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AN INVESTIGATION OF CHANGES IN PERSONALITY AND GENERAL ABILITY
AS RELATED TO VARIOUS PHASES OF SISTER FORMATION

by

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A THESIS SUBMITTED TO THE FACULTY OF THE GRADUATE SCHOOL
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CHAPTER I

INTRODUCTION

Focus on change is well-rooted in modern psychological investigation. Change is most readily observed and analyzed under carefully controlled laboratory conditions and is, in fact, at the heart of the experimental method. Classically, the investigator tests his hypothesis by exposing his subject to some specific treatment in order to measure the effects of this treatment by way of the subject's response to stimulus. All extraneous factors which might affect the response are carefully controlled so that only the experimental factor may be free to influence the outcome. Thus, the scientist takes great precaution to so limit his investigation that when a 'happening' is completed, he knows what elements have contributed to it. His observations of small bits of behavior in this manner provide the raw material from which his speculations and theories arise as inferences from the observed behavior to the nature of man.

Unfortunately, however, the narrowness and the artificiality of the laboratory experiment leave us somewhat impatient. There are many considerations of human nature which defy a rigid control of variables and manipulation of the experimental factor. The analysis of change in the therapeutic process is an outstanding example of a problem which plagues all clinical psychologists and which remains obviously alien to the traditional laboratory approach. Nonetheless, the need to assess the pre-therapy condition and to

measure the result of therapy while attempting to make explicit the variables introduced in the therapeutic situation is undeniable if the clinician seeks to understand the patient and to develop the technique of therapy. The process involved in a change of behavior is, even then, inferred from defining the change by reason of its terms. Such a definition of terms, of initial behavior and of resultant behavior, is admittedly superficial to the analysis of the change process--a defect which is also apparent in the traditional experimental method. An added difficulty arises, however, in the attempt to define the terms of a therapeutic change with some measure of objectivity. Too often, research on therapy has relied completely on the therapist's statement of whether an individual has benefited from therapy as its indication of results. The psychologist is further handicapped in arriving at a scientific conclusion because the therapeutic situation, which is supposedly influencing the movement, is exceedingly complex and only vaguely understood. Yet, he is forced to admit that an analysis of the situation is essential to render his observations of change meaningful.

Any study which focuses on global change within a specific, though not rigidly controlled, field encounters the difficulties illustrated above. When the field enlarges to that of a social institution, the problems are compounded. Nonetheless, since--as Webster, Freedman and Heist have suggested-- "personality development always takes place within social institutions that have aims or purposes," the consideration of personality change not only reflects the influence of known ends and means but also provides some basis for commenting on whether the social institution is promoting healthy and

mature expression.¹ It becomes a matter of putting the society to test as a consequence of measuring its effects on individuals.

The Problem

The attempt to exemplify the technical problems in arriving at conclusions about global changes within a social institution was undertaken in order to define the limits and support the merits of such research. It is within this general framework that the present study takes shape.

The purpose of this research is to investigate the magnitude and direction of change in personality and general ability during various phases of sister formation. More specifically, it is an attempt to examine the differential effects of sister formation during a three-year period and a five-year period by means of a longitudinal study involving test-retest administration of the Minnesota Multiphasic Personality Inventory and the ACE Psychological Examination. The hypothesis under investigation may be stated briefly: that the experience of sister formation modifies the personality and general ability of individuals participating in such program.

Since, as has been indicated above, the objective evaluation of change is meaningless without an understanding of the conditions under which the change takes place and without a clear notion of the variables under consideration, two questions immediately present themselves:

1. What is meant by sister formation?

¹Harold Webster, Marvin Freedman, and Paul Heist, "Personality Changes in College Students," The American College, a Psychological and Social Interpretation of the Higher Learning, ed. Nevitt Sanford (New York: John Wiley & Sons, Inc., 1962), p. 812.

2. What is implied in the measurement of personality and general ability?

Before proceeding to the experimental study, both of these questions will be reviewed in relation to the particular focus of this research.

Sister Formation Program

The sister formation group is a small, rather well-defined college group--a group generally participating in a five-year program of spiritual and intellectual formation for the active apostolate of the religious women of the Catholic Church. It owes its inspiration to the late Pope Pius XII who strongly urged that the sisters teaching in the Catholic schools receive the quality of education and the academic degrees that are demanded by the State. Specific organized efforts to answer this plea were apparent in 1953, less than two years after the late Holy Father's message; a Sister Educational and Professional Standards Commission was created within the National Catholic Education Association after a detailed survey of the current status of teacher education among religious indicated that positive action was necessary in order to guarantee professional excellence in Catholic schools. In 1954, a separate Sister Formation Section was created within the NCEA in the

recognition that sisters doing active works in our own times need a long and careful spiritual formation, a general intellectual training which will equip them for a rich personal life and an effective social leadership, and a precise professional preparation which will make them the equals or superiors of lay people doing the same kind of work.²

²Sister Mary Emil, I.H.M., "What is Sister Formation?" America, (January 12, 1957), p. 412.

Many of the communities of religious in the United States who have embraced the goals of the sister formation movement are allowing five years for basic spiritual development and the completion of degree work. The Sister Formation Bulletin, however, has hastened to warn against the dangers of regarding interest in sister formation as a 'movement' implying "greater homogeneity and organization of program than is actually intended or desired."³ The Bulletin emphasizes in one of its earliest issues that there are only two hard and fast features for which this movement stands: "that it is an effort of the sisters themselves, and that it is concerned only with the improvement of sister formation, and our mutual assistance and inspiration to that end."⁴ The type of training and timing of training are dictated by each congregation in an effort toward general improvement of existing procedure wherever it may be feasible.

Perhaps the most rewarding result of this interest in training for professional excellence is the attention it has brought to the balance of the natural and the supernatural in the individual sister. Father Henle has commented on these various efforts culminating in the individual's "transformation into an integrated human, Christian and religious personality."⁵

³The Sister Formation Bulletin, December, 1954, p. 12.

⁴Ibid.

⁵Rev. Robert J. Henle, S.J., "Locating the Problems in Sister Formation Conference Theme," Spiritual and Intellectual Elements in the Formation of Sisters, ed. Sister Ritamary, C.H.M. (New York: Fordham University Press, 1957), p. xxiii.

Although the sister formation movement arose from a demand to fulfill more adequately the work of the apostolate, the means for attaining this goal have readily taken the course of developing to the utmost that which is natural to the individual. No longer is the 'molding' of personality according to a pre-conceived pattern directing the policy of religious government. No longer are the efforts in training absorbed in eradicating certain personality characteristics as undesirable for a religious. Nonetheless, the essence of religious life remains unchanged and tradition continues to exercise an undeniable influence over many of the customs of the numerous congregations. The fresh outlook which the sister formation program has provided is in no sense revolutionary--nor was it ever intended to be. But it does make a unique contribution by insisting that the whole of the individual must be allowed to grow toward greater integration and maturity. And, it is only through integrated, mature individuals that the work of the Church may be accomplished.

More effort, then, is devoted to providing a "philosophical and theological background to understand the principles of asceticism which are part of the spiritual formation."⁶ Academic training is outlined after the abilities and talents of the young sister have been appraised; attention to developing these gifts as adequately as possible assures the individual and the congregation that the sister is prepared to do what she will be asked to do. At the same time that the young sister's supernatural and professional life are

⁶Sister Mary Emil, I.H.M., "The Sister-Formation Movement and the Pastoral Outlook," Sister Formation Bulletin, (December, 1954), p. 9.

benefiting from a solid foundation, allowance for affective development need be insured. Since the emotions play a major role in the sister's dedicated service, there is an obvious concern to "preserve her emotional spontaneity, encourage her to achieve active rapport with other persons, turn her aggressive impulses into constructive channels, cultivate sensitivity for the feelings of others, and prepare her, as an adult woman, for the realities of individual responsibility."⁷ In the full development of each of these components of the religious personality--the supernatural, the intellectual and emotional--and in the total integration of the religious personality, the aims of the sister formation program are achieved and the individual sister is equipped to meet the challenges of the apostolate.

Measurement of Personality and General Ability

In considering the goals of the sister formation program, much stress has been placed on the efforts involved in furthering a complete and integrated development of each individual participating in the program. This study, however, which focuses on personality and general ability, is obviously and artificially cutting through the integrated whole. Such an approach is a function of the instruments selected and, more generally, of the current status of psychological test development. Typically, as Anastasi has indicated, a 'personality' test measures the non-intellectual traits of the individual such as "emotional adjustment, social relations, motivation, interests, and

⁷Questionnaire to Psychologists," Spiritual and Intellectual Elements in the Formation of Sisters, ed. Sister Ritamary, C.H.M. (New York: Fordham University Press, 1957), p. 213.

attitudes."⁸ Mental tests in the form of intelligence tests or achievement tests tap the intellectual aspects of the person's functioning. It would be more appropriate, however, to view both intellectual and non-intellectual functions as personality functions and tests which measure each aspect as personality tests--one of which might address itself to the affective development of the individual and the other to the intellectual development. Within the person, these aspects are inter-related; if our tests fail to reflect directly this relationship, it is left to the clinician to employ other measures which will facilitate his inference on personality integration.

It is also well to bear in mind that highly structured psychological tests such as a personality inventory and a test of general ability--in comparison to projective techniques--simply order people according to characteristic personality traits or to the amount of information possessed and degree of skill acquired. Although they miss a large portion of the personality dynamics, they carry with them certain compensations. The economy in administration and scoring and access to normative data render structured tests as extremely practical instruments for research. Conclusions formed on the basis of test results are reliable if the tests are highly reliable--that is, if they order persons with relatively few errors.⁹

If, as has been suggested above, structured psychological tests somewhat distort the total functioning personality and tell us relatively little about

⁸Anne Anastasi, Psychological Testing (New York: The Macmillan Company, 1961), p. 16.

⁹Webster, Freedman, and Heist, pp. 814-815.

the individual, it is only natural to question their usefulness. Admittedly, there are many ways of evaluating personality and general ability which do not involve the use of psychological tests. And, in many instances, tests fail to uncover that which a skilled clinician could observe without the aid of instruments. Despite their limitations, however, reliable structured tests tell us something very definite and specific about the variable measured. They state their findings with a degree of objectivity which the projective tests and unaided clinical judgment cannot claim. They are peculiarly suitable to research on large samples and amenable to statistical manipulation. Darley et al., urging the use of tests to measure the progress of college students, have claimed that "structured psychological tests are, in one sense, one of the products of the application of scientific methodology to the study and description of human behavior in which hunches and impressions made without the benefit of facts are removed from consideration."¹⁰ They state more strongly that "to reject tests as a source of information is to ignore the results of research which show them to be as reliable as any of the sources used in some areas and more reliable than most of them."¹¹ Although we are justified in being acutely aware of the limitations of our tests and, therefore, guarded in forming our conclusions from them, we must also admit that they

¹⁰J.G. Darley, W.B. Alexander, H.W. Bailey, W.W. Cook, H.S. Edgerton, and K. W. Vaughn, The Use of Tests in College, (Washington: American Council of Education, 1947), p. iv.

¹¹Ibid., p. 7.

provide a valuable inroad into the understanding of the human person; since we have not yet reached the stage of knowing all there is to know about human behavior, we are willing to obtain our information wherever it may be had.

CHAPTER II

REVIEW OF LITERATURE

This chapter will consider the following topics: the evaluation of personality and the MMPI, the appraisal of general ability and the ACE, the relationship between measures of personality and measures of general ability. Of particular interest will be those studies which contribute to a description of the instruments, to their sensitivity in detecting change, and to their appropriateness for the present sample.

The Evaluation of Personality and the MMPI

The MMPI is the most extensively used personality inventory at the present time--a popularity it has achieved and enjoyed for the past twenty years. According to its authors, Hathaway and McKinley, the "Minnesota Multiphasic Personality Inventory is a psychometric instrument designed ultimately to provide, in a single test, scores on all the more important phases of personality."¹ Initially, it was directed toward the characteristics of disabling psychological abnormalities which the labels for the various scales within the MMPI readily evidence; nonetheless, the authors have hastened to inform its users that, "although the scales are named according to the abnormal

¹S.R. Hathaway and J.C. McKinley, Minnesota Multiphasic Personality Inventory: Manual (New York: The Psychological Corporation, 1951), p. 5.

manifestation of the symptomatic complex, they have all been shown to have meaning within the normal range."² With the development of the booklet form in 1947 and the consequent practicality in group administration, the MMPI became an important tool in the screening and selection procedures of education and industry. At this same time, the projective techniques were proving to be of great value in the clinical area and were gradually replacing the typical paper and pencil tests. We have seen, within the past decade, a reversal of the original situation; the mounting number of studies on the use of the MMPI with various groups of normals suggests that the current interest is focused more directly on the measurement of normal personality traits than on the categorization of abnormal syndromes.

The inventory consists of 550 statements on a wide range of topics representative of physical complaints, moral and social attitudes and psychiatric symptoms. The subject is asked to make one of three responses to these statements: true, false, or cannot say. The time required for administration is approximately one hour varying according to the work rate of each subject. Responses are scored with the aid of scoring stencils to yield ratings on four validity scales and ten clinical scales.

The items on the basic scales of the MMPI were selected as differentiating normals from various psychiatric cases. The clinical sample included more than 800 individuals carefully studied at the University of Minnesota Hospitals. Norms were established on 724 normal men and women between the ages of 16 and 55; all were visitors to the University of Minnesota Hospitals

²Ibid., pp. 5-6.

although none were, themselves, under the care of a physician. In the derivation of additional scales, the test authors have based their norms on the performance of a group of 265 single high school graduates or university students between the ages of 16 and 25 who were seen at the testing bureau of the University of Minnesota. A third group of normals was composed of 265 white-collar workers in various Minnesota WPA projects. In addition, 254 patients in the medical wards of the University of Minnesota Hospitals who were determined to be free from any psychiatric disorder were also used in the derivation of some of the scales.

Although the literature on the MMPI is so extensive as to render duplication of well-known test characteristics somewhat tedious, it appears to be necessary for the purpose of this study to describe briefly the MMPI scales, making particular reference to their meaning for the normal population where such interpretation adds something to the original understanding of the scales.

The four validity scales of the MMPI--designed as checks on carelessness, misunderstanding and test-taking attitudes--are the Cannot say score, the L scale, the F scale, and the K scale.

The Cannot say score refers to the number of unanswered items on the entire test and thus is not considered a true scale. Since the directions for the booklet form emphasize, "Do not leave any blank spaces if you can avoid it... Remember, try to make some answer to every statement," it is not surprising that the Cannot say score is positively skewed to an extreme degree for both normal and psychiatric populations.³ The items omitted are of definite

³W. Grant Dahlstrom and George Schlager Welsh, An MMPI Handbook (Minneapolis: The University of Minnesota Press, 1960), p. 46.

clinical interest but it is only rarely that the Cannot say score is sufficient to affect the summary profile of the personality traits.

