

AN INVESTIGATION OF THE RELATIONSHIP BETWEEN SOME
MOTIVATIONAL FACTORS AND ACADEMIC ACHIEVEMENT

by

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Abstract

This study was an attempt to determine the relationship between the reasons which students ascribe to themselves for attending university and subsequent academic achievement. The study was exploratory and assumed that self-ascribed reasons were tentative indicators of student motivation for achievement.

The principal reasons for attending university which students ascribe to themselves and attribute to others were determined by administering a preliminary questionnaire to 133 first year students at the University of British Columbia and then grouping the students' responses according to similarity. Fifteen representative reasons resulted from this grouping.

A paired comparison questionnaire was constructed and administered to 163 first year students of close to median intellectual ability, as measured by the Cooperative School and College Ability Test from the Faculty of Arts and Science. For purposes of analysis, students in the sample were classified into subgroups according to: (1) level of academic achievement; and (2) sex. Average rank orders of the principal reasons were derived for each group. Differences were not found between the average rank orders of subgroups representing different levels of achievement, nor were differences found between males and females, thus indicating that variations in self-ascribed reasons did not significantly differentiate levels of academic achievement.

A further individual analysis of each principal reason indicated that one of the reasons was related to differences in academic achievement. Relationships were not found between the other fourteen principal reasons and academic performance. Attending university because the student requires it for his preferred profession was considered to be a more important factor in influencing decisions to attend university by the superior students than by the under-achieving students. It was suggested that this relationship may be due to several factors. Students considering this reason to be an influential factor in determining a decision to attend university may be expressing a seriousness of orientation with respect to life purpose, a clarity of perceived purpose, a generalized need for status or motivation towards long range goals whereas other students are oriented towards short range goals.

Failure to find more significant relationships between academic achievement and reasons for attending university was attributed largely to an inability to determine the underlying motivation for the decision to attend using the present techniques and to indications that students' responses to the paired comparison questionnaire were based largely upon some cultural stereotype of social desirability.

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CHAPTER I

INTRODUCTION AND STATEMENT OF THE PROBLEM

Precise definition of the factors determining academic success at university and the development of techniques for their assessment is of vital importance to university administrators and officials and to students who are considering a university education as the necessary background for a proposed career. Many investigators have recognized the need for the comprehensive investigation of the factors determining academic performance and, as a result, extensive studies have attempted to isolate these factors and to specify their relationship to performance. Research in this field has dealt with a large and varied number of variables including those of ability and aptitude, personality and socio-economic background factors.

This study was designed to consider a limited aspect of this broad area. What are the reasons which students will ascribe to themselves for attending university and what will be the relationship between these reasons and subsequent academic performance?

Statement of the problem

The purpose of this study was to test the hypothesis that there is a relationship between the reasons which a

student will ascribe to himself and his level of academic achievement. However, in order to do this, it was necessary to determine empirically the principal reasons that students will ascribe to themselves and attribute to others for attending university.

Self-ascribed reasons as measures of motivation

The individual's choice of academic or vocational pursuits upon graduating from high school is determined by the pattern of motivation directing him. Limitations of intellectual capacity, interest, social adjustment and other personality and environmental factors restrict the range of decisions that are available. In addition, however, the pattern of motivation provides the direction for decisions about future actions.

The individual is predisposed to certain behavioral actions by the motive patterns which are latent in his personality structure. Operation of stimulus cues upon the individual's motive pattern produces a selective action upon the various behavioral alternatives available to him and the direction of the individual's behavior towards ends or goals is determined.

University provides a complex of incentives which influence the individual's decisions and can induce a student to enroll. Whether or not the student will work towards excellence in academic achievement depends upon the extent

to which his decisions are based upon goals which demand high standards of academic attainment. If the student is not motivated towards the efficient utilization of his intellectual capacities, the expected academic standards of the particular student will not be met in his performance.

The student may express many reasons which he feels justify his attendance at university. Many of these reasons imply academic and vocational goals which demand high levels of academic achievement, whereas others are related to activities and goals that do not demand that that student strive for high standards of performance. For instance, such reasons given as attending to satisfy environmental pressures and enrolling for the recreational and athletic activities are not directly related to motivation for academic achievement. Other reasons while not being directly related to motivation for achievement imply this insofar as excellence in academic attainment is required to reach the goals which these other reasons are related to. These reasons are illustrated by such stated reasons as wanting the prestige and status associated with affiliating oneself with a university.

The student's stated reasons are not necessarily the real ones for his behavior and may not have any direct relationship to the underlying motivation for his behavior at university. A great many factors may transform the intrinsic motivation for an act prior to conscious awareness

of what the individual perceives as a reason for behavior. Indeed, considerable emphasis has been given in modern motivational theory to the contention that the individual may not be able to perceive consciously the motivation behind his behavior. Allport, in a review of the problem, refers to Macdougall, Darwin, Schopenhauer, and Freud and states that they "correctly perceived that the main springs of conduct may be hidden from the searchlight of consciousness" and that it is "naive to accept the rationalizations of self justifying mortals" (1953, pp. 107).

Motivation may be consciously apprehended or function unconsciously, but there is no simple way to determine whether or not what the individual states as motivation is responsible for his behavior. It seems a plausible assumption that no direct causal relationship may exist between the student's self-ascribed reasons for behavior and his actual behavior. It was noted, however, that the extent to which relationships are found between academic achievement and these self-ascribed reasons provides some assurance that the students' reasons may be "signs" or indicators of the actual dynamic forces which have directed the student's behavior.

There are several advantages to the use of self-assessment in attempting to determine personality differences in motivational patterns. There is still a considerable need for exploratory work on the relation of motivational variables to performance. Therefore, the justification for the

evaluation of the relationship between self-ascribed reasons and academic achievement is primarily pragmatic since: (1) the student's stated reasons are readily available and easily determined through the use of questionnaires; (2) there is no elaborate interpretation of subject responses involving assumed relationships between responses and some inner dynamic forces, as there is in the projective techniques of Murray (1938), and Atkinson (1958). The individual's responses are accepted at face value until some attempt at validation has disproved them. If there does not seem to be any relationship between his reported motivation and his conduct, then some more valid technique must be employed.

It was not the intention of the present study to directly question the individual as to his motivation and derive some index of motivational strength. Attempts to correlate such an index with a number of variables have failed in the past (DeCharms, 1955). The present study was designed to investigate the reasons which the student perceived as the motivation for his behavior.

Practical objective of the study

The practical value of this study lies in the possibility that its results may be used in the prediction of the academic grades of students enrolling at university. Administrative officials can utilize any relationship found

between self-ascribed reasons for behavior and academic achievement to classify students according to a predicted level of performance and make recommendations for accepting or rejecting applicants for enrolment. In addition, such a relationship would be of value in counselling prospective students.

CHAPTER II

REVIEW OF THE LITERATURE

The field of predicting academic achievement has been a popular line of research for the last four decades. The literature presents a multiplicity of experimental variables dealing with all academic levels and utilizing a large number of different experimental designs. Investigations have included prediction with such variables as intelligence and aptitude, standard achievement tests, social and economic data, personal and educational data, personality factors, and all combinations of these variables. The status of the prediction of academic achievement has been summarized and reviewed by Bloom and Heyns, (1956); Garrett, (1949); Harris, (1931 & 1940); Segel, (1934); and Travers, (1949).

Within the past twenty years there has been considerably more emphasis placed upon the measurement of those variables which cause variation in college performance other than intelligence and scholastic aptitude. Since almost all the evidence cited in the above reviews has indicated that measures of intellectual variables may be expected to correlate with college grades at about .5 and ranging

through to .7, a substantial proportion of the variation in performance must be determined by the influences of non-intellectual factors.

Travers indicates the contribution to be made by the study of non-intellectual factors in one of the more recent reviews:

The present writer feels that educational counselors have tended to underestimate the importance of these non-intellectual factors and too often have placed excessive reliance on standard measure of scholastic aptitude. Academic counselors in universities or colleges must give greater recognition to the non-intellectual factors which contribute to academic success (Travers, 1949, p. 174).

Among those non-intellectual variables which have been receiving attention are those which may be considered motivational influences. Although, as indicated by Travers, we have not given adequate consideration to the influence of motivational factors, there has always been a conviction that these variables are of crucial importance. The success of indices of former achievement as the most effective predictors of academic achievement has been attributed to the fact that they reflect prior motivation in a similar situation (Travers, 1949). Jones (1932) found that the higher the correlation between university grades and intelligence test scores, the greater must be the scholastic motivation of the students. Thus, there appears to be considerable interest and value in the continued exploration

of the influences of motivational variables.

Predictors of motivation for academic achievement

Although there is a voluminous literature on the prediction of academic achievement, there is still a sparsity of knowledge on the influence of motivational factors. This meagerness is demonstrated by the relatively few studies which have attempted this type of investigation and a lack of conclusive evidence for existing relationships. Undoubtedly, the research has been hampered by a lack of clearcut definitions of the motivational factors involved and a deficiency of precise measuring tools.

The development of a technique for measuring motivation through content analysis of responses to projective tests of personality by McClelland (1953) has stimulated considerable interest in the relationship between his "need for Achievement" and academic performance.

Moderate success has been made in distinguishing between high and low achieving students with McClelland's measure. McClelland (1953) reports a correlation of .51 between grade-point average and his measure of need for achievement. Morgan (1952), in a study of high achieving and low achieving liberal arts students of high ability, found that the former group stood higher in the achievement motivation scoring. Further substantiation has been reported

by Applezweig, Moeller, and Burdick (1956), Chabazzi (1956), and Weiss, Wertheimer, and Groesbeck (1959). Chabazzi reports correlations of .47 and .35 respectively between first term college grades and the achievement motivation measure on two projective tests (Sound Stimuli Test and Picture Stimuli Test). Weiss et al derived a correlation of .34 between McClelland's measure and grade-point average. Applezweig et al, using similar measures, found a significant but small correlation of .16.

