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# A STUDY OF THE COLLEGE ENVIRONMENT AND THE DEVELOPMENT OF YOUNG PERSONS' SELF-CONFIDENCE

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## INTRODUCTION

To study college students and learn how they change between the year they enrolled in college and the day they leave is an interesting and complicated project. Although college students are only five percent of the nation's population, they are educated and grow up to become the most essential members of the society. They will hold the important governmental positions; they will be the researchers who develop new cures for various diseases; they will be people who study nature with hope to improve human lives; they would develop new theories to explain the natural and human phenomena in order to accurately predict the future, and so on. On the other hand, from the students' point of view, the period of their college life is a period between late adolescence and early adulthood. Many important decisions must be made on their future careers, on their marital destines, on their life goals, etc. What they decide will have effect on their whole lives. As one stage of the human life span, it is certainly worth looking at seriously and finding appropriate ways to implement the process of reaching maturity.

During this critical period of growth (from about 18 to 25 years of age), by going to college, young people may make

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decisions they would not make otherwise; they may behave differently from other people of the same age; they may hold different world views or become more knowledgeable about the world and themselves. We are interested in finding out what would contribute to the emergence of maturity in young people.

Two things constitute the human personality, one is personal insight which is cultivated by individual internal or inborn ability, the other is outside influence. For every stage of growth, both inside and outside influences interact with each other and help one to reach a certain level of maturity which would be appropriate in order to survive in his/her society.

For persons who receive higher education after they have acquired basic foundamentals and training in high school their development involves the expansion of their knowledge, the formation of world views which are based on various concepts and materials to which they are exposed, and most importantly, the conscious or unconscious development of their personalities because of the outside influences which include college teaching, college experience and college environment. Among these, the influence from outside surroundings is the most essential, because all the other elements occur within that certain environment. Different institutions provide different types of learning experience, interpersonal experience, and different philosophies on which their world views are based. A graduate of a religion-oriented university may hold a different world view from a graduate of a four-year research-oriented university, or from a graduate of a southern liberal arts college. From another standpoint, since human behaviors are functions of many reasons and outside influences, when one's behavior is observed and investigated, there are many related elements which can be attributed as the causes of a single behavior pattern. Among these causes, some belong to personal character, some belong to family background, some belong to the environment, and so on. In the case of student behavior, when a student becomes more confident by the time for graduation from college, it has a lot to do with how confident the student was on first entering the school, but is also related to the sex of the student, the family background, the college activities attended, the kind of institution attended, the college achievement, or even how one thought about the college. Thus it is interesting to find out how much of the cause of student behavior can be attributed to environment and to different kinds of environmental conditions. If we first remove the influences of students' personal characteristics and the results of a highly correlated pretest given in 1971, then we can show the unbiased impact of environmental variables on student outcomes.

One aspect of a young person's growth is the determination of one's self-concept, that is, how a young person perceives himself/herself. Again, there are many views about what should be included in this concept. Many definitions have been offered. Nevertheless, all researchers would agree that the growth of self-confidence should be one sub-concept of self-concept.

This subject has been investigated by many researchers. Theories have been developed, tested, retested, or replicated. Still, there are many different standpoints and divided conclusions (Miller, 1982). It has been suggested that more studies are needed.

This paper attempts to look at college students' development, specifically the development of self-confidence–intellectually and socially. The main theme is the effect of the college environment on students' development. The purposes of this study is set forth in the next section. Many related theories and researches are briefly reviewed in the second section. Study method is discussed in the third section and the discussion of findings follows in the fourth section. The final section consists of conclusions.

## I. PURPOSES

The purposes of this study are threefold. The first is to find the influential environmental elements which have impact or predictive weight on college students' development of their self-concepts, specifically intellectual and social self-confidence. We would like to know what elements or aspects of college environment affect students' growth. It may not be the prestige or selectivity as popularity believed, but the relationship, circumstance or atmosphere of the college surroundings. Using only personal satisfaction about the environment as an indication of the growth of self-confidence will also cause some difficulty in causal interpretation. The second is to provide more evidence that students' input and their environment should be blocked and tested separately for an accurate description and explanation of the process of students' maturity. The third is to provide comprehensive results to enhance the validity of some student developmental theories. Many theories (Chickering, 1969, Heath 1968, Erikson, 1963, Perry, 1970) have been offered in the field of student development. They require a lot of further research to establish their objectivity and their reliability. Astin (1984) also advocated a theory of student involvement which provides a simple, clear and practical foundation in explaining college students behavior. Thus, this study could confirm some conclusions made by different theorists.

