{2}
200	70	1	1	0	0
190	68	2	2	0	0
180	66	3	3	0	0
170	64	4	4	0	0
160	62	5	5	0	0
150	60	6	6	0	0
140	58	7	7	0	0
130	56	8	8	0	0
120	54	9	9	0	0
110	52	10	10	0	0
100	50	11	11	0	0
					$\Sigma = 0$

Σ means "sum of."

$$\text{rho} = 1 - \frac{6 \Sigma D^2}{N (N^2 - 1)}$$

$$\text{rho} = 1 - \frac{6 (0)}{11 (121 - 1)}$$

$$\text{rho} = 1 - \frac{0}{1320}$$

$$\text{rho} = 1 - 0$$

$$\text{rho} = +1.00$$

A POSITIVE RELATIONSHIP (FIGURE 3)

Weight	Height	Weight Rank	Height Rank	Diff.	Diff.^{2}
200	70	1	1	0	0
190	66	2	3	1	1
180	68	3	2	1	1
170	64	4	4	0	0
160	56	5	8	3	9
150	58	6	7	1	1
140	52	7	10	3	9
130	62	8	5	3	9
120	50	9	11	2	4
110	60	10	6	4	16
100	54	11	9	2	4
					$\Sigma = 54$

$$\text{rho} = 1 - \frac{6 \Sigma D^2}{N (N^2 - 1)}$$

$$\text{rho} = 1 - \frac{6(54)}{11 (121 - 1)}$$

$$\text{rho} = 1 - \frac{324}{1320}$$

$$\text{rho} = 1 - .245$$

$$\text{rho} = + .75$$

In the perfect positive relationship the answer is +1.00, because there are no differences in the ranks of weight and height in the 11 pairs, and therefore the differences are 0, as is the sum of the squared differences. This perfect positive correlation indicates that there is a constant ratio of increase of weight and height. As weight increases by 10 pounds the height increases by 2 inches for the whole series of combinations, as seen in the scattergram for the perfect positive relationship. It should be pointed out that a perfect positive or negative relationship can have different constant ratios of change, depending on the variables being correlated on each axis of the scattergram.

In the other data of a good, but not perfect, positive relationship, the ranks are not as symmetrical. Take the case of the student who weighs 160 pounds and is 56 inches tall. His weight is ranked 5th and his height 8th, a difference of 3, which when squared becomes 9. The total of all such squared differences is 54, resulting in a rho of +.75, a very strong positive correlation in the social sciences. It is graphically shown in the scattergram where the dots of the joint frequencies of weight and height do not fall into a straight line as they do in the perfect positive correlation. Rather, they appear to be hovering around an imaginery diagonal line, some dots deviating from this line more than others. This idea of the deviations of the joint frequencies is basic to correlation statistics, and further discussion of it is usually included in a later statistics course. Suffice it to say at this point that correlation coefficients are higher to the extent that the joint frequencies do not deviate very much from the imaginery line of perfect correlation.

Virtually the same comments apply to the data and scattergrams of the two negative relationships. These data are reprinted on page 54, accompanied by their ranks and the computations necessary to calculate the rho correlation coefficient.

A PERFECT NEGATIVE RELATIONSHIP (FIGURE 4)

Weight	Height	Weight Rank	Height Rank	Diff.	Diff.^{2}
200	50	1	11	10	100
190	52	2	10	8	64
180	54	3	9	6	36
170	56	4	8	4	16
160	58	5	7	2	4
150	60	6	6	0	0
140	62	7	5	2	4
130	64	8	4	4	16
120	66	9	3	6	36
110	68	10	2	8	64
100	70	11	1	10	100
					$\Sigma = 440$

$$\text{rho} = 1 - \frac{6\,\Sigma D^2}{N(N^2-1)}$$

$$\text{rho} = 1 - \frac{6(440)}{11(121-1)}$$

$$\text{rho} = 1 - \frac{2640}{1320}$$

$$\text{rho} = 1 - 2$$

$$\text{rho} = -1.00$$

A NEGATIVE RELATIONSHIP (FIGURE 5)

Weight	Height	Weight Rank	Height Rank	Diff.	Diff.^{2}
200	54	1	9	8	64
190	60	2	6	4	16
180	50	3	11	8	64
170	62	4	5	1	1
160	52	5	10	5	25
150	58	6	7	1	1
140	56	7	8	1	1
130	64	8	4	4	16
120	68	9	2	7	49
110	66	10	3	7	49
100	70	11	1	10	100
					$\Sigma = 386$

$$\text{rho} = 1 - \frac{6\,\Sigma D^2}{N(N^2-1)}$$

$$\text{rho} = 1 - \frac{6(386)}{11(121-1)}$$

$$\text{rho} = 1 - \frac{2316}{1320}$$

$$\text{rho} = 1 - 1.75$$

$$\text{rho} = -.75$$

In the data for Figure 4, the weight-height ranks are completely inverted, with the heaviest weight occurring with the shortest height and vice versa. The total of the squared differences is 440, which leads to a −1.00 rho coefficient. By inspecting the relevant scattergram, it will be seen that in this perfect negative or inverse relationship there is a constant ratio of change—as weight increases by 10 pounds, height decreases by 2 inches.

In the data for Figure 5, the ranks are generally inverted, producing a sum of the squared differences of 386, which in turn leads to a −.75 rho coefficient. The inverse ratio of change is not as constant as in the perfect negative relationship simply because the joint frequencies deviate in varying degrees from the imaginery diagonal line.

This brief explanation of scattergrams, correlation, and the rho rank-order correlation technique is intended to provide you with a sufficient background to analyze the extent of the correlation among states of net migration and poverty on the one hand and net migration and white-collar occupational opportunities on the other. Study the logic and the procedure for determining the rho coefficient, so that you can use it.

Table 5.2 is an extension of Table 5.1 and contains all the necessary data for calculating the two rank-order correlation coefficients for state net migration, white-collar jobs, and poverty. You will notice that columns E, G, and H of Table 5.1 have two numbers each, the actual frequency for the state and the rank of that frequency among the 48 states. For example, Maine lost 67,000 people from net migration, which puts it in the 30th position. This contrasts with California's net gain of 3,142,000 people, which ranks it as the number-1 state in net migration. The states' rank for percentage of white-collar workers appears in column G, and their rank for percentage of poor families appears in column H. These three ranks for each state have been inserted in the corresponding E, G, and H columns in Table 5.2. These are all the data needed to calculate rho in addition to N, which is 48, since you will use 48 sets of ranks in calculating the two rhos. Table 5.2 is found on pages 56 and 57; do calculations on page 55.

14. Calculate the rho rank-order correlation coefficient for net migration in 1950-1960 and percent of employed persons in white-collar jobs in 1960, using the ranks and calculating the columns in Table 5.2

$$\text{rho} = 1 - \frac{6\ \Sigma D^2}{N\ (N^2-1)}$$

15. Calculate the rho rank-order correlation coefficient for net migration in 1950-1960 and percent of families with incomes under $3000 in 1959, using the ranks and calculating the columns in Table 5.2.

$$\text{rho} = 1 - \frac{6\ \Sigma D^2}{N(N^2-1)}$$

16. Discuss the two hypotheses in terms of the two correlation coefficients. Are Americans in their interstate migration responsive to *push* and *pull* factors, and if so, in what manner?

TABLE 5.2.

CALCULATION OF THE RHO RANK-ORDER CORRELATION COEFFICIENT FOR NET MIGRATION, PERCENT OF WHITE-COLLAR WORKERS, AND PERCENT OF FAMILIES WITH INCOMES UNDER $3000 (DATA FROM TABLE 5.1)

State	Net Migration Rank (E)	Percent of Employed Persons in White-Collar Jobs Rank (G)	Percent of Families with Incomes Under $3000 Rank (H)	Migration and Jobs		Migration and Income	
				Difference (E-G)	Difference^2 $(E-G)^2$	Difference (E-H)	Difference^2 $(E-H)^2$
NEW ENGLAND							
Maine	30	39	22				
New Hampshire	20	37	38				
Vermont	25	31	21				
Massachusetts	32	10	45				
Rhode Island	24	30	32				
Connecticut	7	11	48				
MIDDLE ATLANTIC							
New York	8	3	44				
New Jersey	3	7	47				
Pennsylvania	48	27	33				
EAST NORTH CENTRAL							
Ohio	4	25	36				
Indiana	16	33	29				
Illinois	11	16	41				
Michigan	10	24	37				
Wisconsin	29	34	30				
WEST NORTH CENTRAL							
Minnesota	33	21	24				
Iowa	40	36	19				
Missouri	36	26	17				
North Dakota	34	40	13				
South Dakota	31	43	10				
Nebraska	35	29	18				
Kansas	27	18	23				
SOUTH ATLANTIC							
Delaware	15	12	35				
Maryland	6	5	40				
Virginia	19	1	16				
West Virginia	47	22	11				
North Carolina	42	38	7				
South Carolina	39	46	3				

TABLE 5.2 *(CONTINUED)*

State	Net Migration Rank (E)	Percent of Employed Persons in White-Collar Jobs Rank (G)	Percent of Families with Incomes Under $3000 Rank (H)	Migration and Jobs Difference (E-G)	Migration and Jobs Difference^2 $(E-G)^2$	Migration and Income Difference (E-H)	Migration and Income Difference^2 $(E-H)^2$
Georgia	37	47	8				
Florida	2	14	15				
EAST SOUTH CENTRAL							
Kentucky	44	42	6				
Tennessee	41	41	5				
Alabama	43	44	4				
Mississippi	46	48	1				
WEST SOUTH CENTRAL							
Arkansas	45	45	2				
Louisiana	28	32	9				
Oklahoma	38	15	12				
Texas	12	20	14				
MOUNTAIN							
Montana	23	28	27				
Idaho	26	35	26				
Wyoming	22	23	34				
Colorado	9	4	28				
New Mexico	17	9	20				
Arizona	5	13	25				
Utah	21	6	42				
Nevada	14	19	46				
PACIFIC							
Washington	13	8	39				
Oregon	18	17	31				
California	1	2	43				
Total					( )		( )

17. How would you elaborate on this research if you wanted to test the two hypotheses more precisely?

DIFFERENTIAL FERTILITY

Earlier it was stated that sociocultural values have an effect on specific attitudes and behaviors. If this is the case, comparisons of various subgroups or categories in the population should reveal differences in birth rates as a result of differences in attitudes about children and family size that, in turn, are a result of the social, religious, and economic values prevalent in these subgroups. The most frequently made comparisons have been among religious groups and socioeconomic categories. Roman Catholics, because of church-related views about large families and birth control, may be expected to have higher birth rates than Protestants. Similarly, black-Americans have been observed to have a higher birth rate than white-Americans; and persons of lower socioeconomic status may be expected to have higher birth rates than those with higher status, due to differences in economic aspirations and educational attainment. The latter is referred to as an inverse relationship, in the same sense as the negative relationship noted in the preceding section.

Before proceeding, it should be noted that the concept of fertility is not synonomous with that of fecundity. When the pure biological capacity to reproduce is under discussion, the term *fecundity* is used, in contrast to actual reproductive behavior, for which *fertility* is the appropriate term. Theoretically, a woman is capable of conception every year from the onset of menstruation until menopause. It is also quite evident that many if not most women in the world do not have annual conceptions; that is, they do not reproduce to the limit of their biological capacity. The actual fertility of a woman is a function of many factors, only one of which is her fecundity. This distinction is critical, because if it is noted that there are group or societal differences in the number of children born, the

difference may be due to variations in the biological capacity to reproduce. However, no substantial evidence to date supports the idea of differential fecundity between races, ethnic and religious groups, nations, or social classes. Therefore, when a differential birth rate is observed, it is due to variations in social and psychological factors.

There are many ways to measure fertility, some of them better than others, but all involving difficulties of one sort or another. The *crude birth rate* is the most widely used instrument because of the greater availability of the statistics—the number of births in a given year and the number of people in the society—that go into its computation. As this rate has certain shortcomings, various modifications have been used, such as the *age-sex specific birth rate* or the *net reproduction rate*, which take into account the sex and age compositions of the society. These refinements increase the validity of the *true fertility rate* by eliminating the influence of certain distorting factors. For example, areas with many young people, particularly in the main child-bearing years of 20-35, will probably have a higher crude birth rate than areas with a lower proportion of this segment of the population. More specifically, the median age of the population in New Mexico was 23 in 1960 and its crude birth rate was 32 per 1000, in contrast to the 21 per 1000 in Rhode Island where the median age was 32. Thus, for sensitive comparisons of the birth rate in different areas it is often necessary to control the influence of age and sex distributions by comparing the birth rates within the same age-sex categories.

In general, however, the crude birth rate is adequate for many purposes and will be used in this assignment. The formula for calculating this birth rate is

$$\frac{\text{Number of recorded live births in an area in 1960}}{\text{Number of people living in an area in April, 1960}} \times 1000 = \text{crude birth rate}$$

In the case of the United States, the 1960 crude birth rate is calculated as

$$\frac{4{,}257{,}850}{179{,}323{,}175} = .0237 \text{ which when multiplied by } 1000 = 23.7 \text{ live births per } 1000 \text{ population}$$

The proportion is conventionally multiplied by 1000 simply to avoid cumbersome decimals. The value of the rate is not changed.

In order to provide some perspective, the crude birth rates for the total United States, the non-white population, and the white population are presented in Table 5.3 for the period 1920-1965. The so called non-white population, according to the U.S. Bureau of the Census, is composed of more than 90 percent Negroes so that the non-white figures may be regarded as essentially the fertility of black-Americans.

TABLE 5.3.
CRUDE BIRTH RATES FOR THE PERIOD 1920-1965

	Births per 1000 Population		
Year	Total U.S. Population	Black-Americans	White-Americans
1920	27.7	35.0	26.9
1930	21.3	27.5	20.6
1935	18.7	25.8	17.9
1940	19.4	26.7	18.6
1945	20.4	26.5	19.7
1950	24.1	33.3	23.0
1955	25.0	34.7	23.8
1960	23.7	32.1	22.7
1965	19.4	27.6	18.3

Source: U.S. Bureau of the Census, *Statistical Abstract of the United States: 1967*, 88th ed., Washington, D.C., GPO, 1967, pp. 47, 48.

18. Briefly indicate the basic features of the data in Table 5.3. How would you explain the differential rates?

Differential fertility can be demonstrated with yet another type of measurement, *the average number of children ever born to women in the main child-bearing ages of 20-44.* One of the several reasons for using this technique is that it can be correlated with other types of information that the U.S. Bureau of the Census regularly collects, but which the U.S. Office of Vital Statistics does not collect in its recording of the number of live births each year. For example, the education or socioeconomic status of the mother is not usually recorded when a birth is registered.

Examine the 1960 Census statistics for the average number of children ever born to women aged 20-44 in Table 5.4 and make certain that the educational and ethnic differentials are clear to you.

TABLE 5.4
NUMBER OF CHILDREN EVER BORN TO WOMEN AGED 20-44 BY EDUCATIONAL ATTAINMENT AND ETHNICITY: 1960

Characteristics of Women	Total Number of Women 20-44	Total Number of Children Ever Born	Mean Number of Children
	Educational attainment		
0-8 years	5,694,528	15,614,128	2.742
1-3 years of high school	6,656,109	15,622,261	2.347
4 years of high school	11,839,556	22,649,855	1.914
Some college or more	5,270,144	8,264,628	1.568
	Ethnicity		
Black-Americans	3,444,228	8,375,091	2.432
White-Americans	26,036,109	53,775,781	2.065

Source: U.S. Bureau of the Census, *U.S. Census of Population: 1960, Subject Reports, Women by Number of Children Ever Born,* Final Report PC(2) – 3A, Washington, D.C., GPO, 1964, p.100.

EXPLANATION: The United States Census

Throughout this assignment you have been using data adapted from the material collected by the U.S. Bureau of the Census. The Constitution requires that every ten years (decennial) the government count the number of people in the country and in the states in order to provide the necessary information for the apportionment of seats in the House of Representatives. Since the first Census in 1790, the country has increased in population and area and the informational needs of the country have increased manyfold, thus

requiring greater effort and expense every ten years to collect and analyze the Census data. These massive counts are supplemented with sample surveys of the population between the decennial Censuses. A wide variety of information is collected about people, business, and agriculture, and the data are used in economic and social planning.