These findings have not been corroborated by all investigators, however. Lowell (1952) did not find any relation between grade-point average and McClelland's measure of need for achievement ($r=.05$). Parrish and Rethlingshafer (1954), in a study of the contention that McClelland's measures are restricted in nature and not capable of long range prediction, were unable to find any differences on a scale of need for achievement between a group of low achievers and a group of high achievers. They concluded that McClelland's need for achievement is not related to scholastic achievement.

It is difficult to account for the disparity among the investigator's findings. McClelland (1958) attributed the failure of Parrish and Rethlingshafer to confirm the findings of the others to the fact that they used individual

administration whereas the others had used group administrations. Loss of anonymity and decreased variability in scores were hypothesized due to the interpersonal relationship involved. The fact that several investigators have found significant correlations between McClelland's measure of need for achievement and academic grades suggests that uncontrolled factors in both Lowell's and Parrish and Rethlingshafer's studies reduced the correlation coefficient of a relationship which does exist. They have not refuted claims for a relationship between academic achievement and McClelland's measure of need for achievement.

Several investigators have suggested that there appears to be a complex of motives involved and that analysis of the relationship between academic achievement and motivation for achievement must give consideration to the influence of factors other than need for achievement. Applezweig et al (1956), in the study mentioned above, hypothesized that academic achievement is a function of more than one motivational variable in addition to ability. They found that students' peer groups exert a pressure to conform to their standards. When the students were classified according to the groups to which they affiliated themselves, significant differences in levels of achievement appeared between the groups.

Atkinson (1958), one of McClelland's coworkers, has acknowledged the complexity of the motivational factors which may influence academic achievement. He considers performance criteria such as academic performance to be determined by several of the individual's motives.

The approach used by McClelland and his co-workers potentially seems to offer some possibilities for the clarification of the motivational factors involved in academic performance and ultimately may allow for its application in university counseling centers.

A number of additional studies have attempted to establish the relationship between a variety of variables purported to measure or reflect motivation and academic achievement.

Attempts have been made to determine the relationship between the Need Achievement scale of the Edwards Personal Preference Schedule and academic performance. Bendig (1958) reported a correlation of .23 when the scale was correlated with average grades and Weiss et al (1959) reported a correlation of .42 with grade-point average. Thus moderate predictive ability appears in this scale.

Although Edwards measures, in a different way, a conceptual variable of need for achievement similar to McClelland's, Bendig (1957) and Weiss et al (1959) have

investigated the possibility that the two measures of need for achievement are related. Correlation studies of the relationship between Edward's and McClelland's measures have given conflicting results. Although Bendig (1957) reported that he found no correlation between the two measures ($r=.11$), Weiss et al (1959) reported the small but significant correlation of .26 and suggested that these two measures may be indices of the same thing to a small extent. It appears, however, that the two measures are only related to each other to a very small extent, if at all, and that the "need for achievement" which these authors profess to measure are not essentially the same.

Crawford (1929) noted that there is some indication that the seriousness of educational purpose is linked with academic success. When the students in his sample were grouped according to their degree of seriousness of orientation with respect to life purpose, with intelligence held constant, a hierarchy of grades appeared. The most seriously motivated students averaged the highest grades and the least seriously motivated students averaged the lowest grades.

Divesta, Woodruff, and Hertel (1949) have developed an orientation inventory which correlated .41 with college grades. The inventory reflected motivation through its expression in their behaviour. The students were requested

to select from among general statements descriptive of their behavior at university. As a practical empirical technique this inventory appears to have some use.

An additional study of the motivational differences in college students is reported by Brown, Abeles, and Iscoe (1954). Brown et al revealed differences among groups of students classified according to grades in terms of their conformity with academic requirements and their willingness to participate in several activities.

Several studies have attempted to derive a relationship between a measure of level of aspiration and academic performance. Holt (1940) could not find a relation between the discrepancy between goals established by an individual and his previous performance on the task and scholastic performance. He concluded that levels of aspiration do not reflect the degree of an individual's motivation in a task.

Schultz and Ricciuti (1954) in a similarly designed experiment using the same measure of level of aspiration were unable to find a relationship either, however, their conclusions were qualified. They concluded that the level of aspiration measure they had derived either did not reflect any meaningful motivational characteristics or those characteristics did not operate in the process of succeeding in college courses. Further work appears to be warranted on this problem.

Two studies (Crawford, 1929; Iffert, 1958) were unable to substantiate the hypothesis of a relationship between the motivation reflected in the reasons for attending university and academic achievement. Crawford (1929), in a different phase of the study mentioned above, grouped his sample according to the students' stated reasons for coming to university. No differentiation appeared between high and low achieving students. Iffert (1958) could not find a relationship between the student's ratings of reasons for going to university and the student's persistence (i.e. length of stay) in remaining in college.

Neither investigator appeared discouraged by their failure to detect any association between the variables. Iffert's study was basically exploratory and the students did not rate the reasons until they had already graduated from university. It would be expected that the students would not have any clear idea of their motivation prior to attending university after they had graduated. Iffert felt that, in terms of the experience gained in his study, a tool useful to college administrators and counselors could be developed. Crawford, on the basis of his data, felt that a questionnaire, if more carefully constructed than his, may have some selective value.

Two studies (Katz, and Allport, 1931; Greenshields, 1957) have provided analysis of the reasons why students attend university. Further investigation was not made of the influences of these reasons upon college success.

In summary, it is noted that the persistent efforts of investigators to find and measure valid relationships between a number of variables and academic achievement have shown that it is multi-determined and no one single measure will provide complete understanding and prediction of the relationship.

Among the more successful attempts to define and measure the motivational variables involved in academic achievement have been the studies by McClelland and his co-workers (the most recent account of developments has been by Atkinson, 1958). Although their attempts have been moderately successful, further revisions of their procedures and exploration appear to be needed before the techniques they have developed can be of use in applied settings. Further revision must be in terms of an analysis of the disparity between the various investigator's conclusions about the relation of this measure to performance criteria.

Of the two studies most directly relevant to the present investigation, (Crawford, 1929, and Iffert, 1958) neither has been able to substantiate the hypothesis of a

relationship between reasons for attending university and academic achievement. In spite of their negative findings, both investigators felt that inadequacies of their methods limited the possibility of their finding a relationship between the variables and that further investigation was warranted on the problem through the application of more precise techniques than they had used.

The paired comparison questionnaire as a research tool

The questionnaire, in addition to having several advantages and disadvantages, has been a useful tool for psychological measurement in the past. Although it has not been used judiciously in some instances and has been subject to criticism as a psychological technique, the questionnaire can be a useful tool if the purpose for which it is to serve has been carefully selected and defined; if it is constructed and administered in an objective manner; and if the data obtained from it is analysed in terms of its limitations (Katz et al, 1931).

A questionnaire in the form of paired comparisons was selected for use in this study. The technique of paired comparisons has a number of advantages which must be considered in its construction, administration, and in the analysis of the data obtained. Since this technique was

selected as being appropriate for this investigation early in the study, methodological considerations have been limited to its use.

The device has been traditionally used to scale stimuli according to the hypothesized psychological absolute continuum of some attribute (Guilford, 1954; Edwards, 1957a; Torgerson, 1958). The use of the technique in the present study deviates from the usual application in that there is not necessarily a continuum of the reasons for attending university on which all students can be placed. The basic premise in this study is that a continuum of reasons for behavior exists for each individual according to the extent to which the student perceives a reason was influential in determining his decision to attend university. Each student will, therefore, rank the reasons according to his perception of their importance to him.

The rank order is obtained through the method of paired comparisons by having every item in turn serve as a standard to which each of the others is compared. This allows for maximal discrimination in the ordering of the items on the basis of judgments. In other methods of rank ordering (ranking, single stimulus rating, sorting into successive intervals (Torgerson, 1958)) the subjects may not take into consideration the merits of all the items since they are not forced to do so.

A further advantage of the technique is noted in the fact that where the number of items is relatively large, the method of paired comparisons reduces the error that may occur due to the inability of the subjects to perceive all the items at once.

An additional advantage is noted in the fact that the rank orders which are obtained are susceptible to statistical treatment. A number of hypotheses may, therefore, be treated at an objective and precise level.

There are, however, distinct limitations to the use of this technique. Thurstone (1948) has pointed out that error may be introduced through variation in the attributes of the stimuli other than the variable under consideration. Self-ascribed reasons for attending university have many attributes other than that which is directly related to motivation for achievement.

One such attribute of importance in the present study is that attribute of the reasons which Edwards has named the "social desirability variable" and describes as;

the tendency of subjects to attribute to themselves, in self description, personality statements with socially desirable scale values and to reject those with socially undesirable scale values (Edwards, 1957b, p. vi).

It was recognized that the students' reasons for attending university would vary considerably in the degree

to which they are socially acceptable to the students. Rank orders obtained through the method of paired comparisons would be based, therefore, not only upon the importance of the reasons as factors determining decisions to attend university but upon how the students would perceive the reasons in the questionnaire to be socially acceptable reasons for attending university.

Although Edwards reports several techniques which have been devised to eliminate the effects of this variable, the paired comparison technique does not allow these influences upon the data to be reduced. Thus, consideration of this factor must be given in the analysis of data in which it may have an influence.