The L scale "affords a measure of the degree to which the subject may be attempting to falsify his scores by always choosing the response that places him in the most acceptable light socially."⁴ The fifteen items of the L scale deal with feelings and acts of aggression, rebelliousness against social norms, and bad thoughts which, it is assumed, most persons would be willing to admit of themselves despite the fact that this behavior is socially unacceptable.

The F scale score legislates on the validity of the entire test record; if the F score is high, the record is likely to have been distorted by the carelessness or lack of comprehension of the subject or by the scoring or recording errors of the examiner. The items which contribute to the F scale focus on psychiatric symptoms, lack of social ties, apathy, and certain physical symptoms; they are undisguised statements which rarely are endorsed by either normal or psychiatric samples.

The K scale "is to be thought of as a measure of test-taking attitude... (in which) a high K score represents defensiveness against psychological weakness ...(while) a low K score tends to indicate that a person is, if anything, overly candid and open to self-criticism and the admission of symptoms even though they may be minimal in strength."⁵ This tendency to 'fake good' or 'fake bad' has a distorting effect on some of the clinical scales. The

⁴Hathaway and McKinley, p. 18.

⁵Ibid.,

authors of the test have attempted to correct this distortion by adding proportions of the K value to the clinical scales affected, viz., the hypochondriasis, psychopathic deviate, psychasthenia, and hypomania scales. This long-standing assumption that K is a measure of defensiveness has received considerable challenge lately. Wheeler, Little and Lehner have found that normal groups scored higher on the K scale than abnormal groups⁶ and numerous studies, notably those of Gallagher⁷ and Schofield,⁸ indicate that K scale scores show an increase when post-treatment MMPI scores are compared with pre-treatment scores. Heilbrun, after comparing the K scores of poorly adjusted college students (those seeking psychological counseling) and better adjusted college students and then correlating the K scale scores with the defensiveness scale on the Adjective Checklist, concluded that "the K scale is a better measure of defensiveness among more maladjusted subjects."⁹ If K is not a measure of defensiveness for the normal groups, the present scoring of the MMPI may be causing serious distortions on normal results.

⁶W.M. Wheeler, K.B. Little, and G.F.J. Lehner, "The Internal Structure of the MMPI," Journal of Consulting Psychology, XV (1951), pp. 134-141.

⁷J.J. Gallagher, "MMPI Changes Concomitant with Client-Centered Therapy," Journal of Consulting Psychology, XVII (1953), pp. 334-338.

⁸W.A. Schofield, "A Further Study of the Effects of Therapies on MMPI Responses," Journal of Abnormal and Social Psychology, 48 (1953), pp. 67-77.

⁹A.B. Heilbrun, Jr., "The Psychological Significance of the MMPI K Scale in a Normal Population," Journal of Consulting Psychology, XXV (1961), pp. 486-491.

The clinical scales of the MMPI are: hypochondriasis (Hs), depression (D), hysteria (Hy), psychopathic deviate (Pd), masculinity-femininity (Mf), paranoia (Pa), psychasthenia (Pt), schizophrenia (Sc), hypomania (Ma), and social introversion (Si).

The Hs Scale measures the amount of abnormal concern with bodily functioning in terms of general health, generalized aches and pains, complaints about breathing, digestion, sleep, etc., and disorders in sensation. The Hs scale is differentiated from the hysterical syndrome since it deals with more generalized complaints designed to elicit sympathy rather than to render the individual incapable of carrying out a dreaded activity. It is further distinguished from the psychotic scales since the content of the Hs scale concerns straightforward internal disorders or common symptoms rather than the bizarre elements of the Sc or Pa scales.

The D scale focuses on the clinical symptom pattern of depression which, according to Dahlstrom and Welsh, "is generally characterized by pessimism of outlook on life and the future, feelings of hopelessness or worthlessness, slowing of thought and action, and frequently by preoccupation with death and suicide."¹⁰ Although the D scale was devised from a psychotic population, it has been particularly useful--along with the Hs and Hy scales--in identifying a large number of neurotic individuals in need of psychiatric care.

The Hy scale detects the degree to which an individual resorts to physical symptoms to solve extreme conflicts in a conversion-type hysteria. The scale

¹⁰ Dahlstrom and Welsh, p. 55.

contains, in general, somatic items and social facility items. In normal subjects, Little and Fisher found that there was a negative correlation between the two sets of items although, within the sets, the items were positively correlated.¹¹

The Pd scale measures the amoral and asocial characteristics of the clinical group now known as sociopathic. The content of the scale reflects the alienation of the individual from his family, difficulty with parental, school, and civil authorities, disregard of social mores, and self-assertion. The psychopathic deviate is often an outgoing, pleasant, likeable individual who, although only capable of superficial relationships with others, is difficult to identify between outbreaks without the aid of a personality measure.¹²

The Mf scale was originally designed to detect a "deviation of the basic interest pattern in the direction of the opposite sex."¹³ The test authors warn against assuming homosexual abnormality among men on the basis of high ratings on the Mf scale and are even more cautious about the interpretation of inversion for high scoring females. Pepper and Strong have characterized the content areas of the Mf scale to include ego sensitivity, sexual identification, altruism, endorsement of culturally feminine occupations and denial of culturally masculine occupations.¹⁴

¹¹K.B. Little and J. Fisher, "Two New Experimental Scales of the MMPI," Journal of Consulting Psychology, XXII (1958), pp. 305-306.

¹²Dahlstrom and Welsh, p. 61

¹³Hathaway and McKinley, p. 20.

¹⁴L.J. Pepper and P.N. Strong, "Judgmental Sub-Scales for the Mf Scale of the MMPI," Unpublished materials (1958).

The Pa scale attempts to identify persons who are suspicious, oversensitive, and who have delusions of grandeur, influence, or reference in common with those clinical groups diagnosed as paranoid or paranoid schizophrenic. The test authors, as well as Dahlstrom and Welsh, have observed that the nature of this syndrome renders test cooperation exceedingly difficult and, in cases of well-developed paranoia, individuals have succeeded in faking normal on this scale.

The Pt scale refers to the neurotic syndrome now termed obsessive-compulsive, including such symptoms as ruminatory thinking, ritualistic behavior, fears, worries, inability to concentrate, and difficulty in making decisions. The unique feature about the content of this scale is that it does not become absorbed in behavioral manifestations but deals more directly with underlying attitudes towards the self and others as in items tapping self-confidence, moodiness, and sensitivity.

The Sc scale "measures the similarity of the subject's responses to those patients who are characterized by bizarre and unusual thoughts or behavior."¹⁵ The items contributing to the Sc scale tap not only the personalistic qualities of the schizophrenic but also the inability to maintain object relations and the lack of self-identity.

The Ma scale is concerned with the affective disorder characterized by over-activity, flight of ideas, and emotional excitement. Among normal populations, the ambitious, vigorous, and energetic individual will rate above the mean on the hypomanic scale and may even present a difficulty in differentiating from

¹⁵Hathaway and McKinley, p. 20.

milder forms of hypomania. Because of the extreme variability in thought and action in the hypomanic syndrome, it is unusually difficult to evaluate on a fixed personality inventory.

The Si scale was designed by Drake in 1946 to contrast individuals on the introversion-extraversion continuum. Both attitude and action are evaluated in terms of this scale so that a high-scoring individual will be seen as withdrawing from social responsibilities and reflecting little interest in other individuals. This scale is not a typical clinical scale and is perhaps more useful in guidance situations with normals who are pursuing a course of studies or an occupation.

During the course of examining numerous MMPI records--raw scores having been converted to T scores to allow comparison between scales--clinicians became alerted to certain configural patterns which proved more meaningful than the interpretation of isolated scale scores. The interest in profile analysis evolved quite naturally, then, and was eventually facilitated by the development of a coding system which preserved the interpretation patterns formerly described in the psychograph but charted the profile in a much more concise and practical mode. Hathaway, Welsh, and Gough, in their examinations of configural patterns, greatly extended the value of the MMPI and stimulated a wide area of research in profile analysis.

The essential questions, after attending to the painstaking development of the inventory, are necessarily questions of validity and reliability. Anastasi has commented that the MMPI serves well as a screening instrument for psychological abnormality although shorter instruments of comparable validity are also available. She warns, as do the test authors, against a

literal interpretation of the clinical scales in view of the negative evidence on the diagnostic validity of the separate scales.¹⁶ Since profile analysis is dependent upon the individual components, it does not adequately compensate for the dubious strength of the single scales. Dahlstrom and Welsh have defended the efforts of MMPI research to achieve definite goals regarding diagnosis, treatment choice, and therapeutic outcome:

The use of successive approximations in scale refinement, the mounting number of personality attributes being discovered as correlates of the basic scales of the MMPI, the increasing precision of predictions of outcome in terms of explicit equations against very carefully established criteria--all indicate that this kind of research has continued and grown.¹⁷

What they are saying, in effect, is that the weakness in validity studies at the present time may be remedied in the future through the efforts of continuous research.

The question of reliability has been examined by the test-retest method during an interval of three days to over a year, yielding reliabilities generally ranging from .50 to the .90's. In testing 89 college psychology students over a one to two week interval, Gilliland and Colgin obtained a range of reliabilities from .29 to .89 in a test-retest measure; they found their lowest reliability rating on the Hs scale and the highest correlation on the D scale.¹⁸ Cottle, who also examined a college sample over a comparable period

¹⁶Anastasi, p. 601.

¹⁷Dahlstrom and Welsh, pp. 333-334.

¹⁸A.R. Gilliland and R. Colgin, "Norms, Reliability, and Forms of the MMPI," Journal of Consulting Psychology, XV (1951), pp. 435-438.

of time, obtained his lowest correlation of the Pa scale (.56) and highest reliability on the Pt scale (.90).¹⁹ McDonald, again dealing with college students during an interval of one week, approximated Cottle's results with a low correlation on Pa (.51) and a high correlation on Pt (.79).²⁰ Split-half reliabilities show an even greater range than those cited for the test-retest method.²¹ McKinley and Hathaway have explained these objectively unimpressive statistics on reliability in terms of the unique nature of the personality inventory:

It is important to introject that the statistical thinking derived from aptitude and achievement tests should be amended when personality tests are considered. Many traits of personality are highly variable. Otherwise there would be little meaning to psychotherapy or preventive mental hygiene. Test-retest data on the MMPI scales are more a measure of trait variance than of reliability of scales.²²

With such a transition from test reliability to trait variance, the authors of the test suggest that the MMPI follows the individual through the ups and downs of personality development and, thus, cannot be expected to

¹⁹W.C. Cottle, "Card Versus Booklet Forms on the MMPI," Journal of Applied Psychology, 34 (1950), pp. 255-259.

²⁰G.L. MacDonald, "Effect of Test-Retest Interval and Item Arrangement on the Shortened Forms of the MMPI," Journal of Clinical Psychology, 8 (1952), pp. 408-410.

²¹Gilliland and Colgin.

²²J.C. McKinley and S.R. Hathaway, "A Multiphasic Personality Schedule," Basic Readings in the MMPI in Psychology and Medicine, eds. G.S. Welsh and W. G. Dahlstrom (Minneapolis: The University of Minnesota Press, 1956), p. 93.

yield similar scores on retests. They further remark that the personality patterns of normals are undoubtedly more stable than those of the psychiatric population. Assuming that a measure of consistency is due to the individual in the normal state, Dahlstrom and Welsh refer to this characteristic as a key concept in personality theory.

The concept of a single, pervasive characteristic of personality that furnishes strength in the face of temptation, stability under external and internal stressors, or control over conflicting impulses to action has long been used by personality theorists to account for the vast differences that are found in individual tolerance and integration. Whether it is called will-power, character, general normality, ego strength, self-consistency, radix, biosphere, regnancy, or self-actualization, the view that a person's stability over time and across situations stems from a single organizing process keeps reappearing in psychological theories.²³

What must be emphasized in considering Dahlstrom and Welsh's statement is that this "single pervasive characteristic of personality" is only relatively stable even in the most integrated individuals. Experience does, in fact, modify our personality--whether this modification shows itself in only a temporary behavioral change or whether it is more fundamental in terms of a change in values. Nonetheless, the comments of Dahlstrom and Welsh stress most appropriately the basic unity of the personality which rides the influences of experience, assimilating--to a greater or less degree--new elements as it develops but, as long as it maintains its integration and organization, it gives evidence of relative though notable stability. Stability is so related to integration that a measure of stability of personality may provide a valuable diagnostic cue in the differentiation of the normal from the abnormal.

²³Dahlstrom and Welsh, p. 300.

In light of this discussion, the MMPI suggests itself as a useful tool in describing changes in personality over a period of time. The research on personality change has, to a great extent, focused on subjects of clinical interest rather than on normal samples. The series of studies on prisoners by Gallenbeck²⁴ and Gill²⁵ indicated a general rise in the MMPI profile after three to six months in prison; Gough and Mann²⁶ tested minor military offenders after a three month rehabilitation plan in prison and obtained a significant decrease in the MMPI profiles. By far, the greatest interest in the measure of personality change is in the area of determining therapeutic gain. Feldman²⁷ and W. Simon and Gilberstadt,²⁸ among numerous others, have compared pre-treatment and post-treatment MMPI profiles and have evaluated the therapeutic results in accord with independent assessments of change. Pacella, Piotrowski and Lewis published a dramatic study on the temporary effectiveness of ECT. They found an abrupt drop and reorganization of the MMPI profile of persons with affective disorders immediately after six to twelve ECT

²⁴C.G. Gallenbeck, "The Effects of Prison Confinement upon Personality Adjustment of Inmates of Waupun State Prison," Unpublished manuscript (University of Wisconsin, 1948).

²⁵D.A. Gill, "An Investigation of the Psychological Effects of the First Three Months of Imprisonment on the Personality of the First Offender" (Unpublished Master's thesis, University of North Carolina, 1953).

²⁶H.G. Gough and G. Mann, "Changes in MMPI Profiles Occurring in a Military Rehabilitation Program," Unpublished manuscript (1952).

²⁷M.J. Feldman, "The Use of the MMPI Profile for Prognosis and Evaluation of Shock Therapy," Journal of Consulting Psychology, XVI (1952), pp. 376-382.

²⁸W. Simon and H. Gilberstadt, "MMPI Patterns Before and After Carbon Dioxide Inhalation Therapy," Journal of Nervous and Mental Disorders, 119, (1954), pp. 523-529.

treatments; a month or two later, however, the profile strongly resembled the pre-treatment pattern. Some psychoneurotics showed a more deviant personality pattern at the follow-up testing than was apparent before ECT was administered. In both the prison and therapy situations, the research on personality change has indicated meaningful shifts in personality traits as might be expected in view of the minimal ego integration of the representative samples. The quality of the intervening experience between test and retest is undoubtedly influential in determining the direction of change; what is disappointing in the research, however, is that follow-up studies of the quality of Pacella et al²⁹ are only seldom reported and, thus, we are left to speculate whether the experience has affected a temporary change or a substantial personality reorganization.