Births, deaths, and marriages are recorded at the local level where they occur. This type of registration is the responsibility of local governments, who pass on the data to the U.S. Office of Vital Statistics, which then processes and publishes them for use by social scientists, public health officials, and others. This material is collected monthly, thereby providing an up-to-date picture of natural increase and marriage trends. As mentioned earlier, the figures from the last Census plus these current birth and death data provide us with a good picture of the size of the population and facilitate making projections or predictions of future population size needed for many types of planning.

Fertility in the United States is clearly influenced by the amount of education parents have as well as by their ethnic backgrounds, and in addition to their association with fertility, these two variables are related to each other. Because of discrimination, residential segregation, economic disadvantage, and family structure, black-Americans have not had the opportunity to benefit from formal education as much as white-Americans. In 1966, the median school years completed by blacks was 9.1 years in contrast to 12.1 years for the whites. (4) There has long been at least a three-year differential between blacks and whites, although evidence shows that for some age categories this differential has been diminishing.(5) In any case, the relationship is clear, whites have attained more education than blacks.

Given this relationship, is it possible that the association of fertility with ethnicity and education is merely due to the association of the latter two variables? For example, might the influence of ethnicity on fertility be interpreted as a function of the different educational levels of the blacks and whites? Or the influence of education on fertility be explained as simply a reflection of black and white differentials in educational attainment and fertility? Table 5.4 is of no assistance in clarifying this issue. Only by simultaneously comparing ethnicity and education for their joint and independent influence on fertility is it possible to test the question. To do this, we need data on individuals rather than geographical units such as states. These data are available from the U.S. Bureau of the Census for the 1960 Census and your 200 data cards are in card positions 36-41, a very abbreviated representation of the 1960 Census. By a process of stratified-random sampling, the data card sample for women aged 20-44 contains data that come extremely close to the 1960 figures for all American women aged 20-44.

You may be surprised to find 100 data cards for black women and 100 cards for white women. Obviously, if black-Americans make up about 11 percent of the country's population, there would be too many blacks in your data card sample. Actually, this oversampling was done intentionally so that you would have a sufficient number of blacks with which to perform the necessary operations in Tables 5.5–5.7 and though the blacks have been systematically oversampled, it makes no difference for these tables because you are going to compare the means for blacks and whites separately; you are not concerned with the marginals. This comparison is facilitated by controlling or holding constant one variable and comparing within the other, as you did in Assignment 4 when controlling for occupations.

You will examine the mean number of children ever born for women with different levels of education, first for black women, and then for white women. In this case, ethnicity is the control variable and education the independent variable, and your task is to determine whether education is related to fertility *irrespective of the ethnicity* of women. (As you know by now, fertility is the dependent variable.) Your next step will be to compare the mean number of children ever born for black and white women at each educational level. Now education is the control variable and ethnicity the independent variable, and your task is to determine whether ethnicity is related to fertility *irrespective of the education* of women.

19. Make four predictions of what you expect to find in the following situations:

    a. The relationship of education and fertility when ethnicity is controlled.

18. Briefly indicate the basic features of the data in Table 5.3. How would you explain the differential rates?

Differential fertility can be demonstrated with yet another type of measurement, *the average number of children ever born to women in the main child-bearing ages of 20-44*. One of the several reasons for using this technique is that it can be correlated with other types of information that the U.S. Bureau of the Census regularly collects, but which the U.S. Office of Vital Statistics does not collect in its recording of the number of live births each year. For example, the education or socioeconomic status of the mother is not usually recorded when a birth is registered.

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19. Make four predictions of what you expect to find in the following situations:

    a. The relationship of education and fertility when ethnicity is controlled.

b. The relationship of ethnicity and fertility when education is controlled.

c. The combination of ethnicity and education that will have the highest fertility.

d. The combination of ethnicity and education that will have the lowest fertility.

20. Explain the reasoning for your predictions.

21. Using Tables 5.5 and 5.6, calculate the mean number of children ever born for the eight combinations of ethnicity and education. A suggested procedure is as follows:

a. Sort for ethnicity [position 36]. Put whites aside.
b. Sort for educational attainment of the black women [positions 37 and 38].
c. After you have the four education sorts for the black women, sort and count in positions 39, 40, and 41 for the number of children ever born to those women in each education category. Enter the counts (frequencies) under the appropriate *f* columns in Table 5.5.
d. When finished with the black women, put their cards aside and repeat the steps for the white women, using Table 5.6.
e. After you have entered the frequencies for the number of children in Tables 5.5 and 5.6, you are ready to calculate the mean number of children for the eight combinations. In each education category, multiply the frequencies by the number of children born. For the 5+ category, use 6 as the multiplier since this is the approximate mean for women who have had five or more children.
f. Add the *f*'s and the *fX*'s in each education category and insert the totals in the appropriate parentheses.
g. To determine the mean number of children ever born for the education categories in each ethnic category,

simply divide the sum of f's ($=N$) into the sum of the multiplied frequencies (ΣfX) and insert the mean at the bottom of each column.

h. After all the calculations are completed, enter the means in the appropriate places in Table 5.7. This will ease the comparison of the eight means.

i. The figures for black women with 0-8 years of elementary schooling have been printed in Table 5.5 to give you a check on your work.

Note: When a variable is coded in only one card position there are obviously only two possible codes, as seen for ethnicity [position 36]. However, when two card positions are used, as in educational attainment [positions 37 and 38], there are four possible codes and sorting requires some extra care. Sort the cards at first for the double-open [37 and 38 open] and the double-closed [37 and 38 closed] codes. Then sort the remaining cards for the open-closed and the closed-open combinations. Thus, position 37 open implies that position 38 is closed, and position 38 open implies that position 37 is closed. The same logic applies to the "number of children ever born" codes, in which case positions 39, 40, and 41 should be sorted in the above sequence.

TABLE 5.5
BLACK-AMERICAN WOMEN AGED 20-44 [36 open]

Number of Children Ever Born	X	0-8 Years of Elementary School [37 open] f	fX	1-3 Years of High School [38 open] f	fX	4 Years of High School [37 and 38 open] f	fX	Some College or More [37 and 38 closed] f	fX
[39 open]	0	8	0	____	____	____	____	____	____
[40 open]	1	5	5	____	____	____	____	____	____
[41 open]	2	2	4	____	____	____	____	____	____
[39 and 40 open]	3	6	18	____	____	____	____	____	____
[39 and 41 open]	4	2	8	____	____	____	____	____	____
[40 and 41 open]	5 + ($\overline{X}$ = 6)	12	72	____	____	____	____	____	____
	N =	(35)		(____)		(____)		(____)	
	ΣfX =		(107)		(____)		(____)		(____)
Mean number of children = $\frac{\Sigma fX}{N}$ =			[3.06]		[ ]		[ ]		[ ]

TABLE 5.6
WHITE-AMERICAN WOMEN AGED 20-44 [36 closed]

Number of Children Ever Born	X	0-8 Years of Elementary School [37 open] f	fX	1-3 Years of High School [38 open] f	fX	4 Years of High School [37 and 38 open] f	fX	Some College or More [37 and 38 closed] f	fX
[39 open]	0	____	____	____	____	____	____	____	____
[40 open]	1	____	____	____	____	____	____	____	____
[41 open]	2	____	____	____	____	____	____	____	____
[39 and 40 open]	3	____	____	____	____	____	____	____	____
[39 and 41 open]	4	____	____	____	____	____	____	____	____
[40 and 41 open]	5 + (X = 6)	____	____	____	____	____	____	____	____
	N =	(____)		(____)		(____)		(____)	
	ΣfX =		(____)		(____)		(____)		(____)
Mean number of children = $\frac{\Sigma fX}{N}$ =		[ ]		[ ]		[ ]		[ ]	

TABLE 5.7
MEAN NUMBER OF CHILDREN EVER BORN TO WOMEN AGED 20-44 BY ETHNICITY AND EDUCATIONAL ATTAINMENT: 1960 (DATA FROM TABLES 5.5 AND 5.6)

Education	Black-Americans	White-Americans
0-8 years of elementary school	_____	_____
1-3 years of high school	_____	_____
4 years of high school	_____	_____
Some college or more	_____	_____

22. Discuss the data in Table 5.7 in terms of your four predictions, and interpret the data as best as you can. In other words, tell why the means came out as they did.

23. What research would you do in order to test whether or not your interpretation has any validity?

REFERENCES

1. U.S. Bureau of the Census, *U.S. Census of Population: 1960*, vol. I, *Characteristics of the Population*, Part I, United States Summary, Washington, D.C., GPO, 1964, Table 112, p. 257.
2. William Petersen, *Population* New York, Macmillan, 1961, p. 170.
3. Robert W. Hodge, Donald J. Treiman, and Peter H. Rossi, "A Comparative Study of Occupational Prestige," and Robert W. Hodge, Paul M. Siegel, and Peter H. Rossi, "Occupational Prestige in the United States: 1925-63," both in Reinhard Bendix and Seymour Martin Lipset, eds., *Class, Status, and Power*, 2nd ed. New York, Free Press, 1966, pp. 309-321, 322-334.
4. U.S. Bureau of the Census, *Statistical Abstract of the United States: 1967*, 88th ed., Washington, D.C., GPO, 1967, p. 114.
5. Karl E. Taeuber and Alma F. Taeuber, "The Negro Population in the United States," in John P. Davis, ed., *The American Negro Reference Book* Englewood Cliffs, N.J., Prentice-Hall, 1966, pp. 144-145.

NAME_____ SECTION_____ DUE ON_____

ASSIGNMENT 6

Urbanization

For a long time the United States has been increasingly becoming an urban society. According to the U.S. Census in 1960, about 70 percent of all Americans live in urban areas, in contrast to only about 40 percent in 1900 and about 6 percent in 1800. What constitutes an urban area is to a considerable extent a question of definition. However, underlying the definition is an idea of urban living that distinguishes between a purely rural and a purely urban way of life. There are differences in rural and urban economies, division of labor, group life, recreation, religious practice, and so on.

It may be surprising that the simple fact of a change in one physical variable of an area, such as an increase in the number of persons living there can lead to and be accompanied by many socioeconomic changes in that area. Urbanization, the process of city living, is one of the most significant developments in the history of our country as well as in other parts of the world. All social institutions are affected in the transformation of rural societies to urban ones.

As might be expected, rural areas are more associated with agricultural activities than are urban areas, while manufacturing activities tend to be more characteristic of urban areas. These differences produce differences in occupational composition, with a greater proportion of the city's labor force made up of workers in white collar-jobs than is found in the rural labor force.

Simple observation confirms the existence of these patterns, but the U.S. Bureau of the Census provides us with more precise measurements. Your data cards for the first part of this assignment contain certain types of information based on the census of individuals but clustered in the form of *counties.* That is, this assignment on urbanization utilizes 1960 data for a cross-sectional sample of 200 United States counties, in which the data of each county represent in general the combined characteristics of the people residing in each county. By this means, it is possible to analyze the population of the United States in an approximate way. For instance, a cross-tabulation of the percentage of the people in a county residing in urban areas and the percentage of the county's labor force engaged in white-collar work can be seen in Table 6.1.

TABLE 6.1.
PERCENT OF WHITE-COLLAR WORKERS AND PERCENT OF URBAN RESIDENTS FOR A SAMPLE OF U.S. COUNTIES: 1960

Percent of County's Labor Force in White-Collar Jobs	Percent of County's Population Living in an Urban Area			
	0-24	25-49	50-74	75-99
	Percent			
50-99	–	2	2	30
40-49	14	11	37	60
30-39	25	58	56	9
25-29	25	22	5	–
20-24	34	7	–	–
10-19	2	–	–	–
0- 9	–	–	–	–

Table 6.1 very clearly shows the socioeconomic differentiation associated with urbanization. There is a positive correlation between a county's degree of urbanization and the proportion of its labor force in white-collar jobs. Along with this relationship, there are other measurable differences associated with urbanization such as urban areas being more socially heterogeneous than their surrounding countryside, as it has long been maintained. The cities contain all manner of variation of mankind, from derelicts to prominent businessmen, from Chinatowns to Nob Hills, Hippie enclaves to Coney Islands, the very religious to the most irreligious, the very poorest to the very richest, the least intelligent to the genius, and so on. When one looks for the widest assortment in a population, he tends to look to the cities.

At the same time, it has been noted that the racial composition is quite mixed in many rural areas, in the South, for example. Moreover, ethnic composition is far from homogeneous in other rural areas, such as the North Central states of Wisconsin and Minnesota, which have many persons of recent German, Scandinavian, Scotch, Irish, and Polish descent. It would appear then, that rural areas also have their share of social diversity.

1. Which of these observations is more general for the United States as a whole? If you were required to make statements of the relationship of county urbanization and social heterogeneity, which of the two observations would you support? Use those variables that are included in the incomplete hypotheses:
   a. The proportion of persons with foreign or mixed foreign and native parentage residing in a county is (*more, less*) in urban counties than in rural counties.
   b. The proportion of Roman Catholics residing in a county is *(more, less)* in urban counties than in rural counties.

2. Test your hypotheses with the data cards and Tables 6.2 and 6.3. However, first read the following operational definitions of your variables and the Explanation following.

URBAN COUNTY: An urban county is defined as one in which 50 percent or more of its population resided in urban areas in 1960.

> The U.S. Bureau of the Census defines the urban population as comprising all persons living in (a) places of 2,500 inhabitants or more incorporated as cities, boroughs, villages, and towns (except towns in New England, New York, and Wisconsin); (b) the densely settled urban fringe, whether incorporated or unincorporated, of urbanized areas; (c) towns in New England and townships in New Jersey and Pennsylvania which contain no incorporated municipalities as sub-divisions and which have either 25,000 inhabitants or more, or a population of 2,500 to 25,000, and a density of 1,500 persons or more per square mile; (d) counties in states other than the New England States, New Jersey, and Pennsylvania that have no incorporated municipalities within their boundaries and have a density of 1,500 persons or more per square mile; and (e) unincorporated places of 2,500 inhabitants or more. (1)

NATIVE OF FOREIGN OR MIXED PARENTAGE: Generally speaking, this variable represents the proportion of a county's residents in 1960 who are in the second generation, that is, persons born in the United States, one or both of whose parents were foreign-born.(2)

ROMAN CATHOLIC: The proportion of a county's population that was Roman Catholic in 1952 is based on official Catholic Church figures as reported to the National Council of Churches.

The U.S. Bureau of the Census does not collect information on religious affiliation and therefore it is necessary to use this alternative, but reliable, data source. Note also, that the proportion is based on 1952 information, not 1960 as are the other variables. While certainly there were changes in religious composition and population size in your sample of counties, these data are the only available estimates of the 1960 data.(3)

EXPLANATION: Selection of the Sample of U.S. Counties Used in This Assignment

A stratified random sample of 200 counties was chosen from the total of 3138 counties in the country. This is a 6 percent sample of all counties. It was necessary to stratify the counties because the number of counties in a state bears no relationship to the state's population size. In order to avoid overrepresenting the states with small populations and many counties or underrepresenting the states with large populations and fewer counties, the number of counties randomly chosen from each state was a function of the proportion of the state's population to the total U.S. population. This procedure minimized the bias in selecting counties, which would otherwise have resulted in taking a simple random sample from the total of 3138 counties. Thus New York for example has more of its 62

counties included in the sample than does Kansas, which has 105 counties, because New York's population in 1960 was 16,782,304 while that of Kansas was 2,178,611.

NOTE: Your basic sort for urbanization in position 29 is the same for both tables. Just sort once for this variable, and then sort and count for each of the variables on the left side of the tables.

TABLE 6.2
PERCENT OF 2ND GENERATION[a] IN COUNTY BY DEGREE OF URBANIZATION OF COUNTY FOR A SAMPLE OF U.S. COUNTIES: 1960

	0-49% Urban [29 open]	50%+ Urban [29 closed]
0-14% 2nd generation [28 open]	( ) %	( ) %
15%+ 2nd generation [28 closed]	( ) %	( ) %
N =	( )	( )

[a]The percentage of the U.S. population in 1960 that was 2nd generation was 13.6 percent.