Erwin (1982) gave a plausible definition for the concept of "self-confidence." This definition clearly stated what we would expect of a person who is self-confident. Intellectual and social self-confidence only differ in their subject matters. Erwin's definition of self-confidence is as follows:

> Confidence is an assuredness in one's self and in one's capabilities. The confident person has some understanding of his or her limitations. A self-confident individual feels comfortable about expressing beliefs, making decisions, and behaving competently, even though action may not be taken in these areas.

We used the definition of self-confidence stated by Astin (1977). Intellectual self-confidence means the feelings of self-esteem based on one's own academic ability; and social self-confidence means the feelings of self-esteem based on one's own interpersonal socializing ability.

We realize that self-confidence constitutes only part of the concept of self-knowledge. To understand its growth we have to examine a lot of related aspects of human personality. Some of these aspects have also been observed in this study and will be considered in the interpretations of the findings.

## II. LITERATURE REVIEW

The relationship between students and their schools or educational environment is like the question of the chicken and the egg. Many theories of student development have been built upon either one of the claims. On the one hand, student affairs professionals would take the point of view that the college environment has a great impact on students. The institutions have obligations in generating programs to facilitate the development and growth of college students. On the other hand, theories which are based upon empirical or psychosocial researches and are concerned with a certain stage of human development arguing that the process of student development has great impact on institutions of higher learning (Miller, 1982).

Theories on student development have their theoretical roots in studies of human development, namely, studying students as human beings, not as subjects who go to school and absorb some objective knowledge. He/she is a whole person, not only consuming and digesting knowledge, learning skills in various areas, but also, more importantly, getting to know oneself and to understand himself or herself as well as relating to other people and nurturing interpersonal relationships. Many theories have given a lot of attention to the study of establishing self-knowledge. For example, Chickering (1969), Erikson (1963), Loevinger (1976) and Perry (1970) have developed their theories in terms of student personal development such as self-identity, relative world-view, social-cognitive development. There are only a few measurements or studies in terms of the development of interpersonal relationship (Kitchner, 1982). All these theories have received a lot of attention and many experimental instruments were developed in order to test their validity and reliability. After more than 20 years, most instruments became very sophisticated in administration, complicated in explanation, and detailed in analysis.

We know that to understand human development is a complicated task. In terms of student development, we have to bear in mind that students constitute a specific group of subjects. They spend most of their time in a certain environment, doing a certain prescribed work, and interacting with the same physical and personal surroundings. So far, college students have been treated as a group different from other groups of population. No matter what college background they are from, they are college students and share the students' subculture. They grow up at a similar pace and develop their character in similar fashion. This is true to a certain point. If this belief was generalized by a theoretical investigation of all students from all colleges or universities, it would be true. But almost all theories mentioned above were generated from studies done on single environments, that is, one campus or campuses in the same region. When other researchers tested one theory or one aspect of the theory, they were also done in a single environment. The truth of the last statement calls for more studies. Even though most testings would confirm the theory, they need to provide some evidence for replying to the inquiry whether the difference among institutions would have a different effect on students' development. For instance, Perry based his theory on the generalization of interview results which were done in an elite, originally liberal arts university. His subjects were all white and mostly male students. Although many replicated studies have been done on one or more positions of Perry's developmental scheme (1970) and most of them confirmed Perry's study results, they were mostly done on one campus, with a single environmental variable. Feldman (1976) discussed the college impact on students. He incorporated many results from different studies which were done on different campuses. Except for Astin's "Four Critical Years" (1977), there has not been a study with a nation-wide sample which included students from different types of institutions. Thus, theoretical validity would be increased if we take the variation of environment into consideration. Besides the question about how the individual student changes through the period of college years, we are also concerned with the answer to the question whether students develop differently in different institutions.

Astin (1984) advocated a theoretical guide to the investigation of relationships between students' development and their environment. It is called the theory of student involvement. Astin emphasized that the environmental intervention variables would make the changes or the growth of student personality more complicated and interesting to investigate. It is also necessary to separate the students' original characteristics and the environmental variables. Thus, the interactive effect among student input, environment and the outcome of their growth could be distinguished. According to Astin, the involvement theory has five basic postulates: (1) involvement refers to general or specific investment of physical or psychological energy; (2) involvement occurs along a continuum but individualized pace; (3) involvement has both quantitative and qualitative features; (4) the amount of student development is positive relative to the quality and quantity of student involvement; and (5) the effectiveness of educational policy is directly related to capacity of that policy or practice to increase student involvement (1984, p. 298). Astin also suggested that by using his theory of student involvement, it would enable us to confirm other theorists' claims for their theories in terms of student development. This is also the theoretical background of this study.

