

AN ABSTRACT OF THE THESIS OF

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Title: A COMPARISON OF CHANGES IN THE PERCEPTION  
OF THE UNIVERSITY ENVIRONMENT BY FRESHMEN  
STUDENTS WHO RESIDE IN COEDUCATIONAL AND IN  
SINGLE-SEX RESIDENCE HALLS

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Abstract approved: \_\_\_\_\_  
Arthur L. Tollefson

The purpose of this study was to compare the changes in the perception of the university environment that occurred in four selected groups of freshmen residence hall students: females residents in single-sex halls (N = 150), female residents in coeducational halls (N = 89), male residents in single-sex halls (N = 95), and male residents in coeducational halls (N = 96). The College and University Environment Scales was the instrument utilized to measure the students' perceptions of the university environment. Additional data <sup>were</sup> ~~was~~ gathered from files in the Residence Hall Programs Office and from a brief questionnaire compiled by the investigator.

During the week prior to the Fall term 1970 at Oregon State

University the participants were administered the CUES and the supplemental questionnaire. The CUES was readministered six months later following two terms of in-residence living by the participants.

The data was subjected to statistical analysis with the .05 level of significance being accepted as indicating degrees of confidence that differences were real.

Hypotheses were stated in the null form indicating that, by comparison, no significant differences would appear.

The following groups were statistically treated relative to the perceptual change in the university environment that occurred:

1. Freshmen females residing in single-sex residence halls.
2. Freshmen females residing in coeducational residence halls.
3. Freshmen males residing in single-sex residence halls.
4. Freshmen males residing in coeducational residence halls.

The following group comparisons were statistically treated relative to differences in degree of change in perception of the university environment that occurred:

1. Freshmen females residing in coeducational residence halls and freshmen females residing in single-sex residence halls.
2. Freshmen males residing in coeducational residence halls and freshmen males residing in single-sex residence halls.
3. Freshmen residing in coeducational residence halls and

freshmen residing in single-sex residence halls.

4. Freshmen males residing in residence halls and freshmen females residing in residence halls.

5. Interaction of coeducational and single-sex residence halls and freshmen male and female residents.

From the findings of this study the following conclusions were drawn.

1. Freshmen students residing in residence halls change their perceptions of the university environment significantly on most scales and in a negative direction during their first six months of attendance at college.

2. Freshmen female residents in single-sex residence halls experience a significantly greater degree of change in their perception of the university environment on the Awareness scale than do freshmen female residents in coeducational residence halls.

3. Freshmen male residents in single-sex residence halls do not differ significantly in the degree of change in their perceptions of the university environment than do freshmen male residents in coeducational residence halls.

4. Freshmen residents in single-sex residence halls change their perception of the university environment to a significantly greater degree on the Awareness scale than do freshmen residents in coeducational residence halls.

5. Freshmen females residing in residence halls change their perception of the university environment to a significantly greater degree on the Community scale than do freshmen males residing in residence halls.

6. Freshmen males residing in residence halls change their perception of the university environment to a significantly greater degree on the Practicality scale than do freshmen females residing in residence halls.

7. A significant relationship exists between sex and type of residence hall on the Scholarship scale. Freshmen females residing in coeducational residence halls and freshmen males residing in single-sex residence halls change their perceptions significantly greater on the Scholarship scale than do freshmen males residing in coeducational residence halls and freshmen females residing in single-sex residence halls.

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A Comparison of Changes in the Perception of the University  
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by

Robert Allen Miller

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# A COMPARISON OF CHANGES IN THE PERCEPTION OF THE UNIVERSITY ENVIRONMENT BY FRESHMEN STUDENTS WHO RESIDE IN COEDUCATIONAL AND IN SINGLE-SEX RESIDENCE HALLS

## CHAPTER I

### INTRODUCTION

Recent unrest on college campuses across the nation has stimulated interest in the relationship between college students and the nature and demands of the college environment (McConnel and Heist, 1962). The need to study explicit relationships between specific experiences has been stressed by Ralph F. Berdie who has pointed out that such meaningful research "is so meager as to be nonexistent" (Berdie, 1966, p. 336).

Obviously individuals who deal with students must have pertinent information about, and a more empathetic understanding of, their lives both in and out of the classroom if educational programs are to result in desired student growth and development. Relevant studies concerning the students' interaction with the college environment have implications for all phases of university decision making, and a special significance for student personnel administrators.

Paul Heist, writing on the implications for institutional research, has stated that:

As institutional staffs become aware of the differences among students and student groups, and cognizant that a larger number of criterion and predictor factors can be measured, much more time and effort will go to studying and attempting to understand the students and the most conducive learning environments. To date only minimal attempts have been made to know and to accommodate the great diversity in students (Heist, 1959, p. 39).

Research studies continually and emphatically suggest that faculties and administrations ought to be more aware of the impact of various institutional characteristics, outside as well as inside the classroom (McGarth, 1962).

The fact that colleges and universities do have an influence on their students is well recognized and accepted by educators and laymen alike (Freedmen, 1967). Even an anti-establishment organization such as the Students for Democratic Society recognize the influence of our colleges and universities and have stated that, ". . . the university is located in a permanent position of social influence. Its educational function makes it indispensable and automatically makes it a crucial institution in the formation of social attitudes" (Port Huron Statement, 1962, p. 2).

Previous research on the college student substantiates that changes do take place during the college years. Earlier studies of Newcomb (1943) at Bennington give evidence of this alteration. More recently, Bushnell (1962), reporting on differences between seniors and freshmen at Vassar, concluded that a major problem for future

investigations is how to account for the changes that do occur in college which leads to the question as to what kinds of students change under what kinds of conditions?

The peer group is a major recognized factor that contributes to change. Sutherland emphasized the importance of the peer group in determining the nature of the college culture when he said, "There undoubtedly exist important and influential subcultures in any complex college environment" (Sutherland, 1962, p. 42).

Theodore Newcomb (1966) concluded from his pioneer research on this subject that the effects of student peer groups were sufficiently important to justify the serious attention of social scientists. He stated, however, that the educator's objective is not necessarily that of maximizing peer group influence. It is, rather of understanding how, when and why it occurs in order that its effects may be consonant with his (the educator's purpose). Bushnell (1962), again reporting on his study of Vassar students, pointed out that the peer group was the fundamental social unit for the vast majority of students. As the peer group went, so went the individual's education. He felt that given the present structure of social organization in higher education, the students, not the faculty, have the final word on how deep and thoroughgoing their own education will be.

Studying the entering freshmen and agents of change, Wilson (1966) reached a similar conclusion. He felt that although the teacher



may have the greatest impact on the student, the student's peers may be of unsuspected and underestimated importance. Moreover, the immediate campus setting may not only exert the most influence on a student's behavior, but may actually weaken the influence coming from the faculty and other parts of the wider environment (LeVine, 1966). Students may well be key agents of change as Eddy (1959), in his report on an exploratory study in selected colleges and universities, concluded for the American Council on Education. He felt that the effect of students on each other, particularly in residential colleges, was great and that in essence "Colleges have failed to realize the potentiality of the living unit both in supplementing the academic program, and in contributing to the character of the student" (Eddy, 1959, p. 152).

The residences in which students live provide a major source of daily peer contact. E. A. Greenleaf (1962) reported that on the average a student spends 65 to 70 percent of his time in his living center and does 50 to 60 percent of his studying in his room.

College residences, therefore, do provide a significant context for student development. That is where close associations with peers occur, where the student has the opportunity to observe the impact of his behavior on different kinds of persons and feels the force of the group's behavioral norms, standards and attitudes. Through such interaction the student develops a personal system of values,

attitudes, perceptions and behavioral patterns which may lead to ease and freedom in his relationships with others.

One of the more fruitful methods of investigating the formation and effect of student subcultures would be through the study of the student residence unit. Not only do student residences provide the major source of daily student contact, they are one aspect of the university environment which can be altered--a significant responsibility, as well as an opportunity, for university administrators.

If the educational function of college housing is to help students to learn and to grow as human beings, then the purpose and objectives of college residence halls must be to create environmental conditions which are conducive to student development; intellectually, culturally, and socially. As E. G. Williamson has stated:

I am convinced that residences can serve most fruitfully educational purposes of significance in higher education. And I am equally convinced that these purposes will be served only when we reappraise our present uses of residences . . . (1958, p. 397).

The possibility and desirability of manipulating this environment, structurally, philosophically, or administratively, depends upon answers to questions now being raised about the interaction of students with their university environment. This study is an attempt to assess that interaction. Specifically the study will attempt to determine if the perceptual change of the university environment which occurs in freshmen students residing in coeducational residence halls

is significantly different from the perceptual change of the university environment which occurs in freshmen students residing in the traditionally single-sex residence halls.

### Statement of the Problem

The study of environmental press and students' perceptions of it has been gaining increased attention in recent years as institutions of higher learning become larger and student populations take on new social and cultural characteristics. Factors related to differences in college environments are many and varied, and frequently are beyond the control of the institution (Duling, 1969). The characteristics of any student population are the result of an interrelation of many factors, including predisposition, personal experiences and the college press.

During the past decade cultural and attitude changes have occurred in our society which altered many of the differing sociological expectations of university students. The recent increase of interest in coeducational living situations attests to this change.

For years, Oregon State University, like other educational institutions, traditionally housed students in single-sex living situations. This, however, changed during the fall term of 1967 with the first coeducational residence hall. Since that time five of the remaining twelve residence halls on campus have been converted from

the single-sex to coeducational arrangement.

Current research suggests that place of residency may affect the student's perceptions of the college environment and, therefore, possibly, the impact of the environment on the student (Baker, 1966a; Lindahl, 1967). If perceptual differences do exist among student groups, membership in these groups will affect the individual as an educational product and may interact with his ability and motivation to realize constructive growth and development.

The problem was to ascertain whether freshmen students who reside in coeducational residence halls differ in a significant degree in their change in perception of the university than freshmen students who reside in the traditional single-sex residence hall.

### Purpose of the Study

The purpose of this study is summarized by the following statement of objectives:

1. To determine, during the period of the study, the change in perception of the university environment that occurs in freshmen females who reside in single-sex residence halls.

2. To determine, during the period of the study, the change in perception of the university environment that occurs in freshmen females who reside in coeducational residence halls.

3. To determine, during the period of the study, the change in

perception of the university environment that occurs in freshmen males who reside in single-sex residence halls.

4. To determine, during the period of the study, the change in perception of the university environment that occurs in freshmen males who reside in coeducational residence halls.

5. To determine whether, during the period of the study, the change in perception of the university environment that occurs in freshmen females who reside in coeducational residence halls differs significantly from the change in perception of the university environment that occurs in freshmen females residing in single-sex residence halls.

6. To determine whether, during the period of the study, the change in perception of the university environment that occurs in freshmen males who reside in coeducational residence halls differs significantly from the change in perception of the university environment that occurs in freshmen males residing in single-sex residence halls.

7. To determine whether, during the period of the study, the change in perception of the university environment that occurs in freshmen students who reside in coeducational residence halls differs significantly from the change in the perception of the university environment that occurs in freshmen students residing in single-sex residence halls.

8. To determine whether, during the period of the study, the change in perception of the university environment that occurs in freshmen females who reside in residence halls differs significantly from the change in the perception of the university environment that occurs in freshmen males residing in residence halls.

9. To determine whether, during the period of the study, the relationship between the sex of the students and the type of residence hall (coeducational or single-sex) in which they reside is significant relative to the amount of change in perceived university environmental characteristics.

### Significance of the Study

In a period of rapid societal and institutional change, an understanding of the perceptions and changes in perceptions of students, relative to the various aspects and pressures of their environment, is necessary in order to accurately assess and evaluate the educational effectiveness of the institution and the appropriateness of any future planning. It therefore becomes imperative that empirical data relevant to the perceptions of students be gathered and realistically analyzed in order to accurately facilitate provisions for academic, cultural and social programs which would stimulate positive growth and development.

Because colleges and universities have been encouraged to view

the residence hall as an integral part of higher education (Williamson, 1958; Riker, 1965) studies need to be made of the dynamics of different environmental factors within residence halls which reflect changes in the perceived environmental characteristics of students residing therein.

Specifically, the data gathered from this investigation will be significant in understanding the perceptions and perceptual change of resident hall students at the university and identifying any relationship between type of residence hall living situation and perceptual change.

Further, the study should have significance in the future planning of residence halls and residence hall programs.

Hopefully, certain hypotheses and questions will be generated by the data which will stimulate further research in the area of coeducational housing situations at Oregon State University and elsewhere.

### Research Hypotheses

In order to facilitate statistical treatment of the data, the following research hypotheses were formulated in the null form:

- I. No significant change in the perception of the university environment occurs in freshmen females who reside in

single-sex residence halls as measured by the College and University Environment Scales.

- II. No significant change in the perception of the university environment occurs in freshmen females who reside in coeducational residence halls as measured by the College and University Environment Scales.
- III. No significant change in the perception of the university environment occurs in freshmen males who reside in single-sex residence halls as measured by the College and University Environment Scales.
- IV. No significant change in the perception of the university environment occurs in freshmen males who reside in coeducational residence halls as measured by the College and University Environment Scales.
- V. No significant differences exist in the amount of change in the perceived university environmental characteristics that occurs in freshmen females who reside in coeducational residence halls and the amount of change in the perceived university environmental characteristics that occurs in freshmen females who



reside in single-sex residence halls as measured by the College and University Environment Scales.

- VI. No significant differences exist in the amount of change in the perceived university environmental characteristics that occurs in freshmen males who reside in coeducational residence halls and the amount of change in the perceived university environmental characteristics that occurs in freshmen males who reside in single-sex residence halls as measured by the College and University Environment Scales.
- VII. No significant differences exist in the amount of change in the perceived university environmental characteristics that occurs in freshmen students who reside in coeducational residence halls and the amount of change in the perceived university environmental characteristics that occurs in freshmen students who reside in single-sex residence halls as measured by the College and University Environment Scales.
- VIII. No significant differences exist in the amount of change in the perceived university environmental characteristics that occurs in freshmen males who reside in

residence halls and the amount of change in the perceived university environmental characteristics that occurs in freshmen females who reside in residence halls as measured by the College and University Environment Scales.

- IX. No significant relationship exists between the sex of the students and the type of residence hall (coeducational or single-sex) in which they reside relative to the amount of change in perceived university environmental characteristics.

#### Limitations of the Study

The participants in this study were limited to the 1970-71 freshmen students residing in residence halls at Oregon State University who were citizens of the United States, who had never attended college before, and who were eighteen years of age or younger.

The data gathered from them is accurate insofar as the College and University Environment Scales is a valid instrument in measuring students' perceptions of the university environment and to the extent that students accurately report personal information used as covariates.

It is not the intent of this study to delineate cause and effect

relationships but rather to accurately answer those questions posed in the null hypotheses. The purpose is to indicate the extent and direction of change in the perception of the university and not to evaluate such change as being either positive or negative.

### Instrument

The instrument utilized in this investigation is the College and University Environment Scales (CUES), 2nd Edition, by C. Robert Pace, published and distributed by the Institutional Research Program for Higher Education, Educational Testing Service, Princeton, New Jersey, 1969. The instrument contains 160 true-false items and is used to define the atmosphere or intellectual-social-cultural climate of the university as students perceive it.

The following five scales plus two special subscales are quoted directly from the CUES technical manual (Pace, 1969).

#### Scale 1. Practicality

The 20 items (that contribute to the scores) for this scale describe an environment characterized by enterprise, organization, material benefits, and social activities. There are both vocational and collegiate emphases. A kind of orderly supervision is evident in the administration and the classwork. As in many organized societies, there is also some personal benefit and prestige to be obtained by

participation in the system--knowing the right people, being in the right clubs, becoming a leader, respecting one's superiors, and so forth. The environment, though structured, is not repressive because it is responsive to entrepreneurial activities and is generally characterized by good fun and school spirit.

### Scale 2. Community

The items in this scale describe a friendly, cohesive, group-oriented campus. There is a feeling of group welfare and group loyalty that encompasses the college as a whole. The atmosphere is congenial; the campus is a community. Faculty members know the students, are interested in their problems, and go out of their way to be helpful. Student life is characterized by togetherness and sharing rather than by privacy and cool detachment.

### Scale 3. Awareness

The items in this scale seem to reflect a concern about and emphasis upon three sorts of meaning--personal, poetic, and political. An emphasis upon self-understanding, reflectiveness, and identity suggest the search for personal meaning. A wide range of opportunities for creative and appreciative relationships to painting, music, drama, poetry, sculpture, architecture, and the like suggests the search for poetic meaning. A concern about events around the world,

the welfare of mankind, and the present and future condition of man suggests the search for political meaning and idealistic commitment. What seems to be evident in this sort of environment is a stress on awareness, an awareness of self, of society, and of aesthetic stimuli. Along with this push toward expansion, and perhaps as a necessary condition for it, there is an encouragement of questioning and dissent and a tolerance of nonconformity and personal expressiveness.

#### Scale 4. Propriety

These items describe an environment that is polite and considerate. Caution and thoughtfulness are evident. Group standards of decorum are important. There is an absence of demonstrative, assertive, argumentative, risk-taking activities. In general, the campus atmosphere is mannerly, considerate, proper, and conventional.

#### Scale 5. Scholarship

The items in this scale describe an environment characterized by intellectuality and scholastic discipline. The emphasis is on competitively high academic achievement and a serious interest in scholarship. The pursuit of knowledge and theories, scientific or philosophical, is carried on rigorously and vigorously. Intellectual speculation, and interest in ideas, knowledge for its own sake, and

intellectual discipline--all these are characteristics of the environment.

### Definition of the Special Subscales

Campus Morale. The items in this scale describe an environment characterized by acceptance of social norms, group cohesiveness, and friendly assimilation into campus life. At the same time, a commitment to intellectual goals is exemplified and widely shared in an atmosphere of personal and social relationships that are both supportive and spirited.

Quality of Teaching and Faculty-Student Relationships. This scale defines an atmosphere in which professors set high standards and are perceived to be scholarly, clear-thinking, and flexible. At the same time, this academic quality of teaching is infused with warmth, interest, and helpfulness toward students.

### Definition of Terms

#### Freshmen Students

Freshmen students refers to male and female enrollees at Oregon State University who had not completed any college credit hours at the initiation of the study and who reenrolled the following winter term 1971.

## Residence Halls

Residence halls at Oregon State University refers to university owned housing complexes which provide, in addition to living quarters for at least 200 students, educational, recreational and social programs.

### Single-Sex Residence Halls

Single-sex residence halls refers to those residence halls in which the occupants, who elect their own governing body which decides policies and plans programs, are of one sex.

### Coeducational Residence Halls

Coeducational residence halls refers to those residence halls in which the occupants, who elect their own governing body, are of both sexes with the separation of sexes by floor or wings. Within these residence halls the occupants share common lounge areas and maintain a joint governing body which decides policies and plans programs for the occupants of the hall.

### Self Selected

Self selected refers to those freshmen students who indicated as their first choice the residence hall within which they reside.

Randomly Selected

Randomly selected refers to those freshmen students who do not reside in the residence hall of their first choice or who did not list any hall preference.



## CHAPTER II

### REVIEW OF RELATED LITERATURE

A search of the literature revealed a lack of published work relative to the specific problem of this study. Studies and reports which relate to the areas of the influence of the university, residence halls and student perceptions are reviewed in this chapter.

The material is organized as follows: (1) influence of colleges and universities upon students; (2) studies related specifically to perceptions of the college environment; and (3) a brief historical and present look at residence halls as an aspect of the college environment.

#### Literature Relative to the Influence of Colleges and Universities

Brookover (1965) believes that the objectives of a college education imply not only the development of skill in critical thinking and problem solving, but also the development of such attitudes and values as may be acquired by an understanding of the physical universe, of scientific method, of social organization and the process of social control, and by a study of man himself. Also, according to Brookover, colleges and universities clearly desire that some behavioral change in some of their students will occur as a result of their attendance.

The importance of the college experience for the entering student was emphasized by Freedman (1956). He concluded from his research that the freshman year apparently determined the basic orientation to the college and contributed a great deal toward either establishing or reaffirming certain enduring habits and values of life. He also noted that the student body as an entity possessed characteristic qualities of personality which, like a culture, provided the basic context in which individual learning occurs.

Whitaker (1969) contended that the college can shape the characteristics of its student body (and in turn be shaped by them) in two general ways: through its influence on its students while they are enrolled; and through the kinds of students it attracts, recruits, and admits. He further noted that the results of research on college influences has shown that general changes do take place over the four years of college, but as yet, the particular impact of specific influences needs further study.

Brown (1962) in reviewing various studies concerned with the values of college women concluded that their values do change as a result of value conflict and individual growth. He felt that women share this common problem with men but have certain special value conflicts due to "early commitment to narrow, and perhaps false images of femininity" (p. 154).

Jacob (1957) has made the most thorough and exhaustive review

of unrelated studies on college students' attitudes and values. He concluded that the main over-all effect of higher education upon student values is to bring about a general acceptance of a body of standards and attitudes characteristic of "college bred men and women in the American community" (p. 4).

Jacob's general conclusions were that while some opinions change as a result of going to college, and while a few colleges have a major impact on their students' values, that nonetheless, "basic values" do not change "for most students at most institutions."

Although Jacob concluded that college students tended to become more homogeneous in attitudes and values from their freshman to their senior year, his views are not supported by the findings of Lehmann and Dressel (1962), and Webster (1958). In fact, in only one instance (male dogmatism) in the Lehmann and Dressel studies did any evidence suggest a greater homogeneity of values in the senior year than in the freshman year.

The findings of Plant (1962) suggest that the college acts only as a catalyst and that there are no experiences unique to the college which have impact upon student values, attitudes, beliefs, and interests.

Barton also criticized Jacob's study citing his lack of cognizance with regards to problems of definition, the factor of acquiescence, and the validity of the measures obtained. Barton stated:

It would be more useful to keep the means by which values are changed (critical independent thought vs. group adaptation) separate from the question of the extent of change in values. If this were done it might permit a clearer assessment of how much values have actually changed as a result of college attendance and a greater specification of areas in which change does and does not take place (Barton, 1959, p. 33).

In a study conducted by Brown (1960), it was found that major types of college careers related to five patterns of college experience: social and peer-group orientation; over achievement; under achievement; family orientation; high achievement; and search for identity.

Three thousand freshmen from Michigan State University and two small liberal arts colleges were studied over a four-year period by Dressel and Lehmann (1965). Their findings indicated that nearly all of the students increased in critical thinking ability, religious tolerance, grade-point consciousness, and homogeneity of attitudes. Authoritarian, stereotypic, and dogmatic attitudes also decreased over the four-year period. Student subjects of the study attributed these changes to peer group influence and non-academic experiences. The researchers, however, believed the changes may have been prompted by the general impact of the college experience.

Lehmann, Sinha and Hartnett (1966) investigated the relationship between length of college attendance and changes in stereotypic beliefs, dogmatism, and value orientation. They administered a battery of instruments to 1,747 students who were freshmen and

repeated the experiment with the same subjects four years later, regardless of whether they were still in attendance. Their principal finding showed that regardless of sex and length of college attendance all groups became less stereotypic in their beliefs, less dogmatic in their attitudes, and (with few exceptions) more "outer directed" in their value orientation. Furthermore, they found no significant relationship between general academic aptitude and either the degree or direction of personality changes. Females, regardless of time spent at college, underwent a more marked change in their attitudes and values than their male counterparts. Although some change occurred during each of the four years, the most dramatic changes took place during the freshman and sophomore years.

In a longitudinal study designed to learn the nature and direction of changes from freshman to senior year at Michigan State University, Lehmann and Dressel (1962) found significant student change occurred in the direction of improved critical thinking ability, a lessening of the stereotypic beliefs and movement away from the traditional value orientation. They found that the greatest changes occurred during the freshman and sophomore years. The question was raised, but not answered, about the possible effect of living groups on these changes. It was observed that the most significant experience in the collegiate lives of these students was their associations with differing personalities in their living units. The total student body did not

appear to have had much impact upon the behavior of students, but small group associations seemed to have been more important.

In a study conducted at a large midwestern public university, Gottlieb and Hodgkins (1963) concluded that a differential rate of change occurs within the same college student body and is linked in part to both the social origins of the students and their adjustment to the academic milieu in which they find themselves. It was felt that life goals socially ascribed to individuals, and manifested in their value orientations, influence to a large extent the manner in which that adjustment is made.

Reporting on a study conducted at Vassar; Webster, Freedman and Heist (1962) found evidence of substantial personality changes in Vassar women between the time they enter as a freshman and are graduated four years later. These findings were present in both longitudinal and cross-sectional studies.

The findings of a study of women at a large coeducational university conducted by Siegel and Siegel (1957) indicate that the greatest change in attitudes with respect to authoritarianism and status occurs when the students were placed in an imposed, initially non-preferred membership group (an assigned college dormitory) as their reference group.

In comparing ethnocentrism and intelligence in students at San Jose State College who remained in college with those who

withdrew voluntarily, Plant (1958a) found that a formal college education resulted in a decrease in ethnocentrism.

In another study, Plant (1958b) compared changes in ethnocentrism, authoritarianism, and dogmatism of students with different amounts of college education. He concluded that all groups changed significantly over the four-year period irrespective of educational experience during that four-year period.

Studies comparing freshmen with seniors often find seniors to be more flexible, more empathetic of people, more critical of institutional authority, and more introspective. In research reported by Stern (1966), 3,075 incoming freshmen at four different institutions were asked to describe what their university would be likely to offer them. More than three-quarters felt the college experience would develop a strong sense of responsibility and would bring them in contact with politically active professors who would encourage them to take an active part in social reforms and political programs. Stern felt that college administrators share more the view of the freshmen than of the seniors.

Mayhew (1958) studying attitudes found little evidence that a college education or experiences peculiar to a college environment per se were responsible for change in the individual. He contended that change in personality characteristics may be a function of the person's maturity or personality, a function of the times, the direct

result of college experiences, or a combination of such factors.

Goldson, Rosenberg, Williams, and Suchman, reporting on research which assessed students at eleven colleges, state:

. . . the findings of the present research call attention to what is almost a sociological truism and yet is often overlooked: that if young people are exposed to four years of institutional norms and values in the very milieu in which they are explicit and authoritative, they will become socialized to the predominant values of that milieu and will come to acknowledge their legitimacy. The present study shows that this occurs with regard to academic educational values (Goldson, et al., 1960, p. 240).