TABLE 6.3
PERCENT OF ROMAN CATHOLICS[a] IN COUNTY BY DEGREE OF URBANIZATION OF COUNTY FOR A SAMPLE OF U.S. COUNTIES: 1952, 1960

	0-49% Urban [29 open]	50%+ Urban [29 closed]
0-14% Catholic [27 open]	( ) %	( ) %
15%+ Catholic [27 closed]	( ) %	( ) %
N =	( )	( )

[a]The mean percentage of Roman Catholics in counties in 1952 was 14.4 percent.

3. What does Table 6.2 show? Explain the results in terms of American social history.

4. What does Table 6.3 show? Explain the results in terms of American social history.

URBANISM AS A WAY OF LIFE

Common sense and personal observation tell us that the people who live in cities behave and think differently than people who live in rural areas and small towns. Residents of large cities appear to live a more hurried life, in contrast to country and town dwellers. They are also more competitive in an environment where competition pervades social contacts and there is a strong emphasis an individualism. In addition, the big-city dweller is primarily occupied with his own life and his immediate family. He has few commitments to organizations and is even less likely than before to owe any allegiances to these collective pursuits should they enroach on his individualistic needs. In comparison with those not living in big cities, the urbanite is much more dedicated to utilitarian goals and attempts to be as efficient as possible in working toward these goals. Whereas money and material possessions are very important to him, religion, neighborhood, and country manage to extract only indifferent loyalty. He is very mobile in movin within the city or to other cities, and what with apartment-house living he develops hardly any social attachment Social contacts, while facilitated by the high density of people in a large city, do not necessarily lead to friendshi Rather, due to the segmentalized and specialized social roles in a city, physical proximity is associated with great social distance than observable in small towns and rural areas. When interacting with others, urbanites are less inclin to interact with their whole personalities, but rather they compartmentalize their behavior to such an extent t social behavior in big cities seems to be more superficial than sincere. Moreover, the impersonality characteriz

urban social contacts is supplemented by the fleeting and transitory nature of the face-to-face encounters. Since no sentimental and emotional ties bind the urbanites, and since in many cases they are competing for seats in buses and subways or positions in some line of people or "jockeying for a better deal" in their jobs, there is a minimum of motivation to expand the range of concern about other persons. As a result, social interaction outside the immediate family is not apt to decrease social distance, but rather to increase it to such an extent that loneliness may appear. The presence of loneliness and the absence of alternative social sources for emotional support (the family appears to be the only viable social support for urbanites) can lead to stress and emotional illness.

A by-product of these social features of urban life is the feeling that people can't be trusted and that one has to rely on himself. This distrust is a result of the impersonal, indifferent, and superficial character of a substantial part of the urban way of life. Automobile drivers, policemen, building inspectors, employers, store clerks, co-workers on the job, and politicians can't be trusted. They are all "out for the buck" and are only concerned with you if you are useful to them. City people tend to look out for themselves and take advantage of others if necessary. Cooperation tends to be within the context of mutual exploitation, and in times of need there are very few people who will care enough to help. This is one of the essential reasons why formalized social welfare, in contrast to informal and friendly mutual assistance, is so much a part of cities.

It is also plausible to expect the city dweller to feel a lack of power or influence, particularly with respect to governmental affairs. There are so many people in a city that it is extremely difficult to have access to political officials. Voting is about the only manner in which the urbanite can register dissatisfaction with the larger scene, but one vote among the thousands of other votes really doesn't count for much. This feeling of political frustration is epitomized in the old saying, "You can't beat city hall!"

How different from each other are the ways of living in small communities and large cities? While there may be agreement on the general features of big-city life, it remains to be seen to what extent this agreement typifies the manner and attitudes of contemporary urbanites as distinct from modes of behavior practiced by those living in the country or small towns. The data you will use for these comparisons come from a national cross-sectional sample in the United States carried out in the summer of 1959 by the National Opinion Research Center. This center chose a stratified-probability sample so that each family in the United States was given an equal chance of having one of its adult members interviewed. A total of 970 interviews were completed. Similar surveys were also done in four other countries, and the entire operation was directed by Gabriel A. Almond and Sidney Verba for their cross-national study of citzenship and political attitudes. Those who would like to examine the entire study should consult their book, *The Civic Culture*.(4) The data selected for this assignment are restricted to a very small part of this large study, although the 200 data cards reflect very accurately the data of the 970 American respondents for the variables that you will use.

If people who live in large cities have a sense of political powerlessness because of the massive nature of big-city political organization and the massive numbers of people living in these big cities, they should express a greater sense of political futility than their fellow citizens living in less populous areas. All respondents in the Almond and Verba study were asked to agree or disagree with the following question: "People like me don't have any say about what the government does." For the whole sample, 38 percent agreed that this was so and 62 percent disagreed. When the sample is broken down into the size of the communities in which the respondents lived, there is little alteration in this pattern. Of those who lived in towns with a population of less than 5,000 persons, 39 percent agreed with the statement, as did 36 percent of those living in communities of 5,000-99,999 and 39 percent of those living in the large cities with 100,000 or more residents. Thus, for this test, at least there appears to be no difference in feelings of political effectiveness among these three types of communities. People who live in big cities appear not to suffer in comparison with those in smaller communities when it comes to self-perceived political effectiveness, sometimes referred to as political efficacy.

Another characteristic of the urbanite as mentioned before, is his individualistic orientation. His preoccupation with self and his immediate family acts to dampen his allegiance to social clubs, organizations, and larger collectivities such as his community and nation. Nevertheless, the data reveal very little difference in the number of organizational affiliations among those living in the three different-sized communities. For example, 46 percent of those in the smallest towns said they belonged to no organizations, in contrast to 40 percent in the 5,000-99,999 cities and 42 percent in the biggest cities. Regularity of church attendance should also indicate that urbanites are less inclined to go to church, but this is not the case. In the order of city size down, 49 percent, 52 percent, and 46 percent of each community category said they attended church at least once a week.

How about the relative importance of self versus the nation? Respondents were asked to agree or disagree with the following statement: "The individual owes his first duty to the state and only secondarily to his personal welfare." If personal interest is more characteristic of residents of big cities, they should disagree with this view more than should the residents of the country and small towns. In the smallest communities, 73 percent disagreed; in the middle

community size, 75 percent disagreed; and in the largest cities 72 percent. Evidently, insofar as this statement is an indicator of individualism, Americans tend to be individualistic regardless of the size of the place in which they live.

Up to now efforts to demonstrate the existence of a distinctive urban way of life have been negative. Perhaps the research techniques are at fault or perhaps the theory is wanting. Or the results may indeed reflect reality in these particular areas of behavior and sentiment. The *theory of urbanism*(5) under test in this assignment may have validity, but for a more narrowly restricted range of social life. Rather than differences in individualism, political efficacy, and group affiliation, the contrast of small towns and big city may be more readily noticed in people's psychological reactions to life, particularly with respect to other people. Possibly as a result of the superficial and indifferent social interaction and the segmented and utilitarian role relationship in big cities, urbanites develop not only a reserve and a "don't get involved" attitude, but a mistrust of people as well. Thus, the theory of urbanism would predict that big-city residents would have less faith in other people (that is, less social trust) than those individuals who live in the country or in small towns. Your data cards contain the data for three of the items in the questionnaire from the national survey, which will facilitate a test of this idea. These items deal with different sides of the sentiment of social faith and appear after the brief Explanation on index construction.

EXPLANATION: Index Construction

In order to increase the researcher's confidence in the ability of his measurement to actually measure what he says it does, several items instead of one are used to measure an individual's faith in other people. If only one item were used, the answers to it might be too specific and might not reflect a general attitude. For example, to determine whether an individual is a liberal or a conservative on economic matters, he might be asked for his opinion on unemployment insurance. But to assume on the basis of his opinion on this one specific issue that he was generally inclined to a liberal or a conservative position would be risky. He should be asked his opinions about the graduated income tax, federally sponsored college scholarships to children for poor families, guaranteed minimum annual wages, increases in social security benefits, and so on. They, by combining his answers to all the questions, he could more validly be classified somewhere on the continuum between economic liberalism and economic conservatism. If he answered all the items in a "liberal direction," he would be at one end of the liberalism-conservatism continuum. If he answered all the items in a "conservative direction," he would be at the opposite end. If his answers were mixed, he would be classified in some appropriate position between the extremes. In like manner, undergraduates could be asked to respond to a range of different items if student alienation were to be measured. They would be asked their views on course requirements, competition for grades, unlimited cutting of classes, the relevance of their studies for their personal lives, tuition costs, student demonstrations, social hours, administrative jurisdiction over personal matters, evaluation of professors' performance, and so on. Opinions on any one of these items by itself does not present a picture of student disaffection and alienation, but the combined opinions on a cluster of such items do provide a more accurate portrayal of this attitude.

Attitude scaling is one of the more complicated techniques in social research and as such, is more appropriately covered in advance courses in sociology. For this assignment it is sufficient to know that measuring any attitude is better done with more than a single item and that the items used in the measurement should have some association with each other as concerns the underlying attitude of which they are different parts. The manner of combining the responses to the questions so as to derive each individual's final score on the scale or index is logically simple, although several of the more refined methods match the pattern of the answers for the whole sample with some mathematical model. Bypassing these procedures, you will construct an index of social trust from three items, which come from a more elaborate social trust scale developed by Rosenberg, Almond, and Verba.(6) First, however, read the following description of the construction of a three-item index.

Suppose the following questions were asked of a systematic random sample of students at your school, dealing with the amount of influence they thought students should have in academic matters.

1. Should students have a voice in establishing and modifying courses? Yes or No?
2. Do you think professors should be required to offer their students an opportunity to criticize a course, as in a course-evaluation questionnaire at the completion of the course? Yes or No?
3. Faculty promotions should be determined without any consultation with students. Agree or Disagree?

All of these items are concerned with a common or underlying theme, that of student influence in academic affairs that have traditionally been the responsibility of the college administration and/or faculty. It has only been in recent years that college students in the United States have significantly raised this issue, but college-student participation has been a tradition or a long-sought-for goal in some areas of the world, most notably in Europe and Latin America. The three items discussed here represent only some of the areas in which these students have tried to gain some power. Thus, the Index of Desired Student Influence composed of the answers to these three items should be regarded as an approximation to a more complete measurement.

Classifying a student simply entails adding up the number of pro-influence responses he made. That is, how many times did he indicate in his answers that he was in favor of granting academic influence to college students? In the present case, the student who gave three pro-influence answers would be classified as most in favor of student influence, and the student who gave no pro-influence

answers would be classified as least in favor of student influence. In between these two poles are those students who responded with either one or two pro-influence answers. Accordingly, the Index of Desired Student Influence has four values:

I. Three pro-influence responses (most favorable to student influence)
II. Two pro-influence responses
III. One pro-influence response
IV. No pro-influence responses (least favorable to student influence).

In the first item, a yes answer indicates a pro-influence response. In the second item a yes answer indicates a pro-influence response. And for the third item, *disagree* is the pro-influence response. Obviously, when items have only two possible answers, the other answer indicates the opposite or negative opinion. In this particular illustration, only the "pro," or favorable-to-influence, answers need be added, for if an answer is an unfavorable one the student respondent will not be scored as giving a "pro" response on the item.

Once the mechanical process of sorting the answers to the three items has been completed for the whole sample of students and they have been classified in the index, it may then be used as its own variable, without reference to the three original items. For example, should you want to know how the student body as a whole (as represented by your random sample) divides itself on the index, as well as how different sectors of the student body stand on the issue of student influence—for example, upperclassmen versus lowerclassmen—the index could then be treated as a dependent variable, as just suggested, or as an independent variable.

5. Name two *dependent* variables for which the Index of Desired Student Influence could serve as an *independent* variable, and briefly indicate your hypothesis (prediction) for the two relationships.

Returning now to the question of the relationship of urbanism and social trust, it will be seen in the following three items from the national survey that the element common to all of them is the idea of whether one has faith in other people. The marginals for each item along with the codes are given below.

A. Some people say that most people can be trusted. Others say you can't be too careful in your dealings with people. How do you feel about it?

Most people can be trusted	(114)	57 percent	[30 open]
You can't be too careful	(86)	43 percent	[30 closed]

B. If you don't watch yourself, people will take advantage of you. Do you agree or disagree with that?

Agree	(138)	69 percent	[31 open]
Disagree	(62)	31 percent	[31 closed]

C. No one is going to care much what happens to you, when you get right down to it. Do you agree or disagree with that?

Agree	(77)	38 percent	[32 open]
Disagree	(123)	62 percent	[32 closed]

6. Read each item carefully, and for each, specify which of the response categories indicates social trust, that is, shows that the survey respondent has faith in other people.

   Item A:_____

   Item B:_____

   Item C:_____

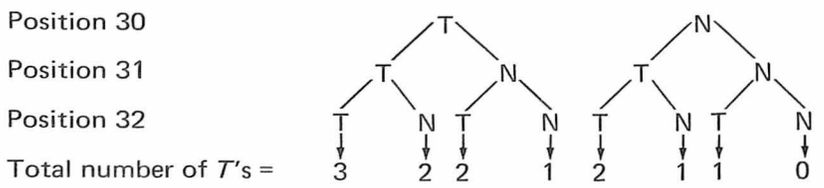
7. Construct an Index of Social Trust by using these three items in positions 30, 31, and 32 in your data cards. This index should be in terms of the number of trust-type responses given, resulting in four index values. The following steps may be of some assistance.

   a. First sort Item A [position 30] to make two piles of cards, one for those who give a trust response and one for those who do not.

   b. Take the trust pile of Item A and sort Item B [position 31] into trust and nontrust piles. You will now have cards with two trust answers on the one hand and one trust answer on the other. This is repeated for the nontrust pile of Item A, which results in two new piles, one with no trust answers and the other with one trust answer. Upon completing the sorting of Items A and B, you should have four piles of cards:

Pile A	*Pile B*	*Pile C*	*Pile D*
2 trust responses	1 trust and 1 nontrust response	1 nontrust and 1 trust response	2 nontrust responses

   c. Taking each of these piles in turn, sort Item C in position 32, giving you eight piles of cards. Do not mix them, and know how many trust responses characterize each pile. The entire process can be visualized in the accompanying diagram in which *T* = trust and *N* = nontrust.



   d. Combine those piles with two trust responses. Then combine those piles with one trust response. Along with the pile containing three trust responses and the other with no trust responses, you should now have four piles. Count the number of individuals in each of the four piles. *But keep the piles separate for the last part of the assignment.* Enter the frequencies below and determine their percentages.

Index Of Social Trust

I. Three trust responses	(high social trust)	(_____)	_____%
II. Two trust responses		(_____)	_____%
III. One trust response		(_____)	_____%
IV. No trust responses	(low social trust)	(_____)	_____%
	Total =	(200)	

8. Now test the proposition that degree of urbanism is inversely (negatively) related to degree of social trust. The population of a respondent's community has been coded in three-sized categories: less than 5,000 people; 5,000-99,999; and 100,000 or more. This information has been coded in positions 33 and 34. For *each* of the social-trust categories, sort the cards in these positions and then count the number of individuals living in the different types of communities. Enter the frequencies in Table 6.4 and determine the relevant percentages.

TABLE 6.4
COMMUNITY SIZE BY SCORE ON SOCIAL-TRUST INDEX

Number of Social Trust Responses	Less than 5,000 Persons [33 open]	5,000-99,999 Persons [34 open]	100,000 or More Persons [33 and 34 closed]
Three (high)	( ) %	( ) %	( ) %
Two	( ) %	( ) %	( ) %
One	( ) %	( ) %	( ) %
None (low)	( ) %	( ) %	( ) %
N =	( )	( )	( )

9. Reread the discussion on the theory of urbanism and then critically discuss this formulation of the urban way of life in the light of the data in Table 6.4 as well as the data provided in the discussion. Use the next page for additional space.

REFERENCES

1. U.S. Bureau of the Census, *County and City Data Book*, 1962, Washington, D.C., GPO, 1962, p. XIX.
2. *Ibid*, p. XX
3. *Churches and Church Membership in the United States: An Enumeration and Analysis by Counties, States, and Regions,* Series A-E, New York, National Council of Churches, 1956-1958.
4. Gabriel A. Almond and Sidney Verba, *The Civic Culture*, Princeton, N.J., Princeton University Press, 1963.
5. Louis Wirth has perhaps made the best statement of this theoretical viewpoint. See his "Urbanism as a Way of Life," *American Journal of Sociology, 44*, no. 1 (July, 1938), 1-24. His thesis may be overstated in this assignment, but only for pedagogical reasons.
6. See Almond and Verba for a description of the social-trust scale, which includes these three items, 266-267. Also see Morris Rosenberg, "Misanthropy and Political Ideology," *American Sociological Review, 21*, no. 6 (December 1956), 690-695; and "Misanthropy and Attitudes Toward International Affairs," *Journal of Conflict Resolution, 1*, no. 4 (1957), 340-345.

