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This study deals with intergenerational differences in the industrial environment. Rapid changes in our social and technological society suggest the characteristics of dogmatism and trust as possible indicators of differences between practicing professionals and upper division university students.

Each subject's reaction to change was measured through administration of Rokeach's Dogmatism Scale. Attitudes regarding Theory X and Theory Y along the Trust Dimension were measured on Karmel's KYX Scale. Finally, a rule enforcement situation developed by Shull and Cummings was tested for its ability to accurately predict the attitudes investigated in this study.

Study participants included 124 upper division university students and seventy-one adults in the fields of Engineering, Business and the U. S. Military.

The study design provides for computation of data mean scores; correlation of individual scores with age; and correlation of disciplinary group mean scores within and between generational populations;

and testing of the relationships among the survey devices. Mean scores for sub-groups of both populations indicate Humanitarian characteristics on the Rule Enforcement Situation, and High Trust orientation on the KYX Scale.

Scores of female and male subjects were found to be similar on all three scales. Hypotheses of positive correlations among the scores from the survey devices were not supported. Hypotheses of age as a correlate of individual scoring on the survey devices were not supported for the populations surveyed. Hypotheses of similarity of trust attitudes between adults and students of the same discipline were generally supported. Differences along the dogmatism dimension were revealed. However, since both generations' mean scores were shown to be in the mid-range on the scale, the concept of intergenerational similarity cannot be totally rejected.

Conclusions drawn from the data and relating to the surveyed population are that: 1) generally speaking, a 'gap' in the attitudes measured does not exist, 2) the attitudinal similarities are interpreted to suggest a potential for successful integration of generations in the work environment. The study results do not indicate that differences or potential for conflict do not exist.

Finally, it was also apparent that the trend in dogmatism as a function of time among engineers should be of paramount concern in his professional development

MEASUREMENT AND MANAGEMENT IMPLICATIONS
OF INTERGENERATIONAL DIFFERENCES IN
RESISTANCE TO CHANGE

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MEASUREMENT AND MANAGEMENT IMPLICATIONS OF INTERGENERATIONAL DIFFERENCES IN RESISTANCE TO CHANGE

CHAPTER I

INTRODUCTION

THE PROBLEM

Traditionally, the engineer has been pictured as virtually a recluse, skilled in the technical application of physical laws and charged by society with the responsibility for manipulating the environment for its general benefit. In most contemporary times it has become increasingly apparent that the environment of society is indeed a complex structure of natural, synthetic, and human resources that is not easily manipulated.

Natural resources heretofore the object of exploitations without particular concern for depletion, have become limits to our common future rather than the building blocks of any future deemed appropriate by society. History suggests that the engineer is also guilty of ignoring our most important resource, the human resource. Only recently has this resource been intensely studied. The question, today, appears to be not merely whether to include man's characteristics as considerations in job and task development, but rather, which characteristics should be studied and how the information gained can be effectively used.

HISTORY

"Scientific management was supposed to stimulate the mental revolution which, in turn would cause managers to manage better and

workers work harder for higher productivity." (Haiman and Scott, 1970, p. 28). The origin of the Scientific Management concept is generally attributed to the work of Fredrick Winslow Taylor. It is reported that Taylor's own bitter experiences as a first line supervisor late in the 19th century caused him to seek better methods for determining what an industrial worker could reasonably be expected to accomplish. His early experiences had a profound effect in establishing his philosophy of 'initiative and incentives'. (Flagel, et al 1960)

The opening remarks of Taylor's (1911) book outline the precepts of his scientific management:

The principle objective of management should be to secure the maximum prosperity for the employer, coupled with the maximum prosperity for each employee.

The words "maximum prosperity" are used, in their broadest sense, to mean not only large dividends for the company or owner, but the development of every branch of the business to its highest state of excellence, so that prosperity may be permanent.

In the same way maximum prosperity for each employee means not only higher wages..., but of more importance still, it also means the development of each man to his state of maximum efficiency, so that he may be able to do, generally speaking, the highest grade of work for which his natural abilities fit him, and it further means giving him, when possible, this class of work to do. (p. 9)

Taylor's efforts were particularly significant because for the first time management was provided with the tools and techniques of not only determining how a specific job was to be done but also the basic considerations of how to select the proper man to do the required task.

The people-oriented portions of Taylor's Scientific Management were largely ignored in the competitive society of the early years in the twentieth century. Domestic acquisitions of United States based industries through the liquidations of foreign holdings brought on by the growing threat of war in Europe plus the eventual involvement of the United States in World War I combined to establish an environment of industrial giants. In the haste of industrial growth, the worker found himself relegated to the position of just another of the tools to be exploited in the quest for greater productivity.

In the period between the World Wars, technology enjoyed unprecedented growth. Workers were represented by a system of unions intended to protect their interests in the growing conflict between management and the managed. Pioneering efforts in the field of Human Relations such as the Hawthorne Studies at Western Electric Company were beginning to appear, but little practicable information was available concerning effective management of the most complex of all the resources used by the industrial sector of the American Society, the human resources.

The post World War II period saw many dynamic changes in the traditional concepts of management. One of the more spectacular was the introduction of Social Sciences into the management and engineering disciplines. It is interesting to note that the national society for the profession of Industrial Engineering, The American Institute of Industrial Engineers (AIIE), defines Industrial Engineering as being concerned with:

The design, improvement and installation of integrated systems of men, materials and equipment. It draws upon specialized knowledge in mathematical, physical and social sciences together with the principles and methods of engineering analysis and design to specify, predict, and evaluate the results to be obtained from such systems.

Perhaps we are now better able to deal with the behavioral aspects of achieving optimum performance by each worker. Today, the need is recognized and at least basic techniques are available to encourage more insight into the human factor in management and industry. David Sirota (1967) expresses the need for closer relationships between the social and technical sciences in an article prepared for the Journal of Industrial Engineering. He suggests that the fields of social science and industrial engineering have a great deal to learn from each other and must work together:

Hopefully, the next decade will witness the lessening of our isolation from each other and the beginning of joint efforts towards modifying jobs and organizations. The managers of the '70's' --- those that must somehow come to terms with America's new conditions and new values --- will demand no less.

THE STUDY

The human factor in the 'system of men, materials and equipment' identified in the AIIE definition is the subject of this study. The term intergenerational, as it appears on the title page, refers to potential differences in certain attitudes found within the adult, working world and attitudes held by students about to enter the work environment. More specifically, Dogmatism and Theory X-

Theory Y test scores taken from selected groups of upper division university students and selected groups of adults were compared to determine the extent of similarity between the groups.

The study is organized in the following manner. Chapter One is the Introduction. Chapter Two presents a brief discussion of the concepts of intergenerational differences and offers support to the idea that humanity is indeed exposed to and participating in the evolution of a dynamic and exponentially changing environment. Chapter Three describes the methodology used to collect data for the study. Chapter Four presents the results of the survey effort and provides analysis of the data collected. Chapter Five provides some insight into the significance of the findings and their implications for the managers and engineers of today and the immediate future. Chapter Six presents the study conclusions and other concluding remarks.

CHAPTER II

BACKGROUND

CONCEPT OF GENERATIONS

As recently as 1953, the term generation was defined by Webster in part as "... the ordinary period of time at which one rank follows another, or father is succeeded by child -- usually taken to be about 33 years." The Webster definition reflects the traditional concept that generations are defined in terms of parent-child relationships. Margaret Mead describes the culture wherein youth matures and is educated in the ways of their parents and are expected to (and do) follow in the footsteps of their forefathers as being postfigurative. "A postfigurative culture is one in which change is so slow and imperceptible that grandparents, holding new born grandchildren in their arms, cannot conceive of any other future for the children than their own past lives." (Mead, 1970, p. 1) The postfigurative culture that Mead describes seems to agree with the generation definition offered by Webster.

Feuer (1969) suggests that the age span of a generational element is not in terms of a specific biological chain or finite number of years such as a father-son relationship. He advocates a generation as being comprised of individuals of a common age group. The generational groups thus formed are differentiated by significant variations in the environment of their respective formative years. The implication drawn from Feuer is that as an environment becomes more dynamic,

the time span of the generations will be substantially shorter than those of the traditional or postfigurative societies. The 1968 version of the Webster Dictionary also reflects this change in definition by including, "... category of individuals born and living contemporaneously."

Mead argues that as the tempo of change accelerates, the post-figurative culture gives way to a new phenomenon which she terms co-figurative. The characteristics of this new culture reflect generational groups armed with new knowledge and skills not possessed nor understood by the older generation. The resultant isolation of the older groups causes the younger groups to become dependent upon their peers for learning and the cultural development that came from the forefathers in the postfigurative societies. The cofigurative society concept is not incompatible with Feuer's classification of generations. Both have as a common basis the function of a changing societal environment.