Among the growth of various aspects of personal character, I chose self-confidence as the item to be investigated. Many studies have been done on this topic, especially in psychological and sociological fields. In higher education, there have also been many theories and studies done on the subject. Chickering (1969) put self-identity in the middle of his seven vectors of student development. It is also the most important one in a student's life. In order to investigate the growth of students' self-identity, Erwin and Delworth (1980) developed an instrument to measure a student's self-identity. It is called "The Erwin Identity Scale (EIS)." Three main concepts comprising the concept of identity: confidence, sexual identity, and conceptions about body and appearance. Later, the authors applied this instrument in their longitudinal study. The purposes of their study (1982) were, first, to validate the instrument and secondly, to provide preliminary information regarding the interaction between development of identity and the college environment as perceived by the students. The authors gave a very clear definition of the concept of self-confidence which has been quoted above. Environmental variables were specifically mentioned and tested, representing various aspects of the environment perceived by the students. Since this was only a report of a preliminary study on the validity of their instrument, more studies with the instrument in diverse and larger populations were suggested. Nevertheless, one of the findings supported the similar finding in Astin's "Four Critical Years." For some students who had the highest identity scores, the environment referents did not have much impact. With a wider range of subjects, Astin also found that while institutions were objectively divided by selectivity, it had no effect on the student's intellectual self-concept one way or the other (p. 42). When we use more recent and larger data, will we obtain a similar result?

Erwin and Kelly (1985) did a longitudinal study on the development of students' self-confidence, using the instrument Erwin developed earlier. They used multiple regression to examine the interactive effects of freshmen confidence and the four environmental variables. They found that when the effect of the freshmen confidence was removed from the regression equation, then the students' perceptions about academic performance became the best predictor in students' self-confidence. Next was the career commitment. Students' satisfaction with intimacy with friends and extracurricular participation had no statistical significance. Erwin and Kelly conducted their study on a single campus, and did not indicate the ratio of race in their sample. Also, they only used one variable from the freshmen confidence measure. It is obvious that a pretest had a high correlation with the outcome self-identity measure, but other related freshmen input variables might have predictive weight on the outcome confidence level, for instance, the high school GPA, the student's sex, the student's activities, and the student's race. But these were not considered in the regression equation. If these items entered in the regression analysis, the correlation between environmental variables and senior self-confidence level would decrease somewhat. They might have some positive or negative association with the outcome. For instance, female students might build up their self-confidence at a slower pace than the male students.

Erwin and Kelly's study did provide a rare longitudinal study on the growth of self-confidence. But it has a couple of faults. First, they used samples from only one campus. To generalize their results, they would need at least one other sample from another campus. Would students develope self-confidence at the same level when they enter different types of colleges? To answer this question, we need to collect data from more than one campus. Second is the problem that happens with a study based on persons' perceptions of a certain environment. These are questions about attitudes. When we use the people's reaction toward some objects or their attitude statement as the independent variables to measure the outcome results, we have to be very careful that the attitude statements do not interfere with the outcome results. It means that we should be able to make objective and clear causal inference based on the attitude measurements. However, if we use satisfaction with school environment or statements of how students perceived their environment to interpret how well they establish their self-confidence, we would run into one difficulty. We might not be able to establish the causal relation between the attitude and the self-concept. There is always the possibility that students who are self-confident would be more satisfied with their environment than those students who are not so self-confident. There is always the possibility of close correlation between satisfaction with environment and self-confidence. Thus, the objective non-personal aspects of the environmental circumstance should be considered first and might be a better predictor for the growth of self-confidence.

Khalili and Hood (1984) used Hunt's four-stages of personal conceptual level development to test the growth of college students' self-concept. The authors did take a students' major, traveling experience, living arrangement and participation in college activities as independent variables. But the methodological aspect of their study caused some problems. (1) Without using regression analysis, they could not detect the interactive effect between students' input and environmental conditions. For instance, students' sexes and their college activities might have some interactive effect on their rate of growth. (2) The original Hunt's model was used in measuring the growth of younger students who were in junior high school. Even though this model had been rated for its reliability and validity before being used in the study, the implication of its results need to be carefully examined. (3) It had the same limitation of studying a single campus mentioned above.