MMPI research on the so-called normal population has been directed more toward college students than toward any other defined group. They have been observed to have unique characteristics which set them apart somewhat from the normative group to the extent that profile analysis on college students demands an adjustment of interpretive standards. Brown compared the performance of 542 college freshmen at the University of Minnesota with McKinley and Hathaway's 'College Normal' group and found many significant differences in scores--particularly for the female population--in which Brown's sample scored consistently higher than the normative group.³⁰ Brown argued for the

²⁹B.L. Pacella, Z. Piotrowski, and N.D.C. Lewis, "The Effects of Electric Convulsive Therapy on Certain Personality Traits in Psychiatric Patients," American Journal of Psychiatry, 104 (1947), pp. 83-91.

³⁰Hugh S. Brown, "Similarities and Differences in College Populations on the Multiphasic," Journal of Applied Psychology, 32 (1948), pp. 541-549.

establishment of local norms but Goodstein's study on the "Regional Differences in MMPI Responses Among Male College Students" obtained no evidence to support the notion that geographical differences are significant; however, he found, as did Brown, that each of the eight colleges tested scored higher than the normative group.³¹ Dobson and Stone, testing 1159 freshmen at the Utah State Agricultural College, also discovered numerous scales in which the college group scored significantly above the national norms.³² The common observation in each of these studies is that the college group has consistently differed from the normative standards cited by the test authors and must be judged on its own norms.

Webster, Freedman and Heist give further evidence that MMPI studies on the college group show that seniors score higher than freshmen on most studies.³³ Black's horizontal study on a large sample of students from ages thirteen to twenty-one takes note of configurational shifts in personality; he characterizes the adolescent as having prominent ratings on the Pd and Ma scales which change at maturity to high scores on the Hs and D scales.³⁴ An important research in this area is Mills' longitudinal study of changes over the four years of college. Mills discovered a progressive rise of the Pd and Ma scores during college; he observed a temporary rise of the Pf, D, Pt and

³¹Leonard Goodstein, "Regional Differences in MMPI Responses Among Male College Students," Journal of Consulting Psychology, 10 (1954), pp. 437-441.

³²W.R. Dobson and D.R. Stone, "College Freshmen Response on the MMPI," Journal of Educational Research, 44 (1951), pp. 611-618.

³³Webster, Freedman and Heist, p. 434.

³⁴J.D. Black, "The Interpretation of MMPI Profiles of College Women," (Unpublished Doctoral dissertation, University of Minnesota, 1953).

So scales followed by a subsequent decrease. Test-retest correlations in a later study range from .16 to .73 on a group of 73 students; the range for a two year period is less variable--from .33-.61.³⁵ One of the main difficulties in interpreting such findings as those of Black and Mills is that we generally lack a comparable non-college control group; we are thus at a loss to determine whether personality changes among individuals of this age level are due primarily to maturational factors or to the external influences of college society. And again, follow-up studies are necessary before we can judge whether the college experience has affected a lasting change in personality.

The sister formation group has many features in common with the college students who were included in the samples we have just discussed. Although the pursuit of a college degree is not the primary goal of sister formation, it is an important goal which has received notable emphasis in the past decade. The entire program of sister formation, however, is devoted to preparing the total individual for her vocation as a religious. The earliest attempts to describe the unique psychological characteristics of religions were made by Moore³⁶ and Bier,³⁷ they, in turn, provided the impetus for a rich series of

³⁵W.W. Mills, "MMPI Profile Pattern and Score Stability Throughout Four Years of College Attendance," (Unpublished Doctoral dissertation, University of Minnesota, 1954).

³⁶Thomas V. Moore, "The Rate of Insanity in Priests and Religious," American Ecclesiastical Review, 95 (1936), pp. 485-498, 601-613.

³⁷William C. Bier, "A Comparative Study of a Seminary Group and Four Other Groups on the Minnesota Multiphasic Personality Inventory," Student Psychology and Psychiatry of Catholic University, 7 (1948), pp. 1-107.

studies, primarily concerned with the psychological assessment and selection procedures for candidates to religious life.

In using the MMPI with religious communities of men, the separate efforts of Vaughan,³⁸ Hispanicus,³⁹ and Weisgerber⁴⁰ have focused on a common problem--the description of personality traits of those persevering in religious life and of those leaving religious life during the training period. Typical personality patterns were seen to emerge. Vaughan discovered that, over a five-year period of time, MMPI results on 163 who persevered and 55 who left during the time interval failed as predictors of success or failure; both groups deviated from the Minnesota norms with high mean scores on K, Pd, and Mf and low mean scores on D. Weisgerber also failed to differentiate the successful from the unsuccessful by means of the MMPI. He found peaks for both groups on the K, Pd, Mf and Sc scales within a summary record which was higher than both the Minnesota college normals and Bier's seminary group. Hispanicus' comparison of those who left (N = 10) and those who stayed (N = 40) in a diocesan seminary during one year revealed slightly different trends. Hispanicus found that the over-all profile of those persevering "was more in the

³⁸Richard P. Vaughan, "A Psychological Assessment Program for Candidates to the Religious Life: Validation Study," The Catholic Psychological Record, 1 (1963), pp. 65-70.

³⁹Petreolus Hispanicus, "Selecting Seminarians," Screening Candidates for the Priesthood and Religious Life, ed. Vincent V. Herr (Chicago: Loyola University Press, 1962), pp. 65-105.

⁴⁰Charles A. Weisgerber, "Survey of a Psychological Screening Program in a Clerical Order," Screening Candidates for the Priesthood and Religious Life, ed. Vincent V. Herr (Chicago: Loyola University Press, 1962), pp. 107-148.

direction of those of normal, healthy persons in every one of the MMPI categories tested;"⁴¹ the So, Pt and Pd scales were significantly higher for the unsuccessful religious. Because of the small sample used in Hispanicus' study, additional evidence would be necessary before the predictive value of the MMPI were substantiated. Nonetheless, there is consistent evidence in the above that the religious seminary population differs from the Minnesota college normals and from the original seminary norms provided by Bier. Rice has added support to this conclusion in his study on teaching and non-teaching religious and has suggested that each community need establish its own set of norms for selection purposes.⁴²

McCarthy and Dondero have attributed, in part, the difficulty of predicting success in religious life to the change in personality which occurs after an applicant enters the seminary or convent. They warn that "an applicant who scores like the typical religious-in-training or professed may not, in fact, be scoring as those people did when they applied."⁴³ Since the concept of change has appeared important in the general practical aim of most studies on religious life--that of sharpening assessment and prediction measures for candidates--there has been some interest, of late, in the objective

⁴¹Hispanicus, p. 99.

⁴²P.J. Rice, "An MMPI Study of Religious Seminarians," (Unpublished Master's thesis, Loyola University, 1958).

⁴³Thomas McCarthy and Austin Dondero, "Predictor Variables and Criteria of Success in Religious Life: Needed Research," The Catholic Psychological Record, 1 (1963), pp. 71-80.

measurement of change during the training period and during various phases of religious life. Mastej used Bier's modified form of the MMPI "to estimate the influence which the different stages of training had on the adjustment of religious women in the course of their religious formation." The experimental group--composed of 100 religious at the postulant, novice, early professed, middle professed, and advanced professed levels--was compared to a group of 100 candidates who had been accepted by, but had not yet entered, a religious community. Mastej found that the configural pattern of the personality profiles was similar for all groups but that the mean scores generally increased with age and length of time in religion.⁴⁴ McCarthy did a longitudinal study on 81 young men in a teaching brothers' community with the Cattell 16 Personality Factor Questionnaire. In one to three year intervals, McCarthy examined the postulant, novice, and scholastic levels, expecting to find "that certain personality traits would vary in a systematic way during the training period." Only one group, the scholastics, changed significantly on the following scales: schizothymis, increased concern with correctness in behavior, and reduction in nervous tension. None of the other groups showed significant personality trait changes and, in contrast to Mastej's findings, each of the groups evidenced a significant amount of intertrait variability.⁴⁵

⁴⁴Sister M. Martina Mastej, "A Study of the Influence of the Religious Life on the Personality Adjustment of Religious Women as Measured by a Modified Form of the MMPI," (Unpublished Doctoral dissertation, Fordham University, 1953).

⁴⁵T.N. McCarthy, "Personality Trait Consistency During the Training Period for a Roman Catholic Congregation of Teaching Brothers," (Unpublished Doctoral dissertation, University of Ottawa, 1956).

Longitudinal studies directed specifically at measuring the changes occurring during sister formation are, as yet, non-existent. The accumulated research on the personality characteristics of religious and the brief insights on change during religious life, however, provide a wealth of background for this research.

Appraisal of General Ability and the ACE

The American Council of Education Psychological Examination for College Freshmen was developed by L. L. Thurstone and published initially in 1924. Numerous, almost yearly, editions followed until 1947 when publication and distribution of the ACE was incorporated by the Cooperative Test Division, Educational Testing Service. The ACE continued to be the most widely used instrument for selection and placement of college freshmen until its last edition in 1954 which marked the shift of the Educational Testing Service's interest to a new instrument, the Cooperative School and College Ability Test (SCAT). According to Buros' recent volume, Tests in Print, the ACE is still available and has continued to be used by many colleges across the country.⁴⁶

The ACE Manual, published in 1950, states that "the purpose of the American Council on Education Psychological Examination is to appraise what has been called scholastic aptitude or general intelligence, with special reference to the requirements of most college curricula."⁴⁷ The ACE is composed

⁴⁶Oscar Kristen Buros (ed.), Tests in Print (New Jersey: The Gryphon Press, 1961).

⁴⁷Manual of Instructions: American Council on Education Psychological Examination for College Freshmen (Princeton, N.J.: Educational Testing Service, 1950), p. 2.

of six subtests--arithmetical reasoning, number series, figure analogies, same-opposite, completion, verbal analogies; the first three subtests contribute to the quantitative or Q-score while the latter three comprise the linguistic or L-score. The subtests are carefully timed and total testing time, including an allotment for directions and demonstrations, approximates one hour. The test may be scored by machine or by hand with the aid of scoring stenoids.

The subtests included in the ACE have been examined in numerous factor analyses in order to justify grouping the subtests into the two classes of quantitative and linguistic. These summary scores, however, are not factorially pure so that differential guidance on the basis of the Q and L ratings is not advised without additional confirmatory support. The Q-L disparity has nonetheless captured the interest of psychologists from time to time as an objective measure of personality differences although the insight into the meaning of these scores has remained at a superficial and fairly obvious level.

Normative data--based on the voluntarily furnished results of four-year colleges, junior colleges, and teachers' colleges and expressed in terms of percentile rank--are available for the later editions of the ACE. The test publishers make no claims to data on reliability and validity. Anastasi cites that a number of follow-up studies have been directed toward the predictive value of the ACE, primarily as a predictor of grade point average.⁴⁸

⁴⁸Anastasi, pp. 226-227.

The cluster of correlations around .45 suggests that the validity of the ACE is somewhat lower than the validities of more recent tests of general ability. Anderson et al report a study in which the Wechsler-Bellevue, the Stanford Binet (Form L) and the ACE were correlated with grade point average. All tests were approximately equivalent in their correlations, ranging from .50 to .55. Of particular interest is the observation that the L-score of the ACE yielded a correlation with grade point average as high as that of the total ACE score while the predictive value of the Q-score was questionable.⁴⁹

The use of the classification, test of general ability, to describe the ACE is somewhat vague. Michael has stated that "the instrument furnishes an indication of general scholastic aptitude in which verbal reasoning and numerical abilities are primarily required."⁵⁰ Basically, the ACE is an intelligence test with a particular end--to select and place college freshmen. As Kennedy has commented, "the content of the test is probably less affected by knowledge than is that of most group tests, for the emphasis is on the manipulation of symbols rather than the utilization of previously learned facts."⁵¹ The college freshman demonstrates, in his performance on the ACE, his intellectual capacity for grasping the content subjects of a college curriculum.

⁴⁹E.E. Anderson et al, "Wilson College Studies in Psychology: A Comparison of the Wechsler-Bellevue, Revised Stanford Binet and American Council on Education Tests at the College Level," Journal of Psychology, 14 (1942), pp. 317-326.

⁵⁰William B. Michael, in The Fifth Mental Measurement Yearbook, ed. Oscar Kristen Buros (New Jersey: the Gryphon Press, 1959), p. 429.

⁵¹Thomas Michael Kennedy, "The Variation of Certain Personality Characteristics as Related to Curricular Differences," (Unpublished Doctoral dissertation, Loyola University, 1951), p. 50.

This capacity can best be judged in terms of the subject's evidence of intelligent action (obtaining a high score) on tests which demand the use of symbols.

The ACE does not yield a numerically constant IQ since it lacks the necessary conditions for constancy which have been summarized by Garrett: "regular and progressive increase of the SD's of the MA distributions with increasing age; homogeneity of function throughout the scale; absence of correlation between CA and IQ." Although it is fallacious to state that education changes the IQ, "no one would argue seriously that increased schooling does not in general lead to higher scores on any valid group test; but that such increases in score imply 'true' increases in 'intelligence' is certainly open to doubt."⁵² With maturity and increased educational experience, the individual is better prepared to deal with the symbolic tasks contained in tests such as the ACE.

Thorndike administered 2,310 pairs of ACE tests with a time lapse of one year to adolescents ranging from 13-6 to 20 years. After converting his results into standard scores and controlling for the practice effect, he determined the average gain of all age groups at 34.5 standard score points; individuals still showed appreciable gains at the highest ages included in the study. Thorndike concluded that "...in the case of individuals still attending school, ability to achieve on a standard type of paper and pencil test of intelligence or scholastic aptitude continues to increase at least until age 20 and probably beyond."⁵³ Bentz, in a "Test-Retest Experiment on the

⁵²H.E. Garrett, "A Developmental Theory of Intelligence," American Psychologist, I (1946), pp. 372-378.

⁵³Robert L. Thorndike, "Growth of Intelligence During Adolescence," Journal of Genetic Psychology, 72 (1948), p. 15.

Relationship Between Age and Mental Ability," administered the ACE to two groups: 40 years and older, 34 years and younger. He discovered that, during an interval of eight years, the older group dropped in their performance while the younger group showed a consistent increase.⁵⁴

Countless studies on change in general ability during the college years have utilized the ACE in test-retest designs. One of the earliest of such studies was that of McConnell who administered the 1927 edition to 70 members of the class of '32 at Cornell; he found a mean gain of 40.42 points over a period of four years.⁵⁵ McConnell's results were reinforced by Livesay⁵⁶ with the 1931 edition and Flory⁵⁷ with the 1934 edition. Hunter retested a class at Converse College each year and compared the subsequent test results with the first performance. Hunter found a gain of 23 percentile points by the end of two years, 26 percentile points by the end of three years, and 31 percentile points by the end of four years; aside from the evident increase during this period, it is noteworthy that 75 per cent of the four year gain took place during the freshman year.⁵⁸ Sister M. Florence Louise, in addition

⁵⁴V. J. Bentz, "A Test-Retest Experiment on the Relationship Between Age and Mental Ability," American Psychologist, 8 (1953), pp. 319-320.