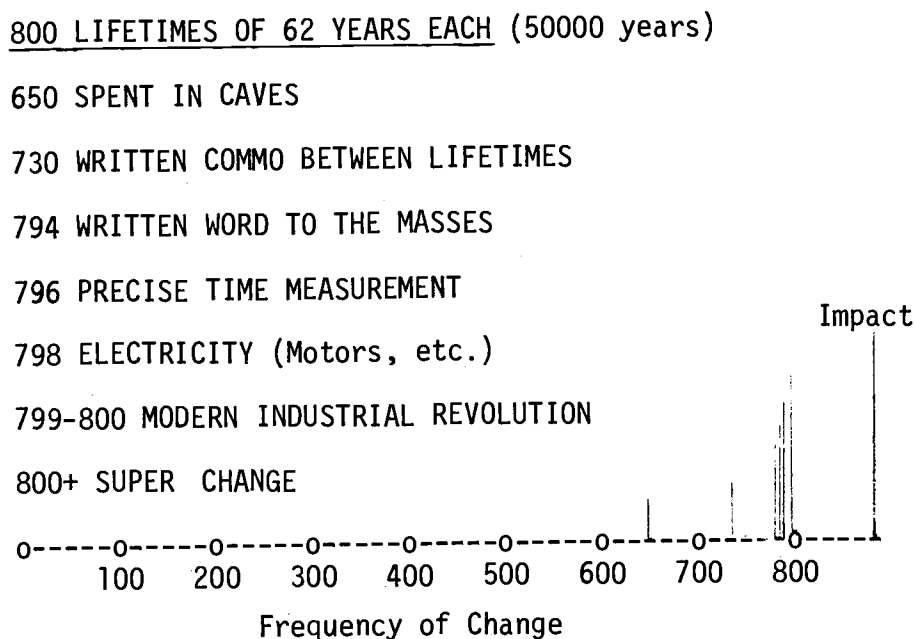
ENVIRONMENT OF CHANGE

During the last decade considerable attention has been devoted to the effect of change on our society, environment, and future. One of the more sensational and thought provoking treatments is presented in Alvin Toffler's 1970 book, Future Shock. Toffler (1970) divides the last 50,000 years of human history into sixty-two year increments, each representing one lifetime. He then traces the technological achievements of man during the 800 lifetimes represented. Toffler further points out that only the most recent 150 lifetimes have been

spent freed from the caveman environment. However, once freed from the caveman limitations, changes began to accelerate with the growth of knowledge and advent of technology. Toffler suggests that nearly ninety percent of all scientists who ever lived are alive today, and he theorizes that the phenomenal growth in applied knowledge experienced to date is only the very beginning of a future of truly dynamic and exponential change.

Figure 1 depicts graphically the increasing frequency of major and technological changes since man left his caves. The data represented suggests that the impact of these changes should be viewed as exponential rather linear functions.

FIGURE 1. History of Man



It is necessary to look only at the technological changes that have occurred during the lifetime of any one in the "over thirty" age

group to provide the basis for accepting Toffler's concepts of change.

Luthans (1973) traces the stages of technology development in terms of: Handicraft Technology of the middle ages; Mechanized Technology of the Industrial Revolution of the 1700's; Mass-production Technology introduced by the Ford empire; The Automated Technology of the post WWII era; and finally what he terms Cybernated Technology. Cybernated Technology is defined by Luthans as a "... stage beyond automation where machines run and control other machines. Computers, not humans, play the most important role in the cybernated technology." (Ibid., p. 288) Note that the advent of Luthan's Mechanization appeared a scant three lifetimes ago as measured on Toffler's lifetime scale. Luthans also offers the opinion that today the total scientific knowledge available to society is doubling each decade and the rate of doubling is accelerating.

This supports the concept that not only is technology responsible for change in the social framework but that the rate of change is accelerating at a pace that is already difficult to measure. An environment of rapid change cannot be logically denied.

REACTION TO CHANGE

Margaret Mead concludes her study of the generations (Mead op sit) with a discussion of the culture that she suggests is dictated by the environment of dynamic change. In the prefigurative culture the various generational groups are cast in the role of both student and teacher. The skills and experiences unique to each generation

are shared with the society as a whole. According to Mead, establishment of a prefigurative culture is the challenge faced by mankind today.

In management literature, the basic precepts of what Mead terms the prefigurative culture are identified and stressed as the guiding principles of managerial thought. Given that generational groups can be expected to retain their individuality and given a dynamic environment in which the unique generational groups must interface, one measure of the degree to which the generations are able to be mutually supportive might be the extent to which the groups are similar in their ability to accept change.

OPEN - CLOSED MINDS

Study of the human belief systems have long been the forte of the psychological and sociological professions. In the period immediately following World War II, practitioners of the 'social' sciences devoted vast efforts in the investigation of the characteristics of people who espoused the concepts of anti-semitism and fascism so prevalent in that time period. One of the important research efforts of the late 1940s was The Authoritarian Personality written by Adorno and his associates. Adorno's study (1950) and his California 'F' Scale attracted wide attention, not all of which was complimentary.

In 1967, Kirscht and Dillehay published a review of the Authorian concept with supporting and dissenting opinions. M.

Brewster Smith, in the Forward to the Kirscht and Dillehay material, has this to say about Adorno's effort:

The Authoritarian Personality captured the imagination of scholars in many fields for its portrayal of a coherent psychological posture or syndrome of personality that makes psychological sense of diverse forms of social irrationality. Ethnic prejudice was the initial target, but the picture of the authoritarian that emerged . . . seemed to throw light on much else; on modes of leadership and followship, on true believers of various stripes, . . .

One of the extensions of authoritarianism was the development of the concept of Dogmatism by Milton Rokeach. In 1960, Rokeach expressed dissatisfaction with the concept of attempting to identify specific beliefs as indicators of personality classification such as in the Adorno method. He suggests that it is more significant to consider the individual's beliefs in the context of a system of beliefs. Rokeach developed the 'Dogmatism Scale' which was designed to measure generalized authoritarianism.

The relative openness or closedness of a mind cuts across specific content: That is, it is not uniquely restricted to any one particular ideology, religion, philosophy, or scientific viewpoint. (Ibid., p. 6)

In support of Rokeach's concept, Plant (1960) reports that the "Dogmatism Scale is less loaded with prejudice than the California F Scale and is a better measure of authoritarianism than the California F." Harvey (1963, p. 467) also reports findings that support Rokeach's concept that authoritarianism and closed-mindedness are directly related:

Both theory and research findings suggest strongly that authoritarianism disposes the individual toward increased closedness of his conceptual system and

hence toward warding off events that deviate very far from his simple and narrow-banded interpretive schemata.

Rokeach implies that the more closed an individual's belief system, the more the individual will be resistant to changes imposed by his environment and the more he will tend to view the unknown future with fear and mistrust. The resulting assumption is that "the closed mind, through fear of the new, is a passive mind ... it cannot integrate new beliefs into a system ..." (Ibid., p. 23) Conversely, the open-minded person will be more apt to deal effectively or at least rationally with the changes encountered and look to the future with personal confidence concerning the challenges of the future.

Rokeach's comments concerning dogmatism and resistance to change are generally supported in the literature dealing with dogmatism. For example, Pyron (1966) and Pryon and Lambert (1967) report that low dogmatics are more apt to be accepting of change. Ehrlich and Lee (1969) report that the literature on dogmatism supports the concept that high dogmatics are more apt to resist change. Cottle (1971) offers further evidence that the dogmatic individual demonstrates his anxiety about the unknown future by placing greater importance on the past than on either the present or the immediate future.

Rokeach is very specific in differentiating between dogmatism and rigidity. He states: "Rigidity refers to the resistance to change of single tasks or beliefs; dogmatism, to the resistance to change of a total system of beliefs." (Ibid., p. 22) This can

Be interpreted to mean that although an individual may hold certain of his beliefs very tightly, he none-the-less may be willing to alter his attitudes as a result of the cognitive thought process.

Stark and Kugel (1970, p. 291) use the works of Inkeles (1966) and Smith and Inkeles (1966) to imply a dogmatically inclined individual's predicament in modern society.

... that the higher a person scores on the Dogmatism Scale, the less likely that he will make what Inkeles (1966) means by a "successful adjustment as a citizen of a modern industrial nation (p. 144); or that he will possess what Smith and Inkeles (1966) mean by the attitudes, values, and ways of feeling and acting ... required for effective participation in a modern society. (p. 353)

Lipetz (1960) suggests that individuals who are less authoritarian tend to be better able to use information in arriving at judgmental decisions. The implication that low scores on the Dogmatism/Authoritarian Scales are more desirable is common throughout the references. However, Lipetz also reports that both low and high scores (extremes) tend to indicate stereotyped thinking. Thus, the individual who's dogmatism score is extremely low might also demonstrate the symptoms of resistance to change.