NAME_____ SECTION_____ DUE ON_____

ASSIGNMENT 7

Factors Associated with Marital Adjustment

The family is universally found around the world, although its form varies in many ways. It is the one social context into which virtually all human beings are born and in which they spend a considerable part of their first years. As such, it may be expected to have some effect on individual perspectives, attitudes, behavior, and personality in general. For this reason, the family is usually cited as a good illustration of a *primary group* reflecting the social characteristics of commonly held goals, an intrinsic valuation of the group and its members, an extended knowledge of family members, feelings of freedom and spontaneity, and the operation of informal controls.(1) By no means do all families in all societies exhibit these characteristics, but these properties are very important in the structuring of the individual's social and economic life from birth on.

While the process of socialization in the family is particularly crucial for children, the family is also important for the adults in it. It is the socially accepted group for emotional and sexual satisfaction and provides security from the strains and uncertainties that emanate from the economic, political, and status systems within society. It is apparent, however, that some families operate more efficiently than others in satisfying the needs of their members, and moreover, that some family situations produce strain. In this latter respect, interpersonal antagonisms are to be expected because of the long duration of intimacy and the variety of personality traits of family members. Husbands and wives in their youth were exposed to different socializing agents and experiences and may, as a result of these factors and personality needs, have different values and attitudes on many issues confronting the family. For example, an American middle-class mother may be less inclined than her husband to allow her son much freedom and independence and incline to overprotect the boy. A substantial amount of parental conflict may be created by this differential perception of the appropriate male sex role to teach, particularly if both parents have strong views on the subject.

Another potential source of stress in the family is in the area of role definitions of the marriage partners. The culture usually prescribes the general rights and obligations associated with the roles of husband and wife, and there are culturally approved sanctions, which encourage conformity. Nevertheless, and particularly at times when the society or sectors of it are undergoing rapid social change, consensus about role rights and obligations (role norms) may diminish. This outside change and lack of strong consensus would increase the possibilities of strain between husband and wife unless there was agreement about acceptable and unacceptable behavior between themselves.

In societies that have undergone rapid industrialization, many traditionally accepted norms are challenged by competing norms, which mesh more readily with the newer values and organizational needs. For example, industrial economies require mobile populations to move to plant locations and to respond to economic opportunities elsewhere. Although the traditional family pattern has been for the *nuclear family* or *family of procreation* (parents and their children) to remain within or near to the *extended family* or *family of orientation*, the economic inducements to move are often considerable. The nuclear family is compelled to make a major decision—to move and thus effectively reduce the influence of the kin of the extended family or to remain and forego possible economic improvement. This is a simplified picture of the processes associated with the motivations and social readjustments involved in familial migration.

Within the nuclear family two major components of husband and wife roles are (a) the nature of authority and (b) the division of labor. Role differentiation in the family has been shown to be a universal phenomenon, but the substance of the difference varies markedly from society to society. Obviously women bear the children, nurture them, and are usually important socializing agents for them. With the exception of certain tasks, which require the female's reproductive attributes or a male's greater strength, task differentiation in the family is culturally defined and

varies accordingly. However, when it comes to role performance *specifically involving social relationships*, a particular pattern is evident across a wide variety of societies. The wife-mother is customarily involved in *expressive, emotional,* and *integrative* functions and thus exercises "leadership" in these areas, and the husband-father is the *instrumental* leader in the sense that he is customarily involved in coordinating the economic activities of the family and acting as its representative in activities outside the family.(2)

The essential character of these roles lies in the widespread expectation that wives and mothers act as warm consolers to the children, resolve intrafamilial disagreements, and display affection, and that husbands and fathers assume the responsibilities of linking the family to the other institutional activities in the society. What this adds up to, in less elegant terms, is that the wife is socially expected to take care of the home and the husband to be chief provider of economic assets.(3)

Another aspect of marital roles is the expected allocation of authority in the family. To a great extent, the husband is expected to make the major decisions in the family. This generalization is subject to several qualifications, depending on the societies and substrata being observed. Nonetheless, the pattern of authority in the family is more likely to have the husband in the role of at least the ultimate decision-maker. He usually can, and is culturally permitted to, exercise authority over wives and to make important decisions.

When a wife takes a job outside of the home, she in a sense calls into question the role patterns of authority assignment and relational leadership. In the latter case, she becomes more involved in instrumental activities and has less time to devote to expressive and integrative activities. She is assuming at least a portion of the husband's traditional functions, which are not unrelated to the tendency for him to be the ultimate authority in the family. Consequently, by working, the wife undercuts one foundation of male dominance—wage-earning, or breadwinning.

It would seem that the departure from customary role performance would tend to create negative feelings in the family, first as the husband responds to the attrition of his authority and monopoly of instrumental responsibility, and second as the wife in turn responds to her husband's response. It might therefore be expected that marital maladjustment would increase under these circumstances. Stated in the form of a hypothesis, marital maladjustment should be greater in families in which the wife is employed than in those in which she is not employed. One study,(4) conducted by F. Ivan Nye in three small cities in Washington State, found a tendency for less marital adjustment in families with employed wives than in families in which the wife was not employed. There is thus some evidence that marital strains are increased when a wife is gainfully working outside the home.

If this hypothesis has general applicability, we should expect it to be supported in other societies. That is, if an alteration in the authority and relational leadership patterns in the family takes place when a wife works, we should expect to find that marital adjustment will be affected as a result of the shifting role expectations. The current assignment has been organized to permit your analysis of this hypothesis with data from a study of former citizens of the Soviet Union.

The differences between American and Soviet societies are considerable. Not only are the political and economic institutions quite divergent, but there are evident contrasts in ethnic composition, history, religion, recreational activities, and educational processes. With respect to the current question, two additional notable differences between these societies are the level of industrialization and the extent of female labor-force participation. According to recent information, (5) the labor force in the United States is much less agriculturally occupied than in the Soviet Union. For example, about 48 percent of the total labor force in the Soviet Union is engaged in agricultural pursuits, in contrast to only 10 percent in the United States. Since agricultural economies are more resistant to modernization, it might be expected that there would be less acceptance of employed wives in the Soviet Union and thus more marital maladjustment in those families where the wife does work than in those where she does not work.

On the other hand, the official governmental and ideological position in the Soviet Union encourages female labor-force participation, whereas in the United States there is no official pronouncement one way or the other. These different attitudes are reflected in the fact that about 47 percent of the wage- and salary-earners in the Soviet Union are female, as opposed to about 32 percent in the United States, suggesting that it is more socially acceptable and therefore possibly less productive of marital strain than in the United States for Soviet wives to work outside their homes. Thus two features of the Soviet social structure would appear to push in canceling directions with regard to facilitating the development of marital maladjustment as a result of working wives.

1. Considering the hypothesis and the available information, do you expect marital maladjustment to be greater in those Soviet families that have working wives than in those families having full-time housewives? Explain your answer.

In 1950 and 1951, several hundred refugees from the Soviet Union were interviewed in Europe and the United States by a research team from the Harvard Russian Research Center. The interviewers covered a large assortment of topics, including very specific questions about family life in the Soviet Union. Obviously no pretense was made that the persons interviewed constituted a representative sample of Soviet citizens. Nevertheless, this sample, along with another sample of emigrés who were not interviewed but who filled out lengthy questionnaires, contained persons from all major subgroups in the Soviet Union, most of whom did *not* leave the country voluntary, who were quite successful while in the country, and held a higher proportion of membership in the Communist Party or in the Young Communists than was the case in the Soviet population at large. The data collected in this study can thus be relied on to give a significant approximate reflection of life in Soviet society prior to World War II. For a fuller description of the methodology and results of this study, consult the book *How the Soviet System Works.*(6)

The specific data used in this assignment were selected by Kent Geiger from a special sample of the larger sample described above, for his intensive analysis of Soviet family life.(7) By a technique known as cluster sampling, Geiger chose only married respondents and included adequate proportions of each sex, age, and socioeconomic status. He further chose only those with a Slavic nationality who were essentially urban residents when they were in the Soviet Union. On the basis of the interview and questionnaire information, Geiger made an overall impressionistic evaluation of the degree of marital adjustment of the respondent and his or her spouse. For present purposes, marital adjustment has been reduced from Geiger's four-point scale to a dichotomy wherein each respondent and spouse are either classified as having *good marital adjustment* or *poor marital adjustment*. The percentages for the whole sample for these two types are 77 percent and 23 percent respectively. The other variables are self-explanatory.

2. Test your earlier-stated expectations as to the relationship in the Soviet family of marital adjustment and the outside employment of wives. Use Table 7.1 for frequencies and percentages, and compute the Q coefficient, which was discussed in Assignment 4. Keep your sorted data cards separated, to speed up doing Table 7.2.

TABLE 7.1
MARITAL ADJUSTMENT BY WHETHER WIFE IS EMPLOYED OUTSIDE THE HOME

	Wife Employed [43 open]	Wife Not Employed [43 closed]
Poor marital adjustment [44 open]	( ) %	( ) %
Good marital adjustment [44 closed]	( ) %	( ) %
N =	( )	( )

$$Q = \frac{ad - bc}{ad + bc}$$

$$= \_\_\_\_\_$$

3. Briefly indicate what the data in Table 7.1 show, and state whether your prediction was supported or not.

In Nye's research on American women referred to earlier, it was found that the martial-maladjustment differential existing between situations of the wife working and situations of the wife not working is substantially reduced among *higher* SES couples, while consistently being maintained among those of *lower* SES. It made more difference in husband-wife relationships and attitudes when a wife in the lower-status families worked than when a wife in the higher-status families worked. The inference is that outside employment for lower-status wives created more tension in the family than when higher-status wives were employed.

4. How would you explain this qualification of Nye's original relationship? Use the next page for additional space for your answer.

5. It is possible to examine the influence of SES on the results obtained in Table 7.1 to determine whether these American results are replicated by the Soviet data. Do you expect that marital adjustment will be less in the higher-status Soviet families than in the lower-status families as a result of a wife working? State your prediction and the reasons for it.

6. Test your prediction with the data cards, using educational attainment as your index of SES. Table 7.2 has been outlined in such a way that you should fill in the appropriate variables and their codes before sorting and counting the data cards. All of the relevant information for the Soviet sample are in positions 43, 44, and 45. After constructing your table and performing the other operations, compute the *Q* coefficients for both of the 2 X 2 tables included in Table 7.2.

TABLE 7.2
MARITAL ADJUSTMENT BY EDUCATIONAL ATTAINMENT AND WHETHER WIFE IS EMPLOYED OUTSIDE THE HOME

	[ ]		[ ]	
	[ ]	[ ]	[ ]	[ ]
[ ]	( ) %	( ) %	( ) %	( ) %
[ ]	( ) %	( ) %	( ) %	( ) %
N =	( )	( )	( )	( )
	Q =		*Q* =	

7. Discuss the data of Table 7.2 from the point of view of your prediction and rationale, as well as from the point of view of the results of the one American study cited earlier. Continue your answer on the next page.

An additional test of the general hypothesis that marital maladjustment is to some extent due to an increase in the wife's assumption of instrumental role tasks would be to note the effect of a wife's success motivation. As you read in the social-stratification assignment, American society is characterized by a pronounced emphasis on personal achievement and success in many spheres of activity, from Little League baseball to teenage dating and from school grades to occupational and income advancement. This personal success motivation or orientation is one of the predominant cultural values in this country and clearly contrasts with its own relative absence or underemphasis in most other societies. The American husband is supposed to reflect this orientation in a constant endeavour to be more successful in his instrumental role tasks, while the wife is expected to backstop her husband in his efforts and to help instill the achievement motive in their children.

As in all social values and motives, there is a considerable range of varying conformity and internalization. In the case of the personal success orientation, some individuals will be very highly motivated to succeed while other individuals will be very much less motivated in this direction. If a wife possessed more of this motivation than her husband, some effect on their marital relations might be expected, particularly if the different attitudes were clearly expressed in the area of instrumental tasks. In modified form, there might be more potential for marital maladjustment to develop in those families in which wives wanted their husbands to advance more rapidly on their jobs than in those families where wives were little concerned about the speed of their husband's advancement. The wife in the first case is more clearly personally involved in instrumental concerns than the wife in the latter case. If the general hypothesis of this assignment is to be supported, there should be more marital maladjustment when the wife has this orientation than when she does not.

Unfortunately, there are no American data available to directly test this idea, but your Soviet material allows for such a test. One important point should be stressed before you do your analysis. The culture of the Soviet Union does not put the same emphasis on personal achievement and success as does the American culture. This is not to say that Soviet individuals do not want to do good jobs or to excel in their various tasks, but rather that there is an apparent absence of focus on personal achievement. For instance, two different studies of the themes in Soviet children's books and school books showed less stress on personal achievement and more stress on friendship, courage, education, perserverance, and scientific information.(8)

8. As you undoubtably have noticed, the independent variable has changed, although the same general hypothesis is being tested. A wife's employment situation has been replaced by her attitude regarding the rapidity of her husband's occupational progress. Given the lesser concern about personal achievement in Soviet society, what do you anticipate will be the relationship of marital adjustment and whether or not a wife wants more rapid occupational advancement for her husband?

9. To test your idea, write in the necessary variables and codes in Table 7.3 and then perform the necessary operations to complete it. Compute the *Q* coefficient. The code for the new independent variable is:
   [45 open] Yes, wife wanted husband to advance more rapidily.
   [45 closed] No, wife did not want husband to advance more rapidily.

TABLE 7.3
MARITAL ADJUSTMENT BY WIFE'S ATTITUDE ABOUT
THE RAPIDITY OF HER HUSBAND'S OCCUPATIONAL ADVANCEMENT

	[ ]	[ ]
[ ]	( ) %	( ) %
[ ]	( ) %	( ) %
N =	( )	( )

Q =

10. Briefly describe the data which you obtained in Table 7.3.

11. In the light of your results in Table 7.2, where educational attainment was used as an explanatory or interpretative variable, do you believe that the same variable will affect the results of Table 7.3? That is, do you believe that educational attainment affects the attitude of a wife concerning the speed at which her husband advances occupationally?

    If your answer is yes, explain why, and indicate how you think this might affect marital adjustment.

    If your answer is no, explain why, and indicate whether or not you expect the results of Table 7.3 to change accordingly and why.

12. In order to test your idea, write in the necessary variables and codes in Table 7.4, and then do the required operations to complete the table. Make certain to compute both *Q* coefficients.

TABLE 7.4
MARITAL ADJUSTMENT BY EDUCATIONAL ATTAINMENT AND WIFE'S ATTITUDE ABOUT THE RAPIDITY OF HER HUSBAND'S OCCUPATIONAL ADVANCEMENT

	[ ]		[ ]	
	[ ]	[ ]	[ ]	[ ]
[ ]	( ) %	( ) %	( ) %	( ) %
[ ]	( ) %	( ) %	( ) %	( ) %
N =	( )	( )	( )	( )
	Q =		*Q* =	

13. Discuss your results in Table 7.4 in terms of your ideas presented above. Continue your answer on the next page.

14. Summarize the data presented in Tables 7.1, 7.2, 7.3, and 7.4, and indicate how they bear on the general hypothesis of this assignment. Continue your answer on the next page.