An additional limitation to the paired comparison technique is that the individual does not have complete freedom of expression. Reasons which may be of high importance to the individual may not be included in the questionnaire's construction. The rank order of the individual's motives may not be completely descriptive of his behavior. Consideration of this factor must be given in the construction of the questionnaire to include as comprehensive and complete a series of reasons as possible.

In spite of these limitations, the paired comparison technique provides the most exact method of ranking the

students stated reasons for attending university and therefore was the most suitable technique for the present study.

CHAPTER III

DERIVING THE PRINCIPAL REASONS

The initial problem was to determine empirically the principal reasons which students will claim as being factors influencing their decisions to enroll at university. Students subscribe to, and attribute to others, a large variety and number of different reasons. This section of the study was designed to ascertain, as comprehensively as possible, the full range of these reasons, and to resolve them according to their common features into a small number of representative reasons. These principal reasons were then used as the basis for the construction of a paired comparison questionnaire (See chapter IV).

In order to determine the principal reasons for attending university, a sample of first year students was surveyed. The responses of these students were classified according to the common features which appeared in them and a number of reasons representative of all the students' responses were developed.

I. PROCEDURE

A preliminary questionnaire was constructed to be administered to a sample of first year students requesting

that they give as accurately as possible the reasons why they felt that (a) students in general, (b) an intimate friend, and (c) they themselves came to university (See Appendix A). The questions the students were requested to answer were as follows:

1. Give the reasons why you feel that students in general come to university. List form is suggested.
2. Why do you think a very close friend of yours came to university? Think of an intimate friend specifically and write down his faculty and year along with the reason.
3. As accurately as possible, give your reason(s) for coming to university.

Questions one and two were given in order to ensure that the students would give as many reasons as possible. The possibility existed that the students would not be willing to express some of their reasons or would not recognize others as being descriptive of their behavior. The faculty and year of the student's intimate friend were requested to ensure that a specific friend was thought of.

Pre-testing the preliminary questionnaire

The preliminary questionnaire was initially administered to a sample of ten male first year Arts and Science students to check the instructions and questions for ambiguities; to see if the students would be willing to respond to the questions; and to ascertain whether the responses would be susceptible to reduction to a number of representative

reasons according to their common elements.

The pre-testing indicated that problems were not likely to be encountered when the preliminary questionnaire was given to the larger sample. The students were cooperative and the questionnaire did not need any additional instructions or clarification. The students volunteered an average of 4.2 reasons on the first question, 2.6 on the second, and 3.6 on the third. Their responses offered such variety that of the 104 reasons they gave, six appeared to be distinct reasons. A rough classification of these reasons, however, indicated that there was sufficient similarity among them to warrant their classification into a reduced number of reasons.

Administration

The preliminary questionnaires were administered to 133 students while they were in class during the month of February. Complete instructions for filling in the questionnaire were given verbally to make certain the students understood. Their cooperation was requested.

The students' names were not requested and they were advised that their responses would be kept confidential to allow them complete freedom of response.

Selection of the sample

The subjects were all first year University students and enrolled at the university for the first time in September, 1959.

With the exception of those enrolled in the Faculties of Education and Agriculture, all undergraduates are required to complete the first year in Arts and Science before they will be admitted into their preferred faculties. Since only 37 of the 2712 first year students were enrolled in the Faculty of Agriculture, it was decided not to include them. However, the 417 students enrolled in the first year in the Faculty of Education represented such a considerable proportion of the total first year students that a portion of them was included.

Therefore, a sample of 133 students was selected from among the first year students in the Faculty of Arts and Science and the Faculty of Education. The sample included 16 female and 4 male first year students enrolled in the Faculty of Education taking a course in educational methods and assigned to this course on a random basis, and 48 female and 65 male first year students enrolled in the Faculty of Arts and Science taking a course in introductory psychology.

Since only two-thirds of the students in first year Arts and Science are enrolled in this course, the sample does not include representatives from the remainder and, therefore, bias may have resulted. Most of these are probably Science majors and it is not known to what extent the lack of representatives from this group may have biased the findings.

It was expected that the sample would provide a wide variety of stated reasons for attending university.

Classification of the reasons

The students' responses were classified and grouped according to their common features. Each of the student's reasons was typed upon a separate card to facilitate classification.

The primary consideration during the classification was that the number of principal reasons must be limited in order to make the paired comparison questionnaire of reasonable length. Since several reasons were unique and highly individual reasons for attending university, they could not be categorized separately if the number of principal reasons was to be limited. They were classified, however, according to the principal reason to which they were most nearly related.

In addition, the principal reasons decided upon had to be as distinct from each other as possible. Minimal vagueness of meaning or ambiguity should exist within each individual principal reasons or between the principal reasons when compared with each other.

It was recognized that the classification of the reasons was subject to distortion due to the investigator's preconceptions of what the principal reasons should be. To provide a check for the reliability of the distribution, a graduate student in Psychology was provided with the principal reasons which had been resolved and requested to classify independently each of the students' reasons under them. The percentage of agreement between the two classifications was regarded as a measure of reliability.

Disagreement between the two classifications was discussed and the reasons for this disagreement were clarified.

II. RESULTS OF THE PRELIMINARY QUESTIONNAIRE

The 133 students who completed the preliminary questionnaire identified approximately 1640 factors which influenced their decisions to attend university--742 reasons why students in general came, 398 reasons why intimate friends came, and 504 reasons why they came. Elimination

of repetitions reduced the number to 247 separate reasons.

Classification according to the similarities gave the following fifteen principal reasons. They are expressed in the form of "I came to university because:" since this was the form desired for the construction of the paired comparison questionnaire. Appendix B lists the students' reasons classified according to the principal reasons.

I came to university because:

1. It will provide me with security for the future.
2. It will give me greater social prestige and status.
3. It provides an opportunity for well rounded personality development.
4. I received encouragement or strong pressure from family, friends or others.
5. It will provide opportunities for intellectual development and satisfaction of my intellectual curiosity.
6. My preferred profession requires a University education.
7. It may provide me with a better job in terms of salary, personal satisfaction, and opportunity for advancement.
8. It will enable me to be of more help and service to others.
9. I wanted to explore various fields in order to decide upon a profession and future plans.

10. I wanted a change from my home community and to assume some independence.
11. I didn't feel that I was ready to, or wanted to, start working.
12. I wanted to remain with my old friends.
13. It provides opportunities to meet different people and make new friends.
14. It provides many opportunities for participation in social and athletic activities.
15. It provides an opportunity to meet a marriage partner.

Consideration was given to the extent to which the reasons descriptive of the formulated principal reasons were subscribed to by the students themselves. In general, all of the derived reasons were attributed to themselves by a number of the students. In addition, both sexes indicated all of these principal reasons.

Results of the classification by the independent observer indicated that there was substantial reliability in this distribution. Eighty-nine percent of the students' reasons were distributed in agreement with the original classification. Discussion of the disagreements revealed that they were generally due to ambiguities in the students' reasons. Those which were not classified similarly generally

had double meanings and could have been placed in more than one category. Thus, these 15 principal reasons were accepted as being the most influential in forming decisions to attend University.

CHAPTER IV

CONSTRUCTION OF THE PAIRED COMPARISON QUESTIONNAIRE

The paired comparison questionnaire was developed to provide an objective technique whereby students might rank order the importance of their reasons for attending University. The paired comparison questionnaire achieves this by totalling the frequency of choice for each principal reason.

Standard procedures (Torgerson, 1958; Ross, 1934, 1939) were followed in the construction of the questionnaire. Several criteria have been established (Ross, 1934, 1939) for the optimal order in the presentation of the pairs to the subjects in order to avoid bias which may result from grouping or patterning the items. The general scheme presented by Ross (1934, 1939) has been followed. His criteria were followed so that each principal reason appeared equally often and was alternated in first and second position in the pairs as far as conditions permitted, and each principal reason was spread as far apart in the pairs as possible before appearing again. See Appendix C for the order of the principal reasons in the pairs.

Each principal reason was paired with each other giving 105 pairs ($N(N-1)/2$) of principal reasons for attending university. The order of pairing and the consecutive order of the pairs on the questionnaire were followed as specified by Ross's technique. International Business Machine forms, No. 255, were used as answer sheets. Instructions provided for the student to indicate their choice on the answer sheet by making a heavy black mark in the column corresponding to the principal reason in each pair of statements which they felt came closest to indicating their reason for coming to university. Since it was recognized that there might not be a plausible choice for each student in each pair, they were further requested to make the choice even though they felt that either reason might not strictly apply to them. The complete paired comparison questionnaire appears in Appendix D.

Pre-testing the paired comparison questionnaire

To evaluate the completed questionnaire in terms of ambiguity of the instructions and questions, and to determine the extent to which students would be willing to respond to the questionnaire, a pre-testing of the paired comparison questionnaire was undertaken.

The questionnaire was administered to eight male students from the Faculty of Arts and Science. They were requested to fill out the questionnaire according to the instructions and were left alone until finished.

Discussion of the questionnaire after it had been completed revealed that the students had no difficulty in understanding the instructions and in following them to complete the questionnaire. Moreover, the students did not discern any lack of clarity or ambiguity in the statements of the principal reasons. They did not express any concern about divulging the information which was required, and in no instance did they block in coming to a decision over any of the pairs. In addition, the pilot study disclosed that the students required approximately thirty-five minutes to complete the questionnaire, a not unreasonable demand to make upon the students' time.

There seemed to be, therefore, sufficient evidence to conclude that the items were, on the whole, clear and specific in their content and phrasing, and that the students would be willing to complete the paired comparison questionnaire according to the instructions.