Concepts of a dynamically changing environment, the potential of a prefigurative culture with its demands for cooperative learning by its participants and generational identities extending beyond the family relationships suggested dogmatism or resistance to change as a common characteristic from which intergenerational differences and similarities might be identified. To that end, the volunteer

participants in this study were asked to complete the E Scale of Rokeach's Dogmatism questionnaire. The scale used is reproduced in Appendix II.

MANAGERIAL ATTITUDES

The prefigurative culture is defined as being dependent upon a high degree of reliance and cooperation among generations. Therefore, measurement of opinions concerning the value of man and man's propensity to rely on those persons with whom he must interact has been included in this study. These results provide another basis for discussion of the potential for intergeneration compatibility.

The late Douglas McGregor, investigated the subject of managerial approaches to the value of man and proposed the concepts of Theory X (McGregor, 1960). Briefly stated Theory X is:

1. The average human being has an inherent dislike for work and will avoid it if he can.
2. Because of this inherent dislike of work, most people must be coerced, controlled, directed, threatened with punishment to get them to produce adequately.
3. The average human being prefers to be directed, wishes to avoid responsibility, has relatively little ambition and wants security above all (Ibid., pp. 33-34).

Advent of the Human Relations Movement required an extension of Theory X. As a result, McGregor revised his original concept by adding the principles of Theory Y:

1. Work is as natural to man as play and rest and therefore is not avoided.

2. Self-motivation and inherent satisfaction in work will be forthcoming in situations where the individual is committed to organizational goals. Hence, coercion is not the only form of influence that can be used to motivate.
3. Commitment is a crucial factor in motivation and it is a function of the rewards coming from it.
4. The average individual learns to accept and even seek responsibility given the proper environment.
5. Contrary to popular stereotypes, the ability to be creative and innovative in the solution of organizational problems is widely, not narrowly, distributed in the population.
6. In modern organizations and business, human intellectual potentials are only partially realized. (Ibid., pp. 47-48)

McGregor intended that these assumptions concerning man be used as guides from which managers could better identify their own opinions and thus facilitate the development of their managerial strategies.

Karmel (1970) used McGregor's basic concepts to develop her investigation into the subject of the group decision process. Using a factor analytic technique, an attitude characteristic identified as the Trust Dimension was isolated. Trust is identified as "The extent to which employees trust superiors, subordinates and peers to do their jobs and to treat one another fairly." (Ibid., p. 13-14) Karmel argues that high trust generally corresponds to McGregor's Y orientation and conversely, the low trust attitude reflects X orientation.

The measurement of the Trust Dimension is accomplished through administration of Karmel's KYX Survey. From the original twenty-three items in the survey, nine have been identified as discriminating and have been incorporated into an abbreviated format. This nine-item scale was used in this study as a measure of the trust dimension for

the study participants. The KYX Scale is reproduced on page 4 of Appendix II.

A PREDICTOR

The two attitudinal scales discussed thus far are designed to identify individual characteristics along the dimensions of resistance to change and trust. To the layman, they are obviously psychological tests that might identify characteristics that the subject wishes to obscure or he may feel obligated to provide a "correct" rather than sincere response to the questions. The Dogmatism Scale and KYX Survey data must be interpreted in light of these biases.

Research for this paper uncovered a brief managerial-type situation, the Rule Enforcement Situation developed by Thomas Shull, Jr. and L. L. Cummings (Shull, et al 1966). The RES seems to offer the possibility of identifying both Dogmatism and X - Y attitudes with a less obviously psychological instrument that has face validity.

The problem presents four workers Adams, Baker, Carter and Edmonds, each of whom have violated a stated company rule. Brief justification is presented for each individual's recent infraction. The subject being tested is asked to identify how he would respond if he were the supervisor of each man. The response is merely to indicate against which, if any, of the workers the subject would impose the fine established for the rule infraction.

Shull and Cummings (Ibid.) argue that a subject's response about which workers he would penalize will identify the subject's character-

istics along an attitudinal continuum scaled from Humanitarian (no one penalized) to Legalistic (all workers penalized).

These authors also report that their studies suggest an individual who takes a position at the Legalistic extreme on the RES also demonstrates the characteristics of closed-mindedness and authoritarianism. The RES can be found on page 1 of Appendix II of this paper.

Figure 2 identifies stages along the RES continuum and defines their respective characteristics. The figure also reflects the hypothesized relationship of responses among the Rule Enforcement Situation, Rokeach's Dogmatism Scale and Karmel's KYX Scale.

FIGURE 2. Comparison of Rule Enforcement Situation responses with degree of dogmatism and Theory Y - Theory X attitudes.

SHULL & CUMMINGS Classification	Worker(s) Penalized	ROKEACH	KARMEL
<p>PURE HUMANITARIAN</p> <p>Rules are for guidance and development of employees</p> <p>Control via self or social discipline, not rules.</p> <p>Imposed legal authority is not needed</p> <p>Man is mature and will honestly try to comply with reasonable rules.</p>	No one	Open Minded Low Dogma	Theory Y Oriented
<p>CLINICAL-HUMANITARIAN</p> <p>Complete knowledge of rules is not expected</p> <p>Most violations are accidental and usually employees are not at fault</p> <p>Sometimes violations are for selfish reasons</p>	Edmonds		
<p>JUDICIAL-CLINICAL</p> <p>Supervisory judgment is required</p> <p>Intent and degree of violation are considerations</p> <p>Maintain integrity of rule</p>	Edmonds Carter		
<p>LEGALISTIC-JUDICIAL</p> <p>Administrative efficiency via rule enforcement</p> <p>Ignorance of rule is no excuse</p> <p>Management by exception</p>	Edmonds Carter Baker		
<p>PURE LEGALISTIC</p> <p>A rule is a rule-is-a-rule</p> <p>Any deviation from the rule must be dealt with</p> <p>Standards are necessary for control</p>	Edmonds Carter Baker Adams	Closed Minded Dogmatic	Theory X Oriented

CHAPTER III

METHODOLOGY

THE SURVEY POPULATION

Unfortunately, the literature search conducted for this study did not identify specific methods for establishing a precise point where one generation ends and another begins. As a result, the decision was arbitrarily made to concentrate upon two easily identifiable generations 1) those undergoing formal higher education and 2) individuals practicing their selected professions.

The student population was taken from the upper-class enrollment at Oregon State University. Subgroups are identified according to the course of study being followed. The primary disciplines included Engineering and Business. A third primary group is composed of individuals currently registered in Army or Air Force Reserve Officer Training Programs. In an attempt to obtain an acceptable cross-section of students, data were collected only from regularly scheduled class meetings of courses required for completion of a degree program. More will be said later concerning the validity of this sample.

On the personal data section of the survey (Appendix II) in addition to anonymous biographical data, students were asked to list their major school and ROTC affiliation (if any). This additional information was useful in arranging the survey data in appropriate disciplinary groups. Data from foreign students was isolated and not included in this study.

Although a random sample of the students at Oregon State University could have been obtained, it was recognized that a similar sample taken from the practicing adult groups was clearly beyond the capabilities of this researcher. It was decided instead, to develop the adult input from the same groups represented in the student population. Therefore, members of the faculty from the schools of Business and Technology and Engineering at Oregon State University and members of the active military affiliated with the Army and Air Force ROTC programs, were asked to participate. Members of the Portland, Oregon Chapter of the American Institute of Industrial Engineers were also included in this study. The data collected from this non-academic body were found to be compatible with data from the Engineering faculty and were ultimately included in the results.

It is important to recognize that the surveyed populations do not constitute a randomly drawn sample. The results obtained from the analysis of data taken from these populations can be said to represent only the groups actually tested. No attempt has been made by this researcher to generalize the results to all students or all employed adults. Any such attempt would not be supported by the data.

SURVEY PROCEDURES

It is recognized that data collection in a controlled environment is most desirable. However, in the case of this study, total control was not possible due to the limiting time constraints of some of the students and the inaccessibility as a group of parts of the faculty.

The collection of survey data for this study was accomplished through the use of three techniques. These included a controlled environment where the survey was completed in the presence of the researcher. In the two uncontrolled environments, participation was required by the researcher but completed surveys were returned at a later time or the total request for participation and return of the surveys was accomplished by mail.

All contacts were made between September and December of 1972. Particular effort was made to avoid having the survey in the hands of any participant during holidays and periods of unusual stress such as mid-term or final examination periods or national elections.

In all cases, permission to approach each group of participants was sought and received from the proper authorities prior to actual contact.

Detailed introduction of the questionnaire to the subjects was kept to a minimum to avoid biases created from foreknowledge of what information was sought. Instructions were limited to those printed on the survey itself (Appendix II). All participation was voluntary and it was stressed that individual responses would be held in the strictest confidence. Approximately twenty minutes were required to complete the survey.

The letter of introduction accompanying the mailed surveys is shown in Appendix I.

SURVEY SCORING

The scoring of the three questionnaires included in the survey was in accordance with instructions provided by the respective authors.