The community environment of the campus may also be related to the type of social, academic, and political climate that prevails there. As Riesman and Jencks point out in their discussion of American colleges:

It is no accident that some of the more experimental colleges have been located in the country, building an intense in-group spirit often in opposition to the hostile or indifferent "natives." Relative isolation probably helped Bennington, Black Mountain, Goddard, Antioch, and Marlboro to maintain certain independence of current fashions in curricular organization (Riesman and Jencks, 1962, p. 95).

Pepinsky (1958) pointed out that the educational setting, like the individuals who comprise it, is best understood in the context of the culture and society in which it has developed.

Studying students at Michigan State University, Lehmann and Payne (1963) concluded that "insofar as college experiences or contacts are concerned, the formal academic type such as instructors or



courses have no impact upon student behavior" (p. 408). However, there appeared to be a significant relationship between some of the informal, extracurricular activities and value change.

Through visitation and interviews with faculty, administrators, and students at twenty colleges and universities of various types throughout the United States, Eddy (1959) found that experiences outside the classroom were a factor of paramount significance in the development of character. Further, particular aspects of the environment, such as attitudes, surroundings, extra activities, manners, and morals have the power to either reinforce or negate all that college has to offer.

According to Newcomb, Turner and Converse (1965), a student's interpersonal environment has much to do with both what he learns and how he learns it. They feel that, academically, a student in a large university is a stranger. Although socially and personally he is a member of various groups of friends (usually in the dormitory), little or no overlap exists between his groups of friends and the groups of students who attend his various classes.

In an earlier article Newcomb (1962) related that the socialization process plays an extremely important role in human behavior and that in recent years, increased attention has been given to the role of the peer group in the formation, the modification, and the reinforcement of attitudes and values.

Dressel and Lehmann (1965) as a result of the study they conducted at Michigan State University, state that although courses and instructors do seem to have some impact on students' attitudes and values--especially in the last two years--peer group contacts and non-academic experiences are regarded by students as being more important.

Heist (1960) also exhibits this view in noting that significant peer group experiences for numerous sophomore students occur within the immediate acquaintances of a dormitory floor or hall. For many, the impact of so-called student culture of the large campus was of minimal consequence.

Lehmann and Hill (1969) also state that today's college students respond more to peer group and social pressure, and are more likely to act to please others. As an example of this attitude, most students in their survey at Michigan State University in 1967 cited peer pressure as an acceptable reason for breaking a rule.

Studying undergraduates at a small men's college, Davie and Hare (1956) concluded that the peer culture was the most important single external factor in the students' experience at the institution. The small, relatively homogeneous student body led to group solidarity, which was reinforced by geographical isolation and the absence of automobiles and dormitories.

A statement by Raushenbush in 1957 appears to still be

applicable today. Cumulating and commenting on the findings of previous research on the influence of college attendance and the peer group, she wrote:

If student mores and the influence of the peer group and the experiences outside the classroom are as important as all this research has indicated, the conclusion we should come to is, not the pessimistic one that education does not matter at all, but rather that education has another job to do, perhaps beyond the one educators have felt was their job. Colleges must take responsibility for creating a climate of values that will give some direction to student mores (Raushenbush, 1957, p. 152).

#### Studies Relative to the Perception of the University

Studies pertaining to changes in college students as a result of their college experiences have been quite prevalent. Until recently, however, there have been few studies of the college environment. One of the early descriptions of a college campus was presented by Angell (1928). In his book, which comprised observations of the campus culture, he observed that: "Sometimes the individuals identify themselves with the group to the extent of prejudicing the best intentions of the university" (p. 21).

The Center for the Study of Higher Education of the University of California at Berkeley, as reported in the January 1966 issue of the Carnegie Corporation of New York Quarterly, has intensively studied eight widely different colleges in order to learn how students change in attitudes, values and aspirations. The freshmen classes of

the eight universities differed significantly in their perceptions of the environment with regards to curriculum, academic reputation, regulatory control of students, friendliness, religious emphasis, and physical facilities. Students also differed in their commitment to intellectual values, in aptitudes, and in educational and vocational goals. The conclusion was that much of the impact of a particular university may be due to the environmental image it presents in initially attracting particular types of students.

In order to determine if perceptions of the university environment differ between colleges, Centra (1966) administered the College and University Environment Scales to a random sample of 500 juniors and seniors in ten colleges at Michigan State University. The scales were used to articulate perceptions of the university as a whole, and were also adapted for evaluation of major fields. In general, the students' evaluation of the practical level of student awareness and propriety of the university were similar between colleges. Differences were apparent, however, in estimations of the degree of community atmosphere and level of scholarship. Students' perceptions of the total university were similar to those of their own college. Apparently, then, students generalized from the environment with which they were familiar to the university environment as a whole.

Coker (1965) conducted a study on the diversity of scholastic aptitudes, non-intellective attributes, and environmental

characteristics of students on six Indiana University campuses. The purpose of the study was to seek out the nature and extent of the diversity of the characteristics of students within and among the various campuses of a state university. Using the CUES, he endeavored to assess the environmental characteristics of the campuses as perceived by the students. In comparing the various scores, he found that all five scales differentiated the six campuses at a significant level.

Murphy and Vail (1965) conducted a study of students from three curricula at an Eastern church-affiliated liberal arts college in order to determine differences in student attitudes toward the environment. They found that students in the arts are community oriented, that business students are self oriented, and that science students are subject oriented. Students in the arts showed a compelling curiosity that only college can satisfy and were interested in finding out more about other fields. Business students appeared to be going to college in preparation for a vocation which would result in financial security. Science students tended to be subject oriented and were more likely to enjoy study and look forward to a continuation of their academic curriculum.

A study conducted by Greene (1966) using the CUES and CCI compared the perceptions of the university climate by 111 students enrolled in the University of the Seven Seas Afloat with their

perceptions of colleges previously attended. In addition the perceptions of these students were compared with the national sample norms for the two instruments. The results showed that the perceptions of the Seven Seas students differed significantly from those perceptions of their previous colleges and also from those of the national sample. The results indicated that the Seven Seas students were more critical of administration policies, curriculum, intellectual climate, and scholarship, but were more favorably impressed with the friendliness and expressiveness of the campus.

Edson (1965), in a study at the University of Minnesota, used the CUES to assess the environment and found significant differences between the environment freshmen expected and that which they perceived after two quarters of residence. This study was designed to determine the relationship of change in perceptions of the environment to certain personality constructs. The results indicated that change in perception of the environment is not related to social relationship adjustment or conformity as defined by the researcher.

One hundred and ninety Princeton undergraduates were administered the College and University Environment Scales by Pervin (1966) in May of 1964. Fifty students each from the freshman, sophomore, and junior classes, and forty from the senior class were sampled. In addition, the CUES was mailed to all accepted applicants in June, 1964, in order to measure their expectations of the Princeton

environment. It was found that the expectations of the entering freshmen were significantly higher on every scale than were the expectations of the students already enrolled.

When the freshmen were asked to evaluate their views after one year on the Princeton campus, they reported less emphasis than at the first administration on intellectual and abstract understanding, togetherness, and social welfare. They also reported an increased emphasis over their prior responses on fantasied achievement, objectivity, open-mindedness, and heterosexual interest. One-half of the students indicated that their academic expectations had been realistic, while one-third of the students indicated an unrealistic expectation.

A similar study, but with somewhat different results, was done by Shemky (1966) at St. Joseph's College. Faculty and students responded to the CUES in two ways: first, according to the way the school really was; and second, according to the way they would like it to be. Analysis of the data failed to reveal any major differences in the way entering freshmen students and returning students and faculty perceived the environment. A possible interpretation of these results could be that because the institution in question is very small (644 including faculty) and parochial, a consistent image was present to all groups.

Birney and Taylor (1959) used interviews and the Orientation to College Inventory in a study at Amherst University. They found that

orientation to college went through a progressive change from the freshman to senior years.

Results of a study conducted by Shaw (1966) based on an analysis of scores from four College Characteristics Index scales demonstrated that differences between the environment expected and later perceived by engineering freshmen at Purdue University does exist.

In a study of student and faculty perceptions, McPeck (1967) compared returning students and faculty with new students and faculty at Millikin University using the CUES. She found that returning students and faculty had strikingly similar perceptions of the university and of what the ideal university should be. New students and new faculty members also agreed with each other on what they expected the Millikin environment to be and what they believed to be an ideal university environment. Perceptions differed significantly, however, between male and female students, between classes, and according to academic major.

In a study examining perceptions of the campus environment at a land-grant university conducted by Ivey, Miller, and Goldstein (1967), it was found that students perceived the environment as possessing a greater degree of all the characteristics measured and valued by the academic community (i. e. aspiration level, intellectual climate, and academic achievement) than did student personnel workers and dormitory head residents. They concluded that head



residents and other student personnel staff may be involved with selected aspects of the campus life and with atypical groups of students.

In the fall of 1964 Berdie (1966) administered the CUES to the following groups at the University of Minnesota: (1) 85 percent of the entering freshman class--7,188; (2) a sample group of upperclassmen--a randomly selected group and a group of highly selected freshmen camp counselors; (3) a sample group of residence hall counselors; (4) a sample group of faculty; (5) a group of counseling psychologists; and (6) a group of parents of 99 entering freshmen. He also retested a sub-sample of the entering freshmen in April of the same academic year. The purpose of the study was to investigate the consistency of expectations and perceptions of a large university.

The results of the study indicated that the expectations of freshmen relative to the five CUES scales differed significantly according to undergraduate college. A difference also existed on three of the scales according to sex. Freshmen men generally expected to find a greater practical emphasis, more campus concern with world affairs, and less emphasis on scholarship than did women. In general, the expectations of the parents who were surveyed were consistent with the expectations of their sons and daughters. The perceptions of the upperclassmen were slightly lower than the expectations of the freshmen on most of the scales. The faculty and the randomly selected

group of upperclassmen perceived the university as being less friendly, cohesive, and group oriented than did the other groups.

Pate (1968) studying freshmen students' perceptions which were expected and later perceived at the University of North Carolina at Chapel Hill found that freshmen expectations differed significantly from their later perceptions on all CUES scales except Propriety. On each of the four remaining scales the expectation score was higher.

In a study conducted with freshmen at Eastern Illinois University Rogers (1968) concluded that student expectations regarding the college environment are not related significantly to their improvement in intellectual maturity during the freshman year. She also concluded that based on the subject's responses to the CUES questionnaire, students do not anticipate that the environment of the university is characterized by any single distinguishing environmental press.

Boyer and Michael (1968) found that faculty members and seniors at seven small religious colleges were in close agreement on all scales of the CUES. The colleges surveyed appeared to have a strong sense of community feeling and propriety.

Hopper (1966) found differences in perceived environment as measured by the CUES among faculty and student groups at Northern Illinois University. Faculty and upperclassmen differed significantly on the Practicality scale and freshmen differed significantly on all scales from upperclassmen and faculty. However, no significant

differences were found among subgroups, such as commuters, fraternity members, etc., within the upperclassmen population.

The University of North Dakota was the setting of a study by Johnson and Kurpius (1967) which utilized the College Characteristics Index. The CCI was administered to 99 freshmen and 61 juniors in the spring of 1962, and to 151 freshmen and 41 juniors in the spring of 1964. (The 1962 freshmen were retested as juniors in 1964.) The purpose of the study was to determine whether students perceived the climate of the university to be intellectual or non-intellectual. The results showed that both groups of freshmen (1962 and 1964) perceived the university climate to be more intellectual than did juniors. The difference, however, was smaller in 1964.

Bragg (1967) administered the CCI to two matched groups of seventy-five underclassmen at Deep South State College, a Negro college of arts and science and education with an enrollment at the time of twelve hundred. The purpose of the study was to compare the results with college norms. Results of the survey showed that upperclassmen and underclassmen differed significantly on only eleven of the thirty scales of the CCI.

The purpose of a study by Heskett and Walsh (1969) was to determine the differences of perceptions as measured by the CUES of three groups (management staff, personnel staff, and student officers) which worked and interacted with students. The results

suggested that the management group perceives a stronger environmental press on all five of the CUES dimensions when compared to the other two groups.

To study the relationship of environmental press and attrition, Conner (1968) tested more than one thousand fall 1964 entering freshmen at Southern Methodist University. Men's and women's views of campus press differed; however, no significant relationship between environmental press and attrition were found.

A similar study by Reeves (1968) conducted at East Texas University found that no significant differences existed when persisters and dropouts were compared on the basis of ACT scores, grade-point average, sex and CUES scores.

Califf (1967) studying achieving and non-achieving freshmen at Augustana College found that achieving students appeared to have somewhat greater intellectual interest and motivation than the "low" group. Expectations about the college experience as measured by the College Characteristics Index was also similar with the "low" group expecting more support for practical concerns and for "collegiate fun."

The results of a study by Bodelson (1967) concerning students' ability level and their perceptions of the university environment at Indiana University indicated that the perceptions of the campus environment characteristics of 573 freshmen college students are associated with measured academic ability levels.

Thistlewaithe (1960) used a modification of the CCI in research involving fifteen hundred high ability students at 327 colleges and universities. He summarized his findings by stating that, "Student reports of faculty and student press were related to change in the direction and level of career choice" (p. 234).

In an earlier study, Thistlewaithe administered the CCI to 916 National Merit Scholars and Certificate of Merit Winners who were attending thirty-six different colleges to determine if the college environment influenced motivation to seek advanced training. In his conclusion, he states:

The present report suggests that the college environment is an important determinant of the students' motivation to seek advanced intellectual training. Moreover, the student cultures and faculty press which stimulate achievement in the natural sciences appear to differ from those which stimulate achievement in the humanities, arts, and social sciences (Thistlewaithe, 1959, p. 190).

Standing and Parker (1964) examined the environmental perceptions of students just prior to the end of their first semester at Brigham Young University to analyze their expectations in order to determine if change in environmental perception was associated with dropping out of school. Significant changes in perception were discovered, although no significant relationship between these changes and dropping out of college were found.

Research by Lauterbach and Vielhaber (1966) with the CCI at West Point indicated that freshmen who had accurate perceptions of

the environment tended to make higher grades. However, Shemky's (1966), as cited earlier, did not reveal any patterns of environmental perception which were related to grades.

The ability to adapt to social and environmental situations were found to be significantly related to achievement in a study done by Weigand (1957) at the University of Maryland. No tests of perceptions of environmental press were used in this research, with the data being obtained through interviews.

Dropouts and persisters showed little difference (only two of the thirty CCI scales differed significantly) when tested at the beginning of the freshman year in a study by Scoresby (1962). However, when a post-test was done near the end of the semester, the dropout group showed a significant change in seven of the thirty CCI scales. Since there was no significant difference in the academic potential of the two groups, it was concluded that poor adaptation to environmental characteristics was related to attrition.

At Wisconsin State University, Baker (1966b) studied freshmen students who selected an honors program and those who didn't. Using the College Characteristics Index as the instrument to assess the differences in the perceptions of the two groups he found that honors students do perceive greater strength on Aspiration Level, Student Dignity, Self-Expression, Group Level, and Play-Work as compared to the non-honor students.

Walsh and McKinnon (1969) investigated the effect of an experimental program at the College of Arts and Sciences, Ohio State University. Four hundred and seven students participated in the experimental program. Comparisons were made between the experimental and traditional program. The findings indicated that the experimental group placed more emphasis on scholarship, academic achievement, and the practical benefits of the environment. The variation between groups was attributed to the experimental program and not as a result of the difference in the sex of the students.

The results of another study (Schoen, 1966) showed no significant difference in the perception of the university environment between students who attended New College, the experimental college of Hofstra University, and the entire student body of Hofstra.

Duling (1969), investigated the differences that might exist between male and female students, married and single students, social fraternity or sorority members, and native and transfer students at a large university. In administering the CUES to 748 eligible students, he found that subgroups do differ in the perceptions of at least some aspects of their college environment. Significant differences revealed that women students viewed the institution as more group-centered, conforming, and cooperative than did men students.

In a study comparing the perceptions of the university environment between elected residence hall leaders and non-leader residence

hall students it was found that non-leader males, in general, seemed to have a more negative view of the perceived campus environment. Female leaders and female non-leaders, however, tended to have similar perceptions leading the investigator to conclude that sex differences have a greater influence than does the leadership factor (Sanderson, 1971).

Rowe (1964) using the College Characteristics Index which was administered to women at Randolph Macon College for Women, attempted to test the stability of a college environment when controversial issues arise and firm administrative action occurs. During the year 1959-1961, the following events occurred at the college: sororities were abolished; students engaged in a "sit-in," and the administration disagreed with student government regarding drinking. Following these three events the CCI was readministered. The findings revealed that only on four of the thirty scales was there any significant change in perception relative to the college environment.

In a longitudinal study investigating the change in perceptions that occurred in students who participated in two forms of university governance (i.e. joint student-faculty committees and all-student committees). Underwood (1971) concluded that the changes did not vary significantly between the two groups; there was no significant change between pre- and post-test results for all groups; and male and female tended to view the university in similar fashions both



before and after the committees' experience.

Jansen and Windborn (1968) compared the perceptions of the university environment of student social-political action leaders with religious, residence hall, activity, and fraternity leaders at Indiana University. The social-political action leaders scored lower on the Awareness and Community scales of the CUES. Females in all groups scored significantly higher on all scales.

Berdie (1967) conducted a study for the purpose of determining changes in attitudes and student characteristics in relation to various college experiences. The College and University Environment Scales were administered to more than 7,000 entering freshmen at the University of Minnesota in the fall of 1964. A follow-up questionnaire was administered six months later to a random sampling of the same students who continued to be enrolled in the college they had entered the previous fall. The re-test consisted of the CUES plus a questionnaire concerned with living and transportation arrangements, participation in campus activities and organizations, and social activities with other university students. In addition, scores on an academic aptitude test and fall grade-point averages were examined.

The mean change scores from pre-test to post-test were statistically analyzed, and the following results were reported: changes in perceptions of the university were unrelated to living and transportation arrangements; changes in perception of the university were

unrelated to high school grades; changes in perceptions of the university were unrelated to academic aptitude; changes in CUES Community and Awareness scales were related to some college experiences, such as participation in informal discussions, attendance at theatrical performances and concerts on campus, having informal contacts with upperclassmen and the viewing of displays.

A study by Brooks (1968) investigated change in student perception over a period of two years in relation to various major features of the Millikin University environment. Her major findings were that:

1. In general, the sex of the student bore little relationship to change in perception over a two-year period.
2. Place of residence was significantly related to change in student perception.
3. Academic major was related to perceptual change on the Propriety and Scholarship scales of the CUES.
4. Cumulative grade-point averages were noted as being related to only one of the five CUES scales.
5. Amount of financial aid was related to student perceptual change on the Propriety dimension.
6. Participation in seven of the fourteen campus activities was significantly related to student perceptual change.

Lindahl (1967) conducted two studies using subjects from both an urban and suburban college which contradicted the generally-held

opinion that commuter students do not identify closely with the college and, therefore, fail to develop sensitivity and intellectual curiosity.

The first study was completed at two state colleges, one of which had three percent resident students and the other of which had sixteen percent resident students. Using the CUES, Lindahl found that more variation in perception occurred between college than between residents and commuters at the same college. In general, the following results were obtained:

1. The resident college was perceived as being more group-oriented and emphasized practicality; the commuter college was perceived as emphasizing creativity, idealism and self understanding.
2. In both colleges, the commuters perceived less emphasis on practicality than did residents.
3. In both colleges, the commuters perceived more emphasis on Awareness, Propriety and Scholarship scales than did resident students.
4. Male residents perceived an emphasis on friendliness and group orientation.
5. Male commuters perceived an emphasis on personal benefits and enrichment.
6. Female commuters perceived more emphasis on social and aesthetic understanding than did female residents.

The second study conducted by Lindahl was completed between 1962 and 1965 at seven California State colleges. Again, the results indicated that colleges with a large percentage of commuter-students perceived the environment as placing emphasis on self-understanding, creativity, idealism and scholarship at the two colleges with a resident population of at least one third. Resident students described an emphasis on practical benefits, togetherness, and friendliness.

Centra (1967), investigating the effectiveness in promoting a more intellectual, less hotel-like atmosphere, administered the CUES to 483 randomly selected students residing in small residence halls and large living-learning centers. He found that the feeling of community in the living-learning halls was as strong as in the small halls, indicating that the special arrangements were promoting a congenial, cohesive atmosphere.

The CUES was used by Gelso and Sims (1968) to determine whether perceptions of the environment are affected by certain characteristics of the persons perceiving the environment at a junior college. They compared students living at home, those living in college dormitories, and faculty. Their conclusions were that all three groups ranked the five scales in the same order but differed in the degree they perceived the environment to contain various characteristics. The faculty perceived significantly more community dimension than either student group, and the commuters and faculty

perceived the environment as containing significantly more propriety than did the residents.

Baker (1966a) tested the hypothesis that no difference in the perception of a large state university would occur due to the place of residence of students. The comparison was made between residence hall students, students residing in private boarding houses, and students living at home with both parents. Results of the study indicated that type of residence does result in significant differences in perception of the college environment. Boarding and residence hall students appeared to be less aware of the press of the college environment than did those who lived with their parents. In addition, it appeared that boarding and residence hall students were more dependent upon the university for need satisfaction than were those who resided at home.

### History and Implications of College Residence Halls

From their early beginning colleges and universities have been involved with the issues and philosophical implications of student housing. As reported by McKown (1937), the University of Bologna in twelfth century Italy was the first educational institution directly involved with student housing.

Cowley (1934) stated that in 1262, Bologna faculties were lecturing to almost ten thousand students, and in the same century the

University of Paris numbered thirty thousand students. That the influx of these hordes of students created a housing problem of considerable magnitude is clear when one recalls that medieval universities seldom numbered more than five thousand.

Rait (1912) reports that the medieval student housing units which were called hostels were democratic, self-governing groups which set up their own financial and disciplinary regulations and their own methods of enforcement.

It is reported by Thorndike (1944) that during the 1400's students were required to live in housing units controlled by a member of the faculty. Later at Oxford and Cambridge, this idea of students and faculty living and working together in an organized fashion was expanded into the British residential college concept.

Burbacher and Ruby (1958) cited two differences between the British and early American philosophies regarding the housing of students and the residential university concept.

- a. At Oxford and Cambridge the residential colleges developed into highly significant educational agencies due to their removal of the faculty responsibility for enforcing religious rules and maintaining conduct control. Special deans and proctors were charged with this responsibility, which allowed dons and students to live and work together in the pursuit of academic and social discourse.

- b. American dormitories, on the other hand, utilized the faculty in the enforcement of strict religious rules and conduct control. This, coupled with the difficulty of travel for consultation with parents, brought about the substitute parent concept of American colleges and set the stage for the development of the student-teacher relationship as one of natural enemies.

The response of the pre-Civil War college student to the harsh disciplinary system which ruled him was a violent open rebellion.

Shay (1966) also reports that unlike their British counterparts, who utilized the residential college as an instrument for united social and academic life, the early American tutors were consigned to fighting a losing battle with students over the enforcement of a plethora of regulations.

The religious commitment to develop the student's moral character, the difficulty and uncertainty of travel, and the student's early age, thirteen or fourteen years old, were the factors in early American life which pressed the college into a residential mold, according to Cowley (1934).

Feelings concerning residence halls prior to 1900 can best be illustrated in a statement by William Rainey Harper, president of the University of Chicago during that period:

Effort was made on the part of certain educators at the time of the opening of the university to show that dormitory life was a survival of the Middle Ages and that it was something entirely injurious to the development of a proper manhood and womanhood (University of Chicago, 1903, p. 25).

During this period the economic viability of residence halls was at issue. Said Charles W. Eliot:

An experience of 270 years with dormitories has demonstrated that they are not good property for the College, it having proved impossible to earn on them so good an income as the mass of the general investment yields. The President and Fellows have not built a dormitory with their own money since 1870-71, and they are not likely ever to build another, unless with money given for that express purpose (Harvard University, 1906, p. 50-51).

Craig (1960) reports that the greatest significance to the eventual general acceptance of residence halls was Woodrow Wilson's attempt to found the Quadrangle Plan at Princeton. Wilson believed that absorption of social life into the academic life of the university was the only way to prevent the former from distorting the latter.

MacMillan (1928) mentioned the importance of the fraternities in perpetuating the values of a residential system through the period when college halls were generally held in contempt. The fraternity house was a natural consequence of the university's failure to provide homes for students.

According to Shay (1964), Harvard University fought and won the main battle for college residences on the grounds that only



college-owned halls could save democratic student life in Cambridge.

As the records indicate, the early residence hall in the United States met with difficulty in their early years when their basic purpose was the control of student behavior. As related by Williamson (1958), the early small Christian college, usually isolated from urban culture, attempted to mold the character of students in the Christian pattern through the use of repressive and restrictive controls. They see the role of residence halls as progressing from simply providing shelter to offering opportunities for social and educational interaction, to establishing themselves now as living-learning centers.

Riker (1961) stated that, "housing units often reveal a great deal about an institution, from its attitudes toward students to its emphasis on learning" (p. 69).

Recently Powell, Plyler, Dickson and McClellan (1969) have stated that "Student life during the Twentieth Century has reflected the national mood of the time" which they feel "has had implications for college housing" (p. 2).

Arbuckle (1957) has pointed out the fact that the time a student spends in a residence hall usually exceeds by far the time he spends in the classroom, and the learning that occurs in the residence hall may also far surpass that which occurs in the classroom. He further stated that the interaction of various classes of students upon each other, i.e., upperclassmen upon freshmen and vice versa, is a

major consideration in determining the impact of residence living upon students.

Riker (1965) has stated that the future success of residence hall housing is in effective living-learning centers that have three essential elements:

1. Programs, developed as a framework for student action and reaction in learning.
2. Staff, selected and organized to sustain the program.
3. Physical facilities, designed to meet the requirements of students, program, and staff.

These elements are closely interrelated and must be developed together.