⁵⁵T. R. McConnell, "Changes in Scores on the Psychological Examination of the ACE from Freshman to Senior Year," Journal of Educational Psychology, 25 (1934), pp. 66-69.

⁵⁶T. M. Livesay, "Does Test Intelligence Increase at the College Level?" Journal of Educational Psychology, 30 (1939), pp. 63-68.

⁵⁷C. D. Flory, "The Intellectual Growth of College Students," Journal of Educational Research, 33 (1940), pp. 443-451.

⁵⁸E. C. Hunter, "Changes in Scores of College Students on the ACE at Yearly Intervals During the College Course," Journal of Educational Research, 32 (1942), pp. 284-289.

to observing similar increases, indicated the tendency for seniors to be more homogeneous in test performance than freshmen, but not to a significant degree.⁵⁹ Shuey noted further that the lowest quartile of students showed considerably greater gain within four years than each of the other quartiles.⁶⁰ And, in a careful study reported by Rasmussen, college students (in a non-technical school) make higher gains in verbal scores than in quantitative scores.⁶¹

The research on the ACE during the past thirty years has been remarkably consistent. Students gain significantly in measured general intelligence during four years of college--particularly in the linguistic area. Greatest gains are achieved during the freshman year and by persons who are in the lowest quartile of the class. There is some tendency for the performance of the seniors to be more homogeneous than that of the freshmen. It has been argued that the selective process in college experience may account for the improvement of successive classes. Since all of the studies reported above, however, were longitudinal studies, such an explanation is not applicable here. Whether these changes are due primarily to maturation or specific training is impossible

⁵⁹Sister M. Florence Louise, "Mental Growth and Development at the College Level," Journal of Educational Psychology, 38 (1947), pp. 65-83.

⁶⁰Audrey M. Shuey, "Improvement in Scores on the ACE from Freshman to Senior Year," Journal of Educational Psychology, 39 (1948), pp. 417-426.

⁶¹Elmer M. Rasmussen, "A Study of the Changes in Tested General Intelligence Between the Freshman and Senior Years as Measured by the ACE Psychological Examination for College Freshmen," (Unpublished Doctoral dissertation, University of Nebraska, 1952).

to judge since we lack studies comparing college groups with non-college groups of the same age and range of intelligence.

Relationship Between Measures of Personality and General Ability

The relationship between personality and general ability is often alluded to but seldom represented from more than one vantage point--that of the college counselor who bemoans the emotional stress placed on those of lower intelligence, that of the clinician who recognizes the lack of insight in his duller client, or that of the teacher who either over-emphasizes or de-emphasizes the interrelationship of intellectual and emotional factors within the individual.

Horrall, who represents the first of these vantage points, has described the "Relationship Between College Aptitude and Discouragement-Buoyancy Among College Freshmen" in an excellent study conducted through the Psychological Clinic at Purdue University. Horrall observed that freshmen who had scored low on the ACE prior to beginning their scholastic work evidenced much emotional strain expressed in bewilderment, frustration, discouragement, and even extreme depression. She stressed "that when people are placed in situations in which they do not succeed at least a part of the time, their level of mental health is probably lowered." With our American philosophy of 'education for all,' more and more students each year have been placing themselves in such situations and, often enough, the results are far from desirable. Horrall studied 70 persons who fell below the tenth percentile on the ACE at the time of their entrance into Purdue University in September, 1941 and who were still in attendance in April, 1942. The control group consisted of 68 who scored in

the middle range of the ACE and 69 who scored in the upper range, all of whom were matched with the experimental group on sex, curriculum choice, fraternity, and financial status. After testing both groups on the Horrall College Experience Scale, Thorndike-McCall Reading Test, Mooney College Problems Check List, Allport A-S Reaction Study, and Chant-Myers Attitude Scale, Horrall obtained these results: students in the lower group are markedly discouraged and depressed; there is a positive relationship between intelligence and discouragement-buoyancy scores; the greatest number of problems are listed by the low group. She concluded as follows:

Those students who are low in intelligence as measured by the ACE Psychological Examination appear to constitute a radically different group from those who are in the middle or at the top of the distribution. The daily frustrations and failures and the consequent discouragement of the low intelligence students as mirrored on all significant measurements used in this study place them as a group apart....A distinctly separate population whose needs are apparently being exceedingly poorly met at the present time.⁶²

Horrall's study, with its excellent sampling, controls and clear-cut results, provides a solid background against which other studies may be evaluated. Winfield examined the reliability of the MMPI by means of a split-half method of those of high ability (Wechsler Bellevue IQ 120-137) and those of low ability (Wechsler Bellevue IQ 77-95). The performance of the high ability tended to be more reliable but only on the schizophrenic scale was it

⁶²Bernice Moody Horrall, "Relationships Between College Aptitude and Discouragement Buoyancy Among College Freshmen," Journal of Genetic Psychology, 74 (1949), pp. 185-243.

significantly so.⁶³ Attention to differential performance on the MMPI validity scales indicates that those of greater intelligence score lower on the L and F scales and higher on the K scale.⁶⁴

Studies comparing a high ability group with a low ability group in the clinical scales of the MMPI have received considerable interest and yielded some interesting results. Levy et al found that the Mf scale correlated positively with intelligence in male subjects and numerous studies have added support to Levy's findings.⁶⁵ In addition to the above characteristic findings, Wexner observed that the Pa scale also correlated significantly with intelligence as measured by the Otis S-A test.⁶⁶ Anderson reached a similar conclusion when he found a positive correlation between the Pa scale and academic achievement.⁶⁷ High scores for low ability groups have been reported in other studies. Brower found a negative correlation between intelligence and

⁶³D.L. Winfield, "An Investigation of the Relationship Between Intelligence and the Statistical Reliability of the MMPI," Journal of Clinical Psychology, 8 (1952), pp. 146-148

⁶⁴Dahlstrom and Welsh, p. 266.

⁶⁵S. Levy et al, "The Outstanding Personality Factors Among the Population of a State Penitentiary: A Preliminary Report," Journal of Clinical and Experimental Psychopathology, 13 (1952), pp. 117-130.

⁶⁶Lois B. Wexner, "Relationship of Intelligence and the Nine Scales of the MMPI," Journal of Social Psychology, 40 (1954), pp. 173-176.

⁶⁷W. Anderson, "The MMPI Low Pa Scores," Journal of Counseling Psychology, 3 (1956), pp. 226-228.

the Hy scale.⁶⁸ Altus distinguished academic achievers from non-achievers by a significant disparity in performance on the Ma scale--the non-achievers scoring consistently higher.⁶⁹ Yeomans and Lundin reported, in addition to a high Ma rating, a peak on the Pd scale for poorer students.⁷⁰

These studies on the MMPI would lead us to expect a higher score on the Mf (male) and Pa scales for those of greater ability and on the Hy, Pd, and Ma scales for those of less ability. A related series of studies on the Taylor Manifest Anxiety Scale serves to temper our evaluation of the above results. Matarazzo et al had found a significant negative correlation between manifest anxiety and ACE ranking, suggesting--as did Horrall--that those of lower intelligence show less ego integration and, hence, greater anxiety, than the more gifted.⁷¹ Schulz and Calvin, however, failed to replicate Matarazzo's results; instead, they found a low positive correlation between anxiety and intelligence.⁷² The contradictory evidence on the Taylor Manifest Anxiety Scale

⁶⁸D. Brower, "The Relation Between Intelligence and MMPI Scores," Journal of Social Psychology, 25 (1947), pp. 243-245.

⁶⁹W.D. Altus, "A college Achiever and Non-Achiever Scale for the MMPI," Journal of Applied Psychology, 32 (1948), pp. 385-397.

⁷⁰W.N. Yeomans and R.W. Lundin, "The Relationship Between Personality Adjustment and Scholastic Achievement in Male College Students," Journal of Genetic Psychology, 57 (1957), pp. 213-218.

⁷¹J.D. Matarazzo et al, "The Relationship Between Anxiety Level and Several Measures of Intelligence," Journal of Consulting Psychology, 18 (1954), pp. 201-205.

⁷²R.E. Schulz and A.D. Calvin, "A Failure to Replicate the Finding of a Negative Correlation Between Manifest Anxiety and ACE Scores," Journal of Consulting Psychology, 19 (1955), pp. 223-224.

reminds us to proceed with caution when interpreting isolated studies such as those cited on MMPI characteristic performance; as Horrall has suggested, this is an area that has meaningful practical implications to young college students but it is also an area that has been only superficially and inadequately examined thusfar.

CHAPTER III

METHOD

The following topics will be reviewed in the present chapter: a description of the subjects used in this study with regard to group characteristics and to the common experience provided by the sister formation program; a description of test procedure and statistical analyses of the various phases of the research problem.

Description of Subjects

The subjects for this study are forty-three young women who have participated in the sister formation program of a large religious community. This particular sister formation program--established in 1953--allows a training period of five years, during which the young sisters obtain a liberal education and pursue a college degree in various fields which will fit them for their future roles in teaching and nursing. All persons in the present sample received their education at a women's liberal arts college which is conducted by the community of which they are members. Twenty sisters in the total group were completing their fifth year of the training period during the summer of 1963 and already making preparation for their first assignments in the active apostolic work of the Church. The remaining twenty-three sisters were completing their third year in the sister formation program during the summer of 1963 and, following their profession of temporary vows, will undertake two

more years of specialized study before assuming their positions as religious teachers or religious nurses. In order to facilitate discussion and comparison of these two groups of sisters, we will refer to the five year group as 'Juniors', that is, those completing the advanced formal level of training commonly known as the juniorate; the sisters in the three year group who are completing their novitiate training will simply be referred to as 'Novices'.

It is important to note that the sample is composed of two complete classes and, hence, was not subjected to any artificial means of selection. Nonetheless, the procedure regarding admission and acceptance into the religious community has affected a natural selectivity and the effects of this procedure must be borne in mind. Those who apply for admission to religious life comprise only a small proportion of the total population. Before they are accepted by the community, they undergo a well-detailed screening process which attempts to assess their physical, intellectual, emotional, and spiritual qualifications as suitable or unsuitable to this vocation. Regarding the psychological aspect alone, it is essential to the good of the individual and the community that the applicant have sufficient integration and maturity to accept the responsibility of her commitment and sufficient intelligence to perform the works of the community. Psychological assessment, at the time that both groups entered religious life, was largely dependent on previous school records, tests of achievement or general ability, letters of recommendation from teachers or employers, the MMPI, and a structured interview. It is not to the interest of this study to specify particular criterion for selection although it need be emphasized that those accepted into the sister formation program were judged to be capable of doing college work. They were also

judged to be free from severe personality disturbance as might be suggested by high T-scores on the MMPI; there was no attempt, however, to select according to a preconceived 'ideal profile' on the MMPI. During the training period, the groups have been further defined as those who have persevered in their intention to live the religious life and whom the community, after providing an opportunity to adjust to the demands of this life, has admitted to profession of temporary vows.

Table 1 describes the relevant data on chronological age, indicating considerable comparability in the ages of both groups at the time of their entrance into the sister formation program.

The general social background of both groups, prior to entrance into the sister formation program, is also unusually similar. All subjects are American-born and descended from various European countries; the single predominant descendency is Irish, accounting for the national background of approximately fifty per cent of the subjects in either group. The subjects largely represent an urban population drawn from two major cities in the Midwest; two members of each group come from small towns in a rural area. On the basis of the fathers' occupations, economic status of both groups ranges from upper to lower middle class.¹ In the novitiate and juniorate groups alike, approximately one-third of the mothers are employed outside of the home.

¹Criterion for judgment of economic status was adopted from Warner et al., "Social Class in America" as contained in Leonard Reissmann, Class in American Society (Illinois: The Free Press of Glencoe, 1959), p. 149.

TABLE 1

CHRONOLOGICAL AGE OF NOVICES AND JUNIORS AT VARIOUS
DEVELOPMENTAL PHASES OF RELIGIOUS LIFE

Age in years	Novices			
	Range	Median	Mean	Standard Deviation
At decision to be a religious	8-0 to 20-0	17-0	16-8	2-8
At entrance into sister formation program	17-4 to 21-8	18-4	18-8	1-0
At completion of three years in sister formation program	20-2 to 24-5	21-2	21-6	1-0
Age in years	Juniors			
	Range	Median	Mean	Standard Deviation
At decision to be a religious	11-0 to 21-0	17-0	16-6	2-6
At entrance into sister formation program	17-6 to 22-8	18-2	18-7	1-2
At completion of five years in sister formation program	22-4 to 27-6	23-0	23-5	1-2

The family constellation shows slight variability between the Novices and Juniors. Table 2 summarizes the statistics regarding the rank of the subjects within their families. Included in the category of 'middle child' in Table 2 are all those individuals who are not contained within the other three categories; thus, the breadth of this category accounts, in part, for the high percentage charted under 'middle child'. The single characteristic which differentiates the juniorate group from the novitiate group regarding family

position is the much higher percentage of 'only children' among the Juniors. At the time of their entrance into religious life all subjects--with the

TABLE 2
FAMILY POSITION OF NOVICES AND JUNIORS

	Novices		Juniors	
	N	%	N	%
Only child	2	8.8	5	25.0
Oldest child	7	30.4	5	25.0
Youngest child	4	17.4	2	10.0
Middle child	10	43.4	8	40.0

exception of one in the juniorate group--were residing with their families. One mother and one father of the Novices were deceased; three fathers of the Juniors were deceased.

The educational experience of the entire sample at the grammar school and high school levels was obtained, for the most part, in Catholic schools. When they entered the sister formation program, six of the novitiate group had acquired substantial college credit--one having attained an A.B. degree, two having completed the sophomore year, and three having completed the freshman year. In the juniorate group, three had completed the freshman year of college and one had a certificate as an x-ray technician. All other persons were high school graduates with only occasional college credit for one of two courses.

At the time of testing in the summer of 1963, certain obvious differences in educational level were expected and found. Table 3 describes the college status of the Novices and Juniors after three and five years respectively in the sister formation program. During the first three years of training, the

TABLE 3

ACCUMULATION OF COLLEGE SEMESTER HOURS AFTER THREE YEARS
AND FIVE YEARS IN THE SISTER FORMATION PROGRAM

Semester Hours	Range	Median	Mean	Standard Deviation
After three years	41-195	55.0	68.19	33.35
After five years	100-142	126.5	122.85	11.15

emphasis is undeniably on spiritual growth while intellectual pursuits in terms of secular subjects are secondary in the formation plan. The second of these three years, in fact, is set aside solely for the study of theology and the principles of religious life according to the prescriptions of the Church. In the juniorate, however, the great majority of the sisters carry the same number of semester hours as the non-religious student. Thus, the variation in educational level between the Novices and Juniors charted in Table 3 is an effect, not only of time, but also of a differential emphasis placed on acquiring a college degree during the two phases of the formation program.