The Rule Enforcement Situation is scored by totalling the number of individuals selected to receive the penalty. The five possible responses are indicated in Figure 2, page 18. The range of scores is from four to zero. In addition to the numeric answers, subjects were asked to briefly explain why they selected their particular course of action. The question was stated in a broad and non-definitive manner. Responses to this question were equally broad and non-definitive.

The Rule Enforcement Situation is relatively new and therefore has not been subjected to wide usage. The RES is still undergoing further developmental research according to its authors (Shull, et al 1970). Consequently, there is no reliability data available as yet.

The Dogmatism Scale is completed by assigning a whole number value (between negative and positive three omitting zero) corresponding to the degree of agreement with each statement.

The scale can be scored by summing algebraically the positive and negative values awarded to each of the forty items in the scale. Rokeach (1960) suggests adding the positive value of four to each scored item thereby giving each answer a positive value between one and seven. The positive integers are then summed to reflect the subject's dogmatic score. The possible range of scores is then forty to 280 along a continuum from low to high dogmatism. This latter method was used for this study.

Rokeach (1960, p. 89-90) reports reliability developed by the test-retest technique over a period of up to six months with the Dogmatism Scale:

... Form E was found to have a corrected reliability of 0.81 for the English Colleges II sample and 0.78 for the English worker sample. In other samples subsequently tested at Michigan State University, Ohio State University and at a VA Domiciliary, the reliabilities ranged from 0.68 to 0.93.

Ehrlich (1961) used split-half and test-retest techniques to test reliability of the Dogmatism Scale and reports results of 0.75 and 0.73 respectively. Hanson (1970) also reports support of Rokeach's contention that the Dogmatism Scale measures general authoritarianism.

The nine items in Karmel's Scale are two-part questions with one possible response in each set representing Theory X orientation and the other Theory Y. The items have been designed to be double-scored in that agreement with one statement in each set automatically implies rejection of the other statement. In Karmel's Scale, each X oriented statement selected is awarded a value of positive one and each Y oriented statement is awarded the value of negative one. The score on this nine item scale is reflected in a single number representing the algebraic sum of the responses rather than separate scores for the X and Y values. This single number score is made possible because of the double-scoring characteristic of the question arrangement and is easily subjected to statistical computation. An individual's position on the X to Y continuum is reflected by the sign (X=+, Y=-) and weight (1 to 9) of his totalled responses.

The scale has been used frequently to measure student attitudes both before and after taking course work that would be expected to encourage Y orientation. The test-retest results support the predicted attitude change in that the retest scores are more Y oriented than the scores for the same individuals taken from the pre-course testing (West, 1971). These studies demonstrate the scale's stability through its capability to reflect a predictable attitude change.

The KYX Scale's demonstrated stability and its inherent ability to measure the trust factor and correlate with Theory X - Theory Y orientation are the basis for its use in this study.

DATA ANALYSIS

For the purpose of this survey, it has been assumed that the population scores used are normally distributed. Therefore, the use of parametric statistical analysis of the study data is deemed appropriate.

The frequent use of the normal distribution stems from its appropriateness for many variable sampling situations and to the central limit theorem: the means of small samples tend to be distributed according to the properties of the normal distribution regardless of the distribution from which the samples were taken (Riggs, 1970, p. 493).

The individual surveys were scored according to the methods described. All survey scores were double checked for accuracy and were then posted to data sheets representing the individual's scores on the Rule Enforcement Situation, the Dogmatism Scale and the KYX Scale. Each respondent's age was also recorded. The data were initially grouped by respective disciplines, generation group and sex. A data

processing card was key punched for each set of individual data. The verified data cards were then read into the OS3 operating system on Oregon State University's CDC-3300 computer. Specific analysis was performed using the Statistical Interactive Programming System (SIPS) (Guthrie, et al 1972).

Specific computations were performed in conjunction with the Department of Statistics Student Counseling Service. Computations include mean, standard deviation, correlation and analysis of variance, and testing for significance using the Student t techniques with a confidence level of 0.95.

HYPOTHESES

The survey data collected during this study have been subjected to statistical analysis in an attempt to evaluate the following hypotheses.

1. There is strong positive correlation of test scores between the Rule Enforcement Situation, Dogmatism Scale, and the KYX Scale.
2. There is strong positive correlation between the Dogmatism and KYX Scales if the KYX score is in the extreme two thirds of the range (\pm three).
3. There is strong positive correlation between a subject's age and his scores on the Rule Enforcement Situation, Dogmatism Scale, and the KYX Scale.
4. The average scores of the student groups do not vary significantly from the scores of comparable adult groups.

Hypothesis one is directional and is based on the information in Figure Two. The apparent parallelness of the three survey devices is

expected to be reflected in strong positive correlation between the tests.

The concept that closed-mindedness is related to Theory X orientation is addressed in Hypothesis One. However, since dogmatism measures how strongly beliefs are held, rather than which beliefs, it follows, that a highly dogmatic person could be oriented towards Theory X or Theory Y attitudes. Thus, directional Hypothesis Two is based on the concept that strong positive Dogmatism-KYX Correlation will be found in the extreme scores on the KYX Scale.

Hypothesis Three is also directional and is based on the commonly held view that older individuals tend to be more dogmatic and that this rigidity is also reflected in a Theory X orientation.

Hypothesis Four is intended to test the common assumption that today's youth demonstrate attitudes that are more liberal than those of the older generation.

CHAPTER IV

RESULTS OF DATA ANALYSIS

SURVEY RESPONSE

As identified earlier, three methods of gathering data were used during this study. Table 1 presents the over-all response to the request for voluntary participation in the survey effort. The mailed survey returns are included in the response rates for the Adult Engineers and Adult Business classifications. All of the Adult Business surveys and twenty-five of the requests for participation to the Adult Engineer Group were conducted by mail. The Military Cadre and Army ROTC Student surveys were not completed in the controlled environment but were picked up by the researcher after the initial contacts were made.

TABLE 1 SURVEY RESPONSE

	Participation Requested	Returned	Used	Used as Requested	% of Returned
Adult	124	84 (68%)	71	57%	85%
Engineer	54	38 (70%)	33	61%	87%
Business	49	25 (51%)	20	41%	80%
Military	21	21 (100%)	18	86%	86%
Student	149	145 (97%)	135	91%	93%
Engineer	52	52 (100%)	43	83%	83%
Business	51	51 (100%)	40	79%	79%
ROTC					
Army	30	26 (87%)	22	74%	85%
Air Force	19	19 (100%)	19	100%	100%
Foreign	13	13 (100%)	11	85%	85%

Only those surveys that contained complete responses were retained for further analysis. The column titled "used" indicates the number of surveys that were ultimately subjected to detailed analysis. The total student response as shown in Table 1 is 135. However, that includes eleven foreign students who were not included in the subsequent combined analysis. Thus, the N size for the student group will appear in other sections as 124 rather than 135.

The Adult-Business, Student-Engineer, Student-Business, and Student-ROTC groups include the responses of two, three, six and two women respectively. The common concept that women have a different work ethic and cultural outlook necessitated comparative analysis before their data could be included with that of their male counterparts.

The age stratification of the survey respondents represents a span of forty-three years with the age of the youngest being twenty years. Ninety-one percent of the student responses came from the twenty to twenty-five year age groups. Seventy-three percent of the adult responses came from the twenty-five to forty-five year age groups.

TABLE 2 AGE STRATIFICATION

years	adult	percent	student	percent	overall percent
20-25	4	5.6	113	91.1	60.0
25-30	17	23.9	11	8.9	13.8
30-35	11	15.5	--	--	6.2
35-40	16	22.6	--	--	8.2
40-45	8	11.3	--	--	4.1
45-50	6	8.4	--	--	3.1
50-55	4	5.6	--	--	2.0
55-63	5	7.0	--	--	2.6

MALE - FEMALE SCORE COMPATABILITY

The subject of male and female reaction to the Dogmatism Scale has received considerable attention. The polarity of opinions is demonstrated by Rokeach and Alter. Rokeach (1960) in his original study found no difference in male and female scores. Alter, (et al 1966) however, reports that women consistently score lower (less dogmatic) than men. A plausible explanation is offered by Vacchino (et al 1967) who suggests that "The sex difference is due perhaps to the varying cultural roles played by men and women and the opportunities offered them for expressing dogmatism."

It was assumed by this researcher that the female subjects of this study would not score differently from their male contemporaries. However, because of the divergance of opinions found in the literature, it was decided that in order to consolidate the data from both sexes it would be necessary first to determine that the mean values of the male and female responses are not significantly different. Table 3 reflects the Student t values and their respective limits.

TABLE 3 MALE - FEMALE SCORES

Group	Male N	Female N	DF	t observed			t Table @ .05
				RES	DOG	KYX	
Adult-Business	18	2	18	0.6310	0.4450	0.2000	2.101
Student-Engineer	27	3	28	0.4732	0.0243	0.4706	2.048
Student-Business	34	6	38	0.9438	0.9409	0.5770	2.030
Air Force ROTC	17	2	17	0.5760	0.5630	0.3983	2.110

It can be seen from Table 3 that the Student t values for each group fall well below significant levels. Consequently, in subsequent analyses, the male and female data have been combined for each classification.