Ellen Fairchild (1963) believes that the educational emphasis in the hall should enhance the intellectual growth of the student. This would result in character development, faster constructive citizenship, and enhanced aesthetic appreciation. She also noted that the best standards of the business and professional society, which the majority of students will enter, should provide the standard for conduct in every-day social life.

According to Campbell and Richards (1964) the purpose of the residence hall in the educational process is not to compete with or to supplement the formal curriculum. Rather, the hall may be viewed as one means of complementing the academic program. It provides

opportunities to put into use materials assimilated in the formal academic setting, and provides outlets for expression.

Arrangements for housing can foster or inhibit interpersonal exchange, and they can influence the range of persons with whom such exchanges may occur, according to Chickering (1967).

A study conducted at Syracuse University by Conover (1957), which compared students residing in large housing units with students residing in smaller housing units, revealed that in the larger unit a smaller percentage of students participate in and contribute to the dormitory and campus activities. He also concluded that large units provide poor study conditions and limit the student's understanding of, and participation in, hall government.

Thibaut and Kelly (1959) and Newcomb (1961), contend that the college peer group can change both group and individual attitudes. This view is supported by a study conducted at Loyola University by Brown (1966) who found that systematic floor assignments by academic major influenced social interaction and the student's feeling about his goal.

Surveys at the Michigan State University campus indicate, as reported by Olson (1964), that residents of living-learning units feel that they are assuming greater responsibility since their situation is more demanding than a traditional residence hall arrangement. In fact, comparison of average scores on University College final

examinations for students in living-learning units and comparable main campus groups has most often shown somewhat higher achievement for living-learning hall groups.

Adams (1967) reports that a follow-up study at the first living-learning units at Michigan State University indicates that eighty percent of the sample felt the living-learning concept to be superior to the conventional curriculum, course offerings, and residence hall experience.

Greenleaf (1962) reports that, generally, coed housing in any form is new to the larger campus, where traditionally, men and women lived in different areas. Coeducational residence halls have been in existence in some form at Indiana University for six years. In comparing grades of students living in coeducational units with those living in traditional living units, the scholarship average over three years shows no evidence that grades of those in coeducational centers vary from those in an all men's or all women's center. However, the general social behavior patterns appear to be better in the coeducational living situation. She also found that coed center students "stay home" and spend their leisure time with friends in the center. She feels strongly that residence halls will achieve their potential only if universities recognize that they have a broad environmental responsibility which transcends the laboratory and library. Maturation of students is possibly a more important single factor in

academic achievement than textbooks, laboratory facilities, or professors.

Allen, Collins, Gee and Nudd (1964) see the coeducational residence hall as providing men and women experiences in working together whereby they receive new insights into their respective needs, abilities, responsibilities, and roles. Such an experience can provide a more similar climate to that which the resident progressed before college age and to which he will continue after he leaves. An increased understanding of the interests and thinking of the opposite sex which can develop a gradual understanding of the variations in the roles of each sex, can thereby broaden concepts of community leadership and citizenship now and for the future. Thus men and women together are taking a new look at the environment in which they live.

A recently completed four-year study of student development at Stanford University and the University of California at Berkeley, as reported in American School and University has stressed that coeducational housing will transform the traditional dating-mating game on campus.

By placing more emphasis on acquaintance and shared time activities, Katz explained, coeducational housing avoids over-idealization of the opposite sex. Providing men and women students with shared dining and social facilities and common academic programs may lead them to regard each other more like brothers and sisters, Katz stressed (American School and University, 1968, p. 35).

Greenleaf (1965) predicted that in the future, coeducational residence halls, where male and female students share certain common facilities, will continue to increase in number. Coeducational residence halls, according to Greenleaf, provide a challenging and stimulating educational atmosphere for many students. However, the concept of coeducational student housing is relatively new only to the larger university campuses. Coeducational living of some nature has long existed on many smaller campuses such as Oberlin and Antioch colleges. Larger universities have traditionally housed men and women students not only in different residence halls but in different geographical areas of the campus. Greenleaf cited the advantages of coeducational housing as:

1. Creating a more stimulating environment.
2. Increasing opportunities for leadership through coeducational activities.
3. Allowing student government to develop on a more democratic basis.
4. Providing greater efficiency in assigning and utilizing professional staff.
5. Encouraging general social behavioral patterns which appear to be better in the coeducation living center.

Greenleaf further stated that the combining of men's and women's

student government has proven to be of educational value to both sexes because:

1. Women students are provided with competitive experiences with men and have the opportunity to experience how men tend to make decisions in a less deliberate manner than women.
2. Men become aware of the need to incorporate women into the decision-making process, and experience women's tendency to be more deliberate and more concerned with detail in democratic processes.

### Summary of Reviewed Literature

A review of the literature revealed no specific references pertaining solely to perceptual change of students residing in coeducational or single-sex residential units. The review was thus presented in three topical areas: influence of the universities and colleges upon students; studies related specifically to perceptions of the college environment; and a brief historical and contemporary consideration of residence halls as an integral part of the college environment.

It was generally noted that the necessity to ascertain the influence of the university upon the students has gained increased interest among college educators in recent years. The rapid growth of their interest has been the great influx of students which has ascended upon

institutions of higher learning since the Second World War.

A review of the literature in the areas of the influence of colleges and universities upon students suggest that students do change as a result of their attendance at college. These changes tend to be in the areas of a greater awareness of the world and themselves, a decrease in dogmatic attitudes, and an adaptation of less stereotypic beliefs. Factors associated with those changes tend to be related to experiences occurring outside the formal classroom and are generally related to the interpersonal interactions of the individual.

Studies related to the perceptions of the university environment in the review of the literature tended to indicate that perception of the university environment changes from the freshman to the senior year with the greatest degree of change occurring during the freshman and sophomore years. Individuals tend to generalize from the environment with which they are familiar to the university environment as a whole. Male and female perceptions differ significantly and students enrolled in different academic majors tend to view the university environment differently. A relationship between perception of the university and the place of residence of the student is apparent. However, there is no relationship between levels of aptitude or attrition and the perception of the university.

A review of the literature revealed that the historical



responsibility for student housing belonged to the student. Early American educators did not view housing units as educational facilities, but rather as economical controlling facilities of student behavior. Recently the trend in residence halls is toward the concept of living-learning centers and coeducational units which provide a student with an educational environment which is conducive to his growth and development.

## CHAPTER III

### METHODOLOGY AND PROCEDURES

This chapter describes the location and design of the study, the method of student sample selection, and procedures used to collect and analyze the data.

#### Locale of the Study

Oregon State University, a land grant, coeducational university, is located in Corvallis, Oregon, a city of 20,000 population independent of university students. Because of its location, the university is largely a residential campus. Most of the students are from the state of Oregon and from towns of less than five hundred thousand population.

During the fall term of 1970, at the initiation of the study, a total of 13,197 undergraduates were enrolled. Of this total, 2,424 freshmen students (55.1 percent of the total freshman class) were housed in one of the seven single-sex or five coeducational residence halls which comprise the Oregon State University residence hall system. (The sexes in the coeducational residence halls are separated by floors, or, in the case of one hall, by wings.) These residence halls house an average of 262 freshmen each with freshmen occupancy range from 138 to 298. Freshmen students comprised 62.7 percent of the

total residence hall population. The remaining freshmen were housed in either cooperative housing, fraternities, or private residences.

### Participants

The participants in the study were selected from a list made available by the Residence Hall Programs Office. The population from which the sample was drawn was limited to first term freshmen students residing in residence halls at Oregon State University from September, 1970, through March, 1971, who were eighteen years of age or younger, who were citizens of the United States, and who had never attended college prior to September, 1970. Freshmen students with previous experiences such as attendance at other institutions of higher education or prior work or military duty, and foreign students were excluded from the study in order for the selected sample to more truly reflect the general perceptions of the typical entering freshman student resident at Oregon State University.

A population of 2,112 students met the criteria for participants in the study. Of that number 528, or twenty-five percent, were selected by use of the random number sampling technique (Snedecor and Cochran, 1967). Table 1 indicates the number of males and females from the two types of residence halls selected for participation. Of that number 81.4 percent participated throughout the period of the study.

Table 1. Distribution of Random Sample and Pre- and Post-Test Participants.

	Randomly Selected Sample	Pre-Test Participants		Post-Test Participants		
	Number	N	% of Subgroup	N	% of Subgroup	% of Pre-Test Participants
MSS	121	109	90.0	95	78.5	87.2
FSS	191	164	85.9	150	78.5	91.5
MCO	112	106	94.6	96	85.7	90.6
FCO	104	97	93.3	89	85.6	91.7
Total	528	476	90.1	430	81.4	90.3

#### Sources of the Data

The primary source of the data for this study was the College and University Environment Scales. Additionally, the investigator compiled a brief supplementary data form using several selected questions from the College Student Questionnaire, 2nd Edition for use in gathering additional demographic and personal information on all participants. Supplementary information was also gathered from files in the Residence Hall Programs Office, Oregon State University.

#### The College and University Environment Scales

The College and University Environment Scales (CUES), 2nd

Edition, developed by C. Robert Pace, was selected as the research instrument for use in this study because it was designed to define the atmosphere of the intellectual-social-cultural climate of the university as students perceive it. The instrument is composed of 160 true-false items concerning a variety of college-life experiences, such as facilities and unique characteristics, rules and regulations, faculty and instruction, curricula, student life, and campus organizations. These factors are related to the following scales, previously defined in Chapter I:

Scale 1.	Practicality
Scale 2.	Community
Scale 3.	Awareness
Scale 4.	Propriety
Scale 5.	Scholarship
Subscale 1.	Campus Morale
Subscale 2.	Quality of Teaching and Faculty-Student Relationships

Students who take the test are asked to indicate whether each statement concerning an aspect of the university environment is generally true or false. The instrument, therefore, is a means by which students themselves describe a university environment to which they are intimately related. The CUES Manual indicates that the method of administration, whether individual or by group, does not affect the

way in which students answer the items (Pace, 1969).

#### Personal Information Data

In addition to the CUES a brief informational questionnaire (See Appendix A) was administered during the pre-test. The responses to this questionnaire were confirmed by personal information derived from records in the Residence Hall Programs Office and were utilized in an effort to control several factors which might affect student responses to the CUES. The following factors were considered in this study:

a. Hall placement (random or self)

Self-selected refers to those freshmen students who indicated as their first choice the residence hall within which they reside. Randomly selected refers to those students who do not reside in the residence hall of their first choice or who did not list a preference.

b. Fathers' occupation

The following seven categories quoted directly from the Hollingshead Two Factor Index of Social Position were utilized to analyze socio-economic level of each participant's family (Hollingshead, 1957, p. 11):

1. Higher executives, major professional with college

degrees (doctors, lawyers, engineers, foresters), and owners of large concerns.

2. Other professionals (teachers, accountants, civil service, pharmacists, optometrists), and owners of medium-sized business and managers of large concerns.
3. Semi-professionals (photographers, morticians, appraisers, surveyors, reporters), small business owners, managers and agents.
4. Clerks, technicians, farmers and farm owners.
5. Skilled manual employees, foremen and farm laborers.
6. Machine operators and semi-skilled employees.
7. Unskilled employees.

c. Hometown community

An analysis of the participant's hometown was obtained from the following eight categories:

1. Suburb in a metropolitan area of more than 2,000,000 population.
2. Suburb in a metropolitan area of 500,000 to 2,000,000.
3. Suburb in a metropolitan area of 100,000 to 500,000.
4. In a city of 50,000 to 500,000.
5. City or town of 10,000 to 50,000.
6. Town of less than 10,000.
7. Farm, ranch or other open country.

d. Academic major

Oregon State University has the following nine undergraduate schools:

1. Agriculture.
2. Business and Technology.
3. Education.
4. Engineering.
5. Forestry.
6. Home Economics.
7. Humanities and Social Sciences.
8. Pharmacy.
9. Science.

e. Dating status

The participant's marital or dating status was categorized by the following:

1. Single and "unattached."
2. Going steady.
3. Pinned, or engaged.

f. Parent's marital status

The status of the parents were categorized in the following categories:

1. Living together.



2. Divorced, separated.
3. Father deceased.
4. Mother deceased.
5. Both parents deceased.

g. Religious service attendance

The frequency of attendance at religious services was derived by the following six divisions:

1. Not at all.
2. Only on important religious holidays.
3. About once a month.
4. About twice a month.
5. About once a week.
6. More than once a week.

Pre-Test Administration of the Instruments

The participants in this study completed the College and University Environment Scales and the personal information questionnaire during Orientation Week immediately preceding fall term 1970. The questionnaires were administered by two methods. The selected freshmen residents were initially invited by letter (Appendix B) to participate in the study at an evening administration of the instruments. Invited freshmen who, for one reason or another, failed to attend the evening administration of the instruments were contacted

by their respective resident assistants and once again asked to complete the questionnaires and return them prior to the beginning of fall term 1970.

The first method of administration yielded 283 respondents. The followup administration by the resident assistants resulted in an additional 193 completed answer sheets bringing the total number of students participating in the first administration of the test to 476. This number represents 90.1 percent of the selected sample and 22.5 percent of the population from which the sample was drawn. Time limitations and the desirability of testing students prior to their attendance in college classes contributed to the inability to test all participants during the initial administration of the instruments. Table 1 shows the number of males and females from the respective living arrangements who participated in the pre-test of the instruments.

#### Post Administration of the Instrument

A second administration of the College and University Environment Scales was conducted during the first and second week in March, 1971, following two terms of in-residence living by the participants.

The resident assistants were once again personally contacted and given an instruction and information sheet (see Appendix C) with reference to the administration of the test. The resident assistants

then contacted the selected participants on their respective floors and requested their cooperation in the post-administration of the CUES. The completed answer sheets were then returned to the head resident where they were collected by the investigator. When necessary, contact was made directly with the participants by the investigator to encourage and insure the maximum number of responses.

As Table 1 indicates, of the original 476 freshmen who participated in the pre-test, 430 completed the instrument during the second administration. This represents 90.3 percent of those who participated in the first administration of the instrument, 81.4 percent of those randomly selected for participation in this study, and 20.4 percent of the total population from which the sample was drawn. The reduction in completed questionnaires in the post-testing (Table 2) was due to the refusal by two males and two females to participate during the second administration, the inability of the investigator to contact five males and three females, and the withdrawal from college and/or residence halls during the term of the study by the remaining thirty-four subjects. Additional information concerning the SAT scores and high school GPA's for the seventeen males and seventeen females who withdrew from college and/or residence halls during the period of the study was obtained from the Office of the Dean of Students, Oregon State University. A summation of that information is shown in Table 3. The average SAT-verbal and SAT-math for

Table 2. Distribution of Subjects Who Refused to Continue Participation, Who Could Not Be Located or Who Withdrew From College and/or Residence Halls.

	Number of Pre-Test Participants	Subjects Refusing to Continue Participation		Subjects Whom the Investigator Could Not Locate *		Subjects Who Withdrew from College and/or Residence Halls	
		N	%	N	%	N	%
MSS	121	1	.8	3	2.5	10	8.3
FSS	191	2	1.0	2	1.0	10	5.2
MCO	112	1	.9	2	1.8	7	6.2
FCO	104	0	0	1	1.0	7	6.9
Total	528	4	.7	8	1.5	34	6.5

\* Also indicates those students who made hall changes during the period of the study.

entering freshmen in 1970 was 482.8 and 534.6 respectively, with the average high school GPA for entering freshmen at 3.09.

Table 3. Comparison of Average SAT Scores, High School GPA's and Fall Term GPA's for Participants Who Withdrew From College and/or Residence Halls During the Period of the Study, and all Freshmen.

	SAT-V	SAT-M	High School GPA	Fall Term GPA
All Freshmen				
Males	486.5	559.7	3.04	2.35
MSS (10)	451.8	563.3	3.12	2.19 <sup>a</sup>
MCO (7)	444.3	521.2	2.93	2.12 <sup>b</sup>
All Freshmen				
Females	477.7	486.2	3.20	2.45
FSS (7)	462.1	497.7	3.28	2.43
FCO (10)	436.2	464.6	3.08	2.08 <sup>b</sup>

<sup>a</sup> Results not available for one participant.

<sup>b</sup> Results not available for two participants.

An examination of the Fall term grades for those individuals who withdrew from the college and/or residence halls during the period of the study showed that four males and two females in the single-sex residence halls and two males and five females in the coeducational residence hall received GPA's below 2.00 for the term. This suggests

that these individuals withdrew as a result of poor academic performance. The remaining sixteen freshmen withdrew for reasons other than academic.

### Scoring and Coding Procedures

Following the post-administration of the instrument, the answer sheets were hand scored according to directions in the CUES Technical Manual, Second Edition (1969) and subsequently rescored for possible error. Scale scores and the covariate information used in this study which was collected by the personal information questionnaire and from the files of the Residence Hall Programs Office were punched on a standard punch card, verified, and then analyzed by the computer center at Oregon State University for significant differences in perceptual change.

### Statistical Treatment of Data

Three statistical models were employed to analyze the hypothesis under investigation. They were t-test, analysis of variance, and analysis of covariance.

#### t-Test Model

The indices used in the analysis were change scores obtained by subtracting the post-test results from the pre-test results. With

this purpose in mind t-test statistical procedures were selected to test the first six null hypotheses.

For each pair of groups, differences between means were tested at the .05 and .01 level using the Student's t with the .05 level of significance being accepted as indicating the level of confidence that differences were real (Snedecor and Cochran, 1967). The following is a general outline of the test statistic used in analyzing the data:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{\sum x_1^2}{k_1(k_1-1)} + \frac{\sum x_2^2}{k_2(k_2-1)}}}$$

where  $\bar{X}_1$  = mean of pre-test or first group

$\bar{X}_2$  = mean of post-test or second group

$\sum x_1^2$  = sum of squared deviations of the scores away from the mean in the first group

$\sum x_2^2$  = sum of squared deviations of the scores away from the mean in the second group

$k_1$  = number of cases in the first sample group

$k_2$  = number of cases in the second sample group

The t-test statistical model was employed in an effort to measure the degree of perceptual change in the university environment that occurred in the following groups:

1. Freshmen females residing in single-sex residence halls.

2. Freshmen females residing in coeducational residence halls.
3. Freshmen males residing in single-sex residence halls.
4. Freshmen males residing in coeducational residence halls.

The t-test statistical model was also used in treating the following group comparisons relative to the differences in degree of change in perception of the university environment that occurred:

1. Freshmen females residing in coeducational residence halls and freshmen females residing in single-sex residence halls.
2. Freshmen males residing in coeducational residence halls and freshmen males residing in single-sex residence halls.

### Analysis of Variance Model

When the data was not affected by a covariate, the analysis of variance statistical model was utilized to test the final three null hypotheses under examination. The analysis of variance model is as follows:

$$y = \mu + \text{group} + \text{sex} + \text{group} \times \text{sex} + \epsilon$$

where  $y$  = response

$\mu$  = mean

Within the analysis of the data treated all hypotheses were tested at the .05 and .01 levels of significance with the .05 level of



significance being accepted as indication of degrees of confidence that differences were real.

The analysis of covariance and analysis of variance statistical models were utilized in making comparisons between the following groups relative to the degree of perceptual change in the university environment that occurred.

1. Freshmen residing in coeducational residence halls and freshmen residing in single-sex residence halls.
2. Freshmen males residing in residence halls and freshmen females residing in residence halls.
3. Interaction of coeducational and single-sex residence halls and freshmen male and female residents.

#### Analysis of Covariance Model

The analysis of covariance represents an extension of analysis of variance in order to indicate the correlation between initial and final scores. This covariance method is especially appropriate in experiments in which the control and experimental groups are not equated at the beginning of the experiment. Through covariance it is possible to effect adjustments in final scores which will allow for differences in initial variables (Garrett, 1953).

The analysis of covariance procedure first measures the effects upon the initial responses of the subjects in the study to the CUES.

The covariates which have an effect upon the subject's responses are then adjusted upon the means of the groups being studied.

The effect of the seven covariates upon the differences between the pre- and post-results of the instrument were measured in relation to the two criterion variables: the groups under study, and sex.

In measuring the covariate variables the following statistical model was employed (Snedecor and Cochran, 1967):

$$y = \mu + \text{group} + \text{sex} + \text{group} \times \text{sex} + \beta_1 (\text{hall placement}) + \beta_2 (\text{father's occupation}) + \beta_3 (\text{hometown community}) + \beta_4 (\text{academic major}) + \beta_5 (\text{dating status}) + \beta_6 (\text{parental status}) + \beta_7 (\text{religious attendance}) + \epsilon$$

where:  $y$  = response

$\mu$  = mean

Two hypotheses were established:

$$H_o \text{ (null)} \quad \beta_1 = \beta_2 = \beta_3 \dots \beta_7 = 0$$

$$H_a \text{ (alternate)} \quad \text{some } \beta_i \neq 0$$

Therefore, if  $\beta_1 = \beta_2 = \beta_3 = \dots \beta_7 = 0$  it was assumed that each covariate had no effect upon the criterion variables. When this case existed the t-test model or the analysis of variance technique was employed to test the appropriate null hypotheses of the study.

When it was determined that some  $\beta_i \neq 0$ , the means were adjusted before treatment by t-test in the first six null hypotheses or the analysis of covariance technique was employed in place of the analysis of variance model when applicable in the last three null hypotheses.

#### Distribution of Participants by Covariate Variables

Adjusting scores according to the effect of significant covariables allowed for the direct comparison of the groups in their perception of the university as measured by the scales of the CUES.

The following data concerning covariate variables under examination in this study were acquired through the records of the Residence Halls Programs Office and the administration of the personal information questionnaire during the pre-test.

#### Hall Placement

The means by which a student was placed in his respective residence hall is examined in Table 4.

Students who reside in residence halls at Oregon State University are generally given the option as to the residence hall within which they would like to live for the academic year. However, if a student fails to indicate a particular hall, or he gains admission to the University late in the summer, or, if his desired hall is filled at the time of his application, he is randomly assigned to a hall with

Table 4. Distribution of Participants by Method of Hall Placement.

	Randomly Selected		Self-Selected		Total	
	N	%	N	%	N	%
M	85	44.5	106	55.5	191	100
F	87	36.4	152	63.6	239	100
Total	151	35.1	279	64.9	430	100
MSS	58	61.1	37	38.9	95	100
FSS	45	30.0	105	70.0	150	100
TSS	103	42.1	142	57.9	245	100
MCO	27	28.1	69	71.9	96	100
FCO	42	47.2	47	52.8	89	100
TCO	69	37.3	116	62.7	185	100

space available.

As Table 4 indicates, a majority of the students were placed in the hall of their first choice. However, in the male single-sex category, it was found that subjects who were not placed in the hall of their first choice were of a substantial majority when compared with male residents in coeducational residence halls and female residents in single-sex and coeducational residence halls.

When examining the data as presented in Table 4, the previously stated policy concerning hall placement which is followed by the Residence Hall Programs Office should be kept in mind.

#### Father's Occupation

Table 5 represents the socio-economic level based on the criteria for each participant's family for the respective groups. Table 6 is a regrouping of Table 5 and attempts to further define the respective groups as to their socio-economic levels.

As is indicated in Table 5, the modes for all groups were found to be in the middle socio-economic levels representing such occupational levels as agent, manager, owner of a small business, surveyors, reporters, or appraisers. The regrouping in Table 6 revealed that a substantial number (42.0 percent) of male and female subjects in the single-sex residence halls were from families in which the father's occupation was at the professional or higher level as

Table 5. Distribution of Participants by Socio-Economic Level Determined by Father's Occupation.

	1		2		3		4		5		6		7		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
M	24	12.6	44	23.0	56	29.3	20	10.5	27	14.1	13	6.8	7	3.6	191	100
F	41	17.1	50	20.9	42	17.6	38	16.1	27	11.3	31	13.0	10	4.2	239	100
Total	65	15.1	94	21.9	98	22.8	58	13.5	54	12.6	44	10.2	17	3.9	430	100
MSS	15	15.8	26	27.4	25	26.3	7	7.4	12	12.6	6	6.3	4	4.2	95	100
FSS	29	19.3	33	22.0	26	17.3	28	18.7	13	8.7	19	12.7	2	1.3	150	100
TSS	44	18.0	59	24.1	51	20.8	35	14.3	25	10.2	25	10.2	6	.2	245	100
MCO	8	8.3	19	19.8	31	32.3	13	13.5	14	14.6	8	8.3	3	3.1	96	100
FCO	12	13.5	17	19.1	16	18.0	5	5.6	18	20.2	13	14.6	8	9.0	89	100
TCO	20	10.8	36	19.5	47	25.4	18	9.7	32	17.3	21	11.3	11	5.9	185	100

1. Higher executives
2. Other professionals
3. Semi-professionals
4. Clerks, etc.
5. Skilled, etc.
6. Machine operators, etc.
7. Unskilled, etc.

Table 6. Alternate Distribution of Participants by Socio-Economic Level Determined by Father's Occupation.

	1-2		3-7		Total	
	N	%	N	%	N	%
M	68	35.6	123	64.4	191	100
F	91	38.1	148	61.9	239	100
Total	159	37.0	271	63.0	430	100
MSS	41	43.2	54	56.8	95	100
FSS	62	41.3	88	58.7	150	100
TSS	103	42.0	142	58.0	245	100
MCO	27	28.1	69	72.9	96	100
FCO	29	32.6	60	67.4	89	100
TCO	56	30.3	129	69.7	185	100

1. Higher executives
2. Other professionals
3. Semi-professionals
4. Clerks, etc.
5. Skilled, etc.
6. Machine operators, etc.
7. Unskilled, etc.

represented by levels one and two of the tables. Table 6 further indicates that only 30.3 percent of the freshmen who resided in the coeducational residence halls tended to come from families represented in the upper two categories of the table. A further examination of the subgroups revealed that the highest concentration of subjects from families represented in the higher two categories were found in the male single-sex residence halls. The least number of subjects from families represented in those categories were found in the male coeducational group.

#### Hometown Community

The information relative to participant's hometown community are examined in Table 7 and an alternate Table 8. As indicated in Table 7, the mode for all groups was found to be in the population range for towns of ten thousand to fifty thousand with slightly more than fifty percent of the number of participants coming from communities of fifty thousand or less. Alternate Table 8 shows that 58.4 percent of the female participants who resided in coeducational residence halls came from communities with populations of fifty thousand or less, whereas only 39.3 percent of females who resided in single-sex residence halls were found to come from communities in that category.