CHAPTER V

ADMINISTRATION AND ANALYSIS OF THE PAIRED COMPARISON QUESTIONNAIRE

The purpose of this study was to assess the degree of association between academic achievement and an indication of the student's motivation for attending university. Rank orders of the principal reasons for attending university according to responses on the paired comparison questionnaire were utilized to represent indicators of motivation. Academic achievement was represented by average grades obtained on examinations at the end of the first term.

Since this study was designed to determine the relationship between a non-intellective variable and academic achievement, the influence of aptitude factors had to be controlled. The sample was restricted, therefore, to a group of students of relatively common intellectual ability according to total scores on the Cooperative School and College Ability Test (SCAT). This test is administered to all first year students who report to the University Personnel Office for guidance. All first year students are requested to do so at the beginning of the year, although all students do not comply with this request.

The validity of the measure of academic achievement

Prediction from the measure of motivation to academic achievement is restricted by the validity of the measure of achievement selected. At the time this study was conducted there were no objective data available to support the assumption that first term grades are valid estimates of subsequent academic performance. Correlation of first term grades with final examination grades would have made possible such a test of validity but the final grades were not yet available.

However, several considerations led to the selection of first term grades as the measure of academic achievement. The establishment of new goals and concepts of university after the student has had an opportunity to examine it objectively and experience university life may change the students' motivational patterns. Because of the close temporal relationship between first term grades and the student's initial enrolment, they are the single index of achievement most likely to be related to his motivation at that time. Additional justification for the use of first term grades was the fact that the grades on first term examinations are generally included as a portion of the final grades in most courses.

Therefore, on the basis of these considerations, the students' grades on examinations given at the end of the first term were selected as the measure of academic achievement.

Selection of the subjects

All students who completed the SCAT, scoring in the middle one-tenth of ability range (C_{45} to C_{55}) according to total raw scores (74 to 78¹) on the SCAT, and meeting the following qualifications were initially selected as the group to whom the paired comparison questionnaire would be administered.

Students were selected only from the Faculty of Arts and Science. In order to ensure as common an educational background as possible, subjects had to have attended an English-speaking high school. To maintain a relatively constant level of difficulty in the course content the students had selected for their years work, students must have been enrolled in at least 15 units during the 1959-60 session and have written at least four examinations at the end of the first term. One hundred and ninety students fulfilled the above qualifications.

¹Based upon norms developed on the 1959-60 first year students at the University of British Columbia. See Appendix E.

The investigator was unable to contact 16 students and an additional 11 students either refused to volunteer or did not report for their appointments.

Thus the questionnaire was administered to 163 (56 females and 107 males) of 190 students initially meeting the established criteria for selection.

Since only 75% of the 2128 first year students enrolled in the Faculty of Arts and Science completed the SCAT, the sample was not composed of all first year students in this Faculty.

Procedure

The students selected for the sample were contacted by telephone and requested to volunteer to fill out a questionnaire for the investigator. Appointments were made at times convenient for the subjects.

The paired comparison questionnaires were administered to the students in groups of from one to eight. Instructions were read to the subjects and their cooperation in filling out the form as completely and as accurately as possible was requested. The subjects were kept naive as to the purpose of this study and were led to believe that the study was simply investigating the students' reasons for coming to university.

Answer forms for the paired comparison questionnaire were scored upon an International Test Scoring Machine. Answer forms with discrepancies in their total score (frequency of responses had to total 105 on all the answer forms) were rescored by hand to eliminate error due to scoring unreliability.

Examination grades were made available by the University Personnel Office. Average grades were computed for each individual.

Analysis of the data

For purposes of analysis and testing the hypothesis of a relationship between the motivation measure and academic achievement, the sample was divided into various kinds of subgroups:

1. The sample was divided into two groups at the median average grade.
2. To avoid the possibility that the rank orders of the individuals whose average grades were near the median were reducing the significance of differences between high achieving students and low achieving students, two subgroups of extreme achievement were drawn from the sample; an honours group (average grades of 65% or better) and a failure group (average grades less than 50%).

3. The possibility existed that a failure to disclose a relationship between academic achievement and the motivation for attending university for the total sample could be attributed to sex differences in the rankings of the principal reasons. The sample, therefore, was divided into male and female groups to determine whether significant differences existed between the rankings of their reasons for attending university.

4. To provide an additional check on the possibility that sex differences may account for any failure to discover differences in motivation among groups classified according to grades in the total sample, all males were drawn from the sample and divided into an honours group (average grades of 65% or better) and a failure group (average grades of less than 50%)

The hypothesis that differences in academic performance between the subgroups in the pairs were associated with differences in average rankings of the principal reasons of the subgroups was tested. The hypothesis tested where the sample had been divided into males and females was that differences in the average rankings between the two subgroups would be significant. The average rankings for the subgroups were obtained by computing the mean of the ranks assigned to each of the principal reasons by the members of

the subgroups and ranking these. The test for the significance of differences between the average rankings was calculated according to procedures developed by White (1952).

The reliabilities of the average rank orders as estimates of each individual's rank order in the subgroups were calculated for each of the subgroups (Edwards, 1954).

In addition, the coefficient of concordance (Kendall, 1955) was calculated on each subgroup to determine the extent to which members of the groups agreed in their comparative judgments. It was felt that this coefficient of concordance would provide an estimate of the extent to which the groups were responding to some cultural stereotype (perhaps the social desirability value of each principal reason).

Corrections for inconsistencies of judgments were made throughout the analysis in all statistical techniques requiring them (Edwards, 1954). Inconsistencies appeared where circular triads were present. The students chose a first principal reason over another, and then after choosing the second over a third, chose the third over the first. Errors in judgment, therefore, appeared.

Since each principal reason was expected to be indicative of some motivation towards academic achievement or a lack of it, the possibility existed that the rank assigned to each of the principal reasons by the individual would indicate the

student's motivation for academic achievement.

Further analysis, therefore, was conducted to test if the predominance of any principal reason in each student's ranking was related to his level of academic achievement. Subjects were assigned to one of three groups according to the rank they assigned to each principal reason and the analysis of variance was computed upon the means of their average grades to determine if the three groups differed significantly in their grades.

The analysis of variance in the means of the students' grades was computed for the individual principal reason to test if the predominance of any principal reason in the students' rankings was related to their level of academic achievement. Significance tests were computed for the F values.

The students were arbitrarily assigned to one of three groups for each principal reason according to the rank assigned to each. Principal reasons ranked from position 1 to 4.5¹ were considered as of importance to the student, those assigned the ranks of 5 to 9.5 were considered as of medium importance, and those assigned the ranks of 10 to 15 were considered as having no influence on the student's behavior according to his perception.

¹Tied ranks received the mean of the ranks ordinarily assigned to them.

CHAPTER VI

RESULTS OF THE PAIRED COMPARISON QUESTIONNAIRE

Analysis was conducted on the data from the paired comparison questionnaire to test the hypothesis that differences in academic performance among the students were associated with differences in the rank orders of the fifteen principal reasons for attending university. The sample was divided into various pairs of subgroups according to differences in academic grades and differences in sex and the pairs were examined for differences between the subgroups in them. In addition, analysis was conducted to test if the predominance of any principal reason in each student's ranking was related to his level of academic achievement.

The results of the tests for the significance of the differences between the average rank orders of the principal reasons for the various subgroups and the results of the analysis of variance are presented below. The results of the analysis of the four pairs of subgroups follows the same order as in the preceding chapter.

1. The average rank order of the group classified above the median in grades was found not to differ significantly from the average rank order of the group classified below

the median according to grades. The mean rank order for each individual principal reason and the ranks of these means for these subgroups are given in Table 1.

Table 1

2. Differences between the average rank orders of the honours group and the failure group were found not to be significant. Therefore, differences in average rankings for the subgroups did not appear to be associated with differences in average grades. Mean rank orders of the principal reasons and the rank of these means for these subgroups are given in Table 2.

Table 2

3. Significant differences were not disclosed between the average rank orders of the males and the females. The average rank orders did not seem to differ significantly between the sexes. The mean rank order for each individual principal reason and the ranks of these means for each subgroup are given in Table 3.

Table 3

TABLE 1

Mean Rank Orders of the Principal Reasons and
the Rank of these Means for Subgroups of
Students Above and Below the Median

Principal Reasons *	All subjects above median in grades (N=80)		All subjects below median in grades (N=83)	
	Mean	Rank	Mean	Rank
1	4.92	3	4.21	2
2	11.11	13	11.10	13
3	6.51	6	7.07	7
4	9.03	9	8.05	9
5	5.26	5	5.44	5
6	3.87	2	5.17	3
7	3.86	1	3.61	1
8	7.85	8	7.57	8
9	4.98	4	5.40	4
10	10.38	12	9.64	11
11	9.24	10	9.61	10
12	13.03	15	12.84	14
13	7.32	7	7.04	6
14	9.87	11	9.84	12
15	12.76	14	13.33	15

* Numbers refer to the listing on pp. 28-29 and in Appendix B.

TABLE 2

Mean Rank Orders of the Principal Reasons and
the Rank of these Means for Subgroups of
Honours and Failure Students

Principal Reasons *	Failure students (N=59)		Honours students (N=30)	
	Mean	Rank	Mean	Rank
1	4.41	2	5.32	5
2	10.94	13	11.32	13
3	7.01	7	6.88	6
4	8.25	9	9.27	9
5	5.05	3	4.80	4
6	5.23	4	3.90	1
7	3.55	1	4.07	2
8	7.44	8	7.95	8
9	5.59	5	4.40	3
10	9.28	10	10.60	12
11	10.30	12	9.33	10
12	13.14	14	12.53	14
13	6.95	6	6.91	7
14	9.45	11	9.37	11
15	13.30	15	13.28	15

*Numbers refer to the listing on pp. 28-29 and in Appendix B.