STUDY GROUPS

Initially it was intended that the comparisons be conducted for three disciplinary sub-groups in each generation. A procedure similar to that used for the male-female classification was followed in order to classify the data into sub-groups of Business, Engineer or Military. In all cases except one, the elements of the sub-groups were found to be similar. The exception was between dogmatism mean scores for the Army ROTC and Air Force ROTC Student Elements ($t_{\text{observed}} = 3.2932$, $DF = 39$, $t_{\text{Table}} = 2.030 @ .05$). Therefore, the remaining analysis was redesigned to present data for four sub-groups under each of the populations investigated. The group size, mean score for each of the three survey devices and respective standard deviations are shown in Table 4.

TABLE 4 SURVEY MEAN SCORES

Groups	N	RES	RANGE	SD	DOG	RANGE	SD	KYX	RANGE	SD
Adult	71									
Business	20	1.750	0-4	1.743	116.00	76-152	19.66	-1.30	-5+1	2.18
Army Cadre	13	2.384	0-4	1.609	123.30	82-166	24.06	-0.69	-7+3	3.25
Air Force Cadre	5	1.800	1-4	1.304	135.00	101-151	19.83	-1.80	-5+1	2.28
Engineers	33	1.879	0-4	1.710	138.55	78-176	24.45	-1.55	-9+5	4.04
Students	124									
Business	40	1.250	0-4	1.171	137.82	103-193	23.00	-1.15	-9+7	3.88
Army	22	1.227	0-4	1.066	136.86	104-177	17.22	-1.91	-7+5	3.37
Air Force	19	1.579	0-4	1.070	156.68	126-199	21.31	-0.37	-5+5	2.31
Engineers	43	1.953	0-4	1.430	135.37	87-190	24.92	-0.81	-9+7	3.46

The data analyses are presented in order of the hypotheses listed in Chapter Three of this paper.

CORRELATION OF SURVEY DEVICES

Hypotheses One and Two deal with the relationship of an individual's scores on the three tests. Correlation data between the tests, between the tests and subject's age, group sizes, for each group are presented in Table Five.

TABLE 5 TEST SCORE CORRELATION

Groups	N	I	II	III	IV	V	VI
		DOG-RES	DOG-KYX	KYX-RES	AGE-RES	AGE-DOG	AGE-KYX
Adult	71						
Business	20	0.2579	-0.2285	0.0069	-0.2107	0.1197	0.2932
Army Cadre	13	*0.4165	*0.5314	-0.0245	-0.3375	*0.7372	*0.8096
Air Force Cadre	5	-0.8989	-0.5526	*0.7736	0.3716	0.5244	-0.1833
Engineers	33	-0.0611	0.1442	0.0896	*0.4265	-0.0492	0.0112
Students	124						
Business	40	-0.1059	*0.3646	-0.0367	-0.1064	0.1019	0.1123
Army ROTC	22	0.0874	0.0980	*0.6179	0.1956	-0.0149	0.2974
Air Force ROTC	19	*0.4686	-0.1061	0.3375	-0.0280	-0.0779	0.0810
Engineers	43	0.0195	0.1765	-0.0655	-0.1042	-0.1721	-0.0117

* Correlations significant at $\alpha = 0.05$.

Hypothesis One suggests in part that the more closed-minded (dogmatic) an individual is, the more legalistic will be his approach to the Rule Enforcement Situation. As can be seen in Column I of Table Five, there does not appear to be any identifiable pattern of correlation for any of the sub-groups. As shown in the table, the data failed to support this hypothesis in all cases except for the Air Force ROTC Student Group where the observed correlation +0.4686

is significant at the 0.05 level. However, the correlations for the Military Cadre, Adult-Business, and Air Force ROTC Students should not be summarily dismissed. They suggest potential for additional study.

Hypothesis One also suggests that the more dogmatic an individual is, the more X (+) oriented will be his score on the KYX Scale. The data presented in Table Five, Column II again presents a confounding array of information. Two correlations that would tend to support this hypothesis are found in the correlations for the Army Cadre and the Business Adults. Both are significant for their respective n's. However, the correlations observed for the remaining six groups do not support the hypothesized correlation between Dogmatism and KYX. The earlier comment pertaining to additional study is also pertinent to this subject area.

Hypothesis One also deals with the relationship between scores on the KYX Scale and the Rule Enforcement Situation. From Table Five (Col. III) it can be seen that only two significant correlations were found. One is with the Air Force Cadre scores and the other is found with the Army ROTC Students. Thus, it can be seen that the data failed to support the hypothesized strong correlation between the KYX and RES Scales for six of the study groups. Therefore, Hypothesis One, that there is strong positive correlation between the RES, Dogmatism, and KYX Scales cannot generally be supported by the data from this study.

An additional inquiry into the relationship between an individual's scores on the Dogmatism Scale and the KYX Scale was conducted. The purpose of this additional analysis was to determine if extreme scores on the KYX Scale would correlate strongly with the same individual's performance on the Dogmatism Scale. In other words, if the KYX Score is strongly negative (high trust) or strongly positive (low trust) is the dogmatism score also large (more dogmatic)? This is shown in column three. Columns four and five examine if the relationships might only be true among Theory X or Theory Y respondents, respectively. Columns one and two investigate whether the relationship is only true among the more extreme scores.

TABLE 6 EXTREME KYX-DOGMATISM CORRELATION

	RANGE KYX SCORES				
	+(4 to 9)	-(4 to 9)	Absolute (1 to 9)	+(1 to 9)	-(1 to 9)
X-Y Orientation	X	Y		X	Y
Group Size	21	42	195	71	124
Correlation Observed	0.0686	-0.1784	-0.1031	0.0294	0.1325
Correlation tested at $\alpha = 0.05$					

The survey scores were grouped according to the classifications as shown in Table Six. The observed correlations are clearly not significant for their respective n's. Therefore, Hypothesis Two, that there is strong positive correlation between the Dogmatism and

KYX Scales if the KYX score is in the extreme two-thirds of the range (\pm three) cannot be supported by the data from this study.

Hypothesis Three, in part, suggests a strong relationship between a subject's age and his score on the Rule Enforcement Situation. Column IV of Table Five indicates only one observed correlation that is significant, the Adult Engineer Group. Therefore, for this study, the hypothesis of strong age-RES score correlation is not supported.

Hypothesis Three also addresses an expected strong relationship between the age of the subject and his score on the Dogmatism Scale. In other words, it was expected that the older the respondent, the more dogmatic (resistant to change) his attitudes. Column Five of Table Five shows little correlation for most of the groups. For the purpose of this study, then, the greater age, greater dogmatism relationship cannot be supported.

Finally, Hypothesis Three also proposes a strong correlation between an individual's age and his score on the KYX Scale. Column Six of Table Five reflects the data on this subject. Again, the hypothesis of strong positive correlation is not supported by data from this study.

In general, it must be said that Hypothesis Three, that there is a strong positive correlation between a subject's age and his scores on the RES, Dogmatism, and KYX Scales is not supported.

To summarize the results of this study in regard to the first three hypotheses presented, it is appropriate to say an individual's responses to the three survey devices used to gain data for this study do not appear to be strongly related to one another. Additionally, the subject's age and sex did not appear to indicate or predict his response to any of the survey tests. As was pointed out earlier in this paper, the results of this study (because the sub-groups do not necessarily represent their respective populations) cannot be generalized but must reflect the characteristics of only the actual groups that participated in the study.

The test of Hypothesis Four was performed by means of the Two-way Analysis of Variance Technique. This analysis revealed that for the two populations surveyed the individual scores on the Rule Enforcement Situation and the KYX Attitude Scale were similar (Tables Seven and Eight). The conclusion drawn from these results is that intergenerational differences as measured by the two devices are not statistically significant.

However, the ANOVA Test revealed significant differences and interaction on the dimension of dogmatism as shown in Table Nine. Therefore, the group means were subjected to unpaired "t" tests, using the ANOVA estimate of variability for the variance estimate. The data was tested using 187 degrees of freedom and a "t" Table value of 1.97 at the 0.05 level. Table Ten presents the data developed from the "t" Tests.