Table 7. Distribution of Participants by Population of Hometown Community.

	1		2		3		4		5		6		7		8		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
M	11	5.8	16	8.4	22	11.5	8	4.2	25	13.1	50	26.2	37	19.8	22	11.5	191	100
F	7	2.9	18	7.5	24	10.0	15	6.3	54	22.6	59	24.7	46	19.2	16	6.7	239	100
Total	18	4.2	34	7.9	46	10.7	23	5.3	79	18.8	109	25.3	83	19.3	38	8.8	430	100
MSS	6	6.3	8	8.4	12	12.6	3	3.2	11	11.6	28	29.8	16	16.8	11	11.6	95	100
FSS	4	2.7	11	7.3	18	12.0	11	7.3	37	24.7	35	23.3	25	16.7	9	6.0	150	100
TSS	10	4.1	19	7.7	30	12.2	14	5.7	48	19.6	63	25.7	41	16.7	20	8.2	96	100
MCO	5	5.2	8	8.3	10	10.4	5	5.2	14	14.6	22	22.9	21	21.9	11	11.5	96	100
FCO	3	3.4	7	7.9	6	6.7	4	4.5	17	19.1	24	27.0	21	23.6	7	7.9	89	100
TCO	8	4.3	15	8.1	16	8.6	9	4.9	31	16.8	46	24.9	42	22.7	18	9.7	185	100

1. Suburban, over 2,000,000 population
2. Suburban, 500,000 to 2,000,000 population
3. Suburban, 100,000 to 500,000 population
4. City, over 500,000
5. City, 50,000 to 500,000
6. Town, 10,000 to 50,000
7. Town under 10,000
8. Farm, Rural, Etc.

Table 8. Alternate Distribution of Participants by Population of Hometown Community.

	Population Over 50,000		Population 50,000 or Less		Total	
	N	%	N	%	N	%
M	82	42.9	109	57.1	191	100
F	118	49.4	121	50.6	239	100
Total	200	46.5	230	53.5	430	100
MSS	40	42.1	55	57.9	95	100
FSS	81	60.7	69	39.3	150	100
TSS	121	49.4	124	50.6	245	100
MCO	42	43.8	54	56.2	96	100
FCO	37	32.6	52	58.4	89	100
TCO	79	42.6	106	57.4	185	100

### Academic Major

The distribution of the student sample in regard to major areas of study is revealed in Table 9. Freshmen males tended to be registered in the schools of Science, Engineering, Humanities and Social Sciences, and Business and Technology. Freshmen females tended to be registered in the schools of Humanities and Social Sciences, Science, Home Economics, and Education.

A closer examination reveals that a disproportionate number of freshmen males enrolled in the School of Science (37.9 percent) were found to reside in single-sex residence halls whereas only 26.0 percent of the coeducational male residents were enrolled in the School of Science.

### Dating Status

As Table 10 indicates, the largest majority of the students were in the single or unattached category. It was noted that 20.0 percent of the males and 17.3 percent of the female residents in single-sex halls indicated that they were either pinned or going steady; whereas, 26.0 percent of the male and 27.0 percent of the female residents in coeducational halls were found to be pinned or going steady.

Table 9. Distribution of Participants by Enrolled Major at Oregon State University.

	1		2		3		4		5		6		7		8		9		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
M	16	8.3	24	12.6	4	2.1	48	25.1	10	5.2	0	0	25	13.1	3	1.6	61	31.9	191	100
F	2	.8	23	9.6	37	15.5	2	.8	1	.4	51	21.3	64	26.8	6	2.5	53	22.2	239	100
Total	18	4.2	47	10.9	41	9.5	50	11.6	11	2.6	51	11.9	89	20.7	9	2.1	114	26.5	430	100
MSS	7	7.8	7	7.8	1	1.0	21	22.1	6	6.3	0	0	16	16.8	1	1.0	36	37.9	95	100
FSS	2	1.3	12	8.0	27	18.0	2	1.3	1	.7	33	22.0	38	25.3	5	3.3	30	20.0	150	100
TSS	9	3.7	19	7.7	28	11.4	23	9.4	7	2.7	33	13.4	54	22.0	6	2.5	66	26.9	245	100
MCO	9	9.4	17	17.7	3	3.1	27	28.1	4	4.2	0	0	9	9.4	2	2.1	25	26.0	96	100
FCO	0	0	11	12.4	10	11.2	0	0	0	0	18	20.2	26	29.2	1	1.1	23	25.8	89	100
TCO	9	4.7	28	15.1	13	7.0	27	14.6	4	2.2	18	9.7	35	18.9	3	1.6	48	26.5	185	100

1. Agriculture
2. Business and Technology
3. Education
4. Engineering
5. Forestry
6. Home Economics
7. Humanities and Social Science
8. Pharmacy
9. Science

Table 10. Distribution of Participants by Dating Status at Beginning of Study.

	1		2		3		Total	
	N	%	N	%	N	%	N	%
M	147	77.0	34	17.6	10	5.2	191	100
F	189	79.1	39	16.3	11	4.6	239	100
Total	336	78.1	73	17.0	21	4.9	430	100
MSS	76	80.0	14	14.7	5	5.3	95	100
FSS	124	82.7	20	13.3	6	4.0	150	100
TSS	200	81.6	35	13.9	10	4.5	245	100
MCO	71	74.0	20	20.8	5	5.2	96	100
FCO	65	73.0	19	21.3	5	5.6	89	100
TCO	136	73.5	39	21.1	10	5.4	185	100

1. Single, unattached
2. Going steady
3. Pinned (or engaged)

### Parents' Marital Status

As illustrated by Table 11, a great majority of the participants came from families whose parents are married and presently living together. A comparison of males shows that 13.5 percent of coeducational residents come from families in which the parents are divorced, separated or in which one or more parent is deceased. This compared with 5.3 percent of the male residents of single-sex residence halls. The female participants also followed a similar pattern with 20.3 percent of female residents in coeducational residence halls coming from families in which the parents are either separated, divorced or in which one or more parents is deceased. This compared with 12.7 percent of female single-sex residents in the same category.

### Religious Service Attendance

Table 12 reveals that a majority of male participants attend religious services only on important religious holidays or not at all. The mode of female participants relative to religious attendance was shown to be about once a week. An alternate table, Table 13, was developed in an attempt to further define this factor. In this table a division was made between what was considered to be regular attendance of at least once a month or more, and that which was considered to be irregular attendance on only important religious holidays or no

Table 11. Distribution of Participants by Parents' Marital Status.

	1		2		3		4		5		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
M	173	90.6	6	3.1	10	5.2	0	0	2	1.6	191	100
F	202	84.5	21	8.8	9	3.8	7	2.9	0	0	239	100
Total	375	87.2	27	6.3	19	4.4	7	1.6	2	.5	430	100
MSS	90	94.7	1	1.0	3	3.2	0	0	1	1.0	95	100
FSS	131	87.3	11	7.3	4	2.7	4	2.7	0	0	150	100
TSS	221	90.2	12	4.9	7	2.9	4	1.6	1	.4	245	100
MCO	83	86.5	5	5.2	7	7.3	0	0	1	1.0	96	100
FCO	71	79.7	10	11.2	5	6.8	3	3.3	0	0	89	100
TCO	154	83.2	15	8.1	12	6.5	3	1.6	1	.5	185	100

1. Living together
2. Divorced, separation
3. Father deceased
4. Mother deceased
5. Both parents deceased

Table 12. Distribution of Participants by Frequency of Attendance at Religious Services.

	1		2		3		4		5		6		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
M	67	35.1	42	22.0	21	11.0	17	8.9	34	17.8	10	5.2	191	100
F	43	18.0	46	19.2	31	13.0	33	13.8	68	28.5	18	7.6	239	100
Total	110	25.6	88	20.5	52	12.1	50	11.6	102	23.7	28	6.5	430	100
MSS	33	34.7	27	28.4	9	9.5	6	6.3	18	18.9	2	2.1	95	100
FSS	31	20.7	25	16.7	21	14.0	20	13.3	39	26.0	14	9.3	150	100
TSS	64	26.1	52	21.2	30	12.2	26	10.6	57	23.7	16	6.5	245	100
MCO	34	35.4	15	15.6	12	12.5	11	11.5	16	16.7	8	8.3	96	100
FCO	12	13.5	21	23.6	10	11.2	13	14.6	29	32.6	4	4.5	89	100
TCO	46	24.9	36	19.5	22	11.9	24	12.9	45	24.3	12	6.5	185	100

1. Not at all
2. Only on important religious holidays
3. About once a month
4. About twice a month
5. About once a week
6. More than once a week



Table 13. Alternate Distribution of Participants by Frequency of Attendance at Religious Services.

	1-2		3-6		Total	
	N	%	N	%	N	%
M	109	57.1	82	42.9	191	100
F	89	37.2	150	62.8	239	100
Total	198	46.0	232	54.0	430	100
MSS	60	63.2	35	36.8	95	100
FSS	56	37.3	94	62.7	150	100
TSS	116	47.3	129	52.7	245	100
MCO	49	51.0	47	49.0	96	100
FCO	33	37.1	56	62.9	89	100
TCO	82	44.3	103	55.7	185	100

1. Not at all
2. Only on important religious holidays
3. About once a month
4. About twice a month
5. About once a week
6. More than once a week

attendance at all. As Table 13 indicates, no difference exists on this factor between female residents of the two types of residence halls. However, an examination of male residents of the two different types of living arrangements relative to this factor reveals that 63.2 percent of the male residents of single-sex halls attended church only on important religious holidays or not at all. This compared with 51.0 percent of the male residents in coeducational residence halls at the same level of religious service attendance.

In summary, the following profile seems to emerge. Student participants in the study were generally residing in the residence hall of their first choice. They tended to be from families in the middle socio-economic levels and come from communities with populations less than fifty thousand. The vast majority of the student participants were single or unattached and came from families in which the parents were living together. The participants did differ by sex on the categories of major school and religious attendance.

Although this profile appears evident, a further examination suggests that some interesting subgroupings exist within the respective residential living arrangements.

## CHAPTER IV

### ANALYSIS OF DATA

The main objective of this study was to compare the change in perception of the university environment that occurs in freshmen students who reside in coeducational residence halls with the change in perception of the university environment that occurs in freshmen students who reside in single-sex residence halls. The purpose of this chapter is to present and analyze the data relative to this investigation.

#### Analysis of Covariate Variables

Prior to any discussion of the findings, the effects of covariate variables upon the student responses to the questionnaires, should be examined.

The following control variables were treated as covariates to measure the degree to which they affected the participants' responses:

- a. Hall placement (random or self)
- b. Father's occupation
- c. Hometown community
- d. Academic major
- e. Dating status
- f. Parental status
- g. Religious attendance

The  $F$  value for each scale relative to the covariates is shown in Table 14. The null hypothesis  $\beta_1 = \beta_2 = \beta_3 = \dots \beta_7 = 0$  was not rejected for the Practicality, Community, Awareness, Campus Morale and Faculty-Student Relationships scales. Thus,  $t$ -test and the analysis of variance statistical method was utilized in testing the appropriate null hypotheses under study for these five scales. The alternate hypothesis, some  $\beta_i \neq 0$ , was accepted for the Propriety and Scholarship scales. The Propriety scale was affected by the subject's dating status. The Scholarship scale was shown to be affected by enrolled academic major, dating status, hometown community, and socio-economic level as indicated by father's occupation.

Table 14. Summary of the Effect of the Covariate Variables upon Student Responses for Each Scale.

Scale	F Score
Practicality	.425
Community	.440
Awareness	.384
Propriety	3.049**
Scholarship	3.596**
Campus Morale	.481
Faculty-Student Relationships	.726

$F = 1.70$  at .05 level

\* Significant at .05 level

$F = 2.09$  at .01 level

\*\* Significant at .01 level

The covariates which affected these scales were controlled in the first six null hypotheses by adjusting means prior to the t-test on those scales and by employing analysis of covariance in treating the last three null hypotheses. The five remaining scales were analyzed by t-test and the analysis of variance statistical models for the appropriate null hypotheses.

#### Discussion of Findings Relative to the Hypotheses Under Investigation

As previously stated, t-test, analysis of covariance and the analysis of variance were the statistical models employed in testing the hypothesis of this study in which all hypotheses were tested at .05 and .01 levels of significance. The first six null hypotheses were treated by the t-test statistical model.

Hypothesis I. No significant change in the perception of the university environment occurs in freshmen females who reside in single-sex residence halls as measured by the College and University Environment Scales.

Table 15 illustrates the pre-test mean score, post-test mean score, change of mean scores, resultant standard deviations and t-scores of the seven scales under investigation for freshmen females who resided in single-sex residence halls. As is indicated female freshmen residing in single-sex residence halls did change their

Table 15. Change in Perception of the University Environment that Occurred in Freshmen Females Residing in Single-Sex Residence Halls.

	Pre-Test Mean	Post-Test Mean	Change of Mean	Standard Deviation	t
Practicality	10.6800	8.8933	-1.7867	.1956	-9.1335**
Community	13.9533	11.3000	-2.6533	.3097	-8.5668**
Awareness	13.4600	10.9000	-2.5600	.2853	-8.9736**
Propriety	12.4800	10.1200	-2.3600	.3330	-7.0869**
Scholarship	8.6667	8.1000	-0.5667	.3061	-1.8507
Campus Morale	14.6933	11.4333	-3.2600	.3102	-10.5087**
Faculty-Student Relationships	6.9467	5.9933	-0.9533	.1801	-5.2941**

t = 1.9600 at .05 level

\* Significant at the .05 level

t = 2.5758 at .01 level

\*\* Significant at the .01 level

perceptions of the university environment in a negative direction on six of the seven scales under investigation. The change in perception of the university environment which occurred was found to be significant at the .01 level on all but the Scholarship scale which was found not to be significant. In effect, the findings indicate that subjects in this group significantly changed their perceptions relative to the university environment on all but the scale which described the environment as being characterized by intellectual and scholastic discipline with emphasis on high academic achievement and a serious scholastic interest. The first hypothesis was rejected on six of the seven scales and accepted on the Scholarship scale.

Hypothesis II. No significant change in the perception of the university environment occurs in freshmen females who reside in coeducational residence halls as measured by the College and University Environment Scales.

The findings relative to this hypothesis are found in Table 16. As the data indicates, freshmen female subjects in coeducational residence halls did change their perceptions of the university on all scales in a relatively negative direction during the period of the study. The t-scores in Table 16 indicate that the change in perception for freshmen female residents in coeducational residence halls was found to be significant at a .01 level for all scales under examination. The

Table 16. Change in Perception of the University Environment that Occurred in Freshmen Females Residing in Coeducational Residence Halls.

	Pre-Test Mean	Post-Test Mean	Change of Mean	Standard Deviation	t
Practicality	10.5056	8.5393	-1.9663	.2816	-6.9832**
Community	12.9663	10.6517	-2.3146	.4507	-5.1351**
Awareness	12.4382	11.3034	-1.1348	.4140	-2.7411**
Propriety	12.2921	10.3708	-1.9213	.4210	-4.5631**
Scholarship	8.3258	7.1236	-1.2022	.3595	-3.3438**
Campus Morale	13.6180	10.9101	-2.7079	.4469	-6.0587**
Faculty-Student Relationships	6.6292	5.7865	-0.8427	.2606	-3.2339**

t = 1.9600 at .05 level

\* Significant at the .05 level

t = 2.5758 at .01 level

\*\* Significant at the .01 level



second null hypothesis was, therefore, rejected.

Though no test of significance was made, it is interesting to note that a comparison of pre-test scores for female groups, as found in Tables 15 and 16, reveals that freshmen female residents in coeducational residence halls tended initially to perceive the environment lower on all scales when compared with the freshmen female residents in the single-sex residence halls.

Hypothesis III. No significant change in the perception of the university environment occurs in freshmen males who reside in single-sex residence halls as measured by the College and University Environment Scales.

A comparison of perceptual change of the university environment for freshmen male residents in single-sex residence halls is found in Table 17. As is indicated by the table, freshmen males residing in the single-sex residential living arrangements did change their perceptions relative to the university environment in a negative direction on all scales. The degree of that change was found to be significant at a level of .01 for all but one scale; the Faculty-Student Relationships scale. This particular scale, which defines an atmosphere in which professors are perceived to be scholarly, to set high standards, to be clear-thinking and flexible and at the same time warm, interested, and helpful toward students, was found to be significant at the

Table 17. Change in Perception of the University Environment that Occurred in Freshmen Males Residing in Single-Sex Residence Halls.

	Pre-Test Mean	Post-Test Mean	Change of Mean	Standard Deviation	t
Practicality	11.3684	8.9684	-2.4000	.2930	-8.1903**
Community	13.2737	11.3474	-1.9263	.3706	-5.1978**
Awareness	12.3158	10.2632	-2.0526	.3746	-5.4802**
Propriety	11.9474	9.8632	-2.0842	.4339	-4.8033**
Scholarship	8.7579	7.4526	-1.3053	.3129	-4.1717**
Campus Morale	13.3789	10.5368	-2.8421	.4594	-6.1865**
Faculty-Student Relationships	6.7263	6.2000	-0.5263	.2651	-1.9851*

t = 1.9600 at .05 level

\* Significant at the .05 level

t = 2.5758 at .01 level

\*\* Significant at the .01 level

.05 level. The third null hypothesis was rejected on all scales.

Hypothesis IV. No significant change in the perception of the university environment occurs in freshmen males who reside in coeducational residence halls as measured by the College and University Environment Scales.

As illustrated in Table 18, male subjects residing in coeducational residence halls changed their perceptions at the .01 level of significance on the Practicality, Community, Awareness, Propriety, and Campus Morale scales and at the .05 level of significance on the Scholarship scale. The change in perception relative to the Faculty and Student-Relationships scale was found to be non-significant. The fourth null hypothesis was rejected on all but one scale, Faculty-Student Relationships.

Hypothesis V. No significant differences exist in the amount of change in the perceived university environmental characteristics that occurs in freshmen females who reside in coeducational residence halls and the amount of change in the perceived university environmental characteristics that occurs in freshmen females who reside in single-sex residence halls as measured by the College and University Environment Scales.

Table 18. Change in Perception of the University Environment that Occurred in Freshmen Males Residing in Coeducational Residence Halls.

	Pre-Test Mean	Post-Test Mean	Change of Mean	Standard Deviation	t
Practicality	11.1042	8.6979	-2.4063	.2709	-8.8832**
Community	12.8542	11.8646	-0.9896	.3105	-3.1873**
Awareness	12.3750	10.9583	-1.4167	.3216	-4.4047**
Propriety	11.4375	9.3021	-2.1354	.4339	-4.9211**
Scholarship	8.8542	8.2500	-0.6042	.3058	-1.9753*
Campus Morale	13.6458	11.4167	-2.2291	.4089	-5.4513**
Faculty-Student Relationships	7.0938	6.5208	-0.5730	.3127	-1.8324

t = 1.9600 at .05 level

\* Significant at the .05 level

t = 2.5758 at .01 level

\*\* Significant at the .01 level

A comparison of females residing in the two different types of residence hall living arrangements is illustrated in Table 19 which describes the difference between means of the pre- and post-test for freshmen female residents of both the single-sex and coeducational residence halls, the differences between the change in mean, and the resultant t-score.

An examination of the scores relative to the differences between mean changes for the two groups under investigation in Hypothesis V reveals that only one scale, Awareness, was found to differ significantly. The degree of significance on the Awareness scale was found to be at the .01 level and indicates that the change in perception in freshmen female residents of single-sex residence halls is significantly different relative to an environment which is seen as providing a wide range of opportunities for personal, poetic and political meanings when compared with the change in perception of freshmen female residents of coeducation residence halls.

Based upon the data presented in Table 19, Hypothesis V was accepted for all scales but the Awareness scale for which it was rejected.

Though no tests of significance were applied, it is interesting to note that the differences between the change in mean of the two groups showed that freshmen female residents of single-sex residence halls changed their perceptions of the university environment more

Table 19. Comparison of the Change in Perception of the University Environment that Occurred in Freshmen Females Residing in Coeducational Residence Halls and the Change in Perception of the University Environment that Occurred in Freshmen Females Residing in Single-Sex Residence Halls.

	Female Coeducational	Female Single-Sex	Differences Between Mean Change	t
Practicality	-1.9662	-1.7866	-0.1796	-0.5379
Community	-2.3146	-2.6533	0.3387	0.6377
Awareness	-1.1348	-2.5600	1.4252	2.9164**
Propriety	-1.9213	-2.3600	0.4387	0.8116
Scholarship	-1.2022	-0.5666	-0.6356	-1.3119
Campus Morale	-2.7078	-3.2600	0.5522	1.0422
Faculty-Student Relationships	-0.8427	-0.9533	0.1106	0.3591

t = 1.9600 at .05 level

\* Significant at the .05 level

t = 2.5758 at .01 level

\*\* Significant at the .01 level

than freshmen female residents of coeducational residence halls on five of the seven scales. The remaining two scales, Practicality and Scholarship, were found to change more with freshmen female residents of coeducational residence halls than with freshmen female residents of the single-sex residence halls.

More specifically it should be noted that an examination of Tables 15 and 16 shows that female residents of single-sex residence halls initially perceived the university environment as reflecting a greater emphasis upon the scales of Awareness than did the freshmen female residents of coeducational residence halls as indicated by their pre-test mean on that scale. A comparison of the post-test means of that scale for the two groups indicates that they tend to agree more closely as to the perception of the university environment relative to opportunities for personal, poetic and political meanings. This suggests that, during the period of the study, freshmen female residents residing in single-sex residence halls began to perceive the university more compatibly with the general population.

A further comparison of the pre-test means of these two groups reveals that the freshmen female subjects who resided in the single-sex residence halls at the initiation of the study perceived the university environment higher on all scales under examination than did freshmen female subjects who were in residence at the coeducational residence halls.

It should also be noted that a comparison of the pre-test mean scores found in Tables 15, 16, 17, and 18 tends to suggest that the freshmen female residents in single-sex residence halls in this study initially viewed the university environment higher on the Community, Awareness, Propriety, and Campus Morale scales when compared with all other groups under investigation.

Hypothesis VI. No significant differences exist in the amount of change in the perceived university environmental characteristics that occurs in freshmen males who reside in coeducational residence halls and the amount of change in the perceived university environmental characteristics that occurs in freshmen males who reside in single-sex residence halls as measured by the College and University Environment Scales.

Table 20 presents the comparative change in means and corresponding t-scores for freshmen male residents of coeducational and single-sex residence halls. As is revealed in the table, no significant t-scores for any of the scales comparing changes relative to pre- and post-test means between these two groups were found to exist. However, the Community scale which described the university atmosphere as friendly, cohesive, loyal and congenial approached the .05 level of significance.



Table 20. Comparison of the Change in Perception of the University Environment that Occurred in Freshmen Males Residing in Coeducational Residence Halls and the Change in Perception of the University Environment that Occurred in Freshmen Males Residing in Single-Sex Residence Halls.

	Male Coeducational Residents	Male Single-Sex Residents	Differences Between Mean Change	t
Practicality	-2.4062	-2.4000	-0.0062	-0.0157
Community	-0.9896	-1.9263	0.9367	1.9393
Awareness	-1.4167	-2.0526	0.6359	1.2892
Propriety	-2.1354	-2.0842	-0.0512	-0.0834
Scholarship	-0.6042	-1.3053	0.7019	1.6026
Campus Morale	-2.2292	-2.8421	0.6129	0.9972
Faculty-Student Relationships	-0.5729	-0.5263	-0.0466	-0.1136

t = 1.9600 at .05 level

\* Significant at the .05 level

t = 2.5758 at .01 level

\*\* Significant at the .01 level

No significant differences in the amount of change in the perceived college environmental characteristics occurred between the two male groups under examination and null Hypothesis VI was accepted for all perceptual scales.

Though not treated statistically an examination of the pre- and post-test mean score represented in Tables 17 and 18 indicates, unlike the comparison of the two female groups, that freshmen male residents of coeducational and single-sex residence halls tended to be more in agreement on their perceptions of the university environment during the initial administration of the instrument. An examination of the post-test means also indicates that the two male groups were less in agreement in their perceptions of the university environment on three of the seven scales following the period of the study than they were at the beginning.

Hypotheses VII, VIII, and IX were tested concurrently by the employment of the analysis of variance and the analysis of covariance models. Each null hypothesis was tested at the .05 and .01 levels of significance.

Hypothesis VII. No significant differences exist in the amount of change in the perceived university environmental characteristics that occurs in freshmen students who reside in coeducational residence halls and the amount of change in the perceived university environmental characteristics

that occur in freshmen students who reside in single-sex residence halls as measured by the College and University Environment Scales.

As illustrated by Table 21, a comparison between the changes in perceptions of freshmen residents of coeducational and single-sex residence halls reveals that no significant difference exists on six of the seven environmental scales under study. The F value for the Awareness scale was found to be significant at the .01 level, indicating that the change in perceptions which occurred in freshmen residents of single-sex residence halls was greater when compared with the perceptual change which occurred in freshmen residents of coeducational residential units. Thus, freshmen single-sex residents changed their emphasis upon personal, poetic and political meanings to a significantly greater degree when compared with freshmen residents of coeducational residence halls. The seventh null hypothesis under investigation was accepted on all but the Awareness scale which was rejected.

Hypothesis VIII. No significant differences exist in the amount of change in the perceived university environmental characteristics that occurs in freshmen males who reside in residence halls and the amount of change in the perceived university environmental characteristics that occurs in

Table 21. Comparison of the Change in Perception of the University Environment that Occurred in Freshmen Residing in Coeducational Residence Halls and the Change in Perception of the University Environment that Occurred in Freshmen Residing in Single-Sex Residence Halls.