Other instruments have been used in measuring the growth of college students' self-concept. Caracosta (1986) discussed only the effectiveness of the instrument, called Dimensions of Self-Concept (DOSC). There was also an article written by Michael, et al (1984). These were hard to understand for people from fields other than psychology and did not have much practical value for student personnel professionals.

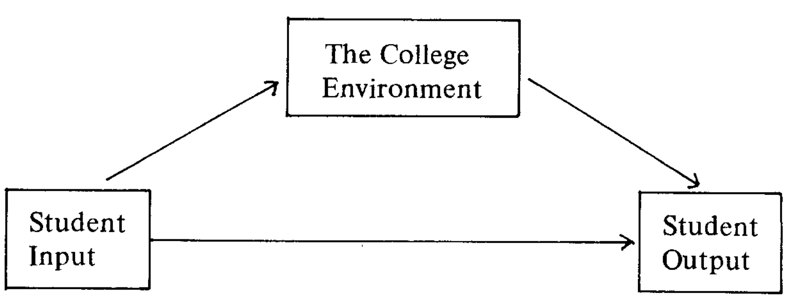
In terms of methodology, student development is a continuous growing process. Just looking at the students of one time or comparing two different groups from different times of study levels would not indicate the individual personal characteristic changes of students during their college years. When these changes occur, we would also like to know the reasons of these change and provide rational interpretation, especially if the college environments have any effect on student's college experience. Many empirical studies with the purpose of learning these effects were published. The investigators applied different techniques. Some used interviews and raters, some administrated questionnaires. Some findings were not easy to interpret and some findings were confusing and with faults. One of the reasons for these confused results was that there is little literature which deals with the methodology of research on college impact.

Astin (1969, 1970) wrote a few articles on the methodology which should be regarded as the most comprehensive method in detecting the effect of college environment on students as well as the interactive effects between students and environment. Some articles which dealt with the proper usage of many instruments did not specify the appropriate statistical designs and the causal inference from data analysis. Astin clarified some confusions in presenting his model. He interpreted his data on the basis of his model which showed the relationship among three conceptual distinct components of the model. These three components are student output, student inputs, and the college environment.

## III. METHOD

There are many models or instruments to be used in studying the development of college students. They are based on one or one aspect of student developmental theories. Each has its specific study targets. But in general, all of them seem to miss one important point which we stated in the last section of this article. The students' original characteristics were not distinguished from the environment they encountered later. While the former were developing, the significance of the later would be obscured. Also, it would be difficult to detect whether the influence should be attributed to students' original character or the influence of college environment. When college student personnel professionals require some evidence of the college impact on students in order to improve student affair programs, they will have a hard time in figuring out which part of the program needs to be changed because there is no indication which specific part of the environment is the cause of the faults of the program. Thus, Astin (1984) emphasized the theory of student involvement and introduced a three-way methodological research model (1970). This model includes three parts, student inputs, the college environmental variables, and the outcome variables. This model is called IEO model, with "I" representing student inputs, "E" environmental variables, and "O" the outcome variables. The relationship among these three elements can be shown in Figure 1.

Figure 1



According to Figure 1, the effects on any outcome measure come from two directions. One is directly from the students' inputs, the other is from the environmental variables which in turn are influenced by student input variables also. Thus, students' changes in their self-confidence level would have two sources of influences. They become more self-confident because of the self-confidence they originally had when they began their higher learning, or because of other personal characteristics which make some students more perceptive or better equipped affectively in being more confident. The other source of influence might be the environmental. Students who are better prepared in academic area might increase their self-confidence when they go to a school with a higher level of selectivity. Students who are not well prepared might decrease or grow slowly in their self-confidence when they go to a school with high selectivity level. How to distinguish these influential sources is a question of using proper statistical method.

Using multiple regression of statistical method, we can not only detect the main effect of college environment on the student outcome, but also detect the interaction effects which involve student input and their environment and the direct relation between student input and outcome.

**Data**

The data for this study was provided by the Institute of Higher Education Research in UCLA. It is a longitudinal data file, described as follows:

> This is a longitudinal data file involving a national representative sample of students who entered college as freshmen in the Fall of 1971 and were followed up nine years later in the Summer of 1980. . . . The original freshman survey attempts to include all first-time, full-time entering freshmen. Participation rates vary from 80% to 100%, depending on the type of institution and the method of survey used. Rosters of students to be surveyed were sent to their freshman institution in order to obtain updated addresses for the 1980 mailing. Following two

> mailings of the questionnaire and a reminder postcard to non-respondents, a total of approximately 11,500 completed questionnaires were returned. This represents approximately 35% of the original sample who received mailed questionnaires.