TABLE 7 RES TWO WAY
ANALYSIS OF VARIANCE

SOURCE	df	TSS	MSS	F _{obs}	F _{TBL}
GENERATION	1	5.5	5.5	2.7604	3.89
VOCATION	2	7.3	3.7	1.8329	3.04
INTERACTION	2	6.6	3.3	1.6541	3.04
ERROR	189	375.5	1.9		
TOTAL	194	396.3			

$\alpha = 0.05$

TABLE 8 KYX TWO WAY
ANALYSIS OF VARIANCE

SOURCE	df	TSS	MSS	F _{obs}	F _{TBL}
GENERATION	1	3.9	3.9	0.3378	3.89
VOCATION	2	0.3	0.15	0.0139	3.04
INTERACTION	2	6.8	3.4	0.2923	3.40
ERROR	189	2212.4	11.7		
TOTAL	194	2223.4			

$\alpha = 0.05$

TABLE 9 DOGMATISM
TWO WAY ANALYSIS OF VARIANCE

SOURCE	df	TSS	MSS	F _{obs}	F _{TBL}
GENERATION	1	4157.5	4157.5	*7.7552	3.89
VOCATION	3	7845.7	2615.2	*4.8783	2.65
INTERACTION	3	5744.4	1914.8	*3.7255	2.65
ERROR	187	96113.5	513.9		
TOTAL	194	114717.9			

*Values significant at the $\alpha = 0.05$ level.

TABLE 10 UNPAIRED 't' TEST - DOGMATISM

Student \ Adult				
	Engineers	Air Force	Army	Business
Engineers	<u>0.6071</u>	0.3258	*2.0544	*3.5092
Air Force	*3.4125	<u>1.9027</u>	0.9832	1.6754
Army	0.2507	*2.2887	<u>1.7099</u>	0.9039
Business	0.4889	*2.9859	0.1562	<u>*3.0509</u>

* Significant at $\alpha = 0.05$

Student-adult tests are on the major diagonal

t values in lower left half of matrix refer to observations from the student groups. t values in upper right position of the matrix refer to observations from adult groups.

Table Ten reflects several sub-group differences that are statistically significant. However, of particular interest to this study is the information contained in the student-adult tests. Clearly, the Engineer Adult and Student Engineer groups are not dissimilar. The Air Force and Army groups fall within the statistical limits for being considered similar, however, the magnitude of the t observed value must not be overlooked. Finally, the Business oriented groups are shown as being clearly dissimilar.

In viewing the results indicated in Table Ten, two factors should be taken into consideration. First, the size of the group participating from the Air Force Cadre is very small (five members) and this relatively small element could have statistical implications. Secondly, the twenty member response from the Adult Business population could be cause for speculation. The comparatively low rate of participation from this group (51%, Table 1) coupled with the group's low mean score (116.0, SD 19.66, Table 4) could be an indication that within the adult business population tested, those individuals who tend to be more dogmatic did not elect to participate in this study. This speculation is supported to some degree also by the fact that the portion of the Adult Engineer group surveyed 'via the mails' also demonstrated a low rate of survey return (36%) and a mean dogmatism score lower than the mean score of the other members of the Adult Engineer Group. Statistical analysis established the compatibility of the 'mail group' scores with the

other engineers participating and therefore, the Adult Engineer groups were treated as one entity for the study purposes. The question of the relationship of dogmatism to voluntary participation cannot be answered here, but it is a potential topic for additional investigation.

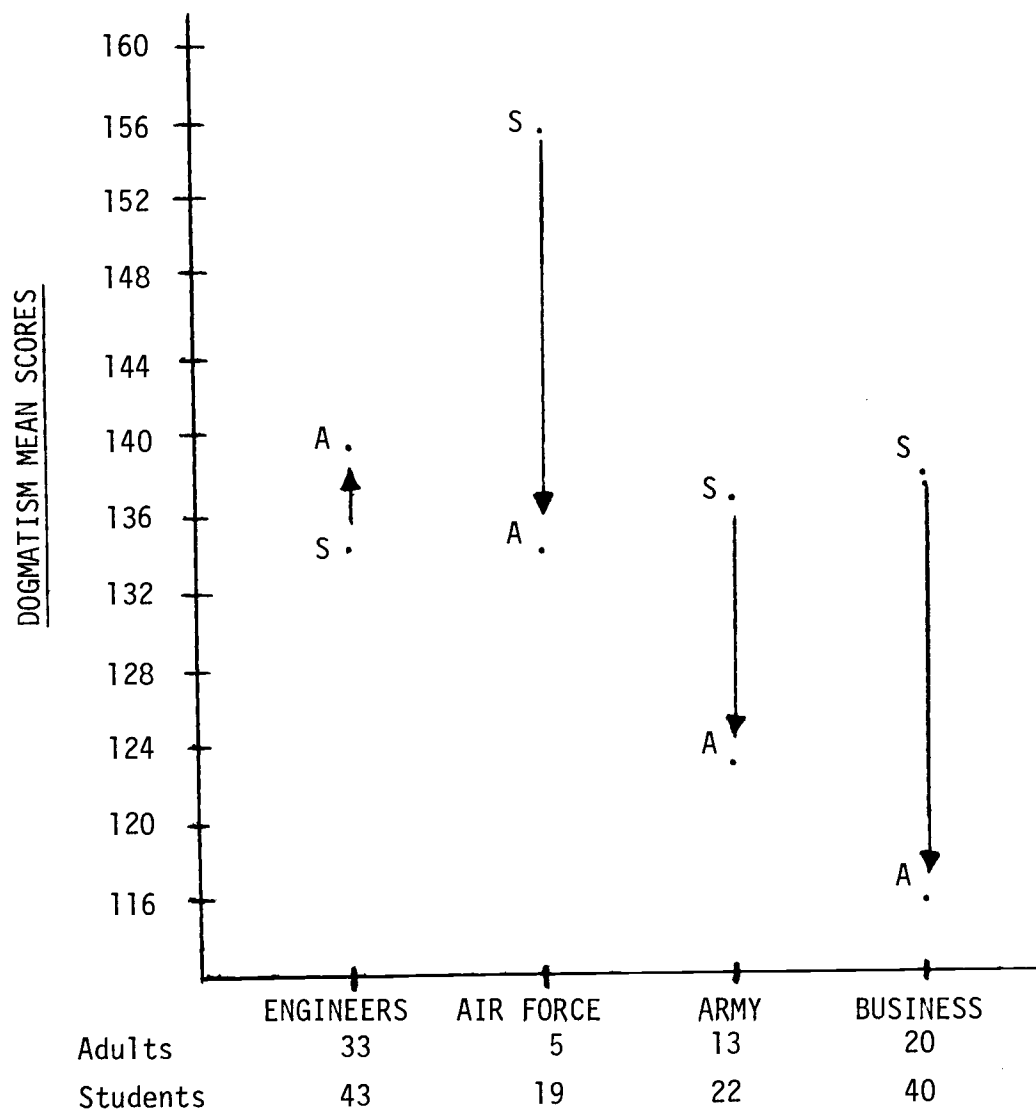
In addition to graphically displaying the pattern of interaction, Figure Three reveals other pertinent information.

First, the student mean scores except for the Engineers are greater than the mean scores for the Adults. This suggests that the students are more dogmatic than their adult counterparts contrary to popular opinion.

Secondly, the trend of attitudes within the adult groups is generally toward less dogmatism. This trend suggests that the more dogmatic attitudes of the students may become muted by work experience. In the case of the engineers, no significance is found. In the absence of strong age-dogmatism correlation (Table 5) it is speculated that the trend toward more dogmatic thinking may be a function of the technical nature of the work environment and is of signal importance to the fields of engineering in today's society.

Thirdly, the values shown for the military groups are not statistically significant. However, as shown in Table Ten, the "t" Tests are very close to being significant. The respective 'n's are small and may account for the inconclusive data. The moderately high dogmatism means for the ROTC Students tends to agree with opinions expressed in the literature on Authoritarianism.

FIGURE 3 DOGMATISM MEAN SCORES



Golightly (et al, 1970) and French (et al, 1955) report findings that voluntary participants in military programs tend towards moderate to moderately high authoritarian characteristics.

Campbell (et al, 1957) reports that authoritarianism tends to decrease with increasing military experience. The lower mean scores of the military cadre may be as Campbell argues or they may be a function of the selection process for making ROTC assignments, or a combination of both.

In summary, the analysis of Hypothesis Four, that the average scores of the student groups do not vary significantly from the scores of comparable adult groups is not rejected by the data from the dimensions measured by the Rule Enforcement Situation and the KYX Scale. The ANOVA data (Table 9) rejects the hypothesis of similarity for the combined data along the dogmatism dimension.

CHAPTER V

MANAGERIAL IMPLICATIONS

GENERAL CHARACTERISTICS

The average student who participated in this study was characteristically somewhat Theory Y oriented on the Trust Dimension. The adults surveyed portrayed the same general characteristics of trust. The two populations did register differences on the Dogmatism Dimension.

However, there is some evidence to suggest that mean scores of sub-groups in this study fall within the middle ranges on the Dogmatism Scale. In the case of student groups, the means are within one Standard Deviation of the overall student mean score ($\bar{X} = 139$, S.D. = 23, ± 1 S.D. = 116 to 162). Similarly, the adult group means are also within one Standard Deviation of the adult mean score ($\bar{X} = 129$, S.D. = 25, ± 1 S.D. = 104 to 154). The Standard Deviations found in this study are representative of those reported by Alter and White (1966) in summarizing the results of many diverse populations.