	Difference Between Means of Pre- and Post-Test Results		Differences Between Mean Change	F
	Coeducational Residents	Single-Sex Residents		
Practicality	-2.2946	-2.0245	-0.2701	.13
Community	-1.6270	-2.3714	0.7444	3.05
Awareness	-1.2811	-2.3632	1.0821	8.70**
Propriety	-2.0324	-2.2531	0.2207	.10 <sup>a</sup>
Scholarship	-0.8919	-0.8530	-0.0389	.32 <sup>a</sup>
Campus Morale	-2.4594	-3.0980	0.6386	3.28
Faculty-Student Relationships	-0.7027	-0.7877	0.0850	.02

F = 3.85 at the .05 level

F = 6.66 at the .01 level

<sup>a</sup> Analysis of covariance statistical model

\* Significant at the .05 level

\*\* Significant at the .01 level

freshmen females who reside in residence halls as measured by the College and University Environment Scales.

Table 22 illustrates comparisons of changes in means between male and female participants. The F values for the seven scales of the instrument indicate that when the change in perception of the university environment for male participants was compared to the change in perception of the university environment for female participants the degree of change between the sexes was found to be significant for the Practicality and Community scale at the .05 and .01 levels respectively. The F values for the comparisons relative to all other scales of the environment under investigation were found not to be significant in Hypothesis VIII.

As the findings in Table 22 show, male participants in this study changed their perception of the university environment to a significantly greater degree than did female participants on the Practicality scale. This indicates a perceived environment characterized by enterprise, organization, material benefits, and social activities and events. The female participants, on the other hand, changed to a significantly greater degree when compared with males in their perceptions of the university environment as being a friendly, cohesive and group-oriented campus. The change relative to the campus atmosphere as congenial and in which group welfare and group loyalty

Table 22. Comparison of the Change in Perception of the University Environment that Occurred in Freshmen Males Residing in Residence Halls and the Change in Perception of the University Environment that Occurred in Freshmen Females Residing in Residence Halls.

	Difference Between Means of Pre- and Post-Test Results		Differences Between Mean Change	F
	Male Residents	Female Residents		
Practicality	-2.4031	-1.8536	-0.5495	4.18*
Community	-1.4555	-2.5272	1.0717	7.19**
Awareness	-1.7329	-2.0293	0.2964	.10
Propriety	-2.1099	-2.1966	0.0867	.01 <sup>a</sup>
Scholarship	-0.9529	-0.8033	-0.1496	.01 <sup>a</sup>
Campus Morale	-2.5340	-3.0544	0.5194	.12
Faculty-Student Relationships	-0.5497	-0.9122	0.3625	1.91

F = 3.85 at the .05 level

F = 6.66 at the .01 level

<sup>a</sup> Analysis of covariance model

\* Significant at the .05 level

\*\* Significant at the .01 level

encompasses the university as a whole was in a negative direction for both sexes as it was in all cases.

Hypothesis VIII was rejected on scales which measured a university environment's Practicality and Community aspects and accepted on all other scales under investigation.

Hypothesis IX. No significant relationship exists between the sex of the students and the type of residence hall (co-educational or single-sex) in which they reside relative to the amount of change in perceived university environmental characteristics.

Table 23 indicates the findings pertinent to the interaction of sex and hall type relative to the perceptual environment scales under investigation.

As is shown, no significant interaction exists between sex and hall type except on one scale, Scholarship. A .05 level of significance was found to exist on this scale which describes an environment characterized by intellectuality and scholastic discipline. High scores on this scale reflect an environment which is perceived as being competitively high on academic achievement and a seriously intent in scholarship. The findings show that freshmen males residents in coeducational residence halls changed in their perception of environment relative to the Scholarship scale very little in comparison with

Table 23. Comparison of the Change in Perception of the University Environment Relative to the Interaction Between Sex and Hall Type.

	Difference Between Means of Pre- and Post-Test Results				F
	Coeducational Residents		Single-Sex Residents		
	Males	Females	Males	Females	
Practicality	-2.4063	-1.9663	-2.4000	-1.7867	.11
Community	-0.9858	-2.3146	-1.9263	-2.6533	.67
Awareness	-1.4167	-1.1348	-2.0526	-2.5600	1.27
Propriety	-2.1354	-1.9213	-2.0842	-2.3600	.31 <sup>a</sup>
Scholarship	-0.6042	-1.2022	-1.3053	-0.5667	5.32 <sup>a*</sup>
Campus Morale	-2.2291	-2.7079	-2.8421	-3.2600	.28
Faculty-Student Relationships	-0.5729	-0.8427	-0.5263	-0.9533	.10

F = 3.85 at the .05 level

F = 6.66 at the .01 level

<sup>a</sup> Analysis of covariance statistical model

\* Significant at the .05 level

\*\* Significant at the .01 level



freshmen females in coeducational residence halls whose perceptual change was double that of their male counterparts. On the other hand the reverse was found to exist for freshmen male and female residents of single-sex residence halls with freshmen male residents in this living arrangement experiencing greater change than the freshmen female residents living in the same residential situation.

Hypothesis IX was accepted on six of the seven environmental scales with the null hypothesis being rejected on the Scholarship scale at the .05 level of significance.

### Summary of Findings

The findings showed a significant negative change in perception on most scales relative to the university environment between the pre- and post-results for each of the four subgroups under investigation. Exceptions to this were noted on the Scholarship scale for freshmen females residing in single-sex residence halls and the Faculty-Student Relationships scale for freshmen male residents in coeducational residence halls. However, each of the changes in perceptions relative to those scales for those groups were approaching the .05 level of significance. Though no test of significances were applied, it was also observed that freshmen females residing in single-sex residence halls appeared initially to perceive the environment higher on all scales when compared with the freshmen females who resided in the

coeducational residence halls. Also, freshmen female residents in the single-sex residence halls, when compared with all other subgroups, appeared to initially have a higher perception of the university environment on four of the seven perceptual scales. Statistically untreated comparisons of freshmen males in single-sex and coeducational residence halls suggested that, unlike the freshmen females, they tended to agree on their perceptions of the university environment during the pre-administration of the instrument.

In some instances the findings pertaining to comparisons between the pairs of appropriate subgroups (female/single-sex vs. female/coeducational, male/single-sex vs. male/coeducational, male vs. female, and coeducational vs. single-sex) relative to the change in perceptions in the college environment were shown to be significant. Freshmen female residents in single-sex residence halls were found to have changed their perceptions of the university environment relative to the Awareness scale to a significantly greater degree than did freshmen female residents in coeducational residence halls. Relative to comparisons between the two freshmen male subgroupings, it was found that freshmen males residing in coeducational residence halls did not change their perception of the university environment to any significantly greater degree than did the freshmen males residing in single-sex residence halls.

The degree of change in perception of the university

environment between freshmen male and female participants relative to the Practicality and Community scales was found to be significant. Male participants were shown to have changed to a significantly greater degree on the Practicality scale and to a significantly lesser degree on the Community scale when compared with the female participants.

A comparison of freshmen residing in the two types of residence halls revealed that a significant difference in the change in the perception of the university environment exists in the Awareness scale. Freshmen residents in single-sex residence halls were found to have changed their perceptions of the university environment to a significantly greater degree on this scale which measures the degree of emphasis for, and concern about, personal, poetic and political meanings when compared with freshmen residents in coeducational residence halls.

Finally, a significant interaction between sex and hall type was found to exist on the measurement of the student's perception relative to the Scholarship scale. Freshmen male residents in coeducational residence halls changed their perception very little relative to the Scholarship scale in comparison with freshmen female residents in single-sex residence halls. For freshmen male and female residents in single-sex residence halls the reverse was found to exist.

Freshmen male residents in this living arrangement changed to a significantly greater degree on the Scholarship scale than did their female counterparts.

## CHAPTER V

## SUMMARY AND CONCLUSIONS

Summary

The interest in the relationship between college students and their environment in a period of rapid social and institutional change led to the initiation of this study. One of the major contexts for student development lies within the residential living units where student residents spend a large part of their time. The concept of initiated changes within the traditional living units raises many questions regarding the effect of various types of living experiences upon student development and change. The purpose of this study was to assess the interaction of students and their perceived environment in an effort to examine perceptual change and determine if such change varies between students residing in coeducational residence halls and students residing in single-sex residence halls. Specifically, the purpose of this study was to ascertain whether freshmen students who reside in coeducational residence halls differed in a significant degree in their change in perception of the university from freshmen students who reside in the traditional single-sex residence halls.

### Sources of Information

Three sources were utilized in gathering information relative to this study. The primary source of the data was the College and University Environment Scales. Additional data was gathered from files in the Residence Hall Programs Office, Oregon State University, and from a brief questionnaire compiled by the investigator to recheck that information and to determine additional demographic and personal data.

### Participants

Participants were drawn from first-term freshmen students residing in residence halls at Oregon State University. The subjects were limited to students who were citizens of the United States, who had never attended college before, and who were eighteen years of age or younger. A total of 430 students, 191 males and 239 females, participated throughout the study. Of that number ninety-six males and eighty-nine females were residents of coeducational residence halls during the period of the study; the remaining ninety-five males and one hundred fifty females resided in single-sex residence halls.

### Method and Procedure

During the week prior to the fall term 1970 at Oregon State University, the participants in this study were administered the College

and University Environment Scales and the supplementary data form. The CUES instrument was again administered six months later during the first and second weeks in March 1971, after two terms of in-residence living by the participants.

Following hand scoring procedures as outlined in the CUES Manual, tests of significance were computed using t-tests, analysis of variance, and analysis of covariance statistical models. Statistical comparisons were made between pre- and post-test for all groups. Differences in the change in perceptions of the university environment were statistically compared for freshmen between female coeducational residents and female single-sex residents, male coeducational residents and male single-sex residents, residents in coeducational residence halls and residents in single-sex residence halls, male residents and female residents, and the interaction of sex and residence hall upon that perception.

### Limitations

Certain limitations of the study must be considered. First, only freshmen students who are eighteen years of age or younger, who were citizens of the United States, and who resided in residence halls at Oregon State University from September 1970 through March 1971 were studied. Second, only subjects who were willing and able to participate throughout the period of the study were used. Third,

data gathered from the participants is accurate only insofar as the College and University Environment Scales is a valid instrument in measuring student's perceptions of the university environment and to the extent that they accurately report personal information used as covariates. Finally, there exists the possibility that some uncontrolled variable produced an effect upon certain subjects' responses.

### Discussion Relative to the Covariates

The Propriety and Scholarships scales were found to have been affected by certain covariates in this study. It was noted that the Propriety scale was affected by the subjects' dating status; and the Scholarship scale was shown to be affected by enrolled academic major, dating status, hometown community, and socio-economic level as indicated by father's occupation. These factors were controlled on the two scales by adjusting the means in the t-tests and utilizing the analysis of covariance statistical model.

As was pointed out in Chapter III, though a general profile of the participants relative to the covariables did appear to emerge, a closer examination revealed that certain subgroupings appeared to exist within the different residential living arrangements. Following the awareness that such subgroups existed, though they were not treated statistically in this study, a cursory investigation was undertaken in an effort to reveal some possible causes for the



disproportionate distributions.

It was found that, relative to hall placement, the greater percentage of freshmen female residents in single-sex and coeducational residence halls and freshmen male residents in coeducational residence halls were placed in the hall they had indicated as their first preference. However, unlike those subgroups the greater percentage of male residents in single-sex residence halls were found to have been randomly assigned to the hall in which they resided.

A further examination of the hall placement procedure revealed that generally fewer males make hall preferences than females. This factor suggests that preference for the coeducational residence hall by freshmen males (71.9 percent) was a true desire for that type of living situation, whereas, freshmen males who found themselves living in single-sex residence halls were initially indifferent to their hall assignments.

The further study of hall selection procedures and their distribution revealed that certain female residence halls tend to reflect regional and socio-economic differences (as will be noted later) and house more first-year sorority pledges. This suggests the freshmen females (perhaps with the assistance of their parents) tend to look more closely at the facilities and tend to make selections based upon the reputation of the hall and recommendations by friends.

An examination relative to the participant's socio-economic

position as determined by the occupation of the subject's father revealed that a substantial number (69.7 percent) of male and female subjects in the coeducational residence halls were found to come from families in which the father's occupation was represented in the lower five categories of Table 6. This compares with 58.0 percent of the single-sex hall residents falling in the same categories.

It may be possible to speculate from these figures that participants from the lower socio-economic levels, as represented by the table, prefer coeducational residence halls because they view them as affording a better opportunity to meet members of the opposite sex, a situation which may seem to them desirable for social interaction or upward mobility through possible marriage.

Another possibility may be the action of several factors upon hall selection in the instance of female residents. From the distribution of the covariates it appears that coeducational residence halls, by comparison with single-sex residence halls, tend to attract a larger percentage of freshmen females from lower socio-economic families and from towns with populations less than fifty thousand. By comparison, female residents in single-sex residence halls were well represented by students from families of a higher socio-economic level and from towns with populations in excess of fifty thousand. Those particular females in the single-sex residence halls may not be so concerned with the social aspects which the coeducational

residence hall may be seen as offering. Their social concerns may lie in the sorority, for it was noted earlier there tends to be a disproportionate number of first-year sorority pledges residing in single-sex residence halls as compared with sorority pledges in coeducational residence halls.

Freshmen male pledges are allowed to live in fraternities during their freshman year. Thus, freshmen males who may desire the social activities of the Greek system may have chosen such living situations, accounting for the relatively low representation (28.1 percent) of males from families of the higher socio-economic levels in coeducational residence halls.

Tables 7 and 8 show the distribution of the participant's hometown community. As was indicated in a comparison of the sexes, male residents tended to be similarly divided between the two population levels as represented in Table 8. However, this was not the case for female residents where it was shown that 58.4 percent of the freshmen female residents in coeducational residence halls were from communities with populations of fifty thousand or less. This compared with only 39.3 percent of the freshmen female residents in single-sex residence halls. (These figures tend to suggest a possible interaction of sex and hall type relative to this covariate.) The difference in this distribution may again be accounted for as a result of the freshmen female residents in the coeducational residence halls as

having perceived the coeducational living arrangement as providing the best environment for social interaction and contacts with potential spouses. Another possibility may be the action of other factors previously discussed. A combination of socio-economic level and size of hometown community are somewhat related to a decision in hall preference which resulted in such disproportionate distributions.

The covariate related to enrolled major revealed no unique distributions in either female subgroups. However, it was observed that a disproportionate number of males (37.9 percent) residing in single-sex residence halls were enrolled in the School of Science. This compared with only 26.0 percent of the male residents in coeducational residence halls being enrolled in the same school. This disproportion may relate to the participant's socio-economic background in which it was found that 43.2 percent of freshmen male residents in single-sex residence halls were from families whose fathers were classified at the professional level or above. On the other hand, only 28.1 percent of the freshmen male residents in coeducational residence halls fell in those socio-economic categories. It may well be that males majoring in science notably tend to come from families of a higher socio-economic level and also prefer single-sex residence halls in which the emphasis is perceived as being of a studious rather than of a social nature. This relationship should be investigated further.

For both sexes, in reference to the dating status factor, there appeared to be a slightly higher percentage of participants from the coeducational residence halls who either were pinned or "going steady." Though the difference on this factor between freshmen residents of the two types of residence halls was small, a possible explanation for its existence may be that certain subjects in the coeducational residence halls selected that particular type of hall because it afforded them the best opportunity to be close to the individual in whom they were emotionally interested.

The covariate concerning the marital status of parents also revealed some interesting distributions. As is noted in Table 11, there was for freshmen in the coeducational residence halls, by comparison with freshmen residents in single-sex residence halls, a higher percentage of both sexes from families in which the parents were divorced, separated, or in which one or more of the parents were deceased. Possibly those individuals residing in coeducational residence halls who were from homes in categories two through five feel a greater need for emotional companionship and stability. This need, they may reason, can be found better in the interaction which the coeducational living situation is seen as providing.

The final factor under consideration as a covariable in the study was that of religious attendance. As is shown in Table 13, no difference in this factor was observed between freshmen female residents

in the two types of residence halls. However, an examination of freshmen male residents revealed that 63.1 percent of those in single-sex residence halls attended church only on important religious holidays or not at all. This compared with 51.0 percent of the freshmen male residents in the coeducational residence halls in the same categories. This difference may possibly be accounted for by the number of science majors (see Table 9) and/or the larger number of participants from upper socio-economic families who were found to reside in single-sex residence halls. There is some reason to believe that these groups may have less interest in formal religion than others.

Summarizing the previous discussion it was observed that, by comparison, some interesting differences in distributions of the covariates used in this study were observed among the four subgroups.

Freshmen male residents in single-sex residence halls, when compared with freshmen male residents in coeducational residence halls, were shown as tending to have been randomly selected into the hall in which they resided (as opposed to self-selection which was the case for freshmen males in the coeducational residence halls), to come from families higher on the socio-economic level, to come from hometown communities with about the same population, to be represented by a higher enrollment in the School of Science, to have fewer members "going steady" or pinned, to have fewer members from families where the parents are divorced, separated, or in which

one or more of the parents is deceased, and to attend religious services less often.

Freshmen females residing in single-sex residence halls, when compared with freshmen females residing in coeducational residence halls, tend to have a greater number of self-selected subjects, to come from families of a higher socio-economic level, to come from larger hometown communities, to be equally represented in the schools of Humanities and Social Science, Home Economics, and Science, to have less representation in the categories of "going steady" and pinned, to have fewer parents who are divorced or separated, or in which one or more parent is deceased, and to attend religious services with about the same frequency.

It seems likely that a combination of certain covariate factors, mainly socio-economic level, academic major, and size of hometown community, plus some uncontrolled factors, were somehow related to a particular hall preference which resulted in some disproportionate distributions within the residence halls.

### Discussion Relative to the Hypotheses

The College and University Environment Scales as an effective instrument for measuring perceptual change that may occur due to a particular college experience has been shown in studies by Berdie (1967), Lindahl (1967), and others as reviewed in the chapter on

related literature. Utilizing the same instrument, this study found that for certain groups in certain types of living arrangements significant changes exist in student perceptions of the university environment on certain scales.

Lindahl (1967), Gelso and Sims (1968), and Baker (1966a) have studied the perceptions of the university environment and made comparisons between groups living in different residential situations. Results of these studies have tended to support the premise that individuals residing in various types of living arrangements do tend to perceive the university environment with a significant difference.

#### Change in Perception of the University Environment

Commensurate with the findings of Pate (1968), Berdie (1968), Shaw (1967), Pervin (1966), and Edson (1965), this study showed that entering freshmen students did change their perceptions of the university environment during the first few months of college attendance. Most groups in this study significantly changed in a negative direction (decreasing emphasis). However, two exceptions were noted. Freshmen male residents in coeducational residence halls, though approaching a significant level, did not significantly alter their perception of the university environment on the Faculty-Student Relationship scale which defined an atmosphere related to the degree which professors set high standards and are perceived to be scholarly,



clear-thinking, and flexible. Also, the change in perception relative to the Scholarship scale was found not to be significant for freshmen females who were residents in single-sex residence halls.

An examination of the pre- and post-test data revealed that the initial perceptions of the university environment, as held by female residents in single-sex residence halls, were unusually high on four of the seven scales under investigation when compared with the other subgroups. This unusually high expectation on the part of these women suggests that this group was atypical and that some factors which were not controlled by the seven covariables may have been affecting their responses. Some of these possible factors may have been associated with sorority pledging or individual self-concepts. The fact that this group had unusually high initial perceptions may account for several of the scales being significant in comparisons of subgroups relative to perceptual change.

The findings relative to the change in perception of the university environment that occurred tend to support a generally held premise that freshmen perceive the university environment rather idealistically and have high expectations prior to their college attendance. An examination of the post-results of this study shows that although there was a change in direction toward an apparently more realistic perception, there was not a close general consensus on that perception as to what the university environment is like. This may be due

to the possibility that not enough time had elapsed for a general consensus to have been solidified or that there were certain experiences, among them their diverse living situations, which were acting upon the participants and resulted in varied perceptions.

### Comparisons Between Female Groups

As reported in the findings of the comparison of freshmen females who resided in the two types of residence halls, freshmen female residents in the single-sex residence halls changed their perception of the university environment to a significantly greater degree than did freshmen female residents in coeducational residence halls on the scale which reflected a concern about, and emphasis upon personal, poetic, and political meanings.

A possible explanation for this difference on the Awareness scale between the two female groups may be that female single-sex residence halls do deemphasize personal, poetic and political meanings and tend to discourage questioning, dissent, and tolerance of nonconformity and personal expressiveness.

Another possible explanation for this difference may be found in the comparatively high perception of the university environment which was initially held by freshmen females residing in single-sex residence halls. The fact that females in this particular group tended to place a greater emphasis on most scales than the other groups may

be related to the general background of these subjects as revealed by the covariates. Though it was found not to be significant by the analysis of covariance, hometown community especially stands out. As was stated previously, freshmen female residents in single-sex residence halls, by comparison with all other subgroups, were disproportionately represented by a high number (60.7 percent) of participants coming from hometown communities with populations in excess of fifty thousand. This was the only covariable factor within any of the subgroups which appeared to be mutually related which may suggest that freshmen females coming from hometown communities with populations in excess of fifty thousand may tend to have higher perceived expectations relative to the university environment. This may be the result of some unknown conditions within the hometown communities or some directly related factors.

#### Comparisons Between Male Groups

The findings indicated that no significant differences existed relative to the perceived university environment between freshmen male residents in single-sex residence halls and freshmen male residents in coeducational residence halls. This suggests that there is no definitive influence upon the perception of the university environment as held by males as a result of coeducational or single-sex residence hall living situations. As noted previously, unlike the female

participants, freshmen males in this study tended to have similar perceptions of the university environment during the pre-testing sessions of the instrument. This suggests that males tend to have a greater similarity of the perception of the university environment prior to college attendance than do females who enter the two different types of halls.

### Comparison Between the Two Types of Halls

A comparison between freshmen residents in single-sex residence halls and freshmen residents in coeducational residence halls relative to changes in the perceived university environment indicated that significant differences do exist on the scale of Awareness. It was shown that freshmen residents in single-sex residence halls changed their perception greater than freshmen residents in coeducational residence halls relative to perceiving the environment as encouraging questioning and dissent and being more tolerant of non-conformity and personal expressiveness. In essence, the freshmen residents in the coeducational living situation maintained a higher perception of the university environment relative to emphasises upon self-understanding, artistic appreciation, and the welfare of mankind than did the freshmen residents in the single-sex residence halls. This suggests that the interaction that occurs in the coeducational residence halls, as perceived by its freshmen residents, tends to

reflect and encourage a concern and emphasis upon the awareness of self, of society and of aesthetic stimuli. An examination of combined pre-test scores by hall type revealed that the participants tended to somewhat agree on this scale at the initiation of the study. A closer examination showed that the freshmen female subjects who resided in single-sex residence halls initially perceived the university environment higher than the other groups on this scale; as they did on four of the seven scales under investigation. This suggests that hall differences relative to the perceptions of factors concerning the Awareness scale may be questionable as other factors not controlled by the covariables may be acting upon those female subjects.

#### Comparison Between the Sex of the Participants

In comparisons between the sexes relative to the changes in the perceived university environment, two scales, Practicality and Community, were found to be significant. The findings showed that freshmen males residing in residence halls changed their perceptions to a greater degree than did freshmen females residing in residence halls relative to perceiving the university environment as being characterized by enterprise, organization, material benefits, and social activities. This indicates that, by comparison, freshmen females in the study tended to continue their view of the institution as being responsive to entrepreneurial activities and emphasizing good fun

and school spirit. It should be noted that the difference in the degree of change between the sexes on the Practicality scale may be accounted for by the fact that male participants at the initiation of this study perceived the university environment higher on this scale than did the female participants; whereas, both sexes were in general agreement in their perceptions on this scale at the time of the post-test. Therefore, it may be inferred that males tend to initially perceive institutions of higher education as being organized and structured in such a way as to promote personal benefit and prestige through participation in the system.

In comparing the perceptions of the university environment of the sexes on the Community scale, it was found that freshmen female residents in residence halls changed in a significantly greater degree than did freshmen males residing in residence halls. The difference in perception that occurred suggests that female residents, as a result of experiences while residing in residence halls and attendance in college, tend to view the university environment less on factors concerning feelings of group welfare and group loyalty than do male residents. However, this may be due only to the comparatively high perception of the university environment which freshmen females in single-sex residence halls tended to have initially.

### Interaction of Sex and Hall Type

The findings related to the interaction of sex and hall type relative to perceptual change in the university environment revealed that one scale, Scholarship, was found to be significant. The data showed that on that scale freshmen females residing in coeducational residence halls and freshmen males residing in single-sex residence halls changed their perceptions significantly greater than did freshmen males residing in coeducational residence halls and freshmen females residing in single-sex residence halls respectively.

A possible cause of such interaction relative to perceptions of the university environment as measured by the Scholarship scale which is related to an emphasis placed on rigorous and vigorous pursuit of scientific and philosophical knowledge and theories in which there is an interest in ideas and intellectual discipline, may be the influence of males upon females, males upon males, females upon males, and females upon females within the residence halls. That is, the influence of males upon females in the coeducational residence hall results in freshmen females changing their perceptions of the university environment to a significantly greater degree on those factors in which it is characterized as being competitively high on academic achievement and emphasizing a serious interest in scholarship. Freshmen male residents in the single-sex residence halls

interacted and influenced one another's perceptions similarly.

Another possible explanation of the significant interaction on the Scholarship scale may be the reversal of the above forestated explanation. Freshmen females residing in coeducational residence halls influenced their male co-residents in such a way that their perception of the university environment as a scholastic and intellectual community decreased less comparatively. Similarly, within the single-sex residence halls for females the same influences were active.

It is assumed that in reference to the interaction of sex and hall type relative to the perception of the Scholastic scale that both of the forestated explanations were in effect upon the residents in their respective halls.

### Conclusions

From the findings of this study the following salient conclusions and implications were drawn:

1. Freshmen students residing in residence halls change their perceptions of the university environment significantly on most scales and in a negative direction during their first six months of attendance at college. This suggests a common and pervasive influence may be a dominant factor in student perceptual change of the university environment.