TABLE 3

Mean Rank Orders of the Principal Reasons and
the Rank of these Means for Subgroups of
Male and Female Students

Principal Reason *	Male students (N=107)		Female students (N=56)	
	Mean	Rank	Mean	Rank
1	3.88	2	5.85	5
2	10.51	13	12.22	14
3	7.36	6	5.76	4
4	8.88	9	7.86	9
5	5.21	5	5.62	3
6	4.09	3	5.38	1
7	2.79	1	5.53	2
8	8.33	8	6.51	8
9	4.73	4	6.06	7
10	10.36	12	9.30	11
11	9.92	11	8.48	10
12	12.86	14	13.06	15
13	7.83	7	5.92	6
14	9.66	10	10.22	12
15	13.51	15	12.16	13

*Numbers refer to the listing on pp. 28-29 and in Appendix B.

4. The test for the significance of differences between the average rank orders of the male honours group and the male failure group failed to reveal any significant differences. Mean rank orders of the principal reasons and the rank of these means for these subgroups are given in Table 4.

Table 4

The average rankings of the principal reasons for the subgroups were found to be highly reliable estimates of the individual rank orders in the subgroups. The coefficients of reliability for each of the subgroups are summarized in Table 5.

In addition, the coefficients of concordance were significant in all groups indicating a high degree of agreement among the members of the subgroups in their comparative judgments. These coefficients are also summarized in Table 5.

Table 5

With the exception of two cases, the analysis of variance in the means of the average grades did not reveal any

TABLE 4

Mean Rank Orders of the Principal Reasons and the Rank of these Means for Subgroups of Male Honours Students and Male Failure Students.

Principal Reason *	Male honours students (N=20)		Male failure students (N=42)	
	Mean	Rank	Mean	Rank
1	3.95	3	3.69	2
2	10.85	12	10.56	12
3	7.65	6.5	7.61	6
4	9.35	9	8.06	9
5	4.74	5	4.96	4
6	3.28	1	4.28	3
7	3.38	2	2.78	1
8	8.75	8	7.94	8
9	4.35	4	5.54	5
10	11.30	13	9.69	11
11	9.72	11	11.82	13
12	12.00	14	13.12	14
13	7.65	6.5	7.77	7
14	9.42	10	9.39	10
15	13.50	15	13.63	15

*Numbers refer to the listing on pp. 28-29 and in Appendix B.

TABLE 5

The Reliability of the Mean Rank Orders as
 Estimates of the Individual Rank Orders
 in the Subgroups and the Coefficients
 of Concordance

Subgroups	r_{xx}	W
All above median	.98	.48
All below median	.98	.45
Honours students	.96	.48
Failure students	.97	.45
Males	.98	.54
Females	.95	.38
Male honours	.98	.55
Male failures	.98	.54

statistically significant differences in average grades amongst the three classifications of students grouped according to their assigned rank on each principal reason--important, medium importance, no perceived influence on their behavior. The computed F values for the principal reasons are summarized in Table 6. (See pp. 28-29 for the principal reasons).

Table 6

Attending university because it is required for the student's preferred future profession (#6) appears to differentiate students according to grades with the superior student ascribing it to himself more often than the under-achieving student. The F value for principal reason 6 equaled 5.78, significant at the .01 level.

The extremely high F value for principal reason 12 has been attributed to sampling error. Only one student rated this principal reason as of high importance to him. In addition, this student's average grade was highly atypical. These factors compounded to give the unusually high F value. Inspection of the data yields no evidence to support a claim that this principal reason differentiates students according to grades.

TABLE 6

Analysis of Variance in Means of the Average
 Grades of Students Classified into Groups
 According to their Ranks assigned to
 Each Principal Reason

Principal Reason	F	Principal Reason	F
1	.14	9	.07
2	1.28	10	2.40
3	.19	11	1.45
4	.44	12	31.86 ^a
5	.12	13	.97
6	5.78 [#]	14	1.33
7	.56	15	.77
8	1.13		

[#]Significant at the .01 level.

^aSignificance attributed to sampling error.

CHAPTER VII

DISCUSSION AND CONCLUDING REMARKS

The hypothesis that the motivation expressed in the students' reasons for coming to university is related to academic achievement has received only limited support in the data of this study. Attempts to find associations of sufficient magnitude to support the hypothesis by comparing the fifteen principal reasons developed from a sample of the students' stated reasons with the students' academic grades has met with failure with one exception. Attending university because this education is a prerequisite for the student's profession was considered to be a more important factor in influencing decisions to attend university by the superior students than by the under-achieving students.

The motivation for academic achievement appears to be related to this self-ascribed reason for behavior. It may have indicated seriousness of orientation with respect to life purpose which Crawford (1929) found to be linked with academic success. Students ranking this reason high appear to have a stronger goal orientation.

In addition, these students express a clarity in their purpose for attending university in their expression of an

orientation towards an occupational goal. This definiteness of an occupational goal would seem to indicate these students recognize the necessity of superior academic performance if their goals are to be attained.

The significance of this relationship may also be attributed, in part, to a reflection of a more generalized need for status in our highly mobile society. Successful completion of a university course and entering professional occupations are conceived to be highly desirable symbols of status in our society.

A final factor which may account for part of the relationship between this reason and academic achievement is the fact that the student who states that it is an influential factor in determining his decision to enroll at university may be expressing a long range goal whereas the other students may be oriented by short range goals. The long range goals may provide a continuous orientation towards and recognition of a continual need for superior academic achievement.

There does not appear to be any bias in the sample due to the 27 students refusing to complete the paired comparison questionnaire or failing to report for appointments. These students appear to be typical of the others in the sample insofar as their average grades are concerned. The mean average grade of these students was 54.9% whereas the mean

of the average grades of the students to whom the questionnaire was administered was 54.5%. No estimate is available of the likely performance of the students who dropped out of classes prior to the examinations.

It has been concluded, therefore, that either the motivation determining the decision to attend university is not a significant factor contributing to academic achievement or that the underlying motivation for the decision is not reflected in this paired comparison questionnaire. The second conclusion seems to be the more tenable in light of the deficiencies of the technique and in terms of the significant coefficient of concordance.

It is suggested that the coefficient of concordance may be an indication of the extent to which the students' responses were simply opinions based upon some cultural stereotype of social desirability and did not reflect the underlying motivation, although its significance may in part be due to the fact that students do attend university for highly common and similar reasons.

The significance of the one self-ascribed reason for behavior related to academic achievement may be attributed to the fact that even though it has a socially desirable value itself, the low achieving students still did not consider this to be an important reason for attending

university whereas the superior students did.

The questionnaire, in its present form without some control of the factor of social desirability present in each of the principal reasons does not have any value in differentiating between students of close to median ability as measured by the SCAT according to grades. It is suggested, however, that if its use was restricted to individual administration and interpretation, and if accompanied by a set of norms developed on the social desirability scale values of the principal reasons, the questionnaire might allow recognition of the entering student who has particularly strong motives for enrolling. Further questioning may still be needed to determine reasons for coming to university which are not included on the questionnaire. These highly individual reasons may be of great significance to the individual and have considerable influence on subsequent performance.

It has been recognized that the conclusions that have been reached have relevance to a very limited group since the study was based upon students of close to median ability. There has been no evidence provided in this study to either refute or support claims that a relationship may exist between the stated reasons for coming to university and the academic performance of students of high and low

ability. The possibility exists that these students would subscribe to entirely different reasons for attending university. Further research, therefore, may be warranted on the relationship between the self-ascribed reasons for attending university which these students subscribe to and their academic attainment.

CHAPTER VIII

SUMMARY

The primary purpose of this study was to determine the relationship between the reasons students ascribe to themselves for coming to university and their subsequent academic achievement. A positive relationship between the two variables was hypothesized. Assumption of some degree of validity of the self-ascribed reasons as measures of motivation provides a justification for the investigation which is primarily pragmatic.

In order to test the hypothesis, it was necessary to determine empirically the principal reasons that students will ascribe to themselves and attribute to others for attending university. A preliminary questionnaire was constructed requesting these reasons and administered to 133 first year students. The students' responses were classified and grouped according to similarities in order to reduce the reasons to the number required for a paired comparison questionnaire. Fifteen representative and unambiguous principal reasons were resolved.

Consideration was given to the advantages and limitations of the questionnaire method, and the questionnaire

technique using paired comparisons was felt to be the most suitable technique for the present study.

The paired comparison questionnaire was constructed and administered to 163 first year students from the Faculty of Arts and Science of close to median ability as measured by the SCAT. To test the hypothesis, students in the sample were classified into subgroups according to level of achievement and, in order to determine whether sex differences were reducing the significance of differences between subgroups on achievement, the sample was divided into male and female groups.

In addition, analysis of variance in the students' grades was computed on the individual principal reasons to test if the predominance of any principal reason for a student was related to his level of academic achievement.

Analysis of the average rank orders of the principal reasons for the different subgroups failed to indicate that differences in these rank orders between the groups classified according to level of achievement and sex were significant. With the exception of one case, the analysis of variance did not reveal any significant relationship between this measure of motivation and academic achievement. Attending university because it is considered by the students to be required for their preferred profession was considered

to be a more important factor in influencing decisions to attend university by the superior students than by the under-achieving students.

Therefore, the hypothesis that the motivation expressed in the students' responses for coming to university is related to academic achievement received only very limited support in this study. This has been attributed largely to a failure to determine the underlying motivation for the decision to attend and to indications that students' responses to the paired comparison questionnaire were based largely upon some cultural stereotype of social desirability.