Since the attitudes of these groups appear to fall within the middle ranges, it might be suggested that the generation gap poses no particular threat to modern industrial society. Daniel Seligman (1969) offers an euphoric view of intergenerational differences:

The Generation Gap is not serious. The notion is agreeable because it implies that this young generation too will eventually come to terms with its elders and their institutions, that the arguments now swirling around the campuses will pass, and at some point looking through a nostalgic haze, we will perceive the young rebels of the 60's as legitimate successors to the flappers of the 20's, campus radicals of the 30's, 'beats' of the 50's, all of whom influenced our society in one way or another but were ultimately absorbed into it.

This reasoning suggests our society is in a postfigurative stage where generational differences occur within the father-son-like relationships. Changes, then, are evolutionary. Each individual knows that his place in the pecking order is determined by age and experience. The cycle is inviolate and self-generating and therefore, the management task is relatively easy.

Seigman identifies the size of today's youthful population as being comparable with that of the 1930's (the older generation). In both cases, approximately twelve percent of the population would fall between the ages of eighteen and twenty-four.

A striking difference, however, is found in education levels. Today approximately four times as many youth are college educated as their 1938 contemporaries.

Since the educational level and skills of today's youth are so dramatically advanced over past generations, the impact is easily identifiable in the business world. William S. Rukeyser (1969) discusses the advance of youth into the business world and stresses that today's group is not similar to past echelons.

The degree to which U. S. corporations are being shaped by the new college graduates they seek and hire marks one of the important new paths taken by business in this decade. Educated young people are bringing impressive skills to business and making equally impressive demands. Companies wise enough to accommodate to both are reaping benefits.

If we accept this picture of college trained youth as being generally more dogmatic than their adult counterparts, highly skilled and at least potentially trusting and trustworthy, then, we must also recognize the potential for achieving a prefigurative culture and the

threat of regression into a postfigurative situation. Of course, the creation of a prefigurative society cannot be the sole responsibility of any single generation since, by definition, it is a cooperative venture. It would seem, however, that the transition from what Mead refers to as the cofigurative situation into the prefigurative must be initiated by those who control the managerial world. As Rukeyser points out, those corporations that encourage youth-oriented change in their traditional operating policies have experienced benefits both corporate and personal.

FEMALE ATTITUDES

We cannot argue that women who elect to be homemakers are attitudinally similar to the working male. However, the results of this study indicate that women who seek employment have similar attitudes of dogmatism and trust as men. The student women who are still to make the definite decision of which profession to follow (homemaker or business person) also share attitude similarities with their male contemporaries.

The implication to be drawn from this study regarding females as employees is that they can be expected to demonstrate the same general open-mindedness, acceptance of change and trust characteristics expected of males.

INTERGENERATIONAL SIMILARITIES

The commonly held opinions of the ultra-liberalism among today's youth are not supported by this study.

Rokeach (1960) states that conservatism is represented by high dogmatism scores while liberals score low on the scale. As has been shown, the student scores in this study fall within a mid-range on the dogmatism scale but generally greater than the scores of the adult population. The possibility that the students through maturation will become less dogmatic and more similar to the adult characteristics is suggested. However, a longitudinal study would be necessary to verify the trend. Interestingly, in this study those who possess the power positions from which the cooperative atmosphere must be initiated also possess the less dogmatic characteristics which would also tend to facilitate the change.

The implications are that management must: 1) Make some allowances at least initially for the more dogmatic characteristics of youth new to their staff. 2) Provide and insure the communication channels which are necessary for the cooperative learning which in turn fosters the development of the prefigurative society.

ENGINEERING APPLICATION

The AIIE definition presented in Chapter I defined the function of the Industrial Engineer as dealing with integrated systems of men, materials and equipment. Among his tools are the Social Sciences which he uses to predict and evaluate output of the system. Vail (1967)

describes the Industrial Engineer as functioning in a 'socio-technical system' where men and machines combine to achieve some predetermined goal. He argues that,

The socio-technical concept implies a view of IE behavior that is transactional rather than solely one of initiation on the work system ... His problem is not to overcome (the) resistance but is, instead, to understand what resistance means and modify his approach to take account of the work system needs of which the resistance is symbolic.

The system that the engineer deals with is a complex structure.

Leavitt (1962) submits that organizations must be considered,

as differentiated sets of sub-systems rather than as unified wholes. Such a view leads us toward a management-by-task kind of outlook, - with the recognition that many subparts of the organization may perform many different kinds of tasks and therefore call for many different kinds of managerial practices.

Fiedler (1965) suggests that the traditional practice of finding the right man for a job is not always the best technique for resolving corporate vacancies: "Business must learn how to utilize the available executive talent as effectively as it now utilizes physical plants and machine tools." Fiedler also advocates redesigning the job to fit the managerial talent available as an acceptable alternative to searching for the man to satisfy the job requirements. Considerations for redesigning the task are suggested to be; Leader-member relations; Leader-position power; and the Task itself. Of the three, the Position-power consideration is a function of the job and its location within the organizational structure. Both the Task and the Leader-member relations factors deal with authoritarian and trust oriented considerations.

However, it should be recognized that dogmatic characteristics are important in some occupational areas and that such an individual should be placed in a position that will take advantage of his characteristics.

Vroom and Mann (1960) report that individuals that tend to be authoritarian prefer and perform more effectively in tasks that require authoritarian direction and supervision. The less-authoritarian personality responds better to supervision that is employee-centered and tasks that are interdependent upon other workers.

The managerial functions depicted in the Vaill, Levitt and Fiedler articles are common operations to which the industrial engineer is expected to contribute his analytical and design skills. He must be fully aware of both the personalities and task characteristics involved if he is to perform successfully.

In addition to appropriate application of the social sciences to his job performance, the engineer is apparently also faced with an important internal attitude trend. The study data (Figure 3) indicates that unlike other disciplines, engineers tend toward greater dogmatism than the other adult groups. If the results of this study are generally characteristic of engineering, then the dogmatism trend discovered holds important implications for the engineer and his professional development. Society, in the past, has been willing to accept the engineers' isolation in return for his technical contributions. Today, the demand is for the engineer to become an integral part of society and to use his skills in conjunction with societal needs and

desires. The study data suggests potential for continuing isolation of the engineer from the society as a whole unless self-imposed actions to prevent it are taken.

CHAPTER VI

CONCLUSIONS AND RECOMMENDATIONS

SUMMARY

The comments in Chapter V are not intended as an inditement of the managerial community. Rather it is hoped that the demonstrated open-mindedness and trust characteristics of the study participants might help dispel the stereotyped opinions of college youth.

The conclusions drawn from this study can be summarized as:

1. No clear-cut, applicable correlation among individual scores on the three survey devices was found.
2. That for this study population, an individual's response to the Rule Enforcement Situation does not reliably predict his response to either the Dogmatism Scale nor the KYX Scale.
3. That intergenerational differences on the trust dimension are not statistically significant.
4. That significant differences were found in the dimension of dogmatism and that the students tended to be more dogmatic than their adult contemporaries.
5. That the Industrial Engineer must be prepared to effectively use the employee personality characteristics in performing the engineer's task design function.

RECOMMENDATIONS FOR FURTHER STUDY

The engineer as a prime factor in influencing the environment in which society must function, the phenomenal rate at which that environment is changing, and the realization that the human factor must be an early consideration in the design of any operating system all combine to suggest almost infinite numbers of subjects worthy of further study.

Within this study several relationships were identified that suggest the need for additional investigation. They include:

1. Conduct of a similar inquiry using populations and samples from which generalizations may be drawn. A field study in an industrial organization where the interaction between generational elements in relationship to the organizational 'family' could be followed would be informative.

2. Unfortunately, relatively few women were available in the disciplines studied in this paper. Although all of their scores were similar to those of their male counterparts, the female group sizes were, at best, small. The study of the human factors in the industrial environment must now include the professional woman as well as her male counterpart.

3. The apparent, although, not statistically significant decrease in dogmatism score between the ROTC Students and the active military personnel represented in this study is a trend worthy of additional study. The less dogmatic characteristics of the military personnel may simply be a function of the process of selection for ROTC duty

and/or advanced studies. At any rate, additional study is indicated.

4. Additionally, a longitudinal study is needed to determine whether or not the higher dogmatism among students is a function of the student status that becomes mediated through post-college work experience.

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APPENDICES

APPENDIX I

LETTER REQUESTING VOLUNTARY PARTICIPATION

December 1973

Faculty Member
Oregon State University
Corvallis, Oregon

Dear Sir:

I am a graduate student here at the University and am presently engaged in thesis preparation. My purpose in contacting you during this busy season is to ask for your assistance in my research effort.