2. Freshmen female residents in single-sex residence halls experience a significantly greater degree of change in their perception of the university environment relative to the Awareness scale which reflects an emphasis on personal, poetic and political meanings than do freshmen female residents in coeducational residence halls.
3. Freshmen male residents in single-sex residence halls do not differ significantly in the degree of change in their perceptions of the university environment than do freshmen male residents in coeducational residence halls.
4. Freshmen residents in single-sex residence halls change their perception of the university environment to a significantly greater degree on the Awareness scale which measures the degree of emphasis for, and concern about personal, poetic and political meanings than do freshmen residents in coeducational residence halls.
5. Freshmen females residing in residence halls change their perception of the university environment to a significantly greater degree on the Community scale which describes a friendly, cohesive, group-oriented campus than do freshmen males residing in residence halls.
6. Freshmen males living in residence halls change their perception of the university environment to a significantly

greater degree than do freshmen female residents on the Practicality scale. This scale measures the environment relative to its organization, enterprise, material benefits and social activities.

7. A significant relationship exists between sex and type of residence hall on the Scholarship scale which measures the perception of the university environment relative to its intellectuality and scholastic discipline. Freshmen females residing in coeducational residence halls and freshmen males residing in single-sex residence halls change their perceptions significantly greater on the Scholarship scale than do freshmen males residing in coeducational residence halls and freshmen females residing in single-sex residence halls.

### Recommendations

On the basis of the findings and results of this study, several recommendations have been generated. The study should be replicated on several campuses in order to determine if the findings are applicable or the results of an unusual set of circumstances. These studies should, if possible, be conducted over a greater period of time and include additional covariables in an effort to control for the influence upon student perceptions that such factors may have.

Consideration needs to be given to a further examination of atypical subgroups or subcultural patterns which may exist in the residence halls as well as in other living units on and off campus. It is also necessary to determine if such subcultural patterns that may exist in the halls also exist in the general student populace. This further suggests a need to study subgroups and their relationship to initial high perceptions of the university and the adjustments which they experience.

Studies need to be undertaken to determine relationships between the degree of perceptual change experienced and such factors as academic attrition, non-academic attrition, behavioral changes, attitude and value changes, and changes relative to interpersonal relationships.

Although some information was obtained regarding the relationship between living arrangements and student perceptual change, it is recommended that a more detailed analysis be conducted in order to ascertain cause and effect relationships. Specifically what experiences within the residence halls and in the university environment as a whole relate to the rapid and sometimes drastic perceptual change which the entering student experiences.

Since it was noted that unusual subgroupings tended to exist in the various types of residence halls, and that differences between sex and type of residence hall existed relative to perceptual change, it is

further suggested that we re-evaluate residence hall objectives and enact hall placement procedures in accordance with those objectives.

Investigations should be conducted in an effort to determine what demographic and/or personality characteristics are related to hall selections which result in disproportionate subgroupings. Also, studies should be developed to determine what factors, relative to those subgroupings, result in the diverse perceptions which were found to exist (i. e. the initially higher perceptions of the university environment which were held by freshmen females residing in single-sex residence halls).

Because the findings of this study suggest that entering freshmen come to the university with fairly unrealistic perceptions of the university environment, it is recommended that further investigation be made of factors which cause this overly idealistic perception with a view to modifying the impact of disenchantment and disappointment experienced by students.

Finally, it is recommended that instruments be developed that can accurately assess interpersonal skills, interpersonal perceptions, and interpersonal behaviors. It is felt that through such sophisticated measurements better assessments could be made relative to the impact of the interaction of various peer groupings upon each other and the resultant developmental characteristics that occur.

## BIBLIOGRAPHY

1. Adams, Donald V. 1967. Living-learning center: an evaluation of the Michigan State experience. *Journal of the National Association of Student Personnel Administrators* 5:116-119.
2. Allen, James G., et al. 1964. Coeducational residence halls. *The Journal of College Student Personnel* 6:82-87.
3. Angell, Robert C. 1928. *The campus: a study of contemporary undergraduate life in the American university.* New York, Appleton, 239 p.
4. Arbuckle, D. S. 1957. Study of residence hall freshmen women. *Journal of Higher Education* 28:384-387.
5. Baker, Sheldon R. 1966a. The relationship between student residence and perception of environmental press. *The Journal of College Student Personnel* 7:222-224.
6. \_\_\_\_\_. 1966b. A comparative study of perceptions of a university environment between honor and nonhonor freshmen groups. *Educational and Psychological Measurement* 26:973-976.
7. Barton, Allen H. 1959. Studying the effects of a college education: a methodological examination of changing values in college. New Haven, Conn., Edward W. Hazen Foundation, 96 p.
8. Berdie, Ralph F. 1966. College expectations, experiences, and perceptions. *The Journal of College Student Personnel* 7:336-344.
9. \_\_\_\_\_. 1967. A university is a many-faceted thing. *The Personnel and Guidance Journal* 45:768-775.
10. Birney, Robert C. and Marc J. Taylor. 1959. Scholastic behavior and orientation to college. *Journal of Educational Psychology* 50:266-274.
11. Bodelson, Gerald R. Environmental perceptions of freshmen college students as related to selected ability and achievement levels. Doctoral dissertation. Bloomington, Indiana University, 1967. 216 numb. leaves. (Microfilm)

12. Boyer, E. L. and W. B. Michael. 1968. Faculty and student assessments of the environments of several small religiously oriented colleges. *California Journal of Educational Research* 19:59-66.
13. Bragg, Emma W. 1967. A study of the college campus as a learning environment. Paper read at the Southeastern Psychological Association, Atlanta.
14. Brookover, Wilbur B., et al. 1965. The college student. New York, Center for Applied Research in Education, 118 p.
15. Brooks, Bonnie Sue. A longitudinal study of perceptual change among students. Doctoral dissertation. Bloomington, Indiana University, 1968. 152 numb. leaves. (Microfilm)
16. Brown, Donald R. 1960. Non-intellective qualities and the perception of the ideal student by college faculty. *The Journal of Educational Sociology* 33:269-278.
17. \_\_\_\_\_. 1962. Value change in college women. *Journal of the National Association of Women Deans and Counselors* 25:148-155.
18. Brown, Robert D. Manipulation of the environmental press in a college residence hall. Doctoral dissertation. Iowa City, The University of Iowa, 1966. 265 numb. leaves. (Microfilm)
19. Brubacker, John S. and Willis Rudy. 1958. Higher education in transition. New York, Harper, 406 p.
20. Bushnell, John H. Student culture at Vassar. In: *The American College* ed. by Nevitt Sanford. New York, John Wiley and Sons, Inc., 1962. p. 489-514.
21. Califf, Stanley N. Perception of college environment by achieving and non-achieving freshmen. Doctoral dissertation. Clairmont, Clairmont Graduate School at University Center, 1967. 126 numb. leaves. (Microfilm)
22. Campbell, Marla and Rosanda Richards. 1964. The residence halls as an integral part of the educational process: an approach. *Journal of the National Association of Women Deans and Counselors* 28:37-39.

23. Centra, John A. 1966. Major field as a variable in student perceptions of a large complex university. Paper read at American Educational Research Association, Chicago.
24. \_\_\_\_\_. 1968. Student perceptions of residence hall environments: living learning vs. conventional units. *The Journal of College Student Personnel* 9:266-272.
25. Chickering, Arthur W. 1967. College residence and student development. *Educational Record* 48:179-186.
26. Coker, David L. Diversity of scholastic aptitude, non-intellective attributes, and environmental characteristics among students and campuses. Doctoral dissertation. Bloomington, Indiana University, 1965. 251 numb. leaves. (Microfilm)
27. Conner, John D. The relationship between college environmental press and freshmen attrition at Southern Methodist University. Doctoral dissertation. Denton, North Texas State University, 1968. 115 numb. leaves. (Microfilm)
28. Conover, Barbara. 1957. A residence survey--an evaluation of the Syracuse University freshmen living center in relation to attainment of goals and objectives. Unpublished paper, Syracuse University. 22 p. (Microfiche)
29. Cowley, W. H. 1934. The history of student residential housing. *School and Society* 40:705-712.
30. Craig, Hardin. 1960. Woodrow Wilson at Princeton. Norman, University of Oklahoma Press, 175 p.
31. Davie, James S. and Paul A. Hare. 1956. Button-down collar culture: A study of undergraduate life at a men's college. *Human Organization* 14:13-20.
32. Dressel, Paul L. and Irving J. Lehmann. 1965. Impact of higher education on student attitudes, values and critical thinking abilities. *Educational Record* 46:248-258.
33. Duling, John A. 1969. Differences in perceptions of environmental press by selected student subgroups. *Journal of the National Association of Women Deans and Counselors* 32:130-132.

34. Eddy, Edward D., Jr. 1959. The college influence on student character. Washington, American Council of Education, 185 p.
35. Edson, Kenneth Charles. Factors related to changes in environmental expectations of college freshmen. Doctoral dissertation. Minneapolis, University of Minnesota, 1965. 198 numb. leaves. (Microfilm)
36. Fairchild, Ellen. 1963. Evaluating residence halls through trifocals. The Journal of College Student Personnel 4:171-176.
37. Freedman, Mervin B. 1956. The passage through college. Journal of Social Issues 12:13-28.
38. \_\_\_\_\_. 1967. Personality growth in the college years. College Board Review 56:25-32.
39. Garrett, Henry E. 1953. Statistics in psychology and education. New York, Longmans, Green, 422 p.
40. Gelso, C. J. and D. M. Sims. 1968. Perceptions of a junior college environment. The Journal of College Student Personnel 9:40-43.
41. Goldsen, Rose K., et al. 1960. What college students think. Princeton, D. Van Nostrand Co., 240 p.
42. Gottlieb, David and Benjamin Hodgkins. 1963. College student subcultures: their structure and characteristics in relation to student attitude change. The School Review 71:266-289.
43. Greene, James E., Sr. 1966. Student perceptions of the college environment of a floating university. Paper read at Southeastern Psychological Association, New Orleans.
44. Greenleaf, Elizabeth. 1962. Coeducational residence halls: an evaluation. Journal of the National Association of Women Deans and Counselors 29:65-69.
45. \_\_\_\_\_. 1965. Coeducational residence halls. Journal of the National Association of Women Deans and Counselors 35:106-111.
46. Harvard University. 1906. Annual report of the President and Treasurer, 1905-06. Cambridge, Harvard University Press, 78 p.



47. Heist, Paul A. 1959. Implications from recent research on college students. *Journal of the National Association of Women Deans and Counselors* 3:116-124.
48. \_\_\_\_\_. 1960. Diversity in college student characteristics. *Journal of Educational Sociology* 33:279-291.
49. Heskett, Sharon L. and W. Bruce Walsh. 1969. Differential perceptions of college environment. *The Journal of College Student Personnel* 10:182-184.
50. Hollingshead, August B. 1957. *The two factor index of social position*. Connecticut, Yale Press, 402 p.
51. Hopper, Gordon Clyde. Faculty freshmen and upperclassmen perceptions of the environment at Northern Illinois University. Doctoral dissertation. DeKalb, Northern Illinois University, 1966. 151 numb. leaves. (Microfilm)
52. Ivey, Allen E., C. Dean Miller and Arnold D. Goldstein. 1967. Differential perceptions of college environment: student personnel staff and students. *The Personnel and Guidance Journal* 46:17-21.
53. Jacob, Phillip E. 1957. *Changing values in college: an exploratory study of the impact of college teaching*. New York, Harper & Row Publishers, 174 p.
54. Jansen, David and Bob Winborn. 1968. Perception of a University environment by social-political action leaders. *The Personnel and Guidance Journal* 47:218-222.
55. Johnson, R. W. and D. J. Kurpius. 1967. A cross-sectional and longitudinal study of students' perceptions of their college environment. *The Journal of College Student Personnel* 8:199-203.
56. Lauterbach, C. G. and D. P. Vielhaber. 1966. Need-press and expectation-press indices as predictors of college achievement. *Educational and Psychological Measurement* 26:965-972.
57. Lawson, Edwin D. and Walter E. Bock. 1960. Correlations of indexes of families' socio-economic status. *Social Forces* 39:149-152.

58. Lehmann, Irwin J. and Paul L. Dressel. Critical thinking, attitudes, and values in higher education. East Lansing, 1962. 232 numb. leaves. (Department of Health, Education, and Welfare, Cooperative Research Project No. 590)
59. Lehmann, Irwin J. and Waker Hill. 1969. Freshmen attitudes and values. *School and Society* 97:199.
60. Lehmann, Irvin J. and Isabelle K. Payne. 1963. Exploration of attitudes and value changes of college freshmen. *The Personnel and Guidance Journal* 41:403-408.
61. Lehmann, Irwin J., Birendra K. Sinha, and Rodney T. Hartnett. 1966. Changes in attitudes and values associated with college attendance. *Journal of Educational Psychology* 57:89-98.
62. LeVine, Robert A. American college experience as a socialization process. In: *College Peer Groups* ed. by Theodore M. Newcomb and Everett K. Wilson. Chicago, Aldine Publishing Co., 1966. p. 107-132.
63. Lindahl, Charles. 1967. Impact of living arrangements on student environmental perceptions. *The Journal of College Student Personnel* 8:10-15.
64. MacMillian, Ken D. The effective college home. In: *The Effective College*, ed. by Robert L. Kelly. New York, Association of American Colleges, 1928. 22-36 p.
65. Mayhew, Lewis B. And in attitudes. In: *Evaluation in the Basic College*, ed. by Paul L. Dressel. New York, Harper & Row, Publishers, 1958. 248 p.
66. McConnell, T. R. and Paul Heist. The diverse college student population. In: *The American College: A Psychological and Social Interpretation of the Higher Learning*, ed. by Nevitt Sanford. New York, John Wiley and Sons, 1962. p. 225-252.
67. McGarth, Earl J. 1962. Observations on the meaning of academic excellence. *Liberal Education* 48:218-221.
68. McKown, Harry C. 1937. Extra-curricular activities. New York, Macmillan, 734 p.

69. McPeck, Beth L. 1967. The university as perceived by its subcultures: an experimental study. *Journal of the National Association of Women Deans and Counselors* 30:129-132.
70. Murphy, J. M. and J. P. Vail. 1965. Motivational patterns of college freshmen. *Catholic Educational Review* 63:1-6.
71. Newcomb, Theodore M. 1943. *Personality and social change*. New York, Dryden Press, 225 p.
72. \_\_\_\_\_. 1961. *The acquaintance process*. New York, Holt, Rinehart and Winston, 303 p.
73. \_\_\_\_\_. Student peer-group influence. In: *The American College*, ed. by Nevitt Sanford. New York, Wiley, 1962. p. 469-488.
74. \_\_\_\_\_. The general nature of peer group influence. In: *College Peer Groups*, ed. by Theodore M. Newcomb and Everett K. Wilson. Chicago, Aldine Publication Co., 1966. p. 2-16.
75. Newcomb, Theodore M., Ralph H. Turner, and Phillip E. Converse. 1965. *Social psychology: the study of human interaction*. New York, Holt, Rinehart and Winston, 591 p.
76. Pace, Robert C. 1969. *College and university environment scales*. 2nd ed. Princeton, Educational Testing Service, 55 p.
77. Pate, Robert H., Jr. A study of entering university students: environment expected and later perceived. Doctoral dissertation. Chapel Hill, University of North Carolina at Chapel Hill, 1968. 110 numb. leaves. (Microfilm)
78. Pepinsky, Harold B. 1958. Research on the student in his educational setting. *National Society for Study in Education*, 231-248 p.
79. Pervin, Lawrence A. 1966. Reality and non-reality in student expectations of college. *The Journal of Psychology* 64:41-48.
80. Plant, Walter T. 1958a. Changes in ethnocentrism associated with a two-year college experience. *Journal of Genetic Psychology* 92:189-197.

81. Plant, Walter T. 1958b. Changes in ethnocentrism associated with a four-year college education. *Journal of Educational Psychology* 49:162-165.
82. \_\_\_\_\_. Personality changes associated with a college education. San Jose, 1962. 132 numb. leaves. (Department of Health, Education, and Welfare, Office of Education. Cooperative Research Project No. 348)
83. Port Huron statement. 1962. Paper read at the Students for Democratic Society Convention, Port Huron, Michigan.
84. Powell, John C., et al. 1969. The personnel assistant in college residence halls. Houghton Mifflin Co. Boston, Mass., 132 p.
85. Olson, L. A. 1964. Student reactions to living-learning residence halls. *The Journal of College Student Personnel* 6:29-31.
86. Rait, Robert Sangster. 1912. Life in the medieval university. Cambridge, The University Press, 164 p.
87. Raushenbush, Esther. Changing values and attitudes on the campus--a look to the future. In: *Long Range Planning for Education*, ed. by Arthur E. Traxler. Washington, D. C., 1957. p. 123-152.
88. Reeves, Teddy G. The relationship between accuracy of perception of environment and achievement, attrition, satisfaction with the environment, and sex of first-semester freshmen. Doctoral dissertation. Commerce, East Texas State University, 1968. 152 numb. leaves. (Microfilm)
89. Riesman, David and Christopher Jencks. The ability of the American college. In: *The American College*, ed. by Nevitt Sanford. New York, John Wiley and Sons, Inc., 1962. p. 74-195.
90. Riker, Harold C. 1961. College students live here; a study of college housing. New York, Educational Facilities Laboratories, 152 p.

91. Riker, Harold C. 1965. College housing as learning centers. Student Personnel Series No. 3. Washington, D. C., American Personnel and Guidance Association, 56 p.
92. Rogers, Mary Elenor Piper. Perception of the college environment as a factor in attitude change during the freshman year. Doctoral dissertation. Bloomington, Indiana University, 1968. 127 numb. leaves. (Microfilm)
93. Rowe, Frederick B. 1964. Stability of a college environment. The Journal of College Student Personnel 5:242-249.
94. Sanderson, Donald R. A comparison of selected characteristics of the university as perceived by male and female elected student residence hall leaders. Doctoral dissertation. Corvallis, Oregon State University, 1971. 81 numb. leaves.
95. Schoen, W. T. 1966. The campus climate: student perception and faculty idealism. The Journal of Educational Research 60:3-7.
96. Scoresby, James. A study to determine the relationship of anticipated and actual perceptions of college environment to attrition and persistence at Brigham Young University. Master's thesis. Salt Lake City, Brigham Young University, 1962. 127 numb. leaves. (Microfilm)
97. Shaw, Kenneth A. 1966. Accuracy and inaccuracy of expectation of Purdue University's engineering environment as it relates to achievement, attrition, change of degree objective and selected background factors. Doctoral dissertation. Lafayette, Purdue University, 1966. 182 numb. leaves. (Microfilm)
98. Shay, John E. 1964. The evaluation of the campus residence hall, part II: the resurgence. Journal of the National Association of Women Deans and Counselors 28:25-33.
99. \_\_\_\_\_. 1966. Residence halls in the age of the university: their development at Harvard and Michigan. Doctoral dissertation. Ann Arbor, University of Michigan, 1966. 250 numb. leaves. (Microfilm)

100. Shemky, Robert W. A study of the environment at Saint Joseph's College as perceived by administration, faculty and students and as anticipated by entering freshmen. Doctoral dissertation. Bloomington, Indiana University, 1966. 150 numb. leaves. (Microfilm)
101. Siegel, Alberta E. and Sidney Siegel. 1957. Reference groups, membership groups and attitude groups. *Journal of Abnormal Psychology* 55:360-364.
102. Snedecor, George and William Cochran. 1967. *Statistical methods*. Iowa State University Press. 539 p.
103. Standing, G. Robert and Clyde A. Parker. 1964. The college characteristics index as a measure of entering students pre-conceptions of college life. *The Journal of College Student Personnel* 6:2-6.
104. Stern, George G. 1966. The freshmen myth. *National Education Association Journal* 55:41-43.
105. Sutherland, R. L., et al. (eds.) *Personality factors on the college campus*. Austin, University of Texas, 1962. p. 29-42.
106. *The invisible thread: a universities reputation*. Carnegie Corporation of New York *Quarterly* 14:1-4. January 1966.
107. They're building more dorms and enjoying them soon. *American School and University* 41:34-6. September 1968.
108. Thibaut, J. W. and H. H. Kelley. 1959. *The social psychology of groups*. New York, Wiley, 313 p.
109. Thistlewaite, Donald L. 1959. College press and student achievement. *Journal of Educational Psychology* 50:183-191.
110. \_\_\_\_\_. 1960. College press and changes in study plans of talented students. *Journal of Educational Psychology* 51:222-234.
111. Thorndike, Lynn. 1944. *University records and life in the middle ages*. New York, Columbia University Press, 448 p.
112. Underwood, Arthur G. A longitudinal study of selected changes in the perception of the university environment as held by students who participate in two forms of university governance. Doctoral dissertation. Corvallis, Oregon State University, 1971. 81 numb. leaves.

113. University of Chicago. 1903. The President's report: July 1892-July 1902. Chicago; The University of Chicago Press, 31 p.
114. Walsh, Bruce and Richard McKinnon. 1969. Impact of an experimental program on student environmental perceptions. The Journal of College Student Personnel 10:310-316.
115. Webster, Harold. 1958. Changing in attitudes during college. Journal of Educational Psychology 49:109-117.
116. Webster, Harold, Mervin B. Freedman and Paul Heist. Personality changes in college students. In: The American College, ed. by Nevitt Sanford. New York, John Wiley and Sons, Inc., 1962. p. 805-847.
117. Weigand, George. 1957. Adaptiveness and the role of parents in academic success. The Personnel and Guidance Journal 35:518-522.
118. Whitaker, David. 1969. Student subcultures reviewed and revisited. The Journal of the Association of Deans and Administrators of Student Affairs 7(1):23-34.
119. Williamson, E. G. 1958. Student residences: shelter or education? The Personnel and Guidance Journal 36:392-398.
120. Wilson, Everett K.<sup>1966</sup> The entering student: attributes and agents of change. In: College Peer Groups, ed. by Theodore M. Newcomb and Everett K. Wilson. Chicago, Adline Publishing Co., 1966. p. 71-106.

## APPENDICES



APPENDIX A      Put Answers on Answer  
Sheet Form X-25

LOCAL OPTION QUESTION

(Mark only one answer per question)

1. Was the residence hall you are presently residing in your:
  1. First choice
  2. Second choice
  3. Third choice
  4. I made no choice of residence hall
2. Is the residence hall you presently reside in:
  1. Coeducational
  2. Sex-segregated
3. Parents' status:
  1. Living together
  2. Divorced, separated
  3. Father deceased
  4. Mother deceased
  5. Both parents deceased
4. Are you:
  1. Single and "unattached"
  2. Going steady
  3. Pinned (or engaged)
5. How often have you attended religious services in the past year or so?
  1. Not at all
  2. Only on important religious holidays
  3. About once a month
  4. About twice a month
  5. About once a week
  6. More than once a week
6. Which of the following best describes the community which you think of as your home town during your high school days?
  1. Suburb in a metropolitan area of more than 2, 000, 000 population
  2. Suburb in a metropolitan area of 500, 000 to 2, 000, 000.
  3. Suburb in a metropolitan area of 100, 000 to 500, 000
  4. In a city of 50, 000 to 500, 000
  5. In a city of 50, 000 to 500, 000
  6. City or town of 10, 000 to 50, 000
  7. Town of less than 10, 000
  8. Farm, ranch or other open country
7. Which of the following categories comes closest to your father's occupation? If your father is retired, deceased, or unemployed, indicate his former or customary occupation.
  1. Higher executive, major professional with college degrees (doctor, lawyer, engineer, forester), or owner of large concerns.
  2. Other professional (teacher, accountant, civil service, pharmacist, optometrist), or owner of medium-sized business or manager of a large concerns.
  3. Semi-professional (photographer, mortician, appraiser, surveyor, reporter), small business owner, manager or agent.
  4. Clerk, technician, farmer or farm owner.
  5. Skilled manual employee, foreman or farm laborer.
  6. Machine operator or semi-skilled employee.
  7. Unskilled employee.

## APPENDIX B

September 21, 1970

Dear Freshmen:

Under the auspices of the Office of the Dean of Students a research study is presently being carried out at Oregon State University in an attempt to determine some of the perceptions of the university environment which are held by freshmen students residing in residence halls. To assess these perceptions a nationally standardized questionnaire, which requires only 45 minutes to take, is being administered to a randomly selected few.

Through this random selection process, your name was chosen as a member of this representative group. It will be appreciated if you would take just 45 minutes to complete this questionnaire on Wednesday, September 23rd in the McNary Dining Hall at \_\_\_\_\_ p.m.

Your cooperation in this project is greatly appreciated and we look forward to seeing you next Wednesday.

Sincerely,

Robert A. Miller

RAM:mo

## APPENDIX C

RESEARCH STUDY  
(Winter Administration)

## INSTRUCTIONS FOR ADMINISTRATION

The purpose of this questionnaire is to determine some of the perceptions which freshmen students hold toward Oregon State University. For proper evaluation of that perception, the respondent should answer every question as he presently perceives the university.

When administering the questionnaire please have each of the individuals listed on the attached sheet respond.

Also, please make sure that the respondent answers all the questions and that his name appears on the answer sheet (Form X-25).

Return all enclosed materials to your head resident by 9 a.m., Monday, March 9, 1971.

If you have further questions, please feel free to contact me at 926-6091, ext. 27 or 926-7065.

Thank you for your assistance.

Robert A. Miller

## APPENDIX D

To determine the participant's socio-economic level, the Hollingshead Two Factor Index of Social Position was utilized because it was felt it provided an objective and easily applicable procedure to estimate the positions individuals occupy in the status structure of our society. Its development was dependent both upon detailed knowledge of the social structure, and procedures social scientists have used to delineate class position. It is premised upon three assumptions: the existence of a status structure in the society; positions in this structure are determined mainly by a few commonly accepted symbolic characteristics; and the characteristics symbolic of status may be scaled and combined by the use of statistical procedures so that a researcher can quickly, reliably, and meaningfully stratify the population under study (Hollingshead, 1957, p. 11). In comparison with other measures of socio-economic status, including income levels, self-estimation scales, and interview ratings, Lawson and Boek (1960) concluded that, "occupation serves as an acceptable method for classifying families into social strata" (p. 152).