1,290 cases including 719 female and 571 male students were filed in this data bank and for the use of this study.

**Statistical Method**

Computer statistical package of SPSS-X was used. Step-wise multiple regression was the statistical procedure used in this study. The procedure was first to separate and block the students inputs and environmental variables. And among the two groups of variables, more blocks were necessary in order to make sure that the effects of some input or environmental variables entered the regression equation according to the rationale we gave.

To test the intellectual and social self-confidence, and given the data we had, we divided related variables into two groups and five blocks in the order of entering regression equation. One is the input variables which include the pretest (the self-confidence rating in 1971), student's sex, student's race (only white and black entering), high school grade point average, high school rank, parents' income, father's educational level, mother's educational level, students' career plans—including business, education, medicine, scientific research, or law. These are some permanent features that students brought with them when they were freshmen.* These enter the equation as the first block. The second block is also input variables. It includes many personal events that happened during the college years, including whether they had dropped out of school, whether they were part-time students, college grade point average, the final major in colleges – art and humanities, biology, business, engineering, physics, pre-professionals, education, political science and social sciences.

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*Each item of the last group was dichotomized in order for it to be a continuous variable for regression calculation.

The second group of variables includes three blocks of environmental variables. The third block of the equation includes the college selectivity level,* college size based on the enrollment, college control, college sex (male, female, and co-ed), college types (university, 4-year college, 2-year college, 4-year branch of university, 2-year branch of university, and 2-year branch of 4-year college). The fourth block includes students' college activities–serving as president of a student organization, serving on university or departmental committee, editing student publication and belonging to an honor society; financial questions–parents paying for the school, having scholarship or grants, or taking loan from government; and college prestige scale which is the product of selectivity and size. The last block includes the perception by students of the environment. It includes satisfaction with college reputation, satisfaction with intellectual environment, satisfaction with the quality of instruction, satisfaction with the faculty-student relations, satisfaction with the friendship with other students, and satisfaction with college administration.

Five blocks of variables were put in regression equation. The rationales for the content of each block are as follows: (1) When students began their higher learning in colleges, they brought with them their personal characteristics and their previous received concepts, some of them were constant, such as sex, race, parent's educational levels, high school grade point average and the pretest of the items we are investigating. The effect of these variables should be removed or controlled, so that other influences on the building of one's self-confidence would not be contravened by these variables. (2) The input variables in the second block are facts which happened to the students or were accomplished by students. These facts would stay the same unless the subjects tried to change them. And the change of these facts might cause change in outcome as well as in environment. (3) The third

* The selectivity measures are based on the mean SAT Verbal (V) plus Mathematical (M) scores of entering freshmen (Astin, 1971).

block is objective environmental variables which are set up by objective standards, by objective testing means and scores, or by governmental divisions. When students entered certain colleges, these features would be present all through the years they were there. These would not change and would be the permanent condition for any personal change. (4) The fourth block is school financial support, and students' activities in the college. They belong to the environmental variables. (5) The last block is the questions about students' attitudes toward their environment. Even if there was some correlation between them and the outcome variables, we would have some reservation in putting too much emphasis on the significance of these variables. The reason has been established in the second section above. The total number and formation of each block of regression equations is showed on Table 1.

Other statistical methods were used in order to detect the changes between two tests for male and female, white and black students. Crosstabs were used to obtain some tables. Lastly, some hand calculation was done on putting the two tables of self-confidence together with the regression table done on the scale of eleven self-rating questions. Besides the two questions on self-confidence, the other nine self-rating questions are academic ability, artistic ability, drive to achieve, leadership ability, mathematical ability popularity, popularity with opposite sex, public speaking ability, and writing ability. The study of the other self-rating questions will not be included in this study.

## IV. FINDINGS AND DISCUSSION

### Findings

Two regression equations were performed for intellectual and social self-confidence. The five blocks of variables were entered in the equations accordingly. The significant results of these two regressions are shown on Table 2 and Table 3.