REFERENCES

1. Kingsley Davis, *Human Society*, New York, Macmillan, 1949, pp. 283-307.
2. Morris Zelditch, Jr., "Role Differentiation in the Nuclear Family: A Comparative Study," in T. Parsons and R. F. Bales, *Family, Socialization and Interaction Process*, New York, Free Press, 1955, pp. 307-351.
3. This section relies a good deal on the presentation of William J. Goode, *The Family*, Englewood Cliffs, N. J., Prentice-Hall, 1964, pp. 69-78.
4. F. Ivan Nye, "Marital Interaction," in F. Ivan Nye and Lois Wladis Hoffman, *The Employed Mother in America,* Chicago, Rand McNally, 1963, p. 274.
5. Bruce M. Russet, *et al., World Handbook of Political and Social Indicators*, New Haven, Conn., Yale University Press, 1964, pp. 31-33, 175-179.
6. Raymond A. Bauer, Alex Inkeles, and Clyde Kluckhohn, *How the Soviet System Works*, New York, Vintage Books, 1956.
7. H. Kent Geiger, *The Family in Soviet Russia*, Cambridge, Mass., Harvard University Press, 1967.
8. David C. McClelland, *The Achieving Society*, Princeton, N.J., Van Nostrand, 1961, pp. 461-462; and Helen Rapp, "Soviet Books for Children," in Alex Inkeles and Kent Geiger, eds., *Soviet Society*, Boston, Houghton Mifflin, 1961, pp. 443-448.

NAME_____SECTION_____DUE ON_____

ASSIGNMENT 8

Sociological Aspects of Economic Underdevelopment

Ever since World War II, most societies have been subject to an assortment of pressures resulting from social and economic changes. Illustrative of these changes are rapid population increase, domestic and international political conflicts, industrialization, and urbanization. In contrast to stable times, the study of social institutions and social organization is facilitated by these conditions. Questions whose answers once required the use of extensive historical materials can now be dealt with more empirically due to the fact that many societies are undergoing rapid changes that are not only observable but are also measurable to a considerable extent. It is possible to measure the direction of change, its forms, its speed, its sources and causes, and its consequences. This is more practical today than in the past because of increased international communication and mobility, United Nations social science activities, greater awareness by societal leaders of the goals and means of social and cultural change, and the increased commitment of governments to the systematic collection of political, demographic, economic, and other forms of data.

There are a variety of ways to characterize the broad patterns of social organization.(1) One form of social organization is based on *kinship*, which continues today to be very important. In fact, some societies have stressed kinship bonds above others in all forms of social activity. *Fealty* is another basis of organization especially predominant during the feudal years of Europe, and it continues in some parts of the world today. Marking this bond was faithful loyalty of one man to another, regardless of personal hardship. Not far removed from fealty is that type of social organization that is based on *status*, involving widely accepted criteria and evaluations of social rank. Thus every person has a social "slot," which defines for him what he may or may not do. The classical illustration of this type of organization is the caste system. A further general form for organizing social behavior is the *contract* system, whereby free individuals make agreements with other individuals specifying and restricting the range of rights and obligations. Whereas this system of organization is a fundamental condition for commercial civilizations, the basis for twentieth-century industrial society is another organizational form, *rational coordination*, otherwise called *bureaucracy*. Modern business and government would have great difficulty were it not for bureaucratic organization with its emphasis on rationality, impartiality, efficiency, and coordination.

These forms of social organization are pure theoretical types, in the sense that actual societies combine two or more types although tending to emphasize one of them. This theoretical viewpoint facilitates the comparison of contemporary societies as well as societies and civilizations through time. For example, it is possible to identify two distinct organizational shifts in the history of the Western world. There has been a decided movement in Western societies from emphasis on kinship and status to contract and rational coordination. Increased social differentiation resulting from specialization and heterogeneity is much more typical of contemporary Western societies than of their past structures, or for that matter, of contemporary non-Western societies. There are sharper distinctions among institutional activities in the current Western organizational pattern, with religious, familial, educational, and economic spheres tending toward greater separation. The division of labor is more specialized and diversified, with an increase in the number and variety of special-interest associations, such as labor unions, trade and industrial associations, political associations, and recreational and social groupings.

Concurrent with this basic trend toward *social differentiation* is an increasing emphasis on *secularism* and *rationality*. Religious or sacred values are less involved in Western man's social life and he is expected to reduce as far as practical irrational behavior, particularly in economic activity. In a great many spheres of behavior where once personalized relationships were the mode, there now exists a strong tendency toward impersonal behavior.

A major component of these broad organizational changes is the economic sphere, in which comparisons of different stages of economic development are now practical. The analysis of economic development is usually

associated with an analysis of political and social changes that have occurred during the last twenty-five years. The study of modernization, emerging societies, and comparisons of have and have-not countries is undertaken by all types of social scientists. This assignment is limited to the examination of only several questions in the sociology of modernization. You will be concerned with determining some of the social correlates of different levels of economic growth.

The data for the assignment come from many different sources. Arthur S. Banks and Robert B. Textor assembled and processed quantitative and qualitative information for 115 countries.(2) These countries constituted whole populations of existing independent countries, except for a small number that became politically independent after about 1961. A large number of variables were classified for each country, only some of which will be used for this assignment.

ECONOMIC DEVELOPMENT

The dependent variable will be the economic-development status of each country operationally defined in terms of the relative degree of a country's self-sustaining economic growth and its per capita Gross National Product (GNP).

Self-sustaining economic growth is judged by a country's technological progress, its differentiated structure of production and investment, and the absence of the need for public foreign aid. Japan has a self-sustaining economy, while Ireland and Venezuela do not. The second component of the index of economic development, the *per capita GNP*, represents the total national output of goods and services at market prices, that is, the goods and services that are actually bought for final use, the total of which is divided by the population size of the country. Examples of countries with high per capita GNP are the United States, Sweden, New Zealand, while Afghanistan, Pakistan, and Yemen have a low per capita GNP.

For the present assignment, countries are classified as *economically developed* if their per capita GNP is $600 or more and they are judged to have a self-sustaining economic growth or are very nearly self-sustaining. All other countries are classified as *economically underdeveloped*. This is a relative distinction, not an absolute one, which means that the index of economic development should be regarded as a continuum or a scale ranging from the United States and the Soviet Union at one end to Guatemala and Nigeria at the other end. Thus, more precisely, your dependent variable is dichotomized into countries which are *more* economically developed and those which are *less* economically developed. The countries included in each of these categories are listed below.

More Economically Developed

Argentina	Ireland
Australia	Italy
Austria	Japan
Belgium	Luxembourg
Brazil	Mexico
Bulgaria	Netherlands
Canada	New Zealand
Colombia	Norway
Cyprus	Poland
Czechoslovakia	Rumania
Denmark	South Africa
Finland	Sweden
France	Switzerland
Germany, East	U.S.S.R.
Germany, West	United Kingdom
Greece	United States
Hungary	Uruguay
Iceland	Yugoslavia

Less Economically Developed

Afghanistan	Ecuador	Lebanon	Rwanda
Albania	El Salvador	Liberia	Senegal
Algeria	Ethiopia	Libya	Sierra Leone
Bolivia	Gabon	Malagasy Rep.	Somalia
Burma	Ghana	Malaya	Spain
Burundi	Guatemala	Mali	Sudan
Cambodia	Guinea	Mauritania	Syria
Cameroun	Haiti	Mongolia	Tanganyika
Central African Rep.	Honduras	Morocco	Thailand
Ceylon	India	Nepal	Togo
Chad	Indonesia	Nicaragua	Trinidad
Chile	Iran	Niger	Tunisia
China (Mainland)	Iraq	Nigeria	Turkey
Congo (Brazzaville)	Ivory Coast	Pakistan	Uganda
Congo (Leopoldville)	Jamaica	Panama	United Arab Rep.
Costa Rica	Jordan	Paraguay	Upper Volta
Cuba	Korea, North	Peru	Vietnam, North
Dahomey	Korea, South	Philippines	Vietnam, South
Dominican Republic	Laos	Portugal	Yemen

Ambiguous

Israel
Saudi Arabia
Venezuela

SOCIAL HETEROGENEITY AND ECONOMIC DEVELOPMENT

The discussion of the changes in social organization that have taken place in the Western world indicated that contemporary Western societies have a greater amount of social differentiation than they had in the past. Furthermore, the large number and variety of interest groups and associations existing in these societies are evidence of the diversified division of labor and specialization characteristic of them. These trends should be apparent if economically developed and underdeveloped countries are compared for social differentiation and the presence of interest groups in the society.

Cities, in contrast to rural areas, are by their nature composed of diverse subgroups engaged in a multiplicity of tasks, and consequently the extent of a country's urbanization should be a good indicator of the extent of its social differentiation. For the present assignment the countries of the world are classified as more or less urban according to whether at least 20 percent of the population lives in cities of 20,000 or more *and* at least 12.5 percent live in cities of 100,000 or more. Table 8.1 presents the data of the relationship of urbanization and economic development.(3)

TABLE 8.1
ECONOMIC DEVELOPMENT BY URBANIZATION

	More Urban	Less Urban
Economically developed	(34) 63%	(2) 4%
Economically underdeveloped	(20) 37%	(46) 96%
N =	(54)	(48)

Q = .95

It is apparent that urbanized countries tend to be more economically developed than the less urbanized countries. Economic development is positively associated with urbanization. The clustering of people into cities seems to facilitate economic change, or at least accompany it.

What of the interest groups that are supposed to permeate modern industrializing countries? In order to curtail the increase of actual and felt powerlessness that comes from the reduction of the influence of kinship, individuals with similar problems, interests, and values may come together to organize common-interest associations. These associations represent their members by articulating and presenting their common viewpoints to whatever institutional agencies are relevant. Gabriel Almond has described the process in the following fashion:

> Associational interest groups are the specialized structures of interest articulation—trade unions, organizations of businessmen or industrialists, ethnic associations, associations organized by religious denominations, civic groups, and the like. Their particular characteristics are explicit representation of the interests of a particular group, orderly procedures for the formulation of interests and demands, and transmission of these demands to other political structures such as political parties, legislatures, bureaucracies.(4)

If economic development has been correlated with the emergence and increase of interest associations, this association should be evident when the two variables are cross-tabulated, as they are in Table 8.2.

TABLE 8.2
ECONOMIC DEVELOPMENT BY ASSOCIATIONAL-INTEREST ARTICULATION

	Interest Articulation by Associations: More	Interest Articulation by Associations: Less
Economically developed	(26) 87%	(9) 12%
Economically underdeveloped	(4) 13%	(69) 88%
N =	(30)	(78)

Q = .96

The data plainly indicate that there is a relationship. Representation of associational interests is positively associated with economic development—the greater the associational articulation in a country, the greater the likelihood that it is economically developed.

It appears then that there is empirical support for the idea that economic development is correlated with social differentiation, and thus with social heterogeneity. In order to confirm this conclusion, additional analysis is required, especially in light of the plausibility of the idea that social homogeneity would seem to provide a more favorable milieu for the change of economic institutions. For instance, a country with significant proportions of its population speaking different languages would have some difficulties in efficient communication unless there was a commonly used language. Possibly more significant as a potential impediment to economic development would be the differences in values and behavior of the various ethnic groups with their different languages. In India, for example, there are so many different languages, castes and subcastes, that national efforts are often encumbered from succeeding, particularly when the language groups are in conflict with each other. Moreover, the existence of significant racial heterogeneity may in a like manner retard economic development. In other words, a case can be made for social homogeneity as an important condition for development. This idea is tested in Tables 8.3 and 8.4.

The operational definitions of the two new factors are:

LINGUISTICALLY HOMOGENEOUS: **Countries in which about 85 percent of the adult population speak a common language, and in which no other significant language is used.**

LINGUISTICALLY HETEROGENEOUS: **Countries that are not classified as linguistically homogeneous.**

RACIALLY HOMOGENEOUS: **Countries where 90 percent or more of the population can be classified as Negroid or Mongoloid or Caucasoid.**

RACIALLY HETEROGENEOUS: **Countries that are not classified as racially homogeneous.**

An examination of Tables 8.3 and 8.4 reveals that indeed there is merit to this common-sense idea of linguistic (ethnic) homogeneity and racial homogeneity being positively associated with economic development. The more similar the language, culture, and racial composition of a population the greater is the chance that it will have an economically developed nation.

It is not untypical for social science research to come across contradictory results. On the one hand, the data support the idea that social heterogeneity in the form of urbanization and interest groups is conducive to societal

TABLE 8.3
ECONOMIC DEVELOPMENT BY LINGUISTIC COMPOSITION

	LINGUISTIC COMPOSITION	
	Homogeneous	Heterogeneous
Economically developed	(25) 54%	(11) 20%
Economically underdeveloped	(21) 46%	(45) 80%
N =	(46)	(56)

Q = .65

TABLE 8.4
ECONOMIC DEVELOPMENT BY RACIAL COMPOSITION

	RACIAL COMPOSITION	
	Homogeneous	Heterogeneous
Economically developed	(31) 38%	(5) 19%
Economically underdeveloped	(50) 62%	(21) 81%
N =	(81)	(26)

Q = .45

economic development. On the other hand, other data for the same countries support the opposite proposition, that social homogeneity in the form of language and racial similarily, is conducive to economic development. The *Q* coefficients of association are stronger in the former than in the latter, but the *Q* of .64 for linguistic homogeneity cannot be lightly regarded. Thus the question remains: Which type of social composition is more important for economic development?

1. You are to try to answer this question. Urbanization [position 68] and linguistic composition in [position 70] will be the two independent variables, with the dependent variable economic development [position 69]. Construct the table and perform all the operations necessary to test the relative influence of urbanization and linquistic composition. But first indicate your expectations and your reasons for them in *a* and *b*.

   a. Do you expect urbanization to be related to economic development irrespective of the degree of linguistic (ethnic) diversity? Why?

   b. Do you expect linguistic (ethnic) diversity to be related to economic development irrespective of the degree of urbanization? Why?

2. Use the space in Table 8.5 for organizing and recording your data. One suggestion: Use the percentage-difference method that was discussed in Assignment 3 rather than the *Q* coefficient, because there will be too few cases in some cells of your table to legitmately use the *Q* formula.

NOTE: For this assignment exclude all cards punched [67 open].

TABLE 8.5
ECONOMIC DEVELOPMENT BY URBANIZATION AND LINGUISTIC COMPOSITION

Before discussing your analysis, you might have a more concrete impression of the problem by examining a sample of countries illustrating the types you have been dealing with in Table 8.5.

	More Urbanized		Less Urbanized	
	Linguistically		*Linguistically*	
	Homogeneous	*Heterogeneous*	*Homogeneous*	*Heterogeneous*
Economically developed	U.S. Italy	U.S.S.R. Belgium	None	Yugoslavia Cyprus
Economically underdeveloped	Chile Tunisia	Peru Turkey	Albania Mongolia	Ethiopia India

3. Discuss your work from the point of view of your two expectations or predictions as well as specifying why one of the independent variables appears to be more important than the other.

4. In terms of the results of your analysis, what would you recommend to Albania and India for developing economically?

REFERENCES

1. This section follows Leonard Broom and Philip Selznick, *Sociology*, 4th ed., New York, Harper & Row, 1968, pp. 42-49.
2. Arthur S. Banks and Robert B. Textor, *A Cross-Polity Survey*, Cambridge, Mass., The M.I.T. Press, 1963.
3. The total number of countries in the tables of this assignment varies from the 115 reported in Banks and Textor because of the incompleteness of the original data. It was not possible to have information on all variables for all countries. The 102 countries coded on the data cards represent the balance from 115 for which there was information on economic development, urbanization, and linguistic homogeneity and have been used for Tables 8.1, 8.3, and 8.5. The data for Tables 8.2 and 8.4 are from Banks and Textor.
4. Gabriel Almond, "Introduction: A Functional Approach to Comparative Politics." in Gabriel Almond and James S. Coleman, eds., *The Politics of Developing Areas*, Princeton, N.J., Princeton University Press, 1960, p. 34.

NAME_____ SECTION_____ DUE ON_____

ASSIGNMENT 9

Anti-Black Prejudice Among Whites

Your assignment this week is about one of the principle ideas in sociology, intergroup hostility. It is also concerned with the single most critical social problem in the United States, the disparity between the American ethos of equality for all and widespread ethnic and racial discrimination. Underlying intergroup hostility and discrimination is the factor of prejudice, a negative and fairly rigid feeling about groups of people. There are many types of prejudice of the sort in which Catholics, foreigners, Mexicans, Jews, city folk, and so on, are singled out by others as possessing certain "undesirable" traits and thus not being worthy of equal treatment. The United States is not the only country with large-scale prejudice and descrimination. Many Europeans have shown in the past and continue to display in the present, negative feelings against various minority groups as also do Asians and Africans. Indeed, the existence of group prejudice is so pervasive around the world that it has prompted the proposition that prejudice is an inherent human characteristic, with its existence thus inevitable. But this generalization fails to account for the fact that the target of a prejudice is socially learned not inborn, nor does it explain why differential degrees of prejudice exist in the same society. However, this issue is too broad for an adequate treatment in a laboratory assignment, and as such, our focus will be on one type of prejudice, namely, that of anti-black or Negro prejudice among white-Americans. If one wanted to broaden the implications of the analysis which you are about to do, it could be said that you were studying anti-Afro-American prejudice among Euro-Americans.