# APPENDIX E

## Summary of Individual Scores Showing Differences Between Pre- and Post-Results

Scale 1 = Practicality  
Scale 2 = Community

Scale 3 = Awareness  
Scale 4 = Propriety

Scale 5 = Scholarship  
Scale 6 = Campus Morale

Scale 7 = Faculty-Student  
Relationship

Source	Pre-Results by Scale							Post-Results by Scale							Difference						
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Coeducational Residence Hall Freshmen Males																					
1	12	16	09	08	05	13	09	09	15	10	08	07	13	07	-3	-1	1	0	2	0	-2
2	14	17	11	08	11	13	07	12	13	12	02	09	11	05	-2	-4	1	-6	-2	-2	-2
3	12	16	15	18	08	19	10	07	17	12	03	08	12	09	-5	1	-3	-15	0	-7	-1
4	08	13	15	12	10	16	10	12	11	12	09	08	11	04	4	-2	-3	-3	-2	-5	-6
5	11	09	13	09	08	11	08	11	07	09	11	10	14	05	0	-2	-4	2	2	3	-3
6	09	14	16	19	10	18	09	11	10	09	05	07	05	04	2	-4	-7	-14	-3	-13	-5
7	12	14	20	17	09	20	07	10	14	16	15	11	12	09	-2	0	-4	-2	2	-8	2
8	11	08	13	03	09	13	08	07	06	06	02	07	04	04	-4	-2	-7	-1	-2	-9	-4
9	10	14	07	10	11	10	04	04	14	10	10	12	12	09	-6	0	3	0	1	2	5
10	14	19	11	17	04	15	06	08	17	13	17	06	17	09	-6	-2	2	0	2	2	3
11	14	14	12	09	03	12	07	11	10	13	08	04	10	04	-3	-4	1	-1	1	-2	-3
12	12	17	16	17	07	18	09	07	16	12	12	07	16	09	-5	-1	-4	-5	0	-2	0
13	09	08	07	05	04	08	08	07	04	04	02	03	03	02	-2	-4	-3	-3	-1	-5	-6
14	10	14	16	09	17	18	09	04	14	17	07	16	17	08	-6	0	1	-2	-1	-1	-1
15	11	13	15	17	12	14	10	10	11	10	08	10	12	07	-1	-2	-5	-9	-2	-2	-3
16	12	10	10	06	17	10	07	08	14	14	08	11	16	08	-4	4	4	2	-6	6	1
17	10	16	15	15	05	18	09	05	16	16	11	05	16	10	-5	0	1	-4	0	-2	1
18	13	16	15	13	10	17	09	12	11	10	13	06	10	05	-1	-5	-5	0	-4	-7	-4
19	14	18	11	10	13	16	08	12	15	10	10	09	12	05	-2	-3	-1	0	-4	-4	-3
20	07	10	15	09	07	15	08	04	11	06	11	06	07	07	-3	1	-9	2	-1	-8	-1
21	14	17	16	15	13	18	09	07	16	10	10	10	15	18	-7	-1	-6	-5	-3	-3	9
22	14	10	18	14	09	17	08	09	10	10	10	05	08	10	-5	0	-8	-4	-4	-9	2
23	08	09	10	07	09	10	06	08	14	13	10	10	17	08	0	5	3	3	2	7	2
24	13	15	14	12	11	18	09	09	14	13	09	12	12	07	-4	-1	-1	-3	1	-6	-2
25	06	18	14	15	12	20	10	08	16	16	08	10	14	08	2	-2	2	-7	-2	-6	-2

APPENDIX E. (Continued)

Source	Pre- Results by Scale							Post-Results by Scale							Difference						
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
26	14	16	09	14	07	11	05	12	10	09	10	07	10	04	-2	-6	0	-4	0	-1	-1
27	13	12	13	18	06	14	08	08	12	12	16	06	15	08	-5	0	-1	-2	0	1	0
28	08	12	12	05	10	12	07	11	13	10	06	06	10	06	3	1	-2	1	-4	-2	-1
29	15	15	09	11	11	14	07	12	14	09	09	08	09	04	-3	-1	0	-2	-3	-5	-3
30	11	14	09	12	06	12	05	08	10	08	10	11	09	05	-3	-4	-1	-2	5	-3	0
31	09	08	13	18	14	16	06	13	12	14	18	06	14	06	4	4	1	0	-8	-2	0
32	12	09	11	04	08	10	06	10	13	11	12	14	14	08	-2	4	0	8	6	4	2
33	13	15	14	10	08	14	04	10	12	11	11	12	13	05	-3	-3	-3	1	4	-1	1
34	08	13	17	16	07	18	08	10	13	15	16	05	16	09	2	0	-2	0	-2	-2	1
35	10	12	14	11	09	14	09	07	10	10	06	10	08	08	-3	-2	-4	-5	1	-6	-1
36	10	17	16	18	12	20	11	10	20	10	03	07	06	06	0	3	-6	-15	-5	-14	-5
37	10	07	07	11	03	04	04	09	08	12	07	04	09	07	-1	1	5	-4	1	5	3
38	12	18	12	13	12	15	09	08	08	10	10	07	10	06	-4	-10	-2	-3	-5	-5	-3
39	08	10	05	05	06	07	06	08	13	02	09	06	08	05	0	3	-3	4	0	1	-1
40	12	17	17	15	14	18	08	10	19	17	12	13	18	11	-2	2	0	-3	-1	0	3
41	09	18	15	16	09	18	10	09	15	14	10	11	17	07	0	-3	-1	-6	2	-1	-3
42	09	17	13	16	11	16	07	08	20	17	17	13	19	06	-1	3	4	1	2	3	-1
43	10	11	13	15	07	15	07	08	14	14	15	07	14	08	-2	3	1	0	0	-1	1
44	12	11	10	14	08	11	04	09	09	12	14	10	13	06	-3	-2	2	0	2	2	2
45	13	14	14	14	13	14	06	10	12	15	12	09	15	06	-3	-2	1	-2	-4	1	0
46	13	17	12	13	11	16	07	09	13	16	14	08	17	06	-4	-4	4	1	-3	1	-1
47	11	14	11	12	13	16	05	10	12	14	07	07	11	06	-1	-2	3	-5	-6	-5	1
48	12	14	09	09	11	11	02	11	10	07	04	09	17	03	-1	-4	-2	-5	-2	6	1
49	11	07	10	13	04	11	04	06	08	08	07	02	07	08	-5	1	-2	-6	-2	-4	4
50	11	11	17	11	10	15	08	08	09	13	13	11	15	05	-3	-2	-4	2	1	0	-3
51	10	10	16	09	04	17	08	08	11	14	12	05	15	08	-2	1	-2	3	1	-2	0
52	12	13	10	05	09	12	08	11	14	12	05	11	12	07	-1	1	2	0	2	0	-1
53	08	12	12	11	10	12	05	08	12	05	03	10	06	05	0	0	-7	-8	0	-6	0
54	08	08	17	12	08	14	07	06	04	12	09	10	08	06	-2	-4	-5	-3	2	-6	-1
55	11	17	16	17	13	19	08	08	12	12	10	08	15	07	-3	-5	-4	-7	-5	-4	-1
56	07	09	07	11	12	11	16	03	07	07	06	09	08	05	-4	-2	0	-5	-3	-3	-11

## APPENDIX E. (Continued)

Source	Pre-Results by Scale							Post-Results by Scale							Difference						
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
57	11	12	05	03	07	04	06	05	04	04	03	07	02	02	-6	-8	0	0	0	-2	-4
58	10	10	07	01	07	06	05	06	15	09	05	08	08	08	-4	5	2	4	1	2	3
59	16	12	08	10	06	10	06	08	07	08	10	05	08	06	-8	-5	0	0	-1	-2	0
60	12	11	07	08	10	09	06	06	12	09	08	04	09	06	-6	1	2	0	-6	0	0
61	10	10	04	12	06	09	08	05	09	10	05	08	08	05	-5	-1	-4	-7	2	-1	-3
62	07	10	09	08	08	10	05	06	05	05	06	11	08	01	-1	-5	-4	-2	3	-2	-4
63	10	09	10	08	10	09	06	05	07	07	06	08	08	05	-5	-2	-3	-2	-2	-1	-1
64	13	14	14	16	06	14	07	06	09	17	06	13	14	01	-7	-5	3	-10	7	0	-6
65	08	16	17	11	04	13	06	09	16	13	17	06	15	07	1	0	-4	6	2	2	1
66	10	16	16	13	10	18	09	10	16	10	11	08	10	08	0	0	-6	-2	-2	-8	-1
67	13	12	11	08	09	12	04	05	07	12	04	05	05	06	-8	-5	1	-4	-4	-7	2
68	13	11	13	07	08	18	07	09	17	11	08	09	17	07	-4	6	-2	1	1	-1	0
69	14	04	07	07	07	04	02	08	06	14	11	09	12	05	-6	2	7	4	2	8	3
70	14	18	15	10	10	18	06	09	12	15	11	11	16	09	-5	4	0	1	1	-2	3
71	13	12	13	18	11	15	08	09	06	19	12	11	12	06	-4	-6	-4	-6	0	-3	-2
72	11	05	10	04	03	07	04	08	07	08	05	05	06	06	-3	2	-2	1	2	-1	2
73	12	13	12	09	10	11	07	10	15	13	11	08	16	10	-2	2	1	2	-2	5	3
74	09	12	06	06	11	09	03	06	07	03	05	09	04	02	-3	-5	-3	-1	-2	-5	-1
75	10	08	17	14	05	19	08	07	13	11	10	11	12	06	-3	5	-6	-4	6	-7	-2
76	12	14	14	13	06	15	09	13	12	13	13	09	14	06	1	-2	-1	0	3	-1	-3
77	11	14	10	11	08	12	06	10	09	12	09	09	11	06	-1	-5	2	-2	1	-1	0
78	07	13	12	17	08	14	09	07	14	14	20	11	18	08	0	1	2	3	3	4	-1
79	12	14	08	07	05	10	08	12	11	06	02	06	03	05	0	-3	-2	-5	1	-7	-3
80	14	15	11	12	11	14	08	09	11	11	07	06	10	07	-5	-4	0	-5	-5	-4	-1
81	13	18	17	16	08	21	08	09	15	13	13	04	14	07	-4	-3	-4	-3	-4	-7	-1
82	03	04	08	02	11	07	03	07	04	07	06	04	05	03	4	0	-1	4	-7	-2	0
83	09	14	09	09	10	13	06	08	10	07	09	09	10	04	-1	-4	-3	0	-1	-3	-2
84	13	13	08	09	11	09	07	08	12	05	03	10	06	05	-5	-1	-3	-6	-1	-3	-2
85	10	10	12	13	07	14	07	12	07	07	08	06	07	04	2	-3	-5	-5	-1	-7	-3
86	11	10	13	12	09	10	07	10	09	09	14	06	09	08	-1	-1	-4	2	-3	-1	1

APPENDIX E. (Continued)

Source	Pre-Results by Scale							Post-Results by Scale							Difference						
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
87	13	15	15	12	09	18	08	09	16	16	11	11	18	09	-4	1	1	-1	2	0	1
88	10	14	11	08	08	12	07	10	15	09	11	06	09	06	0	1	-2	2	-2	-3	-1
89	12	17	16	16	10	19	08	10	19	16	16	13	20	09	-2	2	0	-1	3	1	1
90	11	18	17	13	09	19	09	12	16	11	08	04	12	06	1	-2	-6	-5	-5	-7	-3
91	12	14	14	13	11	14	07	09	13	13	17	11	10	05	-3	-1	-1	4	0	-4	-2
92	15	15	12	14	06	12	07	12	15	09	11	05	09	04	-3	0	-3	-3	-1	-3	-3
93	11	14	13	12	11	14	04	11	13	12	03	09	11	17	0	-1	-1	-9	-2	-3	13
94	14	14	16	11	06	17	07	12	17	16	11	06	14	09	-2	3	0	0	0	-3	2
95	10	09	15	15	12	13	06	10	10	09	04	08	10	05	0	1	-6	-11	-4	-3	-1
96	15	17	12	16	07	14	08	08	16	13	11	12	12	09	-7	-1	1	-5	5	-2	1

Single-Sex Residence Hall Freshmen Males

1	12	06	12	08	07	11	07	06	05	10	09	07	14	07	-6	-1	-2	1	0	3	0
2	11	13	08	10	12	09	05	09	09	13	09	05	14	07	-2	-4	5	-1	-7	5	2
3	13	14	12	09	06	11	05	08	10	06	03	06	05	03	-5	-4	-6	-6	0	-6	-2
4	08	13	07	04	13	11	05	09	14	08	05	05	09	07	1	1	1	1	-8	-2	-2
5	11	15	14	17	11	01	06	09	11	15	10	08	14	08	-2	-4	1	-7	-3	13	2
6	12	13	13	17	12	18	05	10	09	13	17	11	16	04	-2	-4	0	0	-1	-2	-1
7	12	15	11	16	12	12	06	12	16	15	15	11	11	08	0	1	4	-1	-1	-1	2
8	13	14	17	15	10	15	09	10	14	14	12	08	15	06	-3	0	-3	-3	-2	0	-3
9	13	15	08	14	09	15	05	11	12	09	13	08	09	06	-2	-3	1	-1	-1	-6	1
10	11	16	11	09	07	13	06	05	10	10	06	04	07	07	-6	-6	-1	-3	-3	-6	1
11	11	17	16	15	11	17	07	07	13	07	06	13	09	05	-4	-4	-9	-9	2	-8	-2
12	06	10	08	05	09	07	03	12	10	10	08	05	06	09	6	0	2	3	-4	-1	6
13	07	14	13	17	03	16	10	05	10	08	10	03	06	08	-2	-4	-5	-7	0	-10	-2
14	13	16	10	10	12	14	06	10	06	10	03	12	07	04	-3	-10	0	-7	0	-7	-2
15	11	15	11	10	10	15	03	09	14	07	10	10	10	05	-2	-1	-4	0	0	-5	2
16	08	13	10	08	05	10	07	06	11	10	09	03	09	04	-2	-2	0	1	-2	-1	-3
17	08	15	16	16	01	17	09	09	10	15	15	05	16	07	1	-5	-1	-1	4	-1	-2



APPENDIX E. (Continued)

Source	Pre-Results by Scale							Post-Results by Scale							Difference						
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
18	10	20	15	15	14	20	11	10	15	14	14	11	19	07	0	-5	-1	-1	-3	-1	-4
19	13	18	17	11	06	17	08	10	18	14	10	09	15	08	-3	0	-3	-1	3	-2	0
20	18	12	13	13	06	11	07	12	14	14	11	10	15	06	-6	2	1	-2	4	4	-1
21	13	11	14	11	07	12	05	07	07	11	09	09	12	05	-6	-4	-3	-2	2	0	0
22	12	11	16	12	06	15	09	11	08	10	10	06	11	06	-1	-3	-6	-2	0	-4	-3
23	14	13	16	16	02	13	07	10	13	14	12	06	14	07	-4	0	-2	-4	4	1	0
24	08	16	15	12	12	19	09	05	11	10	13	12	15	07	-3	-5	-5	1	0	-4	-2
25	13	09	12	13	06	14	05	08	12	10	09	06	06	08	-5	3	-2	-4	0	-8	3
26	08	17	14	11	09	11	08	07	13	11	11	07	10	08	-1	-4	-3	0	-2	-1	0
27	14	13	15	12	09	14	05	13	10	14	13	10	11	04	-1	-3	-1	1	1	-3	-1
28	09	11	11	07	14	10	05	06	07	11	10	04	11	06	-3	-4	0	3	-10	1	1
29	11	17	16	15	10	18	09	12	16	08	16	11	18	09	1	-1	-8	1	1	0	0
30	14	15	17	18	09	18	09	08	14	12	13	10	14	08	-6	-1	-5	-5	1	-4	-1
31	12	11	13	10	13	12	07	13	07	11	02	13	07	06	1	-4	-2	-8	0	-5	-1
32	10	18	11	13	11	15	06	11	13	10	14	08	12	06	1	-5	-1	1	-3	-3	0
33	13	13	15	15	13	15	06	12	20	17	20	14	12	09	-1	7	2	5	1	-3	3
34	12	08	15	07	11	12	07	09	09	10	20	06	06	04	-3	1	-5	13	-5	-6	-3
35	10	14	09	12	14	12	09	09	09	06	04	10	08	04	-1	-5	-3	-8	-4	-4	-5
36	07	11	05	12	10	11	07	09	09	10	10	11	09	06	2	-2	5	-2	1	-2	-1
37	13	10	12	07	09	09	02	09	10	11	07	05	10	04	-4	0	-1	0	-4	1	2
38	13	13	18	09	13	15	09	10	12	13	08	10	15	07	-3	-1	-5	-1	-3	0	-2
39	09	13	09	06	09	10	08	08	15	12	14	10	16	09	-1	2	3	8	1	6	1
40	13	12	14	16	08	15	04	06	07	01	07	06	05	04	-7	-5	-13	-9	-2	-10	0
41	11	13	13	16	15	17	08	08	07	10	10	06	07	03	-3	-6	-3	-6	-9	-10	-5
42	15	18	17	13	10	19	10	14	07	14	04	11	09	05	-1	-11	-3	-9	1	-10	-5
43	11	15	17	17	07	21	08	08	11	08	15	07	10	05	-3	-4	-9	-2	0	-11	-3
44	12	16	13	15	08	12	06	09	12	12	10	04	11	06	-3	-4	-1	-5	-4	-1	0
45	10	09	09	09	09	09	04	07	10	12	12	05	10	08	-3	1	3	3	-4	1	4
46	10	16	11	15	13	14	05	11	15	19	17	14	19	08	1	-1	8	2	1	5	3
47	09	11	15	13	09	18	07	08	12	09	13	03	10	06	-1	1	-6	0	-6	-8	-1

APPENDIX E. (Continued)

Source	Pre-Results by Scale							Post-Results by Scale							Difference						
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
48	21	17	05	12	09	17	09	09	13	11	04	06	06	06	-3	-4	6	-8	-3	-11	-3
49	09	06	06	12	11	08	03	08	06	04	08	09	02	03	-1	0	-2	-4	-2	-6	0
50	15	13	10	15	07	13	04	04	02	06	07	07	07	02	-11	-11	-4	-8	0	-6	-2
51	11	12	12	12	11	13	09	05	08	06	04	10	03	03	-6	-4	-6	-8	-1	-10	-6
52	11	13	14	12	05	11	06	06	15	17	08	03	07	05	-5	2	3	-4	-2	-4	-1
53	17	16	17	13	14	18	08	06	19	16	18	11	20	11	-11	3	-1	5	-3	2	3
54	10	10	12	12	06	11	06	05	11	06	10	12	08	07	-5	1	-6	-2	6	-3	1
55	10	18	15	13	03	16	09	05	07	06	09	03	05	06	-5	-11	-9	-4	0	-11	-3
56	12	13	14	14	08	14	06	08	08	11	16	04	09	05	-4	-5	-3	2	-4	-5	-1
57	16	15	15	13	07	14	08	15	11	12	08	03	09	07	-1	-4	-3	-5	-4	-5	-1
58	07	11	10	14	08	13	05	05	08	10	10	06	12	02	-2	-3	0	-4	-3	-1	-3
59	12	13	13	15	05	18	06	08	15	13	12	12	19	09	-4	2	0	-3	7	-1	3
60	10	15	12	11	08	14	09	06	12	08	12	07	13	06	-4	-3	-4	1	-1	-1	-3
61	08	11	12	07	08	12	11	10	13	11	06	05	09	07	2	2	-1	-1	-3	-3	-4
62	14	15	15	15	10	13	07	12	13	17	16	12	14	06	-2	-2	2	1	2	1	-1
63	15	11	12	13	11	15	04	07	18	11	11	12	14	09	-8	7	-1	-2	1	-1	5
64	08	12	10	16	03	10	07	12	09	10	11	03	08	08	4	-3	0	-5	0	-2	1
65	16	15	15	18	12	18	08	12	16	07	15	12	08	06	-4	1	-8	-3	0	-10	-2
66	13	13	09	13	04	11	05	06	16	10	07	04	08	08	-7	3	1	-6	0	-3	3
67	08	04	09	10	07	09	06	09	06	09	15	05	13	07	1	2	0	5	-2	4	1
68	12	17	14	18	14	19	07	11	17	11	11	12	13	04	-1	0	-3	-7	-2	-6	-3
69	13	10	11	10	08	10	08	11	14	09	08	10	10	07	-2	4	-2	-2	2	0	-1
70	13	10	12	05	11	12	05	09	15	13	05	06	13	05	-4	5	1	0	-5	1	0
71	11	13	12	08	05	09	11	09	10	05	09	03	06	06	-2	-3	-7	1	-2	-3	-5
72	11	10	08	16	06	10	05	06	12	03	03	07	08	07	-5	2	-5	-13	1	-2	2
73	11	07	06	04	06	05	03	13	05	08	01	03	03	05	2	-2	2	-3	-3	-2	2
74	13	11	12	10	09	13	07	10	14	07	12	09	10	04	-3	3	-5	2	0	-3	-3
75	14	17	16	14	06	18	08	10	13	07	12	04	11	05	-4	-4	-9	-2	-2	-7	-3
76	12	17	17	06	12	17	07	12	10	12	05	10	13	08	0	-7	-5	-1	-2	-4	1
77	13	13	13	09	08	12	08	11	11	15	09	06	11	08	-2	-2	2	0	-2	-1	0

APPENDIX E. (Continued)

Source	Pre-Results by Scale							Post-Results by Scale							Difference						
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
78	07	13	11	13	09	09	08	09	06	06	04	10	08	07	2	-7	-5	-9	1	-1	-1
79	12	17	11	11	10	16	09	10	14	09	16	08	17	05	-2	-3	-2	5	-2	1	-4
80	11	14	18	10	14	17	08	09	13	15	09	06	15	05	-2	-1	-3	-1	-8	-2	-3
81	12	13	14	13	05	15	09	08	13	11	12	14	13	06	-4	0	-3	-1	-1	-2	-3
82	08	11	06	10	09	11	06	06	08	03	03	03	04	04	-2	-3	-3	-7	-6	-7	-2
83	07	17	11	13	11	16	09	09	08	10	08	07	14	06	2	-9	-1	-5	-4	-2	-3
84	12	10	04	07	04	06	02	08	07	04	06	02	02	02	-4	-3	0	-1	-2	-4	-0
85	11	08	12	13	13	08	03	10	07	09	03	07	04	03	-1	-1	-3	-10	-6	-4	0
86	13	15	18	14	09	17	08	14	16	19	17	07	19	17	1	1	1	3	-2	2	9
87	15	17	11	13	06	13	07	11	18	08	15	10	14	08	-4	1	-3	2	4	1	1
88	11	15	14	07	09	19	09	06	09	07	06	07	07	06	-5	-6	-7	-1	-2	-12	-3
89	11	16	09	05	06	09	07	09	16	08	03	08	12	07	-2	0	-1	-2	2	3	0
90	11	16	15	17	07	19	07	07	15	12	10	01	07	06	-4	-1	-3	-7	-6	-12	-1
91	14	11	11	12	07	11	05	10	12	08	10	07	10	06	-4	1	-3	-2	0	-1	1
92	11	15	12	14	06	12	06	10	13	14	09	07	15	09	-1	-2	2	-5	1	3	3
93	12	14	12	16	10	16	07	13	16	12	12	08	15	09	1	2	0	-4	-2	-1	2
94	06	09	08	08	04	08	05	08	06	08	10	05	06	03	2	-3	0	2	1	-2	-2
95	12	14	11	08	09	16	05	08	07	03	04	08	05	04	-4	-7	-8	-4	-1	-11	-1

Coeducational Residence Hall Freshmen Females

1	08	16	14	12	11	16	08	05	15	10	08	10	11	09	-3	-1	-4	-4	-1	-5	1
2	10	16	10	11	06	16	10	07	11	13	12	12	14	07	-3	-5	3	1	6	-2	-3
3	15	10	12	14	06	13	06	10	13	12	14	04	13	07	-5	3	0	0	-2	0	1
4	10	14	11	10	08	10	06	08	16	10	10	09	14	06	-2	2	-1	0	1	4	0
5	15	19	18	17	13	21	09	10	17	16	15	09	18	09	-5	-2	-2	-2	-4	-3	0
6	09	11	14	13	10	16	08	12	06	14	14	01	11	08	3	-5	0	1	-9	-5	0
7	10	14	08	08	08	08	06	07	07	05	08	10	06	03	-3	-7	-3	0	2	-2	-3
8	12	11	16	11	06	14	08	11	08	14	12	06	09	05	-1	-3	-2	1	0	-5	-3
9	10	11	10	16	02	12	04	09	08	14	09	09	15	06	-1	-3	4	-7	7	3	2

APPENDIX E. (Continued)

Source	Pre-Results by Scale							Post-Results by Scale							Difference						
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
10	10	14	16	10	11	16	08	08	11	11	13	07	09	04	-2	-3	-5	3	-4	-7	-4
11	07	14	05	09	03	05	04	05	16	04	11	04	09	04	-2	2	-1	2	1	4	0
12	13	09	14	05	14	13	08	11	13	11	06	09	09	07	-1	-3	-4	-5	3	4	-1
13	10	16	11	18	02	07	06	09	13	07	13	05	11	05	-1	-3	-4	-5	3	4	-1
14	05	17	09	12	07	12	09	08	11	09	13	07	07	06	3	-6	0	1	0	-5	-3
15	09	20	17	18	08	21	11	05	12	13	15	08	14	07	-4	-8	-4	-3	0	-7	-4
16	09	11	10	10	08	13	04	07	12	11	12	11	11	07	-2	1	1	2	3	-2	3
17	09	08	12	06	10	19	09	08	06	11	08	07	15	07	-1	-2	-1	2	-3	-4	-2
18	10	16	16	14	13	20	07	07	09	11	09	12	13	05	-3	-7	-5	-5	-1	-7	-2
19	13	15	11	12	02	14	06	14	13	10	12	07	12	04	1	-2	-1	0	5	-2	-2
20	12	15	06	10	07	13	08	08	09	02	03	08	04	04	-4	-6	-6	-7	1	-9	-4
21	14	14	13	16	08	15	04	12	10	11	11	01	09	01	-2	-4	-2	-5	-7	-6	-3
22	14	18	16	17	08	18	09	16	07	10	07	01	06	02	2	-11	-6	-10	-7	-12	-7
23	09	10	10	11	07	07	05	04	04	05	02	03	02	03	-5	-6	-5	-9	-4	-5	-2
24	08	12	12	10	08	12	05	05	07	12	04	05	05	06	-3	-5	0	-6	-3	-7	1
25	09	09	04	09	07	11	03	11	06	09	08	08	12	08	2	-3	5	-1	1	1	5
26	13	15	12	17	05	12	10	10	10	13	12	02	13	07	-3	-5	1	-5	-3	1	-3
27	11	17	13	16	09	16	05	13	16	13	15	10	15	06	2	-1	0	-1	1	-1	1
28	11	10	09	08	09	12	07	12	07	09	08	06	09	07	1	-3	0	0	-3	-3	0
29	05	14	12	13	09	11	08	05	17	17	10	10	17	09	0	3	5	-3	1	6	1
30	10	09	10	12	10	08	05	03	05	10	05	07	06	03	-7	-4	0	-7	-3	-2	-2
31	10	17	08	15	09	16	06	11	17	09	14	08	13	01	1	0	1	-1	-1	-3	-5
32	10	16	14	16	11	14	07	09	09	15	16	06	04	05	-1	-7	1	0	-5	0	-2
33	12	13	10	10	04	07	05	07	08	07	06	05	09	04	-5	-5	-3	-4	1	2	-1
34	15	07	11	05	10	08	08	12	09	14	03	06	11	06	-3	2	3	-2	-4	3	-2
35	12	08	12	12	05	10	06	09	09	08	06	03	03	03	-3	1	-4	-6	-2	-7	-3
36	07	05	09	11	04	08	04	05	01	05	07	04	04	02	-2	-4	-4	-4	0	-4	-2
37	11	05	15	05	12	14	06	09	15	11	14	06	16	09	-2	10	-4	9	-6	2	3
38	13	17	20	16	15	21	09	12	18	18	18	14	72	10	-1	1	-2	2	-1	51	1
39	10	10	07	13	08	12	06	08	12	18	14	10	07	05	-2	2	11	1	2	-5	-1