Table 2 showed the regression predictors on students' intellectual self-confidence from input and environmental

Table 1 Variables Chosen in Regression for Testing the Students' Growth of Self-Confidence

| | |
|---|---|
| **Dependent Variables (Outcome):** | |
| Self-Confidence (Intellectual) in 1980 | |
| Self-Confidence (Social) in 1980 | |
| **Independent Variables:** | |
| **Student Characteristics:** | |
| First Block: | |
| Pretest in 1971 | |
| Student's Sex—Female | High School GPA |
| Student's Race—White | High School Rank |
| —Black | Career Plan – Business |
| Parents' Income | – Lawyer |
| Father's Educational Level | – Educator |
| Mother's Educational Level | – Doctor |
| Major Plan—Education | – Research |
| Second Block: | |
| Have Dropped Out | |
| Part-Time Students | |
| College GPA | |
| College Major—Art/Humanities | College Major—Biology |
| —Business | —Engineering |
| —Pre-Professional | —Physics |
| —Social Science | —Education |
| —Political Science | |
| **Environmental Characteristics:** | |
| Third Block: | |
| College Selectivity | |
| College Size (Enrollment) | |
| College Control—Public | |
| —Private | |
| College Sex – Male | |
| – Female | |
| – Co-ed | |
| College Type – University | |
| – 4-year College | |
| – 2-year College | |
| – 4-year branch of University | |
| – 2-year branch of University | |
| – 2-year branch of 4-year College | |

Table 1: (Continued)

| | |
|---|---|
| Fourth Block: | |
| College Activities | –Have Been President of Student Organization |
| | –Have Served on University or Departmental Committee |
| | –Have Edited Student Publication |
| | –Belonged to Scholar or Honor Society |
| College Finance | – Parents Paid for College |
| | – Had Scholarship or Grants |
| | – Took Loan from Government |
| College Prestige Scale (Selectivity by Size) | |
| Fifth Block: | |
| Satisfaction with College Reputation | |
| Satisfaction with Intellectual Environment | |
| Satisfaction with Quality of Instruction | |
| Satisfaction with the Faculty-Student Relations | |
| Satisfaction with Variety of Courses Offered | |
| Satisfaction with Friendship with Other Students | |
| Satisfaction with College Administration | |

variables. Among 17 variables which entered the equation as the first block, six of them were found to have significant correlation with the outcome variables. They are the self-rating on intellectual self-confidence in 1971, female student, high school grade point average, plan to major in education, father's educational level, and black student. Except female student and students' plan for a major, other variables have positive association with the outcome. Female student and plan to major in education have negative association with the outcome. High school grade point average has a suppressor effect on the outcome. After the first beta weight of 0.08, its beta weight in the next step increased to 0.113. Also, black student has a weak suppressor effect, from simple correlation of 0.019 to 0.058 in the sixth step when it entered the equation. The 0.382 correlation coefficient between pretest and posttest was high.

When the second block of variables entered the equation, three out of twelve variables showed significant weight on the

Table 2 Regression Predicting Intellectual Self-Confidence in 1980 From Input and Environmental Variables