Group prejudice has been studied by sociologists and social psychologists for many years, and a variety of theories have been suggested for it. However, social scientists are not satisfied that these theories explain all types of prejudice or that they can even explain a large part of any particular type of prejudice. In this assignment you will test one popular hypothesis as well as examine different degrees of prejudice among various types of people. Toward these ends, you will first construct an index of prejudice based on data collected in a national survey in December 1963 by the National Opinions Research Center.

INDEX OF ANTI-BLACK PREJUDICE

Measuring as illusive a feeling as racial or ethnic prejudice is difficult. The three survey questions that you will use represent an approximation of a more adequate method. Nevertheless, the three, when taken together, can provide a reasonably reliable picture of the way an individual generally feels. The following questions were asked of the white respondents in the 1963 national survey.

A. Do you think there should be laws against marriages between Negroes and whites?

Yes	(127)	64 percent	[8 open]
No	(73)	36 percent	[8 closed]

B. Negroes should be satisfied with their present lot in life.

Agree	(43)	22 percent	[9 open]
Disagree	(157)	78 percent	[9 closed]

C. How strongly would you object if a member of your family wanted to bring a Negro friend home to dinner? Would you object strongly, mildly, or not at all?

Would object strongly or mildly	(98)	49 percent	[10 open]
Would *not* object	(102)	51 percent	[10 closed]

An individual who is against interracial marriage, thinks that blacks should be satisfied, and objects to having blacks home for dinner is clearly more prejudiced than the individual who has just the opposite viewpoints. Similarly, an individual who makes two out of three prejudiced responses is probably more prejudiced than the individual who makes only one prejudiced response.

1. Using your data cards, construct an anti-black prejudice index with the three items just discussed. Consult Assignment 6 (Urbanization) to refresh yourself on the mechanics of index construction. You should have four piles of cards after sorting the three items. Count them and enter the frequencies below.

3 Prejudiced replies _____ }
2 Prejudiced replies _____ } _____ High Prejudice

1 Prejudiced reply _____ }
0 Prejudiced replies _____ } _____ Low Prejudice

2. After recording the frequencies, combine the two piles containing the most-prejudiced individuals into one pile, and enter the combined frequencies in the appropriate space next to *High Prejudice*. Then combine the two least-prejudiced piles into a second pile, and enter their combined frequencies in the space next to *Low Prejudice*. This collapsing will facilitate your later analysis. Although you are urged to keep the high- and low-prejudice groups separate for your work in this assignment, it might be wise to mark the edges of your data cards with a colored felt marking pen or crayon for ease in identifying these two groups.

THE SOCIAL-CONTACT HYPOTHESIS

Frequently mentioned in discussions about interracial relations is the idea that by bringing whites into social contact with blacks the prejudice of whites would be reduced. Social contact with blacks, it is reasoned, tends to correct the negative images and stereotypes of blacks held by whites and highlights the human quality of a black man. "They're not so bad after all," is the expected response after social contact. It is also felt that these changed perceptions will lead to a reduction in fear of blacks, which in turn will lead to a reduction in anti-black prejudice.

However, this idea is in sharp contrast to what we know of the black-white experience in the Southern area of the United States. In the South, there has been a good deal of social contact, some of it of a very personal sort. Traditionally, black men and women have worked in the homes of higher-status white Southerners. In some cases, black women have been used as wet nurses for white infants. Yet, despite these and other forms of social contact, anti-black prejudice is quite widespread among Southern whites.

Our survey data give us an opportunity to test whether or not social interaction with blacks is associated with less prejudice. The relevant question asked in the survey, and the answers to it are as follows: "About how often are you around Negroes—almost every day, once or twice a week, less than once a week, or never?"

Never any contact with Negroes	(50)	25 percent	[4 open]
Some contact with Negroes	(150)	75 percent	[4 closed]

Three-quarters of our national sample of whites have contact with blacks in some manner or another. How do they compare in their anti-black prejudice with those who never interact with blacks? The pertinent data for this question appear in Table 9.1.

It appears that whites with no social contact with blacks are slightly more prejudiced than whites who have contact with blacks, 54 percent versus 43 percent. The 11 percent difference. however, is not very convincing and is reflected in a low Q value of .22. Furthermore, it appears that the relationship is *not statistically significant*, because the chi-square value that derives from the data in Table 9.1 is of a sort that could occur through sampling variation

TABLE 9.1
ANTI-BLACK PREJUDICE BY SOCIAL CONTACT WITH BLACKS

	No Contact [4 open]	Some Contact [4 closed]
High prejudice	(27) 54%	(64) 43%
Low prejudice	(23) 46%	(86) 57%
N =	(50)	(150)

Q = .22
χ^2 = 1.51
P > .20 (not significant)
P is the probability of a χ^2 this large or larger.

more than 20 times out of 100. This last statement is probably confusing and has made the following Explanation necessary.

EXPLANATION: Sampling Distribution and Statistical Significance

Throughout this manual you have been dealing with data of groups or categories of people that were based on samples drawn from larger populations. In addition, you have been comparing these groups or categories to see if they differed in their behavior or attitude on some issue. Sometimes the comparison showed there was a difference and sometimes the comparison showed little or no difference. When a difference was observed, it was inferred that this was a real difference between the groups and that it would be found if other similar studies were done or if the whole population was studied. That is, if there was a fairly large percentage difference, or if the Q coefficient was sufficiently large, it was assumed that our sample data meaningfully reflected the real world and were not unique results or statistical flukes.

But how do we know that the groups in our samples are really different? This is a question that must be asked in all sociological research which is based on a sample of a larger population. A great deal of effort has been expended in working out techniques to help answer the question. One such technique will be briefly explained in order to provide you with a tool for evaluating whether or not the relationships that you have found should be considered seriously, that is, whether or not they are significant and probably reflect the actual situation in the white U.S. population from which our sample was drawn.

Although a random sample implies that it was selected from a cross-section of a larger population, it is quite possible that such a sample is not actually representative of the various parts of the population. This can be seen if you select a sample of ten data cards from your complete deck and count the number of individuals who completed high school [1 closed] in the national survey used in this assignment. There might be four such individuals in this small subsample, which does not reflect the proportion of 51 percent in the deck as a whole, that is, 40 percent versus 51 percent. Replacing these ten cards in the deck and then choosing another random sample of ten cards might result in a sample containing five high school graduates, which is an accurate reflection of the whole deck. Should you then repeat this process many times, choosing a random sample of ten cards and returning it to the larger deck, you would note that most of the samples either contained the correct percentage of high school graduates (50 percent) as found in the whole deck of cards or the closest approximations to it, namely, 40 percent (four cards) or 60 percent (six cards). Some of your samples would have three high school graduates, some would have two, and indeed some might have none, one, nine, or ten high school graduates, signifying unrepresentative snapshots of the educational attainment of those in the whole group of 200 cards.

Although you would make every effort to be fair and impartial in selecting the subsamples of ten cards, some of the subsamples will not be representative of the larger group (also called the *population* or *universe*). Regardless of how careful the selecting process is, there will always be a chance that some samples will be unrepresentative, the result of *sampling error*. It is nobody's fault that sampling error occurs, it is a built-in risk whenever a random sample is chosen from some universe. There are certain ways to reduce sampling error, but it can never be completely eliminated. This "hang-up" is the reason why researchers try to determine the probability that

their sample reflects the universe, that is, how probable is it that a specific sample is representative of the population from which it was drawn, or how probable is it that the sample value departs substantially from the true value?

Sampling error can be measured, so that if you have a percentage from a sample it is possible to find out how probable it is that this sample value is due to sampling error. In other words, you can determine the likelihood that this sample percentage could have occurred because of chance variation (sampling variation). This is so because it is also true that the values (percentages, differences between percentages, means, and so on) of a number of random samples will tend to cluster close to the true value of the population. Therefore, while sample values do depart from the true value, most of them will be close to it. In our illustration, we would have found very few samples whose percentage of high school graduates markedly differed from the actual or true value of the whole deck of data cards.

There are several techniques that make use of this idea, and they are used extensively in sociological research to determine whether the difference between two sample values (for example, the percentage from two samples) is probably due to sampling error or whether it reflects a significant departure from what could be expected to have occurred by chance variation.

For example, we can note the difference between high school graduates and nongraduates in their agreement that there should be laws against interracial marriages (as you did in Assignment 1) and raise the question of whether this difference is probably a result of normal sampling variation (chance variation, sampling error). If a very large number of random samples was drawn and the differences in amount of agreement on laws prohibiting interracial marriages for each sample was plotted in a histogram, a shape approximating the normal curve would result. This would give a sampling distribution of the *difference* between the two percentages of those individuals in the two education groups who favored laws barring marriages between blacks and whites. Some of the samples would have a difference in percentages deviating considerably from the true population difference, but the overall tendency for the sample values (the difference in agreement) would be to cluster close to the true population value. Thus, if you had some way to know what the sampling distribution was, you could compare the difference in agreement that you noted in the two education groups with this distribution. This comparison of the one sample value with the sampling distribution would provide you with information indicating the probability (degree of likelihood) that the difference could or could not have been expected because of the process of sampling error. You will not know for certain whether your sample difference was caused by sampling error, but you will have some idea of how certain you can be.

Several types of sampling distributions are available for comparing single sample values, one of which is called the chi-square distribution. By comparing the actual frequencies in a 2X2 table with the frequencies in such a table that would occur if there was no difference between the two groups in question, it is possible to compute a measure called chi square (χ^2). The size of chi square for the data of a 2 X 2 table will provide information as to whether the difference between the two groups compared in the 2 X 2 table is or is not probably due to sampling variation. If we find that the chi-square value is one that could have occurred by variation in sampling (by chance) 6 or more times out of every 100 samples, it is customarily concluded that the 2 X 2 data are not significant, that is, the difference between the two groups is so small that it was probably a result of chance or sampling variation. The inference is then made that, although there is a difference between the two groups in the sample, it is not likely that this difference reflects the actual situation in the larger population. Thus, if the hypothesis of the study was that there is no difference between the groups (conventionally called the *null hypothesis*), there would be support for accepting the hypothesis.

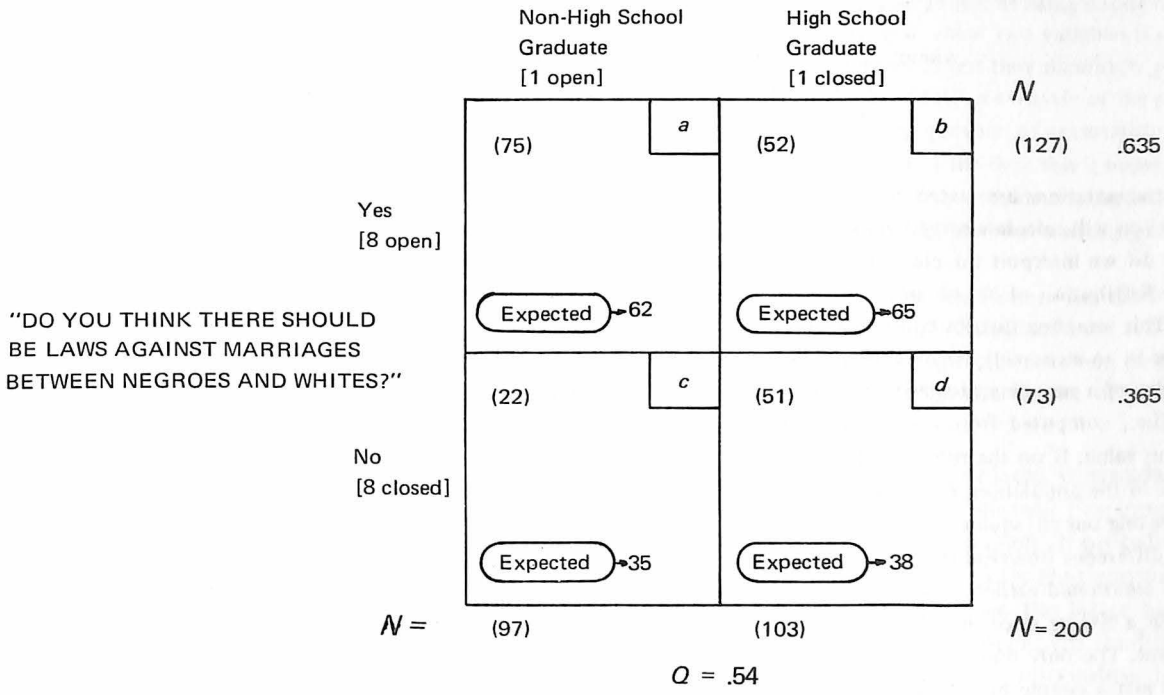
Many times, however, our hope is that a significant difference does exist between the two groups. Then our research hypothesis is that the manner of response of the two groups to the dependent variable is so different, that it is probably not due to sampling variation but to differences within the two groups themselves. In other words, we hope that the null hypothesis, the hypothesis that there is no real difference between the groups in the larger population, will not be supported. Should the chi-square value of our 2 X 2 table then indicate that the difference could have occurred 5 or fewer times in 100 random samples, the null hypothesis conventionally would be rejected and the research hypothesis accepted. However, the sociologist accepts the research hypothesis with the risk that he could be wrong 5 times out of 100, that is, his 2 X 2 data could have been caused by variation in random sampling (sampling errors). He could reduce his risk to 1 in 100 or 1 in 1000, but the more certain he tries to be, the greater will be the demands on his data and the size of his sample.

For the purpose of this assignment we will adopt the most frequently used level of significance, the so called .05- or 5-percent level, signifying that the difference between the two groups in the 2 X 2 tables could have occurred by chance alone 5 percent of the time or less. While it is technically somewhat inaccurate, it could be said that the 5-percent level of significance means that the researcher is, at the least, 95 percent confident that the relationship of his two groups and the dependent variable is not due to random fluctuation or variation. Under these conditions, the relationship is called *statistically significant*; otherwise it is regarded as *not statistically significant*.

The computation of chi square for a 2 X 2 table is relatively simple. We shall illustrate its use with data from our national survey. These data bear on this assignment since they deal with attitudes toward laws prohibiting interracial marriages, which is one of the items in the anti-black prejudice index. Also, you will recall that you did this analysis in Assignment 1. The frequencies (not the percentages, since χ^2 requires absolute frequencies for its calculation) for the four cells of the table appear in the familiar corner

parentheses in Table 9.2. In order to compare these frequencies with frequencies that would occur if there were no population differences in attitude between the two education groups, it is necessary to calculate the *expected frequencies* for each cell. Our research hypothesis is that there is a difference in attitude, but statistical theory requires that the null hypothesis that there is no difference in the population be tested. If the "no-difference hypothesis" is rejected, then the "difference hypothesis" is supported.

TABLE 9.2
ATTITUDE TOWARD LAWS PROHIBITING RACIAL INTERMARRIAGE BY EDUCATIONAL ATTAINMENT



COMPUTATIONS FOR CHI SQUARE

Cell	Observed Frequency O	Expected Frequency E	$O-E$	$(O-E)^2$	$(O-E)^2/E$
a	75	62	13	169	2.723
b	52	65	−13	169	2.600
c	22	35	−13	169	4.828
d	51	38	13	169	4.447
Totals	200	200			14.598

$\chi^2 = \Sigma(O-E)^2/E$

$\chi^2 = 14.598$, which is statistically significant beyond the .001 level.

Now, if there is no difference in attitude toward miscegenation laws between the nongraduates and the high school graduates, the proportion of those saying yes, that there should be laws, would be the same for both education groups. In other words, if there were no difference between the low- and high-education groups in the larger population, repeated samples from it would tend to show very little difference between them. Thus both education groups would have the same proportion answering yes to the question as well as the same proportion answering no.