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APPENDIX A

PRELIMINARY QUESTIONNAIRE ADMINISTERED TO
A SAMPLE OF FIRST YEAR STUDENTS TO OBTAIN
A LARGE AND VARIED SAMPLE OF THE REASONS
FOR COMING TO UNIVERSITY

THESIS QUESTIONNAIRE

February, 1960

Names are not requested.

Confidential.

Faculty;..... Year;..... Circle M or F

Answer the following questions as completely as possible.

Use the back of the page if needed.

1. Give the reasons why you feel that students in general come to university. List form is suggested.

2. Why do you think a very close friend of yours came to university? Think of an intimate friend specifically and write down his faculty and year along with the reason.

3. As accurately as possible, give your reason(s) for coming to university.

Thank you.

APPENDIX B

STUDENTS REASONS FOR COMING TO UNIVERSITY CLASSIFIED
ACCORDING TO THE DERIVED MOTIVES

1. It will provide me with security for the future.

I wanted security.

Security - better chance when I apply for a job.

For an education in terms of security.

I don't like working at jobs with not much future.

(related to 6 & 7).

To provide will for a wife and family in the future.

To gain knowledge so that future life may be secure.

Training in Education will help raise her children.

To get a feeling of security, pride, and superiority. (related to 2).

To gain security in the future.

To take advantage of an opportunity to make his future secure.

Looking for a secure future.

If ever needs a job again in the future after marriage, she can always get one. (related to 7).

Will be able to work after marriage to help get good start.

Want to have a good paying job to be able to rely upon, if something happens to husband, etc.

She is a singer and she wants to have some other profession in case she loses her voice or does not like singing in a few years.

Will better their lives, make their futures more secure and happy.

2. It will give me greater social prestige and status.

To put myself that much above as many other people as possible educationally i.e. an incentive not only to come to university but to successfully complete my courses.

Can't have the kind of life you want without a good education. (related to 3,5,6, & 7).

To raise myself above the socio-economic level of parents and siblings.

To be more socially acceptable.

To work towards eventually gaining authority and prestige.

Prestige of university.

Some students come to a university with the sole purpose of bragging because they are going to a university with no desire to complete a 4 year course.

He wants to get ahead in the world and realizes that the knowledge he will get at the university will enable him to achieve his goal more rapidly. (related to 6 & 7).

He figures when he gets out he will live and be associated with the better peoples of the nation (higher educated).

Gain prestige when: job hunting; living in the community.

To gain knowledge in order to be accepted by high society.

To get ahead in a specialized age and culture. (related to 5,6, & 7).

In order to be generally recognized as an "educated person".

Because it was the only thing an intelligent person should do who wishes to get ahead.

Desire to be "Collegiate". (related to 14).

For the sake of appearance in later life to say that he has attended such and such a university.

To satisfy their dreams of materialism i.e. good job, large income, large house, etc.

To prove superiority over masses.

To become more acceptable socially. (related to 3).

To gain a certain amount of prestige.

They will enjoy greater esteem in their communities due to their above-average education.

Some, I think, come out here just so that they can become the president of a number of clubs no matter how dumb they are or how much its going to cost them in tuition. (related to 14).

3. It provides an opportunity for well rounded personality development.

I felt it would be an excellent preparation for the time when I would take my place in the adult work, because I wanted to be well-informed, mature in outlook, and be able to get along with all types of people.

To improve myself - to gain confidence and so on.

To learn how to cope with many types of problems.

When I marry I want to marry an intellectual equal or better and the only way I will really feel I deserve this is by educating myself as well as possible.

I would like to obtain an education that would allow me to get more out of life, seeing things perhaps I would never see, and be able to talk intelligently with most people.

Will enable to lead a better and fuller life.

(related to 1,2,5,7 & 8).

Search for insight and understanding. (related to 5).

I believe also that three or four years of liberal education will enable me to think, write, and speak more logically and forcefully and help me to form a sounder basic philosophy for living.

To grow up, more mature.

Sophistication. (related to 2 & 5).

To develop a more rounded personality.

To enter new fields and a way of life thus enabling people to become more mature and accept responsibilities.

She hoped to broaden her understanding of people.

To broaden their scope of learning in order to become more useful individuals. (related to 8 & 5).

I want to understand problems in this world that continually puzzle me and to find some answers to questions I have always asked. I think university is the best place to find these solutions. (related to 5).

To develop mental ability for personal satisfaction.

To gain an understanding of many different types of people - race, creed, colour, etc.

To gain a critical mind.

I primarily wanted to get a good education that would enable me to enjoy my life.

To refine my personal tastes - that is, learn more about the arts.

4. I received encouragement or strong pressure from family, friends or others.

Parents were very enthusiastic about my coming.

My parents and high school teachers thought

I had enough intelligence to take on higher education.

To a certain extent, in defiance of his parents who felt he didn't need university education for the work he was going into.

Parents request or make children go because
it gives them a sense of pride to say
children have a university education.

Expected of him. Pushed by parents when really
didn't want to go. Father died and came
partly because father would have wanted him
to.

Taken for granted that they would go to univer-
sity by teachers, friends, etc. and didn't
want to disappoint them.

Everything was made easy for her: her relatives
finance her, and all she has to do is try
to make good grades.

My father achieved his degree in science at
UBC and I heard many tales about university
life which furthered my interest.

I followed the group feeling that I would need
education for further attainment in life.

Because it is "the thing to do".

Some come because the "Jones" boy or girl across
the street has gone. (related to 12 & 2).

Attended a school that had only a university
program so it was assumed from grade nine
that I would enroll.

Some due to influence on them by their class
of society.

It seemed the best thing to do.

They are able to obtain the money.

It is the tradition of the family to send their
sons and daughter to university.

Feel they should: parental and social pressures.

Mother especially wished me to gain as much
education as possible.

Recognition of the fact that a good education
is becoming a necessity and is no longer
the exception but the rule.

Parents felt that he should have an opportunity
to get a better education than they had.

She was raised to believe that it was what her
parents wanted for her and by coming she
satisfied them.

Because of high family education (all college
grads).

5. It will provide opportunities for my intellectual
development and satisfaction of my intellectual curiosity.

Sincere intellectual curiosity.

To develop your intellect for a higher than
average knowledge.

To learn as much as I can.

I wanted to increase my awareness of the world
by learning more.

To be able to express their own opinions and
get a fair chance at what is right.

Established a goal as long as can remember to
attend and complete university (related to
6 & 7).

It is merely the next step beyond finishing
high school. (related to 7 & 6).

To obtain further knowledge in a field that
a student already knows for personal gain
or satisfaction.

Because I have enjoyed school since the day I
was enrolled. (related to 14).

To understand the problems and affairs which
take place in our everchanging world.

To broaden their scope of knowledge.

Thirst for knowledge.

Many come because they feel that they will
"get cultured" --much like cottage cheese.

I have just never considered the possibility of
not coming to university. I have always
liked learning, and it seemed natural that I
should continue doing something I enjoy.

She is fitted for further mental training.

Mentality is such that it could only be gratified in a seat of higher learning. Her exceptional athletic ability coupled with her high I.Q. make inevitable the fact that she should be here. (related to 4 & 14).

To learn more than they now know.

The urge to find out new things (curiosity).

Because they have a genuine desire to learn.

Because they are interested in learning and discovery.

To widen a person's conception of the world today and how he would fit in such a world.

In order to fulfill their need of knowledge personally.

Interest in, e.g. engineering, languages, which are taught at university. (related to 6 & 7).

To acquire an education -- to learn about many varied things.

She is very smart and won several scholarships so she pretty well had to come. (related to 6).

A means of laying groundwork necessary for study out of university.

To continue studying a course that they find interesting.

She was interested in languages and university was the place where she could develop her knowledge of them.

To specialize in a field of study they feel they are interested in. (related to 6 & 7).

I went to university to get a better understanding and appreciation of the arts, especially literature as I read a lot and want to read good books.

I feel that I am presently a relatively ignorant person and the vast store of knowledge available at a university is a stimulating challenge.

Primarily, to become educated and to learn.

To secure a sound liberal education.

Because they have a curiosity about subjects which cannot be satisfied as quickly or completely elsewhere.

The reason (other was just run of mill) why she is attending university and why she would not be satisfied with a monotonous job is her intelligence, which prompts her to want to further her knowledge.

6. My preferred profession requires a University education.

Enable them to get into a certain profession
of their desire.

Profession wish to enter, requires a university
degree.

I wanted to be a teacher.

To be able to teach.

Hard to get a good job without specialized
training. (related to 7).

To work with children after graduating in edu-
cation. (related to 8).

I enjoy working with children and I feel teaching
is one of the best ways of working with them.

They desire to become a professional in a certain
field

One year is needed before one can enter into
some professions (lab. tech.).

So that I would be able to pass what I learn
on to school students.

To get into the field of work he felt himself
suited to.

Vocational choice (teaching) requires university
education.

For preparation to hold higher positions in
Nursing.

To attain specialization in their chosen field
such as Education, Engin', etc.

To obtain training in some specialized field
quite often with the objective of earning
more money when they graduate. (related to
7).

Dreamed of doing social work. (related to 8).

Can further interest developed by working with
children in summer camps by taking up educa-
tion.

I want to become a teacher because I feel that
I have something to offer in the teaching
profession.

To pursue chosen field.

Doesn't feel work in any other field will be
satisfying.

To obtain background for ones future occupation.
(related to 7).