According to the summary of group characteristics above, we may conclude that there were no outstanding differences in social background which distinguished the two groups as they presented themselves for admission to the

religious community. Aside from slight variability in family position and educational status, we are faced with the realization that the most striking feature of our observation is the similarity evidenced prior to undergoing the common experience of sister formation. At the time of current testing, however, there are marked differences in educational status.

Description of Test Procedure and Statistical Analyses

The tests administered were the MMPI, booklet form, and the ACE Psychological Examination for College Freshmen, 1952 edition. The juniorate group took the MMPI and the ACE before they entered sister formation in September, 1958, as part of the screening and college placement program. The novitiate group had taken the MMPI before entering religious life in September, 1960, and were given the same edition of the ACE two days after their entrance into the sister formation program. For practical purposes, we shall consider the previously described test administrations on an equal basis as having been completed before either group was effected by the experience of sister formation. In July, 1963, the MMPI and the ACE, 1952 edition, were readministered to the Novices and Juniors, approximately three years and five years respectively after the first testing.

The tests were hand-scored by the examiner. All subsequent statistical analyses were based on raw scores to prevent any possible distortion which the use of T-scores and percentiles might involve. The use of raw scores avoids making the dubious assumption that the group under study is equivalent to the normalizing population. In the scoring of the MMPI, the proportion of the K value prescribed by the MMPI Manual was consistently added to the Hs, Pd, Pt,

So, and Ma scales. As has been noted in the literature and supported by the present study, K is spuriously high for religious subjects; any distortion caused by the addition of K, then, will be in the direction of unduly high scores on the Hs, Pd, Pt, So, and Ma scales. We have chosen, nonetheless, to proceed in this manner in order to facilitate comparison with the greater number of MMPI studies which use the K addition.

This research project which attempted to investigate the magnitude and direction of change in personality and general ability during sister formation by means of a longitudinal study over a period of three years and five years involved the systematic analyses of the following problems: 1. whether or not the two groups were representative samples of the same population prior to entrance into the sister formation program as evidenced by their performances on the MMPI and the ACE; 2. whether or not significant changes in personality and general ability occurred within the three year period; 3. whether or not significant changes in personality and general ability occurred within the five year period; 4. whether or not the two groups--one completing the third year in sister formation and the other completing the fifth year in sister formation--were significantly different in personality and general ability as measured by the MMPI and ACE.

The stress on intellectual development as advocated by the Sister Formation Movement stimulated another line of inquiry which departed somewhat from the major focus of this research. That is, did the experience of sister formation affect a differential personality change in those of less ability than in those of greater ability? In line with this investigation, a selection was made of the upper and lower quarters of both groups as they were

ranked on the first administration of the ACE and their performances on the MMPI were compared. The general outline of the analysis was similar to that cited above with two important exceptions: the upper and lower quarters were compared within each specific group and no attempt was made to analyze statistically the similarities and differences between the groups; here, we were interested only in personality change as measured by the MMPI.

The statistical analyses of the data in regard to the problems outlined above were both descriptive and inferential. The groups and sub-groups were described according to measures of central tendency (mean, median) and measures of variability (range, standard deviation). The experimental procedure involved, then, finding the significance of difference of means and the significance of difference of variances in order to test the hypothesis which states that change does, in fact, take place as an effect of the experience of sister formation.

A t-test for the difference of means was employed to determine if the group means under comparison were significantly different. When comparing the means of two small independent samples as in the consideration of the novitiate group and the juniorate group prior to entrance into religious life, the following formula suggested by McNemar was used:²

$$t = \frac{M_1 - M_2}{\sqrt{\frac{s^2}{N_1} + \frac{s^2}{N_2}}} \quad \text{and } df = N_1 + N_2 - 2$$

²Quinn McNemar, Psychological Statistics, (New York: John Wiley & Sons, Inc.), pp. 109-110.

In order to determine if change takes place within a specific group, a t-test for the difference of means in small correlated samples was employed according to the formula proposed by Garrett.³

$$t = \frac{M_D}{S_{EMD}} \quad \text{where} \quad S_{EMD} = \frac{S_D}{\sqrt{N}} \quad \text{and} \quad df = N - 1$$

Since it was also to our advantage to know if the range of individual differences was comparable for both groups or for both performances of the same group, a test for the significance of difference of variances seemed necessary. When concerned with data from small independent samples, the following formula was employed:⁴

$$F = \frac{s_1^2}{s_2^2} \quad \text{and} \quad df_1 = N_1 - 1; \quad df_2 = N_2 - 1$$

In consideration of the difference in variances of small correlated samples, the statistical test took the form outlined by McNemar:⁵

$$t = \frac{(s_1^2 - s_2^2)\sqrt{N-2}}{\sqrt{4s_1^2s_2^2(1-r_{12}^2)}} \quad \text{and} \quad df = N - 2$$

³Henry Garrett, Statistics in Psychology and Education, (New York: Longmans, Green & Co., 1958), pp. 227-228.

⁴McNemar, p. 245.

⁵Ibid., pp. 243-244.

All phases of the problem were analyzed in the above manner. The use of specific formulae was determined by the character of the data--correlated or uncorrelated. Since changes were expected on the ACE in the direction of an increase in general ability, a one-tailed test was applied to such data. With the MMPI, changes were again expected but, since we were unable to predict the direction of change, a two-tailed test was applied to this data. Differences in means and variances were judged significant at the .05 level.⁶

⁶The significance level of the t-tests and F-tests was obtained from Table 3 and Table 4 of Fisher and Yates as contained in abridged form in Quinn McNemar, Psychological Statistics, pp. 388-389.

CHAPTER IV

RESULTS

The preceding chapter has outlined the important aspects and methods of investigating the aspects of change in personality and general ability within a specific, well-defined society. In the present chapter, we will examine the significance of change in mean and variability for both groups--Novices and Juniors. We will further define our observations by selecting the upper and lower quartiles of each group--according to group ranking on the original ACE test--to discern whether there are differential changes in personality for the two extremes in ability.

Preliminary Considerations

Table 4 summarizes the test-retest data on the MMPI performance of the Novice group in terms of measures of scatter and central tendency. The data are based on the performance of 23 subjects within a 3 year interval. Results are expressed in raw scores. The value of K in proportions prescribed by the MMPI Manual was added to the Hs, Pd, Pt, Sc, and Ma scales.

The test-retest data on the ACE performance of the Novice group are contained in Table 5. It is to be noted here that the original test results were obtained from 19 subjects; since the remaining 4 subjects had attended college before entering the sister formation program, it had not seemed necessary to require of them a test designed to assess their ability for college activity.

TABLE 4

TEST - RETEST RESULTS ON THE MMPI OVER A THREE YEAR INTERVAL

Scale	Range	Median	Mean	Standard Deviation
L test	1-10	5	4.96	2.19
L retest	1-0	4	4.74	2.19
F test	0-6	3	2.48	1.33
F retest	0-5	3	2.43	1.30
K test	12-24	19	19.00	3.10
K retest	9-25	21	19.35	3.92
Hs test	10-16	12	12.26	1.69
Hs retest	7-19	12	12.74	2.50
D test	12-26	18	18.09	3.15
D retest	11-25	18	17.52	3.59
Hy test	18-27	21	21.83	2.68
Hy retest	13-27	22	21.48	3.11
Pd test	13-26	21	21.48	3.10
Pd retest	15-27	23	22.09	3.26
Mf test	23-42	34	33.39	5.10
Mf retest	21-39	36	34.83	3.89
Pa test	3-13	9	9.04	2.45
Pa retest	5-15	10	9.57	2.16
Pt test	20-35	28	27.65	3.23
Pt retest	20-35	28	28.52	3.78
Sc test	17-32	26	25.30	3.17
Sc retest	17-32	27	25.74	3.59
Ma test	13-27	18	18.78	3.55
Ma retest	14-25	19	19.48	3.06
Si test	14-32	21	22.00	5.19
Si retest	13-43	22	23.83	7.01

The retest data, however, were based on the entire group of 23 persons. The interval between test and retest was 3 years.

TABLE 5

TEST - RETEST RESULTS ON THE AGE OVER A THREE YEAR INTERVAL

Scale		Range	Median	Mean	Standard Deviation
Q	test	15-64	41	38.95	14.00
	retest	18-62	41	41.61	10.76
L	test	36-95	70	66.32	17.64
	retest	47-115	81	79.09	15.29
Total	test	51-158	108	105.32	30.39
	retest	65-165	123	120.70	23.50

The test-retest results for the Junior group are presented in Table 6 and Table 7. Again, the K correction was used on the appropriate scales. The data represent the performance of 20 subjects. The time interval between test and retest was 5 years.

Preliminary to the discussion of the significance of change in results represented in Tables 4 through 7, it is necessary to ascertain if the Novice group and Junior group were representative samples of the same population prior to their entrance into the sister formation program. A comparison of the change which takes place within the 3 year program and the 5 year program can only be undertaken if the groups were judged to be similar on the measures involved before being exposed to the experience of sister formation.

TABLE 6

TEST - RETEST RESULTS ON THE MMPI OVER A FIVE YEAR INTERVAL

Scale	Range	Median	Mean	Standard Deviation
L test	0-9	4	4.40	2.06
retest	0-7	4	3.50	1.91
F test	0-4	2	1.85	1.15
retest	0-10	2.5	2.80	2.23
K test	14-23	17	17.85	2.61
retest	10-25	18.5	18.50	3.98
Hs test	10-16	12	12.40	1.53
retest	9-18	12.5	12.55	2.36
D test	14-25	16.5	17.40	2.92
retest	10-23	17	16.70	3.07
Hy test	14-28	21	20.95	3.61
retest	15-26	21	20.90	2.93
Pd test	16-26	21	21.00	2.85
retest	16-31	22	21.90	3.97
Mf test	28-41	33.5	33.30	4.04
retest	26-39	33.5	33.35	4.15
Pa test	5-13	9	9.30	2.10
retest	4-16	10.5	9.85	2.80
Pt test	19-36	26	26.55	3.89
retest	19-36	28	28.20	3.93
Sc test	20-28	25	24.90	3.06
retest	17-38	26	26.00	4.97
Ma test	14-24	18	18.90	2.66
retest	17-24	19.5	19.85	2.24
Si test	14-41	21.5	21.75	7.01
retest	13-43	24	25.05	8.09

TABLE 7

TEST - RETEST RESULTS ON THE ACE OVER A FIVE YEAR INTERVAL

Scale		Range	Median	Mean	Standard Deviation
Q	test	9-55	39	38.05	11.29
	retest	20-63	40.5	42.45	11.54
L	test	37-97	73	70.65	16.40
	retest	38-112	86	80.60	19.40
Total	test	56-149	108	108.70	23.11
	retest	71-175	124	123.05	27.95

A t test to determine the significance of difference of means and an F test to determine the significance of difference of variances were applied to the original data on the MMPI and are summarized in Table 8.

TABLE 8

COMPARISON OF NOVICES AND JUNIORS ON MEANS AND VARIANCES OF MMPI SCALES PRIOR TO ENTRANCE INTO SISTER FORMATION

Scale	Comparison of Mean Scores		Comparison of Variances	
	t	Higher Mean	F	Greater Variance
L	0.822	Novices	1.103	Novices
F	1.595	Novices	1.324	Novices
K	1.225	Novices	1.402	Novices
Hs	0.278	Juniors	1.169	Novices
D	0.718	Novices	1.156	Novices
Hy	0.888	Novices	1.827	Juniors
Pd	0.511	Novices	1.175	Novices
Mf	0.062	Novices	1.580	Novices
Pa	0.360	Juniors	1.352	Novices
Pt	0.982	Novices	1.461	Juniors
Sc	0.407	Novices	1.066	Novices
Ma	0.120	Novices	1.769	Novices
Si	0.131	Novices	1.837	Juniors

There were no significant differences in mean or variance on the original MMPI performance. We may generalize, then, that the novitiate and juniorate groups were highly similar in personality traits as measured by the MMPI prior to their entrance into sister formation.

Table 9 summarizes the t and F values obtained in a comparison of means and variances on the original tests of the ACE.

TABLE 9

COMPARISON OF NOVICES AND JUNIORS ON MEANS AND VARIANCES OF
ACE SCALES PRIOR TO ENTRANCE INTO SISTER FORMATION

Scale	Comparison of Mean Scores		Comparison of Variances	
	t	Higher Mean	F	Greater Variance
Q	0.215	Novices	1.542	Novices
L	0.778	Juniors	1.160	Novices
Total	0.384	Juniors	1.734	Novices

Again, the t and F values cited in Table 9 fail to reach a level of significant difference and it may be concluded that the two groups were also similar in general ability as sampled by the ACE.

Thus, it is apparent that--in addition to noting a commonality in social, economic, and educational background of the subjects of this study as described in Chapter III--the two groups who have applied to, been accepted by, and have persevered in the religious community concerned for three to five years were remarkably similar in measures of personality and general ability before they entered the sister formation program. We are justified, then, in contrasting the direction of change for each group on the ground that both groups were similar in their initial performance.

Change in Personality During Sister Formation

Figure 1 on page 59 portrays the test-retest MMPI profiles of the Novice group. In order to determine if the changes illustrated are of significance, a t test for means and variances was applied to the test-retest data and is summarized in Table 10.

TABLE 10

COMPARISON OF MEANS AND VARIANCES ON TEST - RETEST
OF THE MMPI OVER A THREE YEAR INTERVAL

Scale	Comparison of Mean Scores		Comparison of Variances	
	t	Higher Mean	t	Greater Variance
L	0.399	test	0.044	retest
F	0.100	test	0.105	test
K	0.492	retest	1.336	retest
Hs	1.111	retest	2.355*	retest
D	0.656	test	0.456	retest
Hy	0.465	test	0.714	retest
Pd	1.001	retest	0.291	retest
Mf	1.917	retest	1.869	test
Pa	1.097	retest	0.686	test
Pt	1.018	retest	0.747	retest
Sc	0.459	retest	0.596	retest
Ma	0.765	retest	0.697	test
Si	1.378	retest	1.636	retest

* significant at the .05 level.

During the first three years of sister formation, there is a general increase in mean scores on most scales although, as Table 10 describes, the difference in scores is not significant. Changes in variances are predominantly in the direction of greater variability within the group after three years in the same situation. Only on the Hs scale, however, does the group become significantly more variable--at the .05 level of confidence.