To find the proportion of each group is a simple matter of determining how the yes and no replies are distributed in the total sample. This can be seen in the marginals for the intermarriage question, which are on the right-hand side of Table 9.2. Of the 200 individuals in the entire sample, 127, or .635, said yes, and 73, or .365, said no to the question. If there is no difference in attitude between the two education groups, then they would both have the same distribution of yes and no responses as the distribution for the whole sample. Hence, the expected frequences of yes and no for each education group are in direct proportion to those found in these right-hand marginals. Thus, .635 of the 97 nongraduates would be expected to say yes as would .635 of the 103 high school graduates. Similarly .365 of each group would be expected to say no. These expected frequencies have been calculated and inserted in each of the four cells of Table 9.2.

The next step in calculating chi square is to find the differences between each pair of frequencies in each cell in order to provide an indication of how far the education groups deviate from what would have been expected by chance alone. Each difference is then squared (multiplied by itself) and the resultant product divided by the expected frequency of the particular cell, thereby providing a relative measurement of the deviation of the observed frequency from the expected one. These procedures are summarized in the following formula for chi square.

$$\chi^2 = \Sigma \frac{(O-E)^2}{E}$$

where: Σ is the sum or total of the four fractions from a 2 X 2 table.
O is the observed *frequency* (not percentage).
E is the expected *frequency* (not percentage).

The computations associated with the chi-square formula are given immediately below Table 9.2. Be certain that you understand them, for you will calculate several chi squares for your analysis later in this assignment.

How do we interpret the chi square of 14.598 obtained in Table 9.2? Someone has done all the work for us by calculating the sampling distribution of chi square, that is, that distribtuion of chi squares which is the result of a very large number of samples of chi squares. This sampling distribution tells us the relative number of times (the probability) that we could expect to get a certain value of chi square in an extremely large number of samples. It might tell us that our chi-square value would be likely to occur in 50 percent of the samples of a sampling distribution, or in 70 percent of the samples. In these cases, we would be inclined to conclude that our chi squares (i.e., computed from our data) are not significant because of the considerable likelihood that they are close to the true population value. If on the other hand, our chi square was shown to be an unlikely or improbable occurrence, being nowhere near the true value of the population, we would conclude that it is significant and does not represent the population value.

Accepting our chi square and thus the data from which it is computed as statistically significant, still leaves us lacking the certainty that the difference observed in the two groups in their attitude toward miscegenation laws is a true difference and not due to sampling error. As mentioned earlier, it is possible to determine what degree of certainty is wanted. Do you want to run the risk of being wrong 5 times in a 100 or once in a 100? It is not possible to reduce your risk of a wrong decision to 0 with data based on samples of populations. The only way to be absolutely sure that an observed difference is a real one is to collect data from the whole population, not from just a sample of it. But since this would be impractical, the social-research convention is to accept a risk or probability of being wrong 5 times or less in 100, that is, the .05 level of significance.

Now, with specific reference to our sample data, what is the probability that the chi-square value for Table 9.2 is the result of a sampling error and that the observed difference between the two education groups does not accurately reflect the true picture of the population? The sampling distribution of chi-square values for a 2 X 2 table is listed below. In the first column are listed those chi-square values that could have occurred by random sampling with the degree of frequency indicated in the second column. For example, a chi-square of 10.83 could occur as a result of sampling variation 1 in 1000 times, a very small probability of occurrence. We could expect a chi-square of 6.64 about once in every 100 samples. Both of these are illustrations of unlikely events in a large number

SELECTED CRITICAL VALUES OF CHI SQUARE FOR A 2 X 2 TABLE

Chi-Square Values	*Probability of Obtaining a χ^2 This Large or Larger*
10.83	.001 (1 in 1,000)
6.64	.01 (1 in 100)
5.41	.02 (2 in 100)
3.84	.05 (5 in 100)
2.71	.10 (10 in 100)
1.64	.20 (20 in 100)
1.07	.30 (30 in 100)
.46	.50 (50 in 100)
.15	.70 (70 in 100)
.064	.80 (80 in 100)
.016	.90 (90 in 100)
.0039	.95 (95 in 100)
.00063	.98 (98 in 100)
.00016	.99 (99 in 100)

Source: R. A. Fisher and F. Yates, *Statistical Tables for Biological, Agricultural, and Medical Research*, 6th ed., 1963, Edinburgh, Scotland, Oliver & Boyd, Table IV.

of samples and are thus regarded as *statistically* significant. They are in contrast to, say, a chi-square of .00016, which could be expected to occur in 99 out of 100 random samples, a high degree of probable occurrence.

As stated earlier, we will use the conventional significance cut-off level of .05 for deciding whether a relationship in a 2 X 2 table is *statistically* significant or not. Any chi-square value that is *larger than 3.84* should be regarded as significant, and similarly the data from which the chi-square value was derived. In the current problem, our chi-square of 14.598 far exceeds 3.84 and has a likelihood of occurring less than once in a 1000 samples. Consequently, we consider the relationship between education and attitude toward miscegenation laws as statistically significant.

You must remember that when we accept this relationship as significant, we still run a very small risk of being wrong in asserting that our sample data reflect the true situation in the whole population as far as the relationship of these two variables is concerned. Since our data are based on a sample from the population, we will never know for certain whether or not they accurately portray the universe. However, the chi-square test and other statistical tests do reduce our uncertainity by providing an estimate of the probability that our sample data represent the true situation in the population. The only way to eliminate the question of uncertainty of sample data is never to use samples but always collect the data from the whole population. Obviously, most of the time this is impractical, and indeed unnecessary, because carefully drawn random samples along with the statistics of inference can provide excellent estimates of the population. This has been repeatedly demonstrated with samples of 1500-5000 individuals, which have successfully predicted the winner and the size of his victory in many elections involving millions of voters.

One last comment. This brief explanation of sampling distributions, chi-square, and statistical significance has omitted a good many other considerations, but it is intended to provide you with a few necessary tools to use with the assignments. It has omitted topics more appropriately considered in courses in social research methods and statistics, such as degrees of freedom, correction for continuity, sample size, and tables larger than 2 X 2. However, their omission here will not affect the validity of your analysis.

In view of the lack of support in Table 9.1 for the hypothesis that social contact with blacks is associated with lower anti-black prejudice, could there be conditions under which contact and prejudice are related? For example, the socioeconomic status of black-Americans is considerably lower than that of white-Americans, which probably means that black-Americans have more contact with lower SES whites. If this is the case, it is less likely that contact will be related to prejudice among the lower SES whites in contrast to higher SES whites, because the latter tend to be separated from blacks and have little occasion to mix with them. When social contact does occur for the higher SES whites, the effect is apt to be a lessening of negative sentiment and a consquential reduction in prejudice, that is, of course, if the logic of the contact hypothesis has any merit. Using education as an index of SES, the proposed

TABLE 9.3
ANTI-BLACK PREJUDICE BY SOCIAL CONTACT WITH BLACKS AND EDUCATIONAL ATTAINMENT

	LESS THAN HIGH-SCHOOL GRADUATION [1 open]		HIGH-SCHOOL GRADUATION OR MORE [1 closed]	
	No Contact [4 open]	Some Contact [4 closed]	No Contact [4 open]	Some Contact [4 closed]
High prejudice	(17) 65%	(41) 58%	(10) 42%	(23) 29%
Low prejudice	(9) 35%	(30) 42%	(14) 58%.	(56) 71%
N =	(26)	(71)	(24)	(79)
	$Q = .16$ $\chi^2 = .199$ $P > .50$ (not significant)		$Q = .27$ $\chi^2 = .818$ $P > .30$ (not significant)	

respecification or qualification of zero-order Table 9.1 (zero, because no control variable is used) is readily done with the data cards, resulting in single-order Table 9.3 (single, because one control or test variable is used).

A quick examination of Table 9.3 shows that by introducing the test or control factor of education nothing is gained. The relationship of contact and prejudice is minimal for both the lower- and better-educated whites, the *Q*'s being respectively .16 and .27. Furthermore, the chi-squares for the two 2 X 2 tables that make up Table 9.3 are not statistically significant, with respective probabilities of occuring by chance alone higher than .50 and .30. Thus we can conclude that insofar as different levels of educational attainment are concerned, contact with blacks and anti-black prejudice are unrelated.

3. Can you think of other social conditions in which contact with blacks might lead to a reduction in prejudice? Explain.

Unfortunately, no other data are available from the national survey that are directly applicable to the social-contact hypothesis. However, the data cards do contain other information, such as education, religion, and place of residence, which could assist you in exploring the contact hypothesis through control tables to see if these other factors would change the outcome. Or, with these other variables, you might want to pursue other questions, such as the influence on anti-black prejudice of an individual's degree of exposure to the Southern subculture. On the other hand, you might prefer to choose to work on the role that prejudice plays in the manner in which an individual percives race relations in the United States. In this case, prejudice would be considered the independent rather than the dependent variable, while the perception or opinion of whether blacks are hurting their cause by demonstrating would be considered the dependent variable.

SELECTING A PROJECT

For this assignment, you will use your index of anti-black prejudice as the focus of analysis for a hypothesis of your own selection. Prejudice can be used as the thing to be explained (a dependent variable), or as a factor (an independent variable) that may affect another factor. Unfortunately, the choices available to you are limited, but the five variables besides prejudice do represent several different dimensions of information. These variables are listed below:

A. *Educational attainment*:

Less than high school graduation	Low	(97)	48 percent	[1 open]
High school graduate or more	High	(103)	52 percent	[1 closed]

B. *Residential background*: "Have you, yourself, ever lived (in) (outside) the South?"

Southerners who *never* lived outside of South	(33)	17 percent	[5 open]
Southerners who *had* lived outside of South	(27)	14 percent	[6 open]
Non-Southerners who *had* lived in the South	(31)	16 percent	[5 and 6 open]
Non-Southerners who had *never* lived in the South	(109)	54 percent	[5 and 6 closed]

C. *Religious preference*:

Baptists	(38)	19 percent	[2 open]
Other Protestants	(105)	52 percent	[3 open]
Roman Catholics	(57)	28 percent	[2 and 3 closed]

D. *Social contact with Negroes*: "About how often are you around Negroes–almost every day, onec or twice a week, less than once a week, or never?"

Never any contact with Negroes	(50)	25 percent	[4 open]
Some contact with Negroes	(150)	75 percent	[4 closed]

E. *Opinion about Negro actions*: "Do you think the actions Negroes have taken have, on the whole, *helped* their cause, or, on the whole, *hurt* their cause?"

Negro actions *hurt* their cause	(101)	51 percent	[7 open]
Negro actions *helped* their cause	(99)	49 percent	[7 closed]

4. Analyze anti-black prejudice either as a dependent or independent variable, using the five variables listed above. Discuss the reasoning associated with your selected project, carefully indicating how you think anti-black prejudice is influenced by or influences the other factors. In the course of your work you should construct at least one table without a control or test factor as well as at least one table involving the control of some relevant factor. An adequate analysis of these data requires more than two tables. The important thing to remember is that you should have a reason for doing a control table and you should indicate in your report what it is.
   All the necessary statistics should be calculated for your problem, including percentates Q's, and chi-squares. Keep in mind, that Q and chi-square *as presented in this manual* are for dichotomous variables only, that is, they can only be used in 2 × 2 tables. As you saw in Table 9.3, this is possible even in the control tables, where Q's and chi-squares are calculated for each 2 × 2 table making-up the larger table. You may have some difficulty deciding what to do when the variables are not dichotomous, as in religion and residential background. Deal with these variables in the customary fashion of examining the percentages to get an impression of the degree and direction of the relationship, after which it will be necessary to collapse the categories into dichotomies in order to compute the Q's and chi-squares. Collapsing here involves no trouble for the two variables in question. Residential background is combined into Southerners and non-Southerners, while religion ends up as Protestants and Catholics. Use the next several blank pages for your analysis.

NAME_____ SECTION_____ DUE ON_____

ASSIGNMENT 10

Attitude Changes Among Undergraduates: A Four-Year Panel Study

Most of the surveys in sociology are studies of one point in time, that is, persons who are interviewed are asked their current views. Since poeple change their minds, one cannot be sure of how long and with what degree of conviction a respondent has had an opinion. In an endeavor to remedy this situation, several research techniques have been developed, such as recall questions, attitude scaling, and the *panel survey*. The latter in particular is suited for measuring attitude change over time. A panel is a group of respondents which is interviewed more than once. The same respondents reply to questions at different times in their lives, and thus if the same questions are repeated it is possible to note the constancy or variability of their answers. In this manner, the sociologist can determine which individuals are constant in their views as well as those who have shifted, and then by comparison note what factors made for the attitude change.

There are other advantages to the panel design in addition to the opportunity to observe change through time with the same sample of people. For example, the panel design is much like the classical research design, using before and after measurements around some situation or event to which some members of the panel had been exposed and the others not. If those who were exposed to the event showed a shift in sentiment about something relevant to the event while those in the panel unexposed to the event showed little or no change in sentiment, it might be concluded that the event caused the change. This of course assumes that other pertinent variables have been held constant for the exposed and unexposed groups.

The panel technique has been used in the study of voting preferences, before, during, and after political campaigns. It is used by the United States government in measuring population mobility, unemployment, and so on. In consumer research, its best-known application is the basis for the ratings of TV programs. And in the field of educational sociology, the panel design has been applied to measure the change in the perspectives and values of medical students during four years of medical school.

Data for this assignment derive from a four-year panel study conducted by William S. MacNaughton of an entire class of students at one of the so called Ivy League colleges. The same students completed questionnaires at the beginning of the freshman year in 1961, at the end of the freshman year, and then once again a few months before graduation in 1965. Thus there were three *waves* or times when this Class of 1965 was observed. We shall use only the data from the first and third waves, that is, the questionnaire data obtained at the beginning and at the end of the college career.

There were 805 men who started with the class, but because of drop-outs, transfers to other colleges, failures, suspensions, deaths, leaves of absence, and refusal by 11 men to complete the final questionnaire, the third and final wave was composed of 621 seniors. The attrition or *mortality* in the size of the Class of 1965 is about 23 percent. Attrition occurs in most panel surveys and its size is a direct function of the length of time between the first and last waves. At times, it is important to be concerned with the composition of the attrition group, for if it differs in some marked fashion from those who remained in the study, the conclusions based on the latter may be spurious. In the present study, for example, it can be assumed that those who transferred to other colleges or took voluntary leaves of absence "to find themselves" were more dissatisfied for any of a number of reasons about this college than the 621 students who stayed four consecutive years. Nonetheless, the large majority of the Class of 1965 remained in the study, and while these 621 students may present a more conservative and less deviant pattern of attitudes than the mortality group, they sufficiently represent the class to reveal attitude differences among themselves and do exhibit attitude constancy and change on a variety of topics. Your data card sample of 200 students accurately reflects the characteristics of the larger group of 621 for Waves I and III.

SOME ILLUSTRATIONS OF THE USE OF A PANEL

A presentation of examples of panel analysis may be of some use to you, as you will design your own plans for the analysis of the panel data for the students of this Class of 1965. Four different attitudes of the members of the panel have been measured. Since the same questions were administered at the beginning and end of the four years and because the answers were dichotomized, four subtypes of students can be classified. For instance, the students were asked to indicate how important it was for them personally to do well in their studies at college. As freshmen and as seniors they could have said very important, or not very important at both times. These are the two *constant groups*, constant in the sense that their attitude did not change during the four years. Or, as freshmen the students may have said that doing well was very important, but as seniors that they did not consider it so important anymore. The fourth type would be the students who also changed their mind, but in the reverse direction. The latter two subtypes are called the *changers*. This may be clearer after examining Table 10.1

TABLE 10.1
ATTITUDE TOWARD DOING WELL IN STUDIES IN FRESHMAN AND SENIOR YEARS

IMPORTANCE OF DOING WELL IN STUDIES AS SENIORS	IMPORTANCE OF DOING WELL IN STUDIES AS FRESHMEN: High	IMPORTANCE OF DOING WELL IN STUDIES AS FRESHMEN: Low
High	(59) *a* 30%	(5) *b* 2%
Low	(114) *c* 57%	(22) *d* 11%

N = 200

Jointly comparing the freshman and senior attitudes as done in Table 10.1, it is possible to make several types of observations.