APPENDIX E. (Continued)

Source	Pre-Results by Scale							Post-Results by Scale							Difference						
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
40	11	11	15	11	05	11	06	06	09	14	11	05	11	09	-5	-2	-1	0	0	0	3
41	13	14	09	14	06	10	06	12	11	16	11	10	05	03	-1	-3	7	-3	4	-5	-3
42	12	16	12	10	11	18	06	06	12	09	11	10	11	06	-6	-4	-3	1	-1	-7	0
43	10	07	09	13	05	08	02	05	07	12	11	07	10	04	-5	0	3	-2	2	2	2
44	10	14	14	14	04	15	07	09	20	07	14	18	12	08	-1	6	-7	0	4	-3	1
45	11	14	17	15	10	20	09	10	14	12	12	05	14	09	-1	0	-5	-3	-5	-6	0
46	11	14	10	16	09	14	03	10	17	07	13	05	09	05	-1	3	-3	-3	-4	-5	2
47	07	11	12	11	07	06	06	11	12	12	05	07	09	05	4	1	0	-6	0	3	-1
48	11	12	16	16	09	12	05	11	03	08	11	05	06	02	0	-9	-8	-5	-4	-6	-3
49	14	13	17	19	12	19	04	08	19	17	15	12	20	11	-6	5	0	-4	0	1	7
50	08	20	18	20	07	22	11	02	17	16	16	08	18	10	-6	-3	-2	-4	1	-4	-1
51	09	09	14	05	08	17	08	09	12	07	09	09	07	05	0	3	-7	4	1	-10	-3
52	05	12	06	05	09	05	04	05	10	07	07	09	04	02	0	-2	1	2	0	-1	-2
53	12	15	17	08	13	14	08	10	09	17	11	08	15	06	-2	-6	0	3	-5	1	-2
54	06	15	05	08	08	10	06	06	07	07	01	07	03	01	0	-8	2	-7	-1	-7	-5
55	08	17	10	16	10	15	08	06	08	12	12	13	15	08	-2	-9	2	-4	3	0	0
56	11	13	12	08	08	15	08	10	11	06	09	07	09	05	-1	-2	-6	1	-1	-6	-3
57	06	10	05	12	10	06	03	06	11	10	12	07	09	05	0	1	5	0	-3	3	2
58	17	16	14	05	05	11	04	13	10	12	13	07	14	05	-4	-6	-2	8	2	3	1
59	12	11	13	11	05	11	06	11	05	07	07	06	05	02	-1	-6	-6	-4	1	-6	-4
60	13	13	15	19	08	18	08	12	05	08	09	03	07	05	-1	-8	-7	-10	-5	-11	-3
61	09	13	08	16	07	11	07	08	07	17	05	06	08	07	-1	-6	9	-11	-1	-3	0
62	10	15	09	15	07	14	06	08	11	08	13	04	07	06	-2	-4	-1	-2	-3	-7	0
63	08	05	12	13	01	10	03	06	07	14	18	08	16	05	-2	2	2	5	7	6	2
64	11	14	14	17	08	15	06	12	12	12	09	07	13	03	1	-2	-2	-8	-1	-2	-3
65	10	16	16	11	13	19	09	09	05	13	12	05	07	07	-1	-11	-3	1	-8	-12	-2
66	15	09	16	11	08	15	08	06	07	11	06	05	10	05	-9	-2	-5	-5	-3	-5	-3
67	13	09	16	11	08	15	08	05	12	16	06	12	13	06	-8	3	0	-5	4	-2	-2
68	07	13	11	16	06	09	06	12	16	17	13	01	14	09	5	3	6	-3	-5	5	3
69	10	17	16	15	13	20	09	13	13	16	14	06	16	09	3	-4	0	-1	-7	-4	0
70	10	16	17	17	08	17	09	05	13	09	10	08	09	05	-5	-3	-8	-7	0	-8	-4

APPENDIX E. (Continued)

Source	Pre-Results by Scale							Post-Results by Scale							Difference						
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
71	13	09	14	15	11	15	09	07	15	17	14	09	16	06	-6	6	3	-1	-2	1	-3
72	14	18	16	12	09	19	10	09	11	13	13	06	12	07	-5	-7	-3	1	-3	-7	-3
73	13	17	17	17	12	21	09	07	16	15	12	11	15	09	-6	-1	-2	-5	-1	-6	0
74	10	16	15	16	09	11	06	07	11	12	13	01	08	03	-3	-5	-3	-3	-8	-3	-3
75	10	16	19	15	11	20	07	09	15	10	15	09	16	04	-1	-1	-9	0	-2	-4	-3
76	07	18	10	14	09	14	07	09	10	17	11	11	18	06	2	-8	7	-3	2	4	-1
77	08	16	09	06	12	14	08	05	14	09	06	14	14	07	-3	-2	0	0	2	0	-1
78	13	12	10	11	09	13	06	09	10	14	14	09	13	07	-4	-2	4	3	0	0	1
79	11	15	17	11	08	17	09	08	12	13	08	07	13	08	-3	-3	-4	-4	-1	-4	-1
80	14	16	14	18	09	13	04	11	11	13	13	08	13	07	-3	-5	-1	-5	-1	0	3
81	09	10	10	07	10	09	02	07	06	09	15	09	11	04	-2	-4	-1	8	-2	2	2
82	12	08	12	11	06	11	04	10	02	06	05	06	02	02	-2	-6	-6	-6	0	-9	-2
83	09	08	14	15	12	15	07	08	11	10	13	07	11	08	-1	3	-4	-2	-5	-4	1
84	11	12	10	05	13	12	06	09	12	08	01	06	07	06	-2	0	-2	-4	-7	-5	0
85	12	13	12	11	05	16	05	12	16	13	11	08	16	08	0	3	1	0	3	0	3
86	10	10	10	11	11	14	04	08	13	11	15	10	12	06	-2	3	1	4	-1	-2	2
87	10	16	16	11	07	16	10	04	03	09	03	04	05	07	-6	-13	-7	-8	-3	-11	-3
88	11	09	17	11	08	16	06	08	07	13	07	04	15	09	-3	-2	-4	-4	-4	-1	3
89	08	08	13	11	09	13	09	09	08	16	11	05	10	06	1	0	3	0	-4	-3	-3
Single-Sex Residence Hall Freshmen Females																					
1	08	10	14	12	08	16	07	10	03	12	13	08	10	01	2	-7	-2	1	0	-6	-6
2	10	04	15	08	12	17	07	12	14	16	04	10	12	06	2	10	1	-4	-2	-5	-1
3	08	13	14	09	09	18	08	08	13	10	13	08	10	05	0	0	-4	4	-1	-8	-3
4	13	18	15	15	08	18	06	05	12	12	03	10	13	08	-8	-6	-3	-12	2	-5	2
5	11	08	11	16	08	09	05	11	13	14	04	10	12	06	0	5	3	-12	2	3	1
6	10	16	15	12	12	15	07	07	14	11	12	09	11	08	-3	-2	-4	0	-3	-4	1
7	10	18	14	12	10	13	07	14	18	14	14	11	16	08	4	0	0	2	1	3	1
8	10	11	13	10	10	12	07	12	10	11	10	09	13	08	2	-1	-2	0	-1	1	1
9	08	16	17	15	13	17	07	07	11	17	13	10	14	07	-1	-5	0	-2	-3	-3	0

APPENDIX E. (Continued)

Source	Pre-Results by Scale							Post-Results by Scale							Difference						
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
10	12	11	12	12	03	13	03	10	11	13	10	03	12	04	-2	0	1	-2	0	-1	1
11	13	08	15	05	08	13	04	12	09	11	07	11	09	04	-1	1	-4	2	3	-4	0
12	14	17	18	17	12	20	08	11	13	10	14	13	11	06	-3	-4	-8	-3	1	-9	-2
13	11	18	17	17	10	21	10	10	15	17	15	11	14	11	-1	-3	0	-2	1	-7	1
14	11	16	13	16	12	15	06	07	06	10	15	07	11	03	-4	-10	-3	-1	-5	-4	-3
15	10	16	13	13	13	15	04	08	15	13	11	10	13	04	-2	-1	0	-2	-3	-2	0
16	12	12	10	06	09	13	05	13	12	08	09	08	14	05	1	0	-2	3	-1	1	0
17	12	14	16	19	12	18	06	09	10	08	11	07	09	03	-3	-4	-8	-8	-5	-9	-3
18	10	14	17	11	09	19	09	09	12	17	11	11	12	10	-1	-2	0	0	2	-7	1
19	11	14	12	11	10	16	10	09	11	09	06	03	05	06	-2	-3	-3	-5	-7	-11	-4
20	10	10	14	14	05	13	01	08	14	12	14	07	12	04	-2	4	-2	0	2	-1	3
21	09	10	08	06	04	08	04	07	06	04	10	01	06	02	-2	-4	-4	4	-3	-2	-2
22	13	12	15	08	04	16	05	07	10	11	11	03	13	04	-6	-2	-4	3	-1	-3	-1
23	12	15	14	15	05	12	08	08	09	09	13	12	08	07	-4	-6	-5	-2	7	-4	-1
24	07	18	14	17	13	18	10	10	17	13	11	13	15	07	3	-1	-1	-6	0	-3	-3
25	11	14	13	14	12	17	05	09	12	11	11	10	11	06	-2	-2	-2	-3	-2	-6	1
26	12	05	12	11	09	11	03	08	08	08	05	07	08	04	-4	3	-4	-6	-2	-3	1
27	13	16	18	15	15	16	09	15	12	18	19	11	17	09	2	-4	0	4	-4	1	0
28	13	19	15	16	06	20	10	10	11	14	14	05	13	05	-3	-8	-1	-2	-1	-7	-5
29	11	16	10	09	11	15	08	07	07	04	08	07	06	03	-4	-9	-6	-1	-4	-9	-5
30	09	08	10	11	09	13	05	06	08	10	13	09	10	07	-3	0	0	2	0	-3	2
31	16	20	21	19	07	22	10	14	15	13	11	16	13	06	-2	-5	-8	-8	9	-9	-4
32	12	07	18	10	05	12	06	10	08	13	06	04	08	06	-2	1	-5	-4	-1	-4	0
33	12	13	13	18	09	14	08	08	13	12	16	09	14	07	-4	0	-1	-2	0	0	-1
34	09	11	08	12	10	12	08	10	11	06	10	08	08	06	1	0	-2	-2	-2	-4	-2
35	11	08	15	15	06	14	04	09	03	07	06	08	06	03	-2	-5	-8	-9	2	-8	-1
36	10	17	15	15	07	16	08	08	14	12	16	07	15	04	-2	-3	-3	1	0	-1	-4
37	10	14	14	11	12	13	08	08	11	14	12	06	12	06	-2	-3	0	1	-6	-1	-2
38	07	09	11	04	09	07	03	07	11	08	01	07	07	06	0	2	-3	-3	-2	0	3
39	12	12	15	18	07	16	07	13	13	12	13	06	08	06	1	1	-3	-5	-1	-8	-1
40	08	05	10	16	07	09	02	02	05	06	03	11	06	03	-6	0	-4	-13	4	-3	1

APPENDIX E. (Continued)

	Pre-Results by Scale							Post-Results by Scale							Difference						
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
41	09	14	09	10	09	15	06	04	09	07	09	10	10	05	-5	-5	-2	-1	1	-5	-1
42	07	10	14	10	07	15	05	07	06	08	12	03	10	03	0	-4	-6	2	-4	-5	-2
43	09	09	14	13	07	10	05	08	08	10	08	04	11	09	-1	-1	-4	-5	-3	1	4
44	07	10	16	11	09	15	06	11	11	08	09	07	06	05	4	1	-8	-2	-2	-9	-1
45	13	17	14	15	14	19	09	10	15	14	15	10	13	06	-3	-2	0	0	-4	-6	-3
46	08	09	13	06	09	13	08	06	18	10	05	11	13	08	-2	9	-3	-1	2	0	0
47	13	10	07	11	08	11	05	08	11	04	02	15	05	05	-5	1	-3	-9	7	-6	0
48	10	17	11	10	10	15	07	08	13	09	08	08	11	05	-2	-4	-2	-2	-2	-4	-2
49	12	16	13	16	05	14	06	11	16	12	14	08	17	06	-1	0	-1	-2	3	3	0
50	19	19	17	16	06	18	11	11	09	12	07	04	10	09	1	-10	-5	-9	-2	-8	-2
51	14	02	04	01	02	00	02	11	07	06	14	03	06	02	-3	5	2	13	1	6	0
52	14	17	16	15	07	18	07	10	14	11	04	07	10	06	-4	-3	-5	-11	0	-8	-1
53	12	15	15	17	12	17	08	10	14	12	09	11	09	07	-2	-1	-3	-8	-1	-8	-1
54	10	18	16	11	07	15	10	06	18	11	10	11	12	10	-4	0	-5	-1	4	-3	0
55	09	13	10	10	11	13	07	09	11	09	10	07	11	05	0	-2	-1	0	-4	-2	-2
56	12	16	14	14	10	14	08	09	13	18	16	08	18	07	-3	-3	4	2	-2	4	-1
57	11	15	17	14	16	20	09	09	16	07	15	12	14	08	-2	1	-10	1	-4	-6	-1
58	11	14	11	14	05	12	05	09	13	11	14	06	15	06	-2	-1	0	0	1	3	1
59	09	15	14	11	11	14	10	09	13	05	12	12	11	03	0	-2	-9	1	1	-3	-7
60	08	15	15	09	11	17	09	06	12	08	05	10	15	05	-2	-3	-7	-4	-1	-2	-4
61	11	14	10	13	08	05	06	05	07	10	11	10	10	04	-6	-7	0	-2	2	5	-2
62	11	17	11	16	09	15	05	11	16	16	15	11	19	10	0	-1	5	-1	2	4	5
63	12	15	12	11	07	15	10	06	11	11	04	07	11	08	-6	-4	-1	-7	0	-4	-2
64	14	16	10	09	09	12	04	12	15	08	10	10	10	07	-2	-1	-2	1	1	-2	3
65	13	15	15	14	05	15	08	10	14	14	15	09	16	05	-3	-1	-1	1	4	1	-3
66	11	08	11	11	08	09	05	05	05	07	06	06	08	04	-6	-3	-4	-5	-2	-1	-1
67	13	16	15	16	11	10	06	10	11	17	14	12	16	07	-3	-5	2	-2	1	-3	1
68	08	10	11	11	06	12	02	07	04	07	07	08	09	00	-1	-6	-4	-4	2	-3	-2
69	07	17	15	15	14	19	09	10	15	10	15	10	12	06	3	-2	-5	0	-4	-7	-3
70	07	17	16	13	10	19	09	09	15	12	09	09	15	07	2	-2	-4	-4	-1	-4	-2
71	10	10	14	11	06	15	08	07	11	15	06	07	11	08	-3	1	1	-5	1	-4	0



APPENDIX E. (Continued)

Source	Pre-Results by Scale							Post-Results by Scale							Difference						
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
72	10	11	07	12	08	12	06	08	06	08	06	08	10	05	-2	-5	1	-6	0	-2	-1
73	14	16	12	13	09	16	05	11	14	06	13	08	08	04	-3	-2	-6	0	-1	-8	-1
74	11	13	11	15	07	17	05	08	11	15	09	11	13	06	-3	-2	4	-6	4	-4	1
75	14	16	14	14	07	18	07	08	03	10	05	08	12	05	-6	-13	-4	-9	1	-6	-2
76	08	15	14	12	05	12	08	06	14	10	04	13	08	07	-2	-1	-4	-8	8	-4	-1
77	14	04	10	07	18	07	02	13	06	10	08	03	08	01	-1	2	0	1	-15	1	-1
78	14	17	17	15	07	17	09	10	08	10	08	03	10	05	-4	-9	-7	-7	-4	-7	-4
79	10	17	15	13	07	17	08	09	15	13	11	09	16	06	-1	-2	-2	-2	2	-1	-2
80	11	12	13	08	11	12	08	05	11	07	03	09	08	06	-6	-1	-6	-4	-2	-4	-2
81	09	19	11	12	10	12	08	09	18	13	15	11	15	07	0	-1	2	3	1	3	-1
82	06	07	10	06	09	10	09	06	05	12	04	06	08	07	0	-2	2	-2	-3	-2	-2
83	15	19	15	18	08	17	07	13	19	13	19	10	18	07	-2	0	-2	1	2	1	0
84	11	17	16	18	08	17	08	10	16	16	16	06	14	10	-1	-1	0	-2	-2	-3	2
85	15	16	18	07	04	16	06	10	05	02	03	02	02	01	-5	-11	-16	-4	-2	-14	-5
86	08	18	16	14	12	18	09	06	10	11	11	09	14	04	-2	-8	-5	-3	-3	-4	-5
87	15	12	17	16	08	16	09	13	14	15	14	06	15	08	-2	2	-2	-2	-2	-1	-1
88	07	16	15	16	10	19	08	09	11	12	17	06	18	08	2	-5	-3	1	-4	-1	0
89	11	16	15	17	07	17	09	07	08	14	10	15	13	06	-4	-8	-1	-7	8	-4	-3
90	09	17	14	16	11	17	08	07	10	16	08	07	14	07	-2	-7	2	-8	-4	-3	-1
91	11	10	16	11	06	14	07	13	09	17	13	05	13	06	2	-1	1	2	-1	-1	-1
92	05	16	10	09	07	12	07	10	09	09	12	06	08	01	5	-7	-1	3	-1	-4	-6
93	08	19	16	11	07	16	09	08	14	13	12	04	12	07	0	-5	-3	1	-3	-4	-2
94	11	19	16	17	13	21	09	05	14	11	15	07	13	09	-6	-5	-5	-2	-6	-8	0
95	11	16	16	09	12	19	09	09	05	09	05	11	09	06	-2	-11	-7	-4	-1	-10	-3
96	11	16	16	06	10	17	08	09	13	16	06	10	13	07	-2	-3	0	0	0	-4	-1
97	10	13	16	16	10	16	08	09	09	08	10	09	06	05	-1	-4	-8	-6	-1	-10	-3
98	13	19	18	16	11	21	09	09	17	12	06	08	14	07	-4	-2	-6	-10	-3	-7	-2
99	12	18	17	20	08	21	09	10	15	16	17	11	18	08	-2	-3	-1	-3	3	-3	-1
100	11	13	11	14	06	14	03	11	10	09	11	12	11	05	0	-3	-2	-3	6	-3	2
101	17	20	17	15	08	16	09	11	09	15	15	13	18	05	-6	-11	-2	0	5	2	-4
102	09	12	08	04	03	10	06	05	09	17	06	13	14	06	-4	-3	9	2	10	4	0

APPENDIX E. (Continued)

Source	Pre-Results by Scale							Post-Results by Scale							Difference						
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
103	05	08	07	01	09	03	04	04	03	07	03	09	04	03	-1	-5	0	2	0	1	-1
104	12	11	04	07	07	06	02	06	10	05	03	08	08	03	-6	-1	1	-4	1	2	1
105	13	18	18	17	05	18	08	10	11	14	14	09	15	07	-3	-7	-4	-3	4	-3	-1
106	11	14	17	11	12	17	09	09	10	10	08	09	12	08	-2	-4	-7	-3	-3	-5	-1
107	08	17	13	18	01	14	06	08	13	15	13	16	15	07	0	-4	2	-5	15	1	1
108	11	11	14	05	12	15	08	08	11	05	11	01	08	05	-3	0	-9	6	-11	-7	-3
109	13	18	10	16	10	16	07	09	14	07	12	08	13	07	-4	-4	-3	-4	-2	-3	0
110	12	07	11	10	05	11	02	10	06	12	10	06	10	02	-2	-1	1	0	1	-1	0
111	11	13	14	10	10	17	08	11	13	15	14	09	15	09	0	0	1	4	-1	-2	1
112	11	14	12	15	06	15	06	06	04	07	06	07	08	03	-5	-10	-5	-9	1	-7	-3
113	08	14	12	11	02	10	08	09	06	10	11	01	08	04	1	-8	-2	0	-1	-2	-4
114	13	15	16	19	03	16	10	12	14	09	13	07	10	07	-1	-1	-7	-6	4	-6	-3
115	13	19	17	18	10	19	10	11	12	08	15	08	10	06	-2	-7	-9	-3	-2	-9	-4
116	11	18	16	16	14	20	08	09	09	06	13	08	08	04	-2	-9	-10	-3	-6	-12	-4
117	12	15	15	13	08	17	07	12	17	11	12	08	15	06	0	2	-4	-1	0	-2	-1
118	07	15	13	04	11	12	07	07	06	09	08	07	10	03	0	-9	-4	4	-4	-2	-4
119	10	12	13	11	04	15	05	08	15	12	06	07	12	07	-2	3	-1	-5	3	-3	2
120	11	13	10	17	05	13	08	13	15	09	13	03	11	09	2	2	-1	-4	-2	-2	1
121	08	14	13	14	06	17	07	09	09	07	15	03	10	05	1	-5	-6	1	-3	-7	-2
122	10	17	18	11	16	18	10	10	14	17	12	13	18	09	0	-3	-1	1	-3	0	-1
123	09	20	10	11	15	16	08	06	17	05	14	05	12	05	-3	-3	-5	3	-10	-4	-3
124	12	15	15	14	08	18	06	11	13	11	07	07	13	07	-1	-2	-4	-7	-1	-5	-1
125	14	13	11	13	07	13	06	13	15	14	11	07	12	06	-1	2	3	-2	0	-1	0
126	13	17	17	12	08	19	10	08	11	12	11	06	13	09	-5	-6	-5	-1	-2	-6	-1
127	15	18	15	13	08	15	09	12	14	15	11	09	15	09	-3	-4	0	-2	1	0	0
128	09	13	10	10	05	09	04	11	05	09	06	08	09	04	2	-8	-1	-4	3	0	0
129	12	17	17	18	12	18	08	08	13	19	17	11	17	10	-4	-4	2	-1	-1	-1	2
130	17	16	16	16	11	17	07	12	11	10	10	07	09	04	-5	-5	-6	-6	-4	-8	-3
131	10	13	12	11	08	13	08	10	09	11	07	07	07	07	0	-4	-1	-4	-1	-6	-1
132	10	13	13	11	10	16	05	06	11	08	07	10	11	08	-4	-2	-5	-4	0	-5	3
133	08	11	16	15	05	14	05	11	15	15	17	09	17	08	3	4	-1	2	4	3	3

APPENDIX E. (Continued)

Source	Pre-Results by Scale							Post-Results by Scale							Difference						
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
134	11	16	15	15	05	16	09	08	07	03	02	04	05	03	-3	-9	-12	-13	-1	-11	-6
135	12	11	07	14	13	06	05	07	06	07	10	08	06	05	-5	-5	0	-4	-5	0	0
136	15	13	11	11	08	09	06	11	16	13	11	03	14	08	-4	3	2	0	-5	5	2
137	06	09	11	03	10	10	06	03	06	10	05	06	08	06	-3	-3	-1	2	-4	-2	0
138	08	14	12	17	04	14	08	06	14	13	12	06	17	10	-2	0	1	-5	2	3	2
139	13	16	14	13	12	18	06	10	17	16	08	08	19	08	-3	1	2	-5	-4	1	2
140	08	08	14	09	10	17	06	08	09	12	12	07	13	08	0	1	-2	3	-3	-4	2
141	10	15	15	19	04	18	10	05	14	11	14	06	14	11	-5	-1	-4	-5	2	-4	1
142	09	13	16	18	10	17	06	10	14	09	09	08	10	08	1	1	-7	-9	-2	-7	2
143	08	14	12	13	08	16	06	06	14	10	08	10	11	08	-2	0	-2	-5	2	-5	2
144	11	14	13	14	06	12	10	09	13	12	14	06	09	10	-2	-1	-1	0	0	-3	0
145	09	15	13	11	11	14	09	09	09	08	07	06	06	04	0	-6	-5	-4	-5	-8	-5
146	11	20	14	11	14	15	09	09	16	13	07	09	16	07	-2	-4	-1	-4	-5	1	-2
147	10	19	16	13	14	18	08	11	19	13	08	14	13	06	1	0	-3	-5	0	-5	-2
148	10	10	12	12	07	12	06	09	09	09	06	09	08	03	-1	-1	-3	-6	2	-4	-3
149	09	14	08	09	05	10	06	08	09	07	09	06	08	04	-1	-5	-1	0	1	-2	-2
150	06	15	10	01	10	09	05	07	09	11	06	05	09	07	1	-6	1	5	-5	0	2