| Step | Multiple R | Variable Entering | Simple r | Beta After Step 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Student Characteristics | | | | | | | | | | | | | | | | | | |
| 1 | .382 | Self-Confidence Intellectual-1971 | .382 | .382 | .365 | .331 | .325 | .323 | .318 | .305 | .3051 | .300 | .295 | .294 | .288 | .289 | .289 | .286 |
| 2 | .403 | Female Student | –.177 | –.130 | –.130 | –.152 | –.142 | –.141 | –.147 | –.155 | –.143 | –.144 | –.131 | –.145 | –.139 | –.138 | –.137 | –.137 |
| 3 | .417 | High School GPA | .179 | .080 | .113 | .113 | .109 | .101 | .113 | .056 | .055 | .050 | .019 | .021 | .018 | .014 | .014 | .020* |
| 4 | .422 | Major Plan–Education | –.137 | –.089 | –.070 | –.063 | –.063 | –.061 | –.058 | –.061 | –.065 | –.067 | –.061 | –.058 | –.058 | –.058 | –.057 | –.055 |
| 5 | .426 | Father's Educational Level | .106 | .073 | .075 | .062 | .059 | .059 | .070 | .067 | .066 | .065 | .041 | .038 | .042 | .041 | .043 | .043** |
| 6 | .429 | Black Student | .019 | .018 | .023 | .047 | .045 | .058 | .058 | .082 | .081 | .079 | .082 | .087 | .086 | .088 | .083 | .090 |
| 7 | .445 | College GPA | .195 | .125 | .147 | .122 | .124 | .121 | .138 | .138 | .135 | .130 | .132 | .133 | .132 | .126 | .129 | .116 |
| 8 | .450 | Major in Professionals | –.128 | –.094 | –.076 | –.073 | –.076 | –.075 | –.074 | –.068 | –.068 | –.065 | –.063 | –.066 | –.065 | –.065 | –.065 | –.063 |
| 9 | .453 | Part-Time Student | –.094 | –.072 | –.077 | –.065 | –.068 | –.067 | –.065 | –.056 | –.052 | –.052 | –.045 | –.043 | –.042 | –.034 | –.035 | –.032*** |
| Environmental Characteristics | | | | | | | | | | | | | | | | | | |
| 10 | .459 | College Selectivity | .218 | .144 | .134 | .107 | .102 | .091 | .094 | .096 | .094 | .089 | .089 | .088 | .087 | .076 | .073 | .074 |
| 11 | .463 | College Sex–Female | .034 | .035 | .065 | .063 | .061 | .057 | .062 | .062 | .066 | .064 | .063 | .063 | .061 | .059 | .060 | .060 |
| 12 | .467 | Been President for Std Organization | .124 | .077 | .066 | .061 | .061 | .065 | .064 | .062 | .061 | .061 | .060 | .058 | .058 | .059 | .061 | .056 |
| 13 | .474 | Satisfied with Intell. Environ. | .132 | .116 | .117 | .104 | .104 | .101 | .103 | .096 | .095 | .091 | .083 | .081 | .081 | .081 | .101 | .083 |
| 14 | .476 | Satisfied with College Admin. | –.001 | –.005 | –.000 | –.009 | –.007 | –.010 | –.004 | –.014 | –.014 | –.016 | –.015 | –.018 | –.021 | –.055 | –.055 | –.077 |
| 15 | .480 | Satisfied with Fac-Std Relations | .134 | .104 | .106 | .097 | .097 | .095 | .106 | .085 | .083 | .080 | .079 | .077 | .072 | .049 | .073 | .073 |

* The significance of this variable diminished after step 7.
** The significance of this variable diminished after step 10.
*** The significance of this variable diminished after step 10.
Note: The numbers on the lower left triangle were beta weight before the variable entering the equation.

outcome variable. They were college grade point average, majoring in pre-professional fields and being part-time students. Only the college grade point average had positive association with the outcome, major and part-time student had negative association with the outcome. Suppressor effect was observed in the variable of college grade point average, where the beta weight before the step was 0.121 and increased to 0.138 after. Also, when college grade point average entered the equation, it cancelled out the effect of the high school grade point average.

The third block of variables entered the equation next. Among twelve variables, college selectivity and women's college showed positive association with the outcome. Suppressor effect also found in women's college. Among eight variables of the fourth block entering the equation, only having been the president of a student organization showed positive association with the outcome. Lastly, seven variables about satisfaction with the environment entered the equation. Although the simple correlation between them and the outcome variable showed that satisfaction with the intellectual environment and with faculty-student relations had positive association with the outcome, 0.132 and 0.134 correlation coefficient with the outcome respectively, the simple correlation between the item of satisfaction with college administration and the outcome was not significant. However, when other blocks of variables entered and controlled, the satisfaction with college administration showed virtually no association with the outcome, from simple correlation coefficient of −0.001 to the correlation coefficient of −0.077 at the last step.

After 15 steps of regression equation were performed, since every block entered the equation accordingly, it happened that some variables entering from later blocks would cancel out the significance of the earlier entering variables. Thus, among 15 variables which showed significant association with the outcome, three of them were cancelled out after the equation was completed. These three variables are high

Table 3 Regression Predicting Social Self-Confidence in 1980 From Input and Evnrionmental Variables