1. Most freshmen regarded doing well as very important, 87 percent versus 13 percent, ($a + c$ vs. $b + d$).
2. Most seniors did not regard doing well as very important, 32 percent versus 68 percent, ($a + b$ vs. $c + d$).
3. Of the whole class, 41 percent were "constants," they did not change their attitude, 30 percent plus 11 percent ($a + d$).
4. There were more high-motivated constants than low-motivated constants, (a vs. d).
5. Of the whole class, 59 percent were "changers," they changed their attitude from low to high or from high to low, 2 percent plus 57 percent, ($b + c$).
6. Most of those who changed their attitude shifted from high motivation to low motivation, 57 percent versus 2 percent, (c vs. b).

1. To test your understanding of reading a panel table, fill in the blanks in the following statments, using Table 10.2 as the source for your data. The specific question asked of the student panel was: "How would you describe your commitment to your religious faith or church affiliation?"

TABLE 10.2
COMMITMENT TO RELIGIOUS FAITH OR CHURCH IN FRESHMAN AND SENIOR YEARS

RELIGIOUS COMMITMENT AS SENIORS	RELIGIOUS COMMITMENT AS FRESHMEN: Strong	RELIGIOUS COMMITMENT AS FRESHMEN: Weak
Strong	(42) *a* — 21%	(7) *b* — 4%
Weak	(49) *c* — 24%	(102) *d* — 51%

$N = 200$

Complete the following statements:

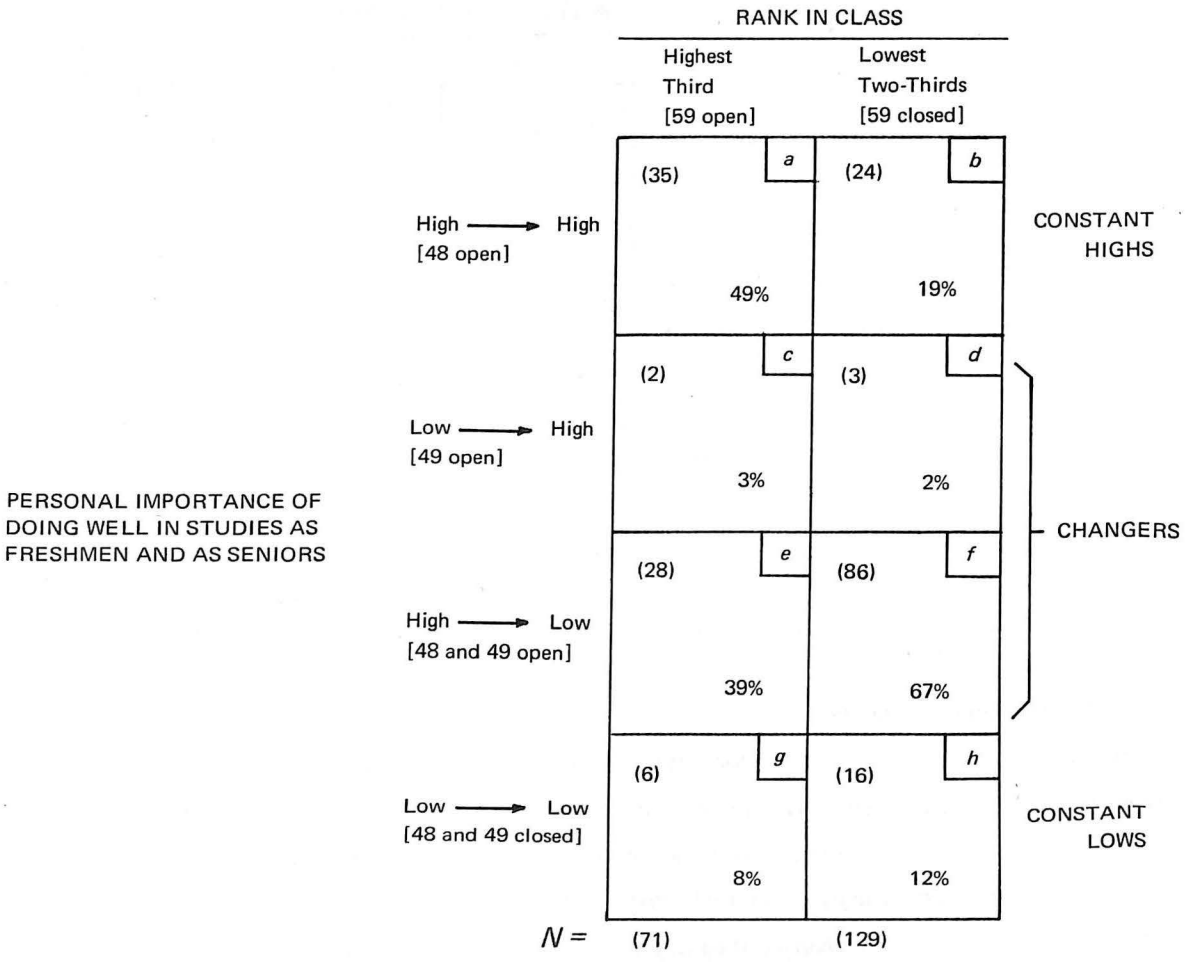
1. As freshmen,_____% were strongly committed to religion and_____% were weakly committed.
2. As seniors,_____% were strongly committed to religion and_____% were weakly committed.
3. Of the entire class,_____% remained *constant* in their degree of religious commitment.
4. There were (*more, less*) strongly committed *constants* than weakly committed *constants.*
5. Of the entire class,_____% *changed* their degree of religious commitment.
6. Most of the *changers* moved to a (*stronger, weaker*) religious commitment.

Once the several types of constants and changers in the panel have been identified, as they have just been done in Tables 10.1 and 10.2, the next step usually seeks to determine their characteristics. For example, what sorts of undergraduates shifted or remained constant in their attitude about the importance of doing well in their studies at college? One of the more obvious factors would be grade average, which is an imperfect but fairly good index of intelligence. It would be expected that those students with the highest academic averages at the end of four years of college would have been more likely to maintain a constant strong commitment to doing well during the four years than those with lower grades. Table 10.3 very clearly shows this to be the case. Among the smartest student, 49 percent, were constant in their higher motivation to do well, in contrast to 19 percent of those with lower averages (*a* vs. *b*).

This result is hardly surprising. What may be more unexpected is the small difference between the two academic groups in their proportions of those who remained constant in the little importance they attached to doing well. Eight percent of the smartest students retained a low motivation during the four years in comparison to 12 percent of the lower-average students (*g* vs. *h*).

Shifting from the constants to those who changed their attitude about the need to do well in their studies, it can be seen in Table 10.3 that a student's grade average makes a difference if the shift in viewpoint is from high motivation to low motivation. Among the smarter students, 39 percent started out with high intentions but lost their enthusiasm as the college years rolled by. In contrast, almost twice as many, 67 percent, of the botton two-thirds of the class started out high and ended low in their motivation to do well (*e* vs. *f*). Thus the smarter students are more inclined to maintain a high commitment to good work during college and are less likely to give up their greater motivation than are the students who have not academically achieved as well.

TABLE 10.3
FRESHMAN AND SENIOR ATTITUDES TOWARD DOING WELL IN STUDIES BY RANK IN CLASS



The number of students who shifted from an initial low motivation to do well to a high motivation was negligible ($c + d$). Apparently, most of the freshmen in the college who start with little enthusiasm for academic success, maintain that attitude through the four years ($g + h$ vs. $c + d$).

One of the other principal advantages of a panel study is that it allows for the analysis of the change in one attitude by examining the change in other attitudes during the same period of time. In Table 10.3, grade average as an indicator of intelligence was used as a measurement at one point in time—the end of the senior year, even though it was a result of almost four years of academic performance. In Table 10.4, the motivation to do well in college will be examined as a function of the student's degree of religious commitment. The importance for the student of his religious faith or church affiliation was measured both in the freshman and senior years, as was his attitude toward academic success. The cross-tabulation of these two variables is shown in Table 10.4.

This 16-cell table is rather complicated at first glance, but an examination suggests the simple conclusion: A constant strong religious commitment is positively related to a high motivation to do well in college, and a weakening in religious commitment leads to a weakening in the motivation.

Of those students who maintained a constant strong religious commitment (the left column), 43 percent also maintained a *constant high* academic motivation during the four years in college. The other two types of religious commitment with enough students did not retain as high a proportion of students who were constantly high in their academic dedication. To see this, compare the following cells in the table (a vs. c and d). Unfortunately, there are too few cases in cell b to be considered seriously. The same may be said of cells f, j, and n. These four cells will be ignored in the discussion, that is, the students whose religious convictions went from weak to strong during the four college years.

At the other end of the scale in the bottom row, it can be seen that a *constant low* academic motivation tends to be more characteristic of those students whose religious commitment was constantly weak. In the weak⟶weak religious commitment group, 15 percent were low⟶low in their academic motivation, in contrast to the smaller percentages found in the other religious types. Compare (*p* vs. *o* and *m*).

TABLE 10.4
FRESHMAN AND SENIOR ATTITUDES TOWARD DOING WELL IN STUDIES BY COMMITMENT TO RELIGIOUS FAITH AND CHURCH AS FRESHMEN AND SENIORS

PERSONAL IMPORTANCE OF DOING WELL IN STUDIES AS FRESHMEN AND AS SENIORS	Commitment to Religious Faith or Church as Freshmen and as Seniors				
	Strong → Strong [50 open]	Weak → Strong [51 open]	Strong → Weak [50 and 51 open]	Weak → Weak [50 and 51 closed]	
High → High [48 open]	(18) *a* 43%	(3) *b*	(12) *c* 24%	(26) *d* 25%	CONSTANT HIGHS
Low → High [49 open]	(1) *e* 2%	(0) *f*	(1) *g* 2%	(3) *h* 3%	CHANGERS
High → Low [48 and 49 open]	(20) *i* 48%	(4) *j*	(32) *k* 65%	(58) *l* 57%	CHANGERS
Low → Low [48 and 49 closed]	(3) *m* 7%	(0) *n*	(4) *o* 8%	(15) *p* 15%	CONSTANT LOWS
N =	(42)	(7)	(49)	(102)	

Now what happens when a student becomes detached or disillusioned about his faith or church? These students are represented in the third column as strong⟶weak, and almost two-thirds of them decreased in their motivation to do well academically. Thus 65 percent of those students whose religious commitment weakened during college also showed a parallel weakening in their desire to do well. This is not to say that some students in the other religious types did not wane in their fervor to do well. They did, but not in the same proportion as the students whose religious orientation was secularized during the college years. Of those students with a weak⟶weak commitment to religion, 57 percent tended to "turn off" academically, while 48 percent of the strong⟶strong religious students did the same. The three percentages, 65 percent, 57 percent, and 48 percent can be found in cells *k*, *l*, and *i* respectively.

These last results may be viewed as a process of *de-idealization*. As the ideals of religion and church become less important for an undergraduate so does his ideal of academic success. Indeed, a decline in academic motivation is characteristic of the majority of the students in this class, as it probably is at many other colleges. But this decline tends to be most pronounced for those students who lose interest in faith and church.

DESIGN YOUR OWN RESEARCH PROJECT

With the several illustrations just provided acting as guides, you will now do a panel analysis of a topic of your own choosing, of course, within the limitations of the variables which are provided. Four variables based on two waves, and four variables based on only one wave have been selected from the Class of 1965 panel study. These are explained below, along with the frequencies and codes.

Two-Wave Variables

A. *Academic motivation*: "How important to you, personally, is it to do well in your studies at college?" Those students who said "very important" have been classified as having *high* motivation, and those who expressed lesser degrees of importance as their answer have been classified as having *low* motivation.

As a Freshman		*As a Senior*			
High	→	High	(59)	29 percent	[48 open]
Low	→	High	(5)	3 percent	[49 open]
High	→	Low	(114)	57 percent	[48 and 49 open]
Low	→	Low	(22)	11 percent	[48 and 49 closed]

B. *Commitment to religion*: "How would you describe your commitment to your religious faith or church affiliation?" Students who replied they had a total or strong commitment have been classified as having *strong* religious commitment, and those stating lesser degrees of commitment have been classified as *weakly* committed.

As a Freshman		*As a Senior*			
Strong	→	Strong	(42)	21 percent	[50 open]
Weak	→	Strong	(7)	4 percent	[51 open]
Strong	→	Weak	(49)	24 percent	[50 and 51 open]
Weak	→	Weak	(102)	51 percent	[50 and 51 closed]

C. *Attitude toward being drafted*: "Assuming you are eligible to be drafted into the military service, which of the following statements best describes your feeling about the prospect of being in the armed forces?" Those students who indicated enthusiastic or favorable feelings have been classified as *favorable* while those who said they were reluctant or opposed to being drafted have been classified as *unfavorable.* All students in this survey are male undergraduates.

As a Freshman		*As a Senior*			
Favorable	→	Favorable	(66)	33 percent	[52 open]
Unfavorable	→	Favorable	(9)	4 percent	[53 open]
Favorable	→	Unfavorable	(75)	38 percent	[52 and 53 open]
Unfavorable	→	Unfavorable	(50)	25 percent	[52 and 53 closed]

D. *Frequency of drinking*: "How often do you drink spirits (whiskey, other hard liquor, rum, etc.)?" Students who replied that they drank spirits frequently or occasionally have been classified as *drinkers*, and those who said they rarely or never drank have been classified as *abstainers*.

As a Freshman		*As a Senior*			
Drinker	→	Drinker	(61)	30 percent	[54 open]
Abstainer	→	Drinker	(95)	48 percent	[55 open]
Drinker	→	Abstainer	(4)	2 percent	[54 and 55 open]
Abstainer	→	Abstainer	(40)	20 percent	[54 and 55 closed]

One-Wave Variables (measured only once)

A. *Desire to be liked*: The following question was asked in the freshman wave. "How important is it to you that you be well liked by many different kinds of people?" Those students who said it was *important* have been classified as such, and those who claimed it was *unimportant* have been classified in this manner.

Important to be liked	(171)	85 percent	[56 open]
Unimportant to be liked	(29)	15 percent	[56 closed]

B. *Morale*: This item was included in the senior wave. "How would you say you have felt most of the time since coming to this college—in good spirits or in low spirits?" Students who indicated they were in good spirits have been classified as having *high morale*, and those who indicated they had been in some measure in low spirits have been classified as having *low morale*.

High morale during college	(140)	70 percent	[57 open]
Low morale during college	(60)	30 percent	[57 closed]

C. *Satisfaction with social life*: Three questions were asked in the senior wave about each student's degree of satisfaction with his relations with other students, with girls, and with social life at the college. An index of social satisfaction was constructed from these three items. Students have been classified in the following manner:

Satisfied with social life	(83)	42 percent	[58 open]
Dissatisfied with social life	(117)	58 percent	[58 closed]

D. *Academic rank in class*: In the senior wave the panel members were asked: "In comparison with the other members of the Class of 1965, where would you estimate you rank academically at this point in the senior year?" The students have been classified as follows:

Highest third of class	(71)	36 percent	[59 open]
Lowest two-thirds of class	(129)	64 percent	[59 closed]

2. After you have examined all of these variables, choose one of the two-wave variables on which you would like to focus your analysis. Needless to say, do not choose Academic Motivation as your focus since this variable was used in the earlier discussion.

   You are to select one other two-wave variable and two of the one-wave variables to center your analysis around. These three variables should be chosen after you have given some thought to their possible association with your independent variable. Carefully reason out the questions to which you would like some answers. Write your hypotheses in the following space, explaining the rationale upon which each is based. Construct the necessary tables to test your ideas and use the data cards to get the data to insert into them. Do the necessary calculations to complete the tables, although *Q*'s and chi-squares need not be computed unless you have 2 × 2 tables.

   After completing the tables, read them carefully in terms of your hypotheses. Discuss the data in detail, particularly with respect to why the variables are related or unrelated. If your predictions were off the mark or were not strongly supported, attempt to explain why. Use the following blank pages for your work.

APPENDIX

Percentages for Numbers 1–150

These tables have been provided to reduce the chore of computing the percentages called for in the assignments. The tables are easy to use. For example, if you want to find what percentage 4 is of 15, find the column headed 15 and then within that column look for the number 4. Opposite 4 you should find 27, which is the percentage that 4 is of 15. If you work this problem with paper and pencil to convince yourself of the accuracy of the table, your answer should come to .266, which when rounded off becomes 27%.

As you will note, there are no percentages with decimals in these tables. The decimals have already been rounded up or down according to a standard procedure, so it is not necessary for you to do any rounding. Report the whole percent as you get it from the table.

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