7. It may provide me with a better job in terms of salary,
personal satisfaction, and opportunity for advancement.

To gain the knowledge necessary for the higher
income bracket.

Opportunities of advancement are better.

Preparation or training required to secure a better job (related to 6).

This friend came to university after working two years. In that time he found out just how hard it was to get anywhere without an education.

Greater personal satisfaction in work.

I could think of nothing worse than working at a routine job.

The desire to work for himself, to do things when and how he sees best.

I wanted to do something more than sit at a typewriter all day.

Was tired of swinging a hammer all day as did before. (related to 6).

Girls come because do not feel like getting married taking secretarial job. (related to 11).

To get a better education to secure better jobs with more pay.

8. It will enable me to be of more help and service to others

So she could go out and help the community.

To help others.

Felt this is the only way he could serve mankind
and obtain security at the same time. (related
to 2).

9. I wanted to explore various fields in order to decide
upon a profession and future plans.

To explore various fields for determining one's
profession.

A means of finding out what one's purpose is in
Life through a large range of electives
(courses, pastimes, etc.).

Search of a profession--not sure of which one.

Some students don't know what they want to do
so they come out here to make up their minds.

To find out if I was suited for it and had the
ability to do university work.

Will give me a good basis for my decision in
choosing my occupation.

I came to find out my likes and dislikes and
what I am good at or bad at.

Some come because they are as yet undecided as
to their future. (related to 11).

To determine whether I wished to become a teacher.

Because I didn't have a definite goal in mind
such as a nurse or stenographer and the only
other obvious place to go was university.

(related to 7).

Because I didn't know what else I wanted to do.

To decide on a vocation and master it.

They are undecided as to what they should do
if anything.

Hadn't decided upon a profession and thought
maybe one year at university would allow
him to make a decision.

To decide on future plans.

To fill in time while they are trying to decide
what to do with their lives.

When I go out to work, I won't have to be bored
with the same type of monotonous work (like
ditchdigging, house painting, etc.).

I had been working for two years and found that
I was not achieving goals that I had wished
for.

In some cases it is a stepping stone to a fairly
good job which will open opportunities for
doing other things. (a girl becoming a
teacher after 2 or 3 years, saving money -
then travelling).

To enable to command better positions in later
life than with high school.

Don't like manual or skilled labour.

She didn't want to be just any "ordinary person"
(working girl).

Very few people without a good education get
steady, well-paid jobs. (related to 1).

Want a good job and security and this is one of
the acceptable ways of doing it. (related to 7).

I want to prepare myself for an interesting job
that will ensure my independence. (related to
1).

To avail myself of a wider range of jobs.

Not interested in any work connected with com-
merce so decided to come to university.
(related to 6 & 7).

The educated are usually in a better position
to attain financial and social success.
(related to 2).

To get jobs - don't care which one - that pro-
duces good wages and not give a darn about
the society in which they live. (related to 2).

Almost a necessity to have education past grade
12 to get a decent paying job.

Am a year younger than most kids and would
just get the very minimum in salary. (related
to 11).

Salaries are higher.

Escape from many problems of the working man.
(related to 11).

To provide background for furthering career
opportunities. (related to 6).

10. I wanted a change from my home community and to assume
some independence.

Get away from home and be slightly independent.

In order to get to a bigger city.

To get away from a small town.

To a certain extent I wanted to leave home and
be independent and responsible for myself.

Came in spite of my parents--so I'll gain some
independence not dependence upon them as they
would like.

To get away from home.

In order to escape eternal parental nagging.

To get into a different way of life.

11. I didn't feel that I was ready to, or wanted to, start
working.

To have a reason for not working.

Do not accept responsibility of steady job
under employer.

No training for a specific job and didn't wish
to get married. (related to 6).

Because they don't want to leave home or their
parents yet. (related to 1).

She came because she is not mature enough to
support herself by working and is thus more
or less filling time.

I can have as much free time as I want.

To avoid manual work.

Because the person is unprepared to accept the
responsibilities of working for a living and
can find the necessary escape from reality
in a sheltered academic life.

To avoid having to go out to work for another
year.

Nothing else to do--no ambition or incentive
to get a job--attempt to forestall getting
a job for another 4 years.

Because they think it is easier than working
for a living.

Afraid to leave world of the student and become
a wage earner.

I am too immature right now to work and the
 jobs I would get are unsatisfactory (pay,
 personal accomplishment).

12. I wanted to remain with my old friends. °

Come to be with friends.

Came because her boy friend came.

13. It provides opportunities to meet different people and
 make new friends.

So she could be accepted into a new group of
 people different from her previous friends.
 (related to 2).

To meet the right people. (related to 2).

Being a new Canadian, meeting other young people
 who live here.

Opportunities of making new friends are so
 numerous here.

Want to meet different people.

To meet people who were at about the same level
 that she was wherein she could share common
 hopes and interests.

I want to share my religious convictions.

To meet people and make associations for later
 business life.

Search for intimacy - feminine companionship
 at intellectual, social and physical levels.
 (related to 2).

14. It provides many opportunities for participation in
 social and athletic activities.

To join in the activities and clubs.

To play sports.

To have a good time--e.g. - social life revolving
 around fraternities - varsity functions,
 girls, etc.

To have a social life--a ball.

Expect a well-rounded social life.

Heard a lot about it and all the activities so
 they want to try out university life.

Want to get in on the varied social life here.

Social life: now and later.

Some come just to see what it is like.

I was too young to go to a hospital for nurses
 training. (related to 11).

Some people come out just to have something to
 do--they're not really interested in learning
 at all. (related to 11).

To join fraternities and sororities.

University life is a real experience in itself.

Some are entering professions (e.g. nursing)
 where there is an age limit or a waiting list
 so they came to fill in time while waiting.
 (related 11).

To experience university life--clubs, debates,
 etc.

I wanted to go for the new people, new events
 that take place, and many new things and types
 you are introduced to. Desire to be "collegiate".
 I am very interested in sports and would probably
 have had to give them up if I hadn't come to
 university.

15. It provides an opportunity to meet a marriage partner.

Girls come to, at least, keep their eyes open
 for a likely prospect for a husband.

To find a marriage partner.

Mostly the female students come to the university
 just to spend their time, because this is an
 easy life, can get together with the boys,
 and later find a husband and be married.
 (related to 14).

To get a husband/or wife.

Husband hunting.

The following were not classified because of their humorous quality.

To get a fraternity man and if not, twenty ordinaries to compensate. To be able to express the extent of her assets to a much larger body of people.

Boys to see if they can get a much better looking girl considering how many are out here.

To get a taste of poor food.

He had a chance to play for the B.C. Lions but could not do so without a first year university education, and without playing for the Thunderbirds first.

APPENDIX C

ORDER OF THE 15 PRINCIPAL REASONS IN THE 105 ITEMS
ON THE PAIRED COMPARISON QUESTIONNAIRE

Principal ¹		Principal		Principal	
Item	Reasons	Item	Reasons	Item	Reasons
1	1 - 2	36	9 - 13	71	4 - 9
2	3 - 15	37	10 - 12	72	3 - 10
3	4 - 14	38	11 - 1 *	73	2 - 11
4	5 - 13	39	4 - 5	74	15 - 12
5	6 - 12	40	3 - 6	75	14 - 13
6	7 - 11	41	2 - 7	76	1 - 7 *
7	8 - 10	42	15 - 8	77	8 - 6
8	9 - 1	43	14 - 9	78	9 - 5
9	2 - 3	44	13 - 10	79	10 - 4
10	15 - 4	45	12 - 11	80	11 - 3
11	14 - 5	46	1 - 5 *	81	12 - 2
12	13 - 6	47	6 - 4	82	13 - 15
13	12 - 7	48	7 - 3	83	14 - 1 *
14	11 - 8	49	8 - 2	84	7 - 8
15	10 - 9	50	9 - 15	85	6 - 9
16	1 - 3 *	51	10 - 14	86	5 - 10
17	4 - 2	52	11 - 13	87	4 - 11
18	5 - 15	53	12 - 1 *	88	3 - 12
19	6 - 14	54	5 - 6	89	2 - 13
20	7 - 13	55	4 - 7	90	15 - 14
21	8 - 12	56	3 - 8	91	1 - 8 *
22	9 - 11	57	2 - 9	92	9 - 7
23	10 - 1 *	58	15 - 10	93	10 - 6
24	3 - 4	59	14 - 11	94	11 - 5
25	2 - 5	60	13 - 12 *	95	12 - 4
26	15 - 6	61	1 - 6	96	13 - 3
27	14 - 7	62	7 - 5	97	14 - 2
28	13 - 8	63	8 - 4	98	15 - 1 *
29	12 - 9	64	9 - 3	99	8 - 9
30	11 - 10	65	10 - 2	100	7 - 10
31	1 - 4 *	66	11 - 15	101	6 - 11
32	5 - 3	67	12 - 14	102	5 - 12
33	6 - 2	68	13 - 1 *	103	4 - 13
34	7 - 15	69	6 - 7	104	3 - 14
35	8 - 14	70	5 - 8	105	2 - 15

* Space errors (12). Defined by Ross (1939) as those errors occurring when an item fails to alternate between first and second place in the pairs.

¹ See pages 28-29 for a listing of the principal reasons.

APPENDIX D

THE PAIRED COMPARISON QUESTIONNAIRE

Indicate on the answer sheet which statement in each of the following pairs of statements comes closest to indicating your reasons for coming to university, even though you feel it may not strictly apply to you.

Make a heavy black pencil mark under either 1 or 2 for each item.