| Step | Multiple R | Variable Entering | Simple r | Beta After Step 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Student Characteristics | | | | | | | | | | | | | | |
| 1 | .357 | Self-Confidence Social–1971 | .357 | .357 | .352 | .346 | .343 | .338 | .340 | .341 | .342 | .338 | .331 | .330 |
| 2 | .365 | White Student | –.100 | –.075 | –.075 | –.103 | –.103 | –.102 | –.101 | –.096 | –.093 | –.090 | –.106 | –.109 |
| 3 | .373 | Parents' Income | .060 | .045 | .080 | .080 | .077 | .074 | .077 | .075 | .075 | .072 | .073 | .069 |
| 4 | .379 | Female Student | –.091 | –.073 | –.075 | –.072 | –.072 | –.064 | –.068 | –.074 | –.071 | –.078 | –.076 | –.076 |
| 5 | .384 | Career Plan–Lawyer | .102 | .071 | .071 | .067 | .058 | .058 | .062 | .061 | .040 | .039 | .035 | .038* |
| 6 | .388 | Career Plan–Educator | .031 | .047 | .045 | .049 | .054 | .058 | .058 | .058 | .058 | .055 | .052 | .051** |
| 7 | .395 | Major in Social Science | .070 | .072 | .067 | .065 | .071 | .071 | .071 | .071 | .076 | .072 | .075 | .073 |
| 8 | .401 | Major in Political Science | .090 | .087 | .085 | .084 | .079 | .068 | .068 | .074 | .074 | .069 | .066 | .066 |
| Environmental Characteristics | | | | | | | | | | | | | | |
| 9 | .406 | Served on Univ. or Dept. Committee | .099 | .076 | .074 | .071 | .080 | .078 | .075 | .071 | .067 | .067 | .053 | .053 |
| 10 | .424 | Satisfied with Friendship with Std. | .146 | .125 | .136 | .136 | .135 | .133 | .131 | .132 | .130 | .124 | .124 | .105 |
| 11 | .429 | Satisfied with Intellectual Envir. | .105 | .094 | .102 | .099 | .099 | .102 | .101 | .099 | .099 | .097 | .069 | .069 |

* The significance of this variable diminished after step 7.

** The significance of thiss variable diminished after step 10.

Note: The numbers on the lower left triangle were beta weight before the variable entering the equation.

school grade point average, father's educational level and being part-time students.

Table 3 showed the regression predictors of social self-confidence, in which eleven variables showed significant weight.

Among 17 variables of the first block, six of them showed significant association with the outcome variable. The self-rating on self-confidence in 1971 had the most positive correlation with the outcome with the coefficient of 0.357. Other five variables were white student, parents' income, female student, career plan to be a lawyer and career plan to be an educator. White student and female student had negative association with the outcome, with –0.075 and –0.072 coefficient respectively after they entered the equation. Weak suppressor effect was found in parent's income.

Among twelve variables in the second block, only social science and political science majors entered the equation and had positive association with the outcome. Their associations were constant and throughout the steps of the equation.

There was no variable from the third block entering the equation. Only one out of eight variables in the fourth block showed positive association with the outcome variable. That was to have served on a university or departmental committee. The simple correlation coefficient is 0.099 and the last beta weight is 0.053. Among seven variables about the perceptions students had for the environment, two variables showed positive correlation with the outcome. They were satisfaction with friendship with other students and satisfaction with the intellectual environment, with simple r of 0.146 and 0.105 and the final beta weight of 0.105 and 0.069 respectively.

After eleven steps of regression equation, the later entering variables cancelled out the significant effect of the earlier variables. This also happened here. When a major in political science entered the equation, the significance of a student's career plan to be a lawyer diminished. Also when variables on satisfaction entered the equation, the significance of career plan to be an educator diminished.

Two crosstab tables were done to examine the changes between the self-confidence rating in 1971 and the rating in 1980. Table 4 showed the changes by student's sex.

For both male and female students, their intellectual and social confidence showed positive gains. In terms of intellectual self-confidence for the 75.4% of the male students who were self-confident in 1980 compared with 49.7 of them who were self-confident in 1971, the change was a positive 25.8%. Likcwise, for the 60.7% of the female students who were self-confident in 1980 compared with only 36.6% of them who were self-confident in 1971, the change was a positive 24.1%. In terms of social self-confidence, for the 57.1% of male students who were self-confident in 1980 comparing with 29.9% of them who were self-confident in 1971, the change was a positive 27.2%. Also, for the 47.4% of the female students who were self-confident in 1980 compared with 27.8% of them who were self-confident in 1971, the change was a positive 19.6%.

Table 5 shows the changes between the 1971 and 1980 self-confident rating with different student race. In this case, only white and black students were considered.

In terms of intellectual self-confidence, for the 67.8% of white students who were self-confident in 1980 compared with 44.2% of them who were-confident in 1971, the change was a positive 23.6%. For the 68% of black students who were self-confident in 1980 compared with 39.1% of them who were self-confident in 1971, the change was a positive 28.9%.

In terms of social self-confidence, for the 49.7% of white students who were self-confident in 1980