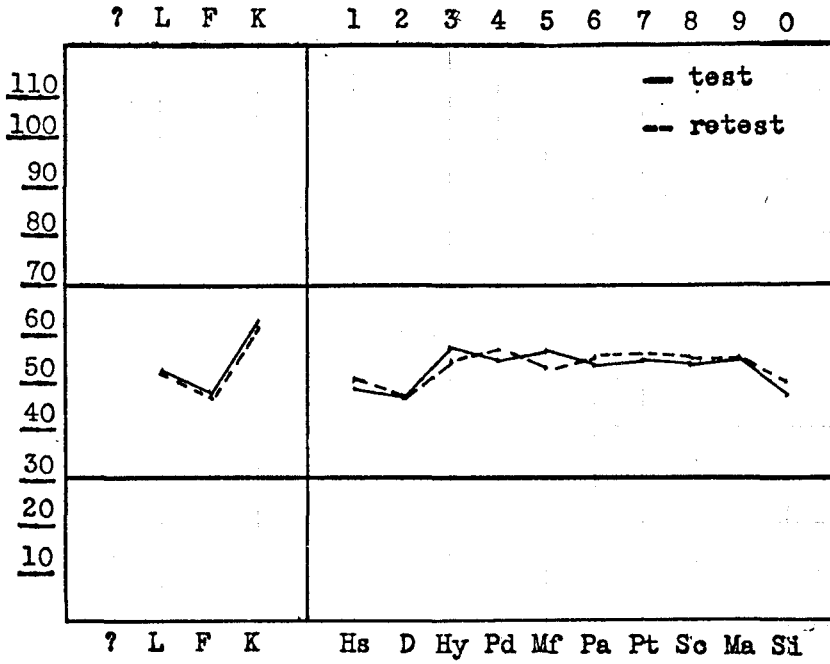


Figure 1.--Test-Retest Profiles of the Novitiate Group

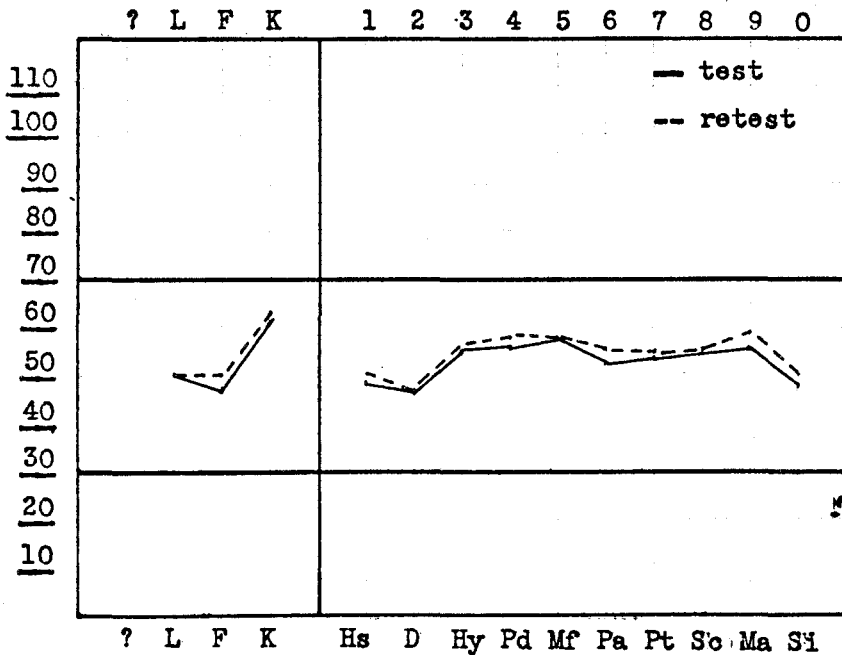


Figure 2.--Test-Retest Profiles of the Juniorate Group

The test-retest profiles on the MMPI for the Junior group are presented in Figure 2 on page 59. Table 11 contains the t values for the comparison of mean scores and variances of the two test administrations over a five year interval.

TABLE 11

COMPARISON OF MEANS AND VARIANCES ON TEST - RETEST
OF THE MMPI OVER A FIVE YEAR INTERVAL

Scale	Comparison of Mean Scores		Comparison of Variances	
	t	Higher Mean	t	Greater Variance
L	1.645	test	0.321	test
F	1.425	retest	3.333***	retest
K	0.681	retest	1.944	retest
Hs	0.304	retest	2.145*	retest
D	0.768	test	0.214	retest
Hy	0.059	test	0.961	test
Pd	1.106	retest	1.623	retest
Mf	0.045	retest	0.119	retest
Pa	0.731	retest	1.251	retest
Pt	1.440	retest	0.441	retest
Sc	0.948	retest	2.237*	retest
Ma	1.377	retest	0.756	test
Si	1.473	retest	0.600	retest

* significant at the .05 level.

*** significant at the .01 level.

As with the three year group, the Juniors show an increase in mean scores over a period of five years but there are no significant changes. There is also greater variability within the group at the end of the sister formation program. The increase in variance on the F scale is significant at the .01 level and on the Hs and Sc scales at the .05 level of confidence.

For both groups, then, there are trends toward greater deviancy and greater variability on the MMPI scales after participating in the sister formation program. Since these trends generally fail to reach a significant level, however, we may conclude that there are no significant changes in personality as measured by the MMPI except for a decrease in homogeneity among the subjects of both groups on the Hs scale and, in addition, on the F and Sc scales for the Junior group.

Change in General Ability During Sister Formation

In assessing the magnitude of change on the ACE performance of the Novice group over a period of three years, a t test for determining the significance of difference in means and variances was applied to the test-retest data and is summarized in Table 12.

TABLE 12

COMPARISON OF MEANS AND VARIANCES ON TEST - RETEST
OF THE ACE OVER A THREE YEAR INTERVAL

Scale	Comparison of Mean Scores		Comparison of Variances	
	t	Higher Mean	t	Greater Variance
Q	1.316	retest	2.354*	test
L	4.973*****	retest	0.563	test
Total	3.947*****	retest	1.694	test

* significant at the .05 level.
***** significant at the .001 level.

Changes in the mean scores of the L scale and the Total score are highly significant after three years. It is apparent that the group becomes more homogeneous in their ability to perform on symbolic tasks after the similar

educational experience; the Novices are more homogeneous on the Q scale to a significant degree.

Table 13 describes the comparative test-retest performance of the Junior group on the ACE

TABLE 13
COMPARISON OF MEANS AND VARIANCES ON TEST-RETEST
OF THE ACE OVER A FIVE YEAR INTERVAL

Scale	Comparison of Mean Scores		Comparison of Variances	
	t	Higher Mean	t	Greater Variance
Q	3.240***	retest	0.190	retest
L	4.038*****	retest	1.286	retest
Total	4.900*****	retest	1.897	retest

*** significant at the .01 level.

***** significant at the .001 level.

Mean score changes in the Q, L and total scores of the ACE are highly significant after five years in sister formation. There is greater variability among the group at this time also, although there is no significant change in variability.

As Tables 12 and 13 describe, changes in general ability as measured by the ACE are highly significant during both the three year period and the five year period with the exception of little change in the Q score for the three year group. Changes in variability are not significant for either the Novices or the Juniors.

Summary on Current Status

We have indicated previously that the performances of both groups on the MMPI and the ACE were highly similar before the subjects entered the sister formation program. We have also noted that there were no significant changes in MMPI performance for either group during sister formation. There were, however, significant changes for both groups in ACE performance during sister formation. Table 14 compares the two groups at the time of retest to discern whether they are as similar on MMPI performance as they had been prior to encountering this common experience.

TABLE 14

COMPARISON OF NOVICES AND JUNIORS ON MEANS AND VARIANCES OF MMPI SCALES AFTER THREE YEARS AND FIVE YEARS RESPECTIVELY IN SISTER FORMATION

Scale	Comparison of Mean Scores		Comparison of Variances	
	t	Higher Mean	F	Greater Variance
L	1.906	Novices	1.306	Novices
F	0.657	Juniors	2.963**	Juniors
K	0.683	Novices	1.038	Juniors
Hs	0.249	Novices	1.114	Novices
D	0.654	Novices	1.358	Novices
Hy	0.608	Novices	1.119	Novices
Pd	0.114	Novices	1.493	Juniors
Mf	0.600	Novices	1.147	Juniors
Pa	0.359	Juniors	1.691	Juniors
Pt	0.264	Novices	1.088	Juniors
Sc	0.193	Juniors	1.930	Juniors
Ma	0.434	Juniors	1.805	Novices
Si	0.221	Juniors	1.331	Juniors

** significant at the .02 level.

There are no significant differences in means on the MMPI at the time of retest. The Juniors are significantly less homogeneous on the F scale than

the Novices.

Table 15 compares the ACE performance of the novitiate and juniorate groups at the time of retest.

TABLE 15

COMPARISON OF NOVICES AND JUNIORS ON MEANS AND VARIANCES OF ACE SCALES AFTER THREE YEARS AND FIVE YEARS RESPECTIVELY IN SISTER FORMATION

Scale	Comparison of Mean Scores		Comparison of Variances	
	t	Higher Mean	F	Greater Variance
Q	0.239	Juniors	1.109	Juniors
L	0.278	Juniors	1.454	Juniors
Total	0.298	Juniors	1.227	Juniors

Although we had noted that significant changes in ACE performance had occurred within each group during the periods of sister formation, there are no significant differences between the groups on the retest of the ACE.

Differential Changes in Personality Within Various Ability Groups

According to the rank received in the initial ACE testing, the upper and lower quartiles of the novitiate group ($N_1 = 6$, $N_2 = 6$) and the upper and lower quartiles of the juniorate group ($N_1 = 5$, $N_2 = 5$) were selected for further investigation of personality change. The test-retest results on the MMPI for each of the above-mentioned groups are contained in the Appendix--A,B,C,D.

In examining the differences in the upper and lower quartiles of the novice group on the original MMPI performances, we observe that the lower quartile scored significantly higher on the K and Pd scales while the upper quartile scored significantly higher on the Pa scale. There are no significant

differences in variances prior to entering sister formation.¹

Figures 3 and 4 on page 66 portray the test-retest MMPI profiles of the upper and lower quartiles of the Novice group. In Table 16, the t values comparing mean scores and variances for the test-retest performance of the upper quartile are presented.

TABLE 16

COMPARISON OF MEANS AND VARIANCES IN TEST - RETEST OF THE MMPI OVER
A THREE YEAR INTERVAL FOR THOSE OF GREATER GENERAL ABILITY

Scale	Comparison of Mean Scores		Comparison of Variances	
	t	Higher Mean	t	Greater Variance
L	0.514	test	0.612	test
F	0.211	test	0.747	retest
K	0.665	test	6.913***	retest
Hs	0.822	retest	2.555	retest
D	0.781	retest	1.201	retest
Hy	0.240	test	0.760	retest
Pd	3.477**	retest	1.004	test
Mf	0.740	retest	3.228*	test
Pa	0.415	retest	1.872	test
Pt	0.216	retest	0.795	retest
Sc	0.205	retest	1.619	retest
Ma	1.896	retest	1.251	retest
Si	0.815	retest	0.699	retest

* significant at the .05 level.

** significant at the .02 level.

*** significant at the .01 level.

The upper quartile changes significantly in mean performance on the Pd scale with a more deviant score after three years in sister formation. Significant

¹Refer to Appendix E for t and F values in comparison of means and variances of the upper and lower quartiles of the Novice group on original MMPI performances.

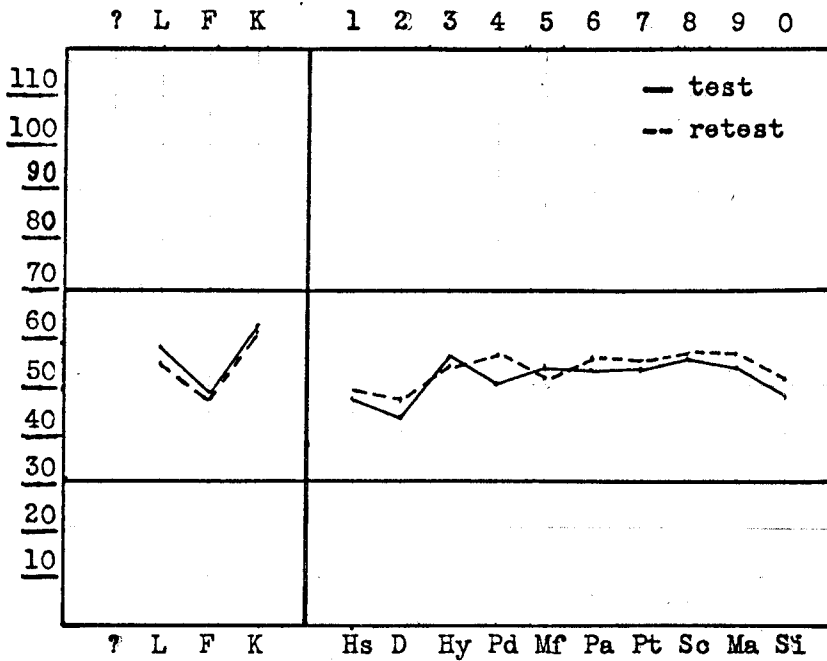


Figure 3.--Test-Retest Profiles of Novices of High Ability Level

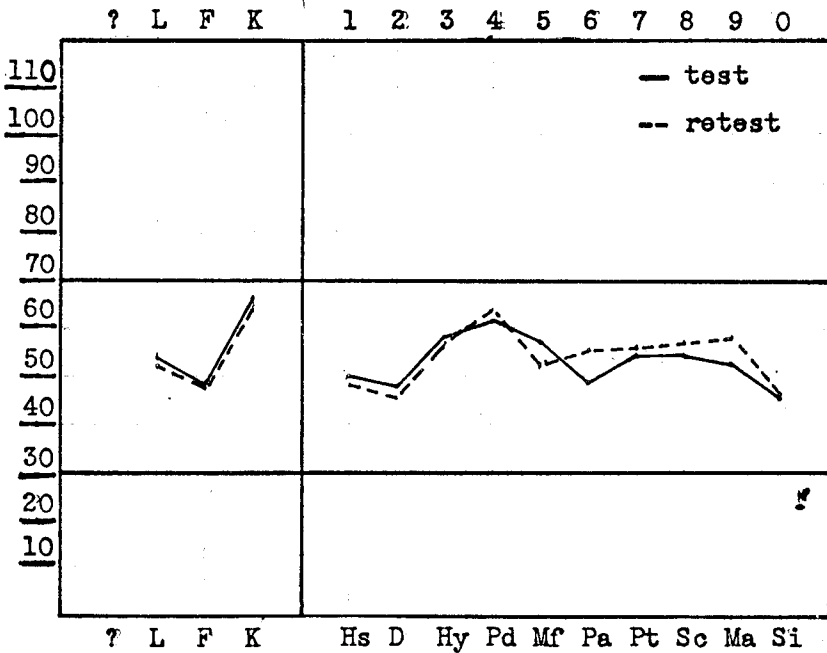


Figure 4.--Test-Retest Profiles of Novices of Low Ability Level

changes in variances are noted by increased variability on the K scale after three years and greater homogeneity on the Mf scale after three years.

Table 17 summarizes the t values on means and variances of test-retest data for the lower quartile of the Novice group.