The assistance requested is in the form of completing a copy of the survey that has been designed to provide data input into my study. I am asking for approximately 20 minutes of your time in order to express your opinions in response to specific questions. This study will measure certain characteristics of selected groups of college students and practicing professionals and attempt to identify any significant similarities and/or differences.

In order that your identity may remain absolutely anonymous, please do not place your name on the survey and do not identify yourself in any way other than the biographical data requested. The completed surveys will be handled by me as confidential documents.

The completed surveys may be returned to me in the self-addressed stamped envelopes provided. I hope to complete this phase of my research by December 20th. If for any reason, you are unable to complete the survey prior to that date, please return it to me anyway.

I deeply appreciate your cooperation and thank you for your assistance.

Carl E. Mohr

APPENDIX II

S U R V E Y

RULE ENFORCEMENT SITUATION DOGMATISM SCALE
KYX SCALE

SURVEY

The first portion of this survey is a brief but not unusual managerial situation. Assume that you are the appropriate supervisor.

1. The company has this plant rule: "An employee shall be fined five dollars (\$5) for being tardy a third time, as well as for any subsequent dates, within any given six-month period."
2. In each of these instances the employee is late for the third time within the six-month period.
 - a. ADAMS, a highly respected employee, is a key man on a sub-assembly. When he is late, four other men are idle. He is to retire in less than two years and, following a new policy, the company has helped him to buy a small farm located 30 miles from town. There are no telephone lines and after a heavy snow, the snowplow doesn't reach his home until late in the morning. He has been late three times because of heavy snow.
 - b. BAKER, a very conscientious and better-than-average worker, was late for the third time because his wife was giving birth to a son, who arrived at 8:05 a.m. After seeing that his wife and baby were well, he came immediately to work.
 - c. CARTER, an average worker and a shop steward, reported late to work for the third time and told you that, although leaving home at a reasonable time, he had a flat tire. Not wanting to be late, he had a service-station attendant change the wheel for him, although he could have done it himself. He produces the charge slip in proof of his story.
 - d. EDMONDS, the "joker" of the crew, arrives late for the third time. His excuse is that as he was leaving the house, his wife said she wanted to ride downtown with him. He waited quite a while for her to get ready. Moreover, it was raining so he had to take her out of his way to work.
3. Whom would you fine? ADAMS BAKER CARTER EDMONDS NO ONE
(CIRCLE YOUR ANSWER)

Why?

The following is a study of what the general public thinks and feels about a number of important social and personal questions. The best answer to each statement below is your personal opinion. We have tried to cover many different and opposing points of view; you may find yourself agreeing strongly with some of the statements, disagreeing just as strongly with others, and perhaps uncertain about others; whether you agree or disagree with any statement, you can be sure that many people feel the same as you do.

Mark each statement in the left margin according to how much you agree or disagree with it. Please mark every one. Write +1, +2, +3, or -1, -2, -3, depending on how you feel in each case.

+1: I AGREE A LITTLE	-1: I DISAGREE A LITTLE
+2: I AGREE ON THE WHOLE	-2: I DISAGREE ON THE WHOLE
+3: I AGREE VERY MUCH	-3: I DISAGREE VERY MUCH

- _____ 1. The United States and Russia have just about nothing in common.
- _____ 2. The highest form of government is a democracy and the highest form of democracy is a government run by those who are most intelligent.
- _____ 3. Even though freedom of speech for all groups is a worthwhile goal, it is unfortunately necessary to restrict the freedom of certain political groups.
- _____ 4. It is only natural that a person would have a much better acquaintance with ideas he believes in than with ideas he opposes.
- _____ 5. Man on his own is a helpless and miserable creature.
- _____ 6. Fundamentally, the world we live in is a pretty lonesome place.
- _____ 7. Most people just don't give a "damn" for others.
- _____ 8. I'd like it if I could find someone who would tell me how to solve my personal problems.
- _____ 9. It is only natural for a person to be rather fearful of the future.
- _____ 10. There is so much to be done and so little time to do it in.
- _____ 11. Once I get wound up in a heated discussion I just can't stop.
- _____ 12. In a discussion I often find it necessary to repeat myself several times to make sure I am being understood.
- _____ 13. In a heated discussion I generally become so absorbed in what I am going to say that I forget to listen to what the others are saying.
- _____ 14. It is better to be a dead hero than a live coward.
- _____ 15. While I don't like to admit this even to myself, my secret ambition is to become a great man, like Einstein, or Beethoven, or Shakespeare.
- _____ 16. The main thing in life is for a person to want to do something important.

+1: I AGREE A LITTLE	-1: I DISAGREE A LITTLE
+2: I AGREE ON THE WHOLE	-2: I DISAGREE ON THE WHOLE
+3: I AGREE VERY MUCH	-3: I DISAGREE VERY MUCH

- _____ 17. If given the chance, I would do something of great benefit to the world.
- _____ 18. In the history of mankind there have been probably just a handful of really great thinkers.
- _____ 19. There are a number of people I have come to hate because of the things they stand for.
- _____ 20. A man who does not believe in some great cause has not really lived.
- _____ 21. It is only when a person devotes himself to an ideal or cause that life becomes meaningful.
- _____ 22. Of all the different philosophies which exist in this world there is probably only one which is correct.
- _____ 23. A person who gets enthusiastic about too many causes is likely to be a pretty "wishy-washy" sort of person.
- _____ 24. To compromise with our political opponents is dangerous because it usually leads to the betrayal of our own side.
- _____ 25. When it comes to differences of opinion in religion we must be careful not to compromise with those who believe differently from the way we do.
- _____ 26. In times like these, a person must be pretty selfish if he considers primarily his own happiness.
- _____ 27. The worst crime a person could commit is to attack publicly the people who believe in the same things he does.
- _____ 28. In times like these it is often necessary to be more on guard against ideas put out by people or groups in one's own camp than by those in the opposing camp.
- _____ 29. A group which tolerates too much differences of opinion among its own members cannot exist for long.
- _____ 30. There are two kinds of people in this world: Those who are for the truth and those who are against the truth.
- _____ 31. My blood boils whenever a person stubbornly refuses to admit he's wrong.
- _____ 32. A person who thinks primarily of his own happiness is beneath contempt.
- _____ 33. Most of the ideas which get printed nowadays aren't worth the paper they are printed on.
- _____ 34. In this complicated world of ours the only way we can know what's going on is to rely on leaders or experts who can be trusted.
- _____ 35. It is often desirable to reserve judgment about what's going on until one has had a chance to hear the opinions of those one respects.
- _____ 36. In the long run the best way to live is to pick up friends and associates whose tastes and beliefs are the same as one's own.
- _____ 37. The present is all too often full of unhappiness. It is only the future that counts.

- _____ 38. If a man is to accomplish his mission in life it is sometimes necessary to gamble "all or nothing at all."
- _____ 39. Unfortunately, a good many people with whom I have discussed important social and moral problems don't really understand what's going on.
- _____ 40. Most people just don't know what's good for them.

Below, you will find nine paired statements. From each pair, please select the one statement with which you agree more or disagree less. Compare each statement with its mate, not with other pairs. Some choices will be very difficult, but please select one statement from every pair. To indicate your choice, place an X in the appropriate box.

- ☐ 1A. Most employees are trustworthy.
- ☐ 1B. Criticism can be a valuable management tool.
- ☐ 2A. Production is influenced by employee attitudes.
- ☐ 2B. To admit a mistake need not cause loss of respect.
- ☐ 3A. Press employees to participate 100% in United Fund Drives.
- ☐ 3B. Employees don't need to understand the REASON for an order.
- ☐ 4A. Employees work more efficiently under a deadline.
- ☐ 4B. Real change in the organization works down from the top.
- ☐ 5A. A supervisor who gets to know his employees on a personal basis is likely to lose their respect.
- ☐ 5B. Lying to employees, though distasteful, may be necessary to keep them hard at work.
- ☐ 6A. To admit a mistake is to lose respect.
- ☐ 6B. Most employees are not trustworthy.
- ☐ 7A. A supervisor should never have to explain why employees on the same job are earning different wages.
- ☐ 7B. Written job descriptions are excess baggage.
- ☐ 8A. Most employees feel a job is a necessary evil.
- ☐ 8B. The facts speak for themselves.
- ☐ 9A. A supervisor should be able to solve his own problems.
- ☐ 9B. A man does a better job if he is allowed to do it his way.

BIOGRAPHIC DATA: NUMBER OF YEARS OF COLLEGE _____

AGE: _____ EDUCATION: BS (A) _____; MS (A) _____; PhD _____

SEX: _____ GRADUATED: BS 19 _____; MS (A) _____; PhD _____

MILITARY EXPERIENCE: No _____; YES _____; OFFICER _____; ENLISTED _____

DATE DISCHARGED: _____

MARITAL STATUS: _____

T-GROUP/SENSITIVITY TRAINING NO _____; YES _____; YEAR(S) _____

JOB/POSITION TITLE: _____