All responses will be kept strictly CONFIDENTIAL

"I CAME TO UNIVERSITY BECAUSE:

1. (1) It will provide me with security for the future.
(2) It will give me greater social prestige and status.
2. (1) It provides an opportunity for well rounded personality development.
(2) It provides an opportunity to meet a marriage partner.
3. (1) I received encouragement or strong pressure from family, friends or others.
(2) It provides many opportunities for participation in social and athletic activities.
4. (1) It will provide opportunities for my intellectual development and satisfaction of my intellectual curiosity.
(2) It provides opportunities to meet different people and make new friends.
5. (1) My preferred profession requires a university education
(2) I wanted to remain with my old friends.
6. (1) It may provide me with a better job in terms of salary, personal satisfaction, and opportunity for advancement.
(2) I didn't feel that I was ready to, or wanted to start working.
7. (1) It will enable me to be of more help and service to others.
(2) I wanted a change from my home community and to assume some independence.
8. (1) I wanted to explore various fields in order to decide upon a profession and future plans.
(2) It will provide me with security for the future.
9. (1) It will give me greater social prestige and status.
(2) It provides an opportunity for well rounded personality development.
10. (1) It provides an opportunity to meet a marriage partner.
(2) I received encouragement or strong pressure from family, friends or others.
11. (1) It provides many opportunities for participation in social and athletic activities.
(2) It will provide opportunities for my intellectual development and satisfaction of my intellectual curiosity.
12. (1) It provides opportunities to meet different people and make new friends.
(2) My preferred profession requires a university education.

13. (1) I wanted to remain with my old friends.
(2) It may provide me with a better job in terms of salary, personal satisfaction, and opportunity for advancement.
14. (1) I didn't feel that I was ready to, or wanted to start working.
(2) It will enable me to be of more help and service to others.
15. (1) I wanted a change from my home community and to assume some independence.
(2) I wanted to explore various fields in order to decide upon a profession and future plans.
16. (1) It will provide me with security for the future.
(2) It provides an opportunity for well rounded personality development.
17. (1) I received encouragement or strong pressure from family, friends or others.
(2) It will give me greater social prestige and status.
18. (1) It will provide opportunities for my intellectual development and satisfaction of my intellectual curiosity.
(2) It provides an opportunity to meet a marriage partner.
19. (1) My preferred profession requires a University education.
(2) It provides many opportunities for participation in social and athletic activities.
20. (1) It may provide me with a better job in terms of salary, personal satisfaction, and opportunity for advancement.
(2) It provides opportunities to meet different people and make new friends.
21. (1) It will enable me to be of more help and service to others.
(2) I wanted to remain with my old friends.
22. (1) I wanted to explore various fields in order to decide upon a profession and future plans.
(2) I didn't feel that I was ready to, or wanted to start working.
23. (1) I wanted a change from my home community and to assume some independence.
(2) It will provide me with security for the future.
24. (1) It provides an opportunity for well rounded personality development.
(2) I received encouragement or strong pressure from family, friends or others.
25. (1) It will give me greater social prestige and status.
(2) It will provide opportunities for my intellectual development and satisfaction of my intellectual curiosity.
26. (1) It provides an opportunity to meet a marriage partner.
(2) My preferred profession requires a University education.
27. (1) It provides many opportunities for participation in social and athletic activities.
(2) It may provide me with a better job in terms of salary, personal satisfaction, and opportunity for advancement.

- 28. (1) It provides opportunities to meet different people and make new friends.
(2) It will enable me to be of more help and service to others.
- 29. (1) I wanted to remain with my old friends.
(2) I wanted to explore various fields in order to decide upon a profession and future plans.
- 30. (1) I didn't feel that I was ready to, or wanted to start working.
(2) I wanted a change from my home community and to assume some independence.
- 31. (1) It will provide me with security for the future.
(2) I received encouragement or strong pressure from family, friends or others.
- 32. (1) It will provide opportunities for my intellectual development and satisfaction of my intellectual curiosity.
(2) It provides an opportunity for well rounded personality development.
- 33. (1) My preferred profession requires a University education.
(2) It will give me greater social prestige and status.
- 34. (1) It may provide me with a better job in terms of salary, personal satisfaction, and opportunity for advancement.
(2) It provides an opportunity to meet a marriage partner.
- 35. (1) It will enable me to be of more help and service to others.
(2) It provides many opportunities for participation in social and athletic activities.
- 36. (1) I wanted to explore various fields in order to decide upon a profession and future plans.
(2) It provides opportunities to meet different people and make new friends.
- 37. (1) I wanted a change from my home community and to assume some independence.
(2) I wanted to remain with my old friends.
- 38. (1) I didn't feel that I was ready to, or wanted to start working.
(2) It will provide me with security for the future.
- 39. (1) I received encouragement or strong pressure from family, friends or others.
(2) It will provide opportunities for my intellectual development and satisfaction of my intellectual curiosity.
- 40. (1) It provides an opportunity for well rounded personality development.
(2) My preferred profession requires a University education.
- 41. (1) It will give me greater social prestige and status.
(2) It may provide me with a better job in terms of salary, personal satisfaction, and opportunity for advancement.
- 42. (1) It provides an opportunity to meet a marriage partner.
(2) It will enable me to be of more help and service to others.

43. (1) It provides many opportunities for participation in social and athletic activities.
(2) I wanted to explore various fields in order to decide upon a profession and future plans.
44. (1) It provides many opportunities for participation in social and athletic activities.
(2) I wanted a change from my home community and to assume some independence.
45. (1) I wanted to remain with my old friends.
(2) I didn't feel that I was ready to, or wanted to start working.
46. (1) It will provide me with security for the future.
(2) It will provide opportunities for my intellectual development and satisfaction of my intellectual curiosity.
47. (1) My preferred profession requires a University education.
(2) I received encouragement or strong pressure from family, friends or others.
48. (1) It may provide me with a better job in terms of salary, personal satisfaction, and opportunity for advancement.
(2) It provides an opportunity for well rounded personality development.
49. (1) It will enable me to be of more help and service to others.
(2) It will give me greater social prestige and status.
50. (1) I wanted to explore various fields in order to decide upon a profession and future plans.
(2) It provides an opportunity to meet a marriage partner.
51. (1) I wanted a change from my home community and to assume some independence.
(2) It provides many opportunities for participation in social and athletic activities.
52. (1) I didn't feel that I was ready to, or wanted to start working.
(2) It provides opportunities to meet different people and make new friends.
53. (1) I wanted to remain with my old friends.
(2) It will provide me with security for the future.
54. (1) It will provide opportunities for my intellectual development and satisfaction of my intellectual curiosity.
(2) My preferred profession requires a University education.
55. (1) I received encouragement or strong pressure from family, friends or others.
(2) It may provide me with a better job in terms of salary, personal satisfaction, and opportunity for advancement.
56. (1) It provides an opportunity for well rounded personality development.
(2) It will enable me to be of more help and service to others.
57. (1) It will give me greater social prestige and status.
(2) I wanted to explore various fields in order to decide upon a profession and future plans.

58. (1) It provides an opportunity to meet a marriage partner.
(2) I wanted a change from my home community and to assume some independence.
59. (1) It provides many opportunities for participation in social and athletic activities.
(2) I didn't feel that I was ready to, or wanted to start working.
60. (1) It provides opportunities to meet different people and make new friends.
(2) I wanted to remain with my old friends.
61. (1) It will provide me with security for the future.
(2) My preferred profession requires a University education.
62. (1) It may provide me with a better job in terms of salary, personal satisfaction, and opportunity for advancement.
(2) It will provide opportunities for my intellectual development and satisfaction of my intellectual curiosity.
63. (1) It will enable me to be of more help and service to others.
(2) I received encouragement or strong pressure from family, friends or others.
64. (1) I wanted to explore various fields in order to decide upon a profession and future plans.
(2) It provides an opportunity for well rounded personality development.
65. (1) I wanted a change from my home community and to assume some independence.
(2) It will give me greater social prestige and status.
66. (1) I didn't feel that I was ready to, or wanted to start working.
(2) It provides an opportunity to meet a marriage partner.
67. (1) I wanted to remain with my old friends.
(2) It provides many opportunities for participation in social and athletic activities.
68. (1) It provides opportunities to meet different people and make new friends.
(2) It will provide me with security for the future.
69. (1) My preferred profession requires a University education.
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103. (1) I received encouragement or strong pressure from family, friends or others.
(2) It provides opportunities to meet different people and make new friends.
104. (1) It provides an opportunity for well rounded personality development.
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105. (1) It will give me greater social prestige and status.
(2) It provides an opportunity to meet a marriage partner.

APPENDIX E

NORMS FOR THE COOPERATIVE SCHOOL AND COLLEGE ABILITY TEST
USED IN SELECTING THE SAMPLE FOR THE PAIRED COMPARISON
QUESTIONNAIRE ADMINISTRATION BASED ON 1959-60 FIRST
YEAR STUDENTS AT THE UNIVERSITY OF BRITISH COLUMBIA

SCAT	V	Q	T ¹
1	17.16	19.24	45.53
5	21.00	25.11	53.3
10	23.60	28.62	58.21
20	30.20	32.27	65.25
30	33.24	34.73	70.02
40	36.03	36.91	73.30
45			74.97 *
50	38.78	38.92	76.65
55			78.35 *
60	41.50	40.68	80.05
70	44.24	42.45	83.70
80	47.26	44.42	88.10
90	51.41	46.61	93.67
95	53.99	48.10	97.79
99	57.35	50.10	103.65
M	38.82	38.06	76.35
N	1832	1836	1830
SD	9.4	7.0	12.25

*Derived by linear interpolation.

¹Total scores only were used in selecting the sample.