TABLE 17

COMPARISON OF MEANS AND VARIANCES IN TEST - RETEST OF THE MMPI OVER
A THREE YEAR INTERVAL FOR THOSE OF LESS GENERAL ABILITY

Scale	Comparison of Mean Scores		Comparison of Variances	
	t	Higher Mean	t	Greater Variance
L	0.165	test	0.184	test
F	0.000		1.711	test
K	0.000		0.367	retest
Hs	0.679	test	1.180	test
D	1.511	test	0.113	retest
Hy	0.362	test	1.312	test
Pd	1.104	retest	0.447	test
Mf	1.960	retest	0.951	test
Pa	2.712*	retest	2.993*	retest
Pt	0.583	retest	0.377	retest
So	0.630	retest	1.395	retest
Ma	1.103	retest	0.382	retest
Si	0.093	retest	0.270	retest

* significant at the .05 level.

The mean performance for the lower quartile changes significantly on the Pa scale in the direction of greater deviancy after three years in sister formation. Changes in variances are minimal with the exception of a significant increase in variability on the Pa scale at the retest performance.

In our comparison of the upper quartile with the lower quartile on retest MMPI performances, we observe that the lower quartile's mean performance on the Pd scale is still significantly higher than that of the upper quartile;

differences in means for other scales are not significant at the .05 level. The upper quartile shows significantly greater variability. (.02 level of confidence) than the lower quartile on only two scales: Hs and Hy.²

Comparison of the original performances of the upper and lower quartiles of the Junior group indicates that, prior to entrance into sister formation, the upper quartile scored significantly higher on the Si scale. There were no significant differences in variances between the two groups.³ Figures 5 and 6 on page 69 illustrate the test-retest profiles of the upper and lower quartiles of the Junior group. Table 18 summarizes the changes observed in the upper quartile within the five year period. A significant increase of mean score on the Pd scale and a significant increase in homogeneity on the Pd scale are observed after five years. No other changes in mean or variances attain the .05 level of confidence.

Table 19 describes the results of the t-tests on mean differences in variances for the lower quartile. The lower quartile of the Junior group scored significantly higher on the Pt scale and Ma scale after five years. There were no significant changes in variability.

²Refer to Appendix F for t and F values in comparison of means and variances of the upper and lower quartiles of the Novice group on retest MMPI performance.

³Refer to Appendix G for t and F values in comparison of means and variances of the upper and lower quartiles of the Junior group on original MMPI performance.

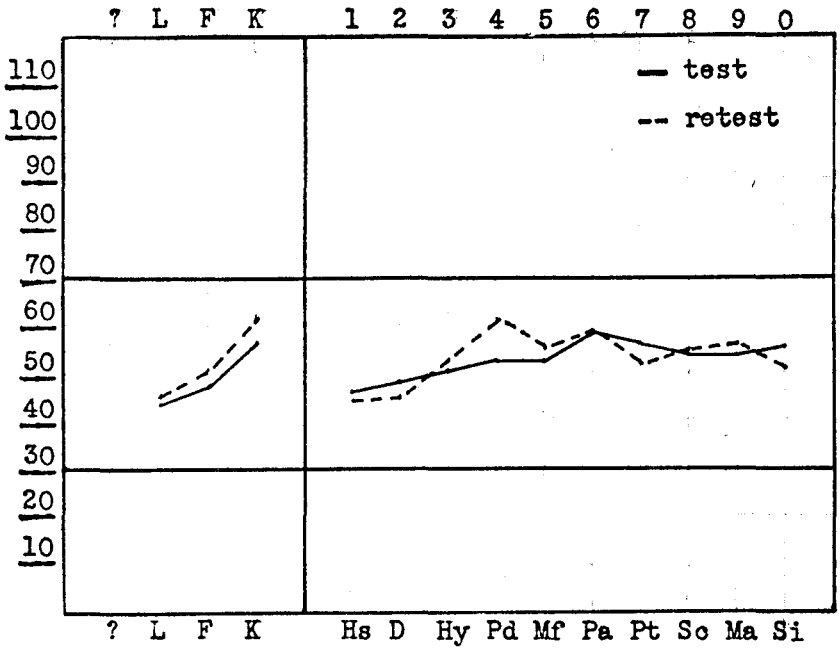


Figure 5.--Test-Retest Profiles of Juniors of High Ability Level

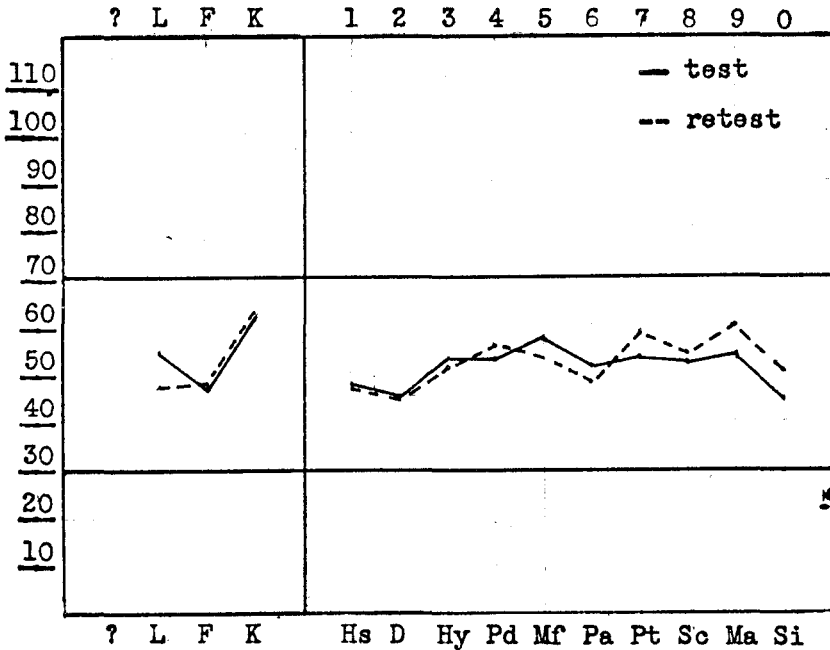


Figure 6.--Test-Retest Profiles of Juniors of Low Ability Level

TABLE 18

COMPARISON OF MEANS AND VARIANCES IN TEST - RETEST OF THE MMPI OVER
A FIVE YEAR INTERVAL FOR THOSE OF GREATER GENERAL ABILITY

Scale	Comparison of Mean Scores		Comparison of Variances	
	t	Higher Mean	t	Greater Variance
L	0.343	retest	0.403	retest
F	0.784	retest	0.767	retest
Hs	0.590	test	1.703	retest
D	0.818	test	0.237	retest
Hy	1.056	retest	0.516	retest
Pd	3.087*	retest	3.253*	test
Mf	0.470	test	0.277	test
Pa	0.000		0.716	retest
Pt	1.500	test	0.087	retest
Sc	0.000		1.010	retest
Ma	0.305	retest	2.004	test
Si	0.778	test	0.237	retest

* significant at the .05 level.

When we compare the performances of the upper and lower quartiles after five years in sister formation, we find that there are no differences in mean scores or variances which are significant. During the course of the five years, then, the two extremes of the group become more similar in their personality profiles than they had been prior to entering sister formation.⁴

⁴Refer to Appendix H for t and F values in comparison of means and variances of the upper and lower quartiles of the Junior group on retest MMPI performance.

TABLE 19

COMPARISON OF MEANS AND VARIANCES ON TEST - RETEST OF THE MMPI OVER
A FIVE YEAR INTERVAL FOR THOSE OF LESS GENERAL ABILITY

Scale	Comparison of Mean Scores		Comparison of Variances	
	t	Higher Mean	t	Greater Variance
L	1.064	test	2.225	test
F	0.272	retest	0.334	test
K	0.178	test	2.176	retest
Hs	0.272	retest	1.634	retest
D	0.512	test	0.368	retest
Hy	1.603	test	0.201	test
Pd	1.221	retest	1.121	retest
Mf	0.693	retest	0.276	retest
Pa	0.527	test	1.035	retest
Pt	3.584*	retest	2.332	retest
Sc	0.753	retest	0.525	retest
Ma	3.256*	retest	0.247	retest
Si	1.856	retest	0.883	retest

* significant at the .05 level.

CHAPTER V

DISCUSSION OF RESULTS

In our consideration of the changes in personality and general ability during sister formation, it had been hypothesized that the specific experiences of sister formation would modify the personality and general ability of individuals participating in such a program. Change was expected for numerous reasons: the majority of subjects involved were in late adolescence and the assumption of an adult role could readily involve some personality reorganization; the subjects were exposed to definite activities in education aimed at preparing them for a new and unique vocation and occupation; a religious society which the subjects represent traditionally, at least, emphasizes a certain conformity to a behavioral code; the literature on change in MMPI and ACE performance for the age group represented in the study suggests--almost without exception--that significant change in personality and general ability do take place during the college years.

The first concern of this investigation, then, was to discern whether change in personality did, in fact, take place within two specific groups in sister formation. According to the results cited in Chapter IV, there are no significant mean changes in the MMPI scales for either group although the slight changes evidenced are generally in the direction of greater deviancy from the MMPI normative population. After five years, the Juniors are significantly less homogeneous on the F, Hs and Sc scales; the Novices are

significantly less homogeneous on the Hs scale at the end of three years. No other changes in variability are significant although the over-all trend for each group is to become more variable on the retest of the MMPI.

If we were to explain this unexpected stability in personality traits over a considerable time limit in line with what had been discussed regarding change in MMPI scores in Chapter II, we would entertain the idea that the persons entering sister formation had achieved a specific, mature identity which is unaltered with a change in circumstances. We had pointed out before that this stability mirrors an adequate ego integration and negates the processes of neurotic adjustment or decompensation which would be evidenced in less intact ego structures. The persons involved in the study, then, do not show any inclination toward pathological adjustment--a characteristic which undoubtedly has been influenced by the careful screening of the groups before being accepted into the religious community.

These results also reflect seriously on the society of which the subjects are members. Contrary again to expectation, the society does not evidence any influence toward pathological adjustment. Nor does it appear to be emphasizing conformity since we find a slightly greater variability in scores after the experience of sister formation. On the positive side, it seems apparent that the society encourages, to a great extent, the maintenance and expression of the native characteristics of the subjects participating in the training program.

Interpreting our data in the manner stated above culminates in an obviously favorable impression of both the subjects and the religious society. Although such an interpretation has considerable support in the MMPI literature

it seems possible to view these results in quite an opposite vein. Perhaps the failure to change over a long period of time reflects a rigidity of the individual which is reinforced by the rigidity of the society. The subjects might be maintaining an adolescent development within the confines of a protective atmosphere--a parental society--where definite standards of behavior guide the individuals' actions much as their parents' prohibitions did at an earlier time. Then, in order to secure the approval of the society, the individuals must repress independent, freeing inclinations and stand still. In line with this interpretation, the society would be turning out retarded adolescents who are ill-equipped to assume the responsible activities of adult life.

It is the opinion here that if this alternative explanation more adequately describes the phenomena observed in the present study, it should show specific effects in definite areas of ego functioning. That area of ego functioning most readily observed by means of tests is the use of intellectual potential. In this study we treated the intellectual development during sister formation as a distinct and separate problem from that of personality development. However, as had been indicated in Chapter 1, such a separation is artificial and may somewhat distort the reality of the functioning being. The research procedure was dictated rather by the limitations of our instruments. It may be possible to bridge the gap by evaluating the intellectual performance and then reviewing it in relation to the whole person.

The retest performance on the ACE shows highly significant increases in scores after three years and five years in sister formation. In only one area did the mean gain fail to reach the .05 level of confidence--that of an

increase in the mean quantitative score for the Novice group. The results obtained on the ACE test-retest performance support the hypothesis of this study and coincide with the literature on the ACE performance during the college years. Of particular note is the observation that increases in L and Total mean scores are as great during the three year period as in the five year period--suggesting that the earlier period in sister formation, in which there is much less stress on academic achievement, is providing well for the intellectual development of the subjects.

It seems appropriate, now, to reintegrate the individual and view him in his totality. With such evidence of healthy intellectual development as a result of education and experience, we are less inclined to think that the subjects who are evidencing this development are constricted and fixated at an adolescent level. One of the major signs of inhibition or constriction is failure to achieve; the individual's energy is absorbed in containing his feelings and cannot be channeled in the direction of productive activity. Since ego functioning in regard to the use of intellectual potential appears, according to the results of this study, to be entirely adequate, we would postulate that the ego is intact and relatively free from crippling, inhibiting defenses.

With the support of the test-retest data on the ACE, then, we are inclined to endorse our first interpretation of the lack of change on the MMPI--that the individuals participating in the sister formation program evidence an adequate and stable personality integration which is unaltered by considerable change in circumstances. The real test of this interpretation, however, would be a re-evaluation of personality functioning a few years after the

sister formation period using, in addition to the tests involved in this study, a more subtle personality test--possibly the TAT--in order to assess motivation and modes of handling situational problems. Then, we would be better able to determine whether the individuals in the study truly evidence the capacity for mature, responsible action.

In addition to the major focus of this study, we were concerned with the differential effects of the sister formation program on various ability groups. Since the focus on education and professional preparation has received much emphasis during the past ten years, we had hypothesized that those of lower ability may be experiencing considerable pressure during their college years and, thus, would evidence more extreme changes on the MMPI than would those of greater ability. Within the Novice group, the lower quartile becomes significantly more deviant and less homogeneous on the Pa scale after three years; at the same time, the upper quartile becomes significantly more deviant on the Pd scale. The interesting feature is that originally the lower quartile was significantly higher on the Pd scale while the upper quartile was significantly higher on the Pa scale. As a result of the common experience of sister formation, we observe the extremes moving toward each other and assuming the primary characteristic of the opposite ability group. At the end of three years, we find that the two groups measure relatively alike on the Pa scale although the lower quartile still scores significantly higher on the Pd scale. Apparently, in this phase of sister formation, there is a trend toward uniformity which was not as evident when we had studied the total Novice group. This tendency toward a group identity may have been achieved, in part, through the emphasis placed on shared activities and group solidarity during the

novitiate years.

Those of lower ability continue to give more evidence of assertive non-critical, uninhibited, outgoing behavior; yet, their experiences in the sister formation program have increased their sensitivity and, perhaps, a suspicious or guarded quality has tempered their freedom of action. The increase in variability among the lower ability group suggests that one or two individuals are scoring considerably higher than the remainder of the group and it is on a few rather than the entire sub-group, that the high level on the Pd scale is maintained.

The upper quartile's increase on the Pd scale is somewhat puzzling. It is dubious that such a change is in imitation of the characteristics of those of less ability. It may simply mean that the upper quartile is becoming less sedate and cautious and is finding expression in active, even rebellious, behavior.

We notice the same characteristic changes within the upper quarter of the Junior group. Thus, we would expect these individuals to demonstrate some of the qualities of sociopaths--however, within normal limits. They have probably become more assertive than they were before they had entered sister formation and appear less concerned with conventionality in a facade which may take the form of rebelliousness or arrogance.

The lower quarter of the Junior group is significantly higher on the Pt and Ma scales after five years in sister formation. They appear energetic, aggressive, emotional, unconventional--perhaps disguising some dissatisfaction in a burst of enthusiastic activity. At the end of five years in sister formation, there is no difference in means of the upper and lower quartiles.

Again, as with the Novice sub-groups, we see the effects of group interaction modulating the characteristic personality patterns of the extremes.

It is difficult to view the extremes of either group as representing a differential reaction to the sister formation program, despite the significant mean change and change in variability which have been indicated above. We do not find, as had been hypothesized, that the lower ability group gives clear-out evidence of depression or apathy as the result of overwhelming circumstances. Rather, we notice that the low scores on depression and social introversion are consistent within each sub-group examined.

The change of those in the upper and lower quartiles appears to be in the direction of greater self-expression, greater acting out as evident in the peaks on retest in the Pd and Ma scales. The MMPI does not allow us a great deal of insight into the quality of activity for either extreme in ability level which might, indeed, differentiate them. However, in line with the data available, we may generalize that the experience of sister formation appears to encourage an assertive quality in both extremes of ability level at both stages in the training program. This characteristic was not significant in the analysis of the total group although minor changes on the Pd and Ma scales of the Novice and the Junior group were observed.

This pattern of change may have been influenced by one or all of the following factors: the expression of independent, assertive inclinations could have been inhibited at the initial screening situation and allowed to be voiced at the retest when the subjects were reassured that their results would remain anonymous and be used solely for research; self-assertion might have resulted as a reaction to the regulatory life to which the subjects had

been exposed and during which self direction must frequently give way to the demands of defined activities and horariums; stimulation toward active, outgoing behavior may be engendered during the training program in line with the exposition of the subjects to the work of the religious community and the portrayal of a personal role for each subject within the community. Whether the self-assertiveness observed is a negative reaction to restriction or a positive reaction to challenge is impossible to determine with the present test data. Again, it is suggested that a more adequate explanation of the phenomena might be gained through the use of the TAT and the support of behavioral observations.

CHAPTER VI

SUMMARY

The purpose of this research was to investigate the direction and magnitude of change in personality and general ability during two phases of a particular sister formation program. It attempted to examine the differential effects of sister formation by means of a longitudinal study involving test-retest administration of the MMPI and the ACE Psychological Examination. The hypothesis was that the experience of sister formation modifies the personality and general ability of individuals participating in such program.

Analyses of the data were directed to three major problems: whether there were significant changes in personality within the three year period and the five year period as measured by the MMPI; whether there were significant changes in general ability within the three year period and the five year period as measured by the ACE; whether there were differential personality changes in those of less ability as compared with those of greater ability. The experimental design involved finding the significance of difference of means and the significance of difference of variabilities by means of t and F tests.

The results of the examination of personality change within both sister formation groups are summarized in Table 10 and Table 11. There were no changes in mean scores which were significant at the .05 level of confidence for either group; the general change trend was in the direction of more

deviant scores following the sister formation experience although the scores remained well within the normal range. The Novice group showed significantly greater variability on the Hs scale and the Junior group on the F, Hs and Sc scales in the retest performances.

Table 12 and Table 13 describe the changes in general ability during sister formation. The score increases for both groups were highly significant with the exception of little change in the quantitative score during the novitiate period. Change in variability in test performance was negligible.

In the Novice group, the upper quartile (as ranked on the original ACE test) scored significantly higher on the Pd scale after three years and became more variable on the K and Mf scales--as indicated in Table 16. The lower quartile of the Novice group became significantly more deviant and variable on the Pa scale, according to the t values charted in Table 17. The upper quartile of the Junior group, described in Table 18, shows a significantly increased mean and variance on the Pd scale. The lower quartile performs significantly higher on the Pt and Ma scales, as summarized in Table 19.

According to the above results, then, there is no significant evidence of personality change within the entire novitiate and juniorate groups during the sister formation program. Changes in general ability are highly significant. The personality development of the extreme ability levels within each group reflect the tendency to assume the predominant trait of the opposite extreme. The general direction for all sub-groups is toward greater self-assertion in active, uninhibited activity.

A follow-up study was suggested in order to verify our interpretation that the general lack of personality change reflects the strong ego

integration of the individuals tested which remains stable in the face of considerable environmental change. Further investigation was also suggested in order to determine whether the tendency toward self-assertion observed in the upper and lower quartiles is a negative reaction to restriction or a positive reaction to the challenge provided by the sister formation program.

APPENDIX
TABLES A TO H

TABLE A

TEST - RETEST RESULTS ON THE MMPI OVER A THREE YEAR INTERVAL
FOR THOSE OF GREATER GENERAL ABILITY

Scale	Range	Median	Mean	Standard Deviation
L test	4-10	5	6.50	2.51
retest	3-9	6	5.67	1.89
F test	1-4	2.5	2.50	0.96
retest	1-5	2	2.33	1.38
K test	17-21	20	19.50	1.50
retest	9-24	20.5	18.33	5.20
Hs test	10-15	11.5	11.83	1.58
retest	7-18	12.5	12.67	3.26
D test	12-19	17.5	16.17	2.68
retest	11-25	18	17.50	4.40
Hy test	18-26	20.5	21.17	2.80
retest	16-26	20.5	20.83	3.81
Pd test	13-24	19.5	19.00	3.52
retest	18-26	21	21.50	2.57
Mf test	30-40	35	34.50	4.24
retest	34-38	35.5	35.67	1.49
Pa test	7-12	10	9.83	1.96
retest	9-12	10	10.17	0.90
Pt test	23-31	27.5	26.83	2.68
retest	20-31	28	27.83	3.91
Sc test	22-27	25	24.83	1.96
retest	17-29	26	25.19	3.90
Ma test	13-20	18	17.83	2.91
retest	15-25	18	19.00	3.52
Si test	14-26	20	22.50	5.86
retest	20-43	22	25.50	8.09

TABLE B

TEST - RETEST RESULTS ON THE MMPI OVER A THREE YEAR INTERVAL
FOR THOSE OF LESS GENERAL ABILITY

Scale	Range	Median	Mean	Standard Deviation
L test	4-8	5	5.50	1.50
L retest	4-7	5	5.33	1.38
F test	0-6	2.5	2.50	1.90
F retest	1-4	2.5	2.50	0.96
K test	19-24	22	22.00	1.53
K retest	19-25	22	22.00	1.83
Hs test	10-15	13.5	13.00	1.64
Hs retest	11-14	12.5	12.50	0.96
D test	16-22	17.5	18.50	2.57
D retest	12-20	18	17.17	2.68
Hy test	19-26	24.5	23.50	2.37
Hy retest	22-24	23.5	23.17	0.90
Pd test	22-27	23.5	23.83	1.78
Pd retest	23-27	24	24.50	1.50
Mf test	29-39	33	33.19	3.49
Mf retest	31-38	37	35.83	2.34
Pa test	7-9	7.5	7.67	0.27
Pa retest	7-17	9.5	10.17	2.51
Pt test	23-35	27.5	28.00	4.09
Pt retest	24-34	27.5	28.67	3.64
Sc test	22-28	26	25.83	1.87
Sc retest	22-32	27.5	27.00	3.57
Ma test	14-21	18.5	18.17	2.27
Ma retest	16-24	19.5	20.00	2.75
Si test	14-32	19	20.00	5.79
Si retest	16-33	19	20.17	6.29

TABLE C

TEST - RETEST RESULTS ON THE MMPI OVER A FIVE YEAR INTERVAL
FOR THOSE OF GREATER GENERAL ABILITY

Scale	Range	Median	Mean	Standard Deviation
L test	0-4	3	2.60	1.36
retest	1-5	3	2.80	1.60
F test	1-4	2	2.20	1.17
retest	0-5	4	3.00	1.79
K test	14-21	15	16.00	2.53
retest	15-23	18	18.20	3.06
Hs test	10-12	11	11.20	0.75
retest	9-13	11	10.80	1.60
D test	14-24	18	18.20	3.39
retest	10-21	18	16.40	3.93
Hy test	17-23	18	19.20	2.40
retest	15-24	22	20.60	3.07
Pd test	16-23	20	19.60	3.14
retest	22-25	23	23.20	1.17
Mf test	28-41	37	35.80	4.26
retest	28-38	37	34.40	3.83
Pa test	9-13	10	10.80	1.47
retest	8-13	11	10.80	2.04
Pt test	27-36	27	29.00	3.52
retest	20-31	27	26.60	3.72
So test	22-28	25	25.20	2.14
retest	19-29	26	25.20	3.54
Ma test	15-24	18	18.60	2.94
retest	17-21	19	19.20	1.33
Si test	20-41	31	29.80	7.51
retest	16-36	29	22.00	8.17

TABLE D

TEST - RETEST RESULTS ON THE MMPI OVER A FIVE YEAR INTERVAL
FOR THOSE OF LESS GENERAL ABILITY

Scale	Range	Median	Mean	Standard Deviation
L test	2-9	5	5.40	2.25
L retest	2-5	4	3.80	0.98
F test	1-3	1	1.80	0.98
F retest	1-3	2	2.00	0.63
K test	16-21	18	18.40	1.86
K retest	11-25	18	18.00	4.47
Hs test	11-13	12	12.00	2.23
Hs retest	10-14	13	12.40	1.63
D test	16-20	18	17.80	1.60
D retest	14-20	17	17.00	1.90
Hy test	20-28	22	22.80	2.79
Hy retest	16-23	21	19.80	2.48
Pd test	17-23	20	20.20	2.14
Pd retest	16-25	22	21.60	3.38
Mf test	29-38	32	32.80	3.31
Mf retest	29-39	37	34.60	3.88
Pa test	6-11	9	8.60	1.86
Pa retest	4-12	6	7.60	3.26
Pt test	22-35	25	26.80	4.75
Pt retest	27-36	28	29.80	3.44
So test	20-27	22	23.20	2.48
So retest	18-27	26	24.40	3.26
Ma test	17-21	18	18.20	1.47
Ma retest	19-23	20	21.00	1.67
Si test	14-24	20	19.40	3.88
Si retest	17-36	24	24.80	6.11

TABLE E

COMPARISON OF NOVICES OF GREATER ABILITY WITH THOSE OF LESS ABILITY
PRIOR TO THEIR ENTRANCE INTO SISTER FORMATION

Scale	Comparison of Mean Scores		Comparison of Variances	
	t	Higher Mean	F	Greater Variance
L	0.346	Upper quartile	2.778	Upper quartile
F	0.000		3.913	Lower quartile
K	2.612*	Lower quartile	1.038	Lower quartile
Hs	1.151	Lower quartile	1.072	Lower quartile
D	1.409	Lower quartile	1.083	Upper quartile
Hy	1.425	Lower quartile	1.394	Upper quartile
Pd	2.749*	Lower quartile	3.931	Upper quartile
Mf	0.545	Upper quartile	1.476	Upper quartile
Pa	2.319*	Upper quartile	6.850	Upper quartile
Pt	0.535	Lower quartile	2.335	Lower quartile
Sc	0.828	Lower quartile	1.104	Upper quartile
Ma	0.203	Lower quartile	1.649	Upper quartile
Si	0.680	Upper quartile	1.028	Upper quartile

* significant at the .05 level.

TABLE F

COMPARISON OF NOVICES OF GREATER ABILITY WITH THOSE OF LESS ABILITY
AFTER THREE YEARS IN SISTER FORMATION

Scale	Comparison of Mean Scores		Comparison of Variances	
	t	Higher Mean	F	Greater Variance
L	0.320	Upper quartile	1.882	Upper quartile
F	0.230	Lower quartile	2.062	Upper quartile
K	1.492	Lower quartile	8.071	Upper quartile
Hs	0.110	Upper quartile	11.521**	Upper quartile
D	0.145	Upper quartile	2.697	Upper quartile
Hy	1.384	Lower quartile	17.261**	Upper quartile
Pd	2.256*	Lower quartile	2.926	Upper quartile
Mf	0.134	Lower quartile	2.462	Lower quartile
Pa	0.000		6.382	Lower quartile
Pt	0.559	Lower quartile	1.151	Upper quartile
Sc	0.777	Lower quartile	1.196	Upper quartile
Ma	0.500	Lower quartile	1.640	Upper quartile
Si	1.165	Upper quartile	1.655	Upper quartile

* significant at the .05 level.

** significant at the .02 level.

TABLE G

COMPARISON OF JUNIORS OF GREATER ABILITY WITH THOSE OF LESS ABILITY
PRIOR TO THEIR ENTRANCE INTO SISTER FORMATION

Scale	Comparison of Mean Scores		Comparison of Variances	
	t	Higher Mean	F	Greater Variance
L	2.136	Lower quartile	2.741	Lower quartile
F	0.052	Upper quartile	1.416	Upper quartile
K	1.531	Lower quartile	1.860	Upper quartile
Hs	0.470	Lower quartile	0.000	
D	0.214	Upper quartile	4.484	Upper quartile
Hy	0.871	Lower quartile	1.348	Lower quartile
Pd	0.316	Lower quartile	2.159	Upper quartile
Mf	1.112	Upper quartile	1.839	Upper quartile
Pa	1.853	Upper quartile	1.592	Lower quartile
Pt	1.138	Upper quartile	1.820	Lower quartile
Sc	1.833	Upper quartile	1.352	Lower quartile
Ma	0.253	Upper quartile	3.997	Upper quartile
Si	2.515*	Upper quartile	3.548	Upper quartile

* significant at the .05 level.

TABLE H

COMPARISON OF JUNIORS OF GREATER ABILITY WITH THOSE OF LESS ABILITY
AFTER FIVE YEARS IN SISTER FORMATION

Scale	Comparison of Mean Scores		Comparison of Variances	
	t	Higher Mean	F	Greater Variance
L	1.066	Lower quartile	2.666	Upper quartile
F	1.054	Upper quartile	8.012	Upper quartile
K	0.074	Upper quartile	2.147	Lower quartile
Hs	1.404	Lower quartile	1.032	Lower quartile
D	0.274	Lower quartile	4.290	Upper quartile
Hy	0.405	Upper quartile	1.532	Upper quartile
Pd	0.894	Upper quartile	8.413	Lower quartile
Mf	0.073	Lower quartile	1.027	Lower quartile
Pa	1.063	Upper quartile	2.557	Lower quartile
Pt	1.264	Lower quartile	1.139	Upper quartile
Sc	0.332	Upper quartile	1.180	Upper quartile
Ma	1.685	Lower quartile	1.590	Lower quartile
Si	0.378	Upper quartile	1.788	Upper quartile

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APPROVAL SHEET

The thesis submitted by Sister Marie Raymond Garrity, R.S.M. has been read and approved by three members of the Department of Psychology.

The final copies have been examined by the director of the thesis and the signature which appears below verifies the fact that any necessary changes have been incorporated, and that the thesis is now given final approval with reference to content, form, and mechanical accuracy.

The thesis is therefore accepted in partial fulfillment of the requirements for the Degree of Master of Arts.

10/24/64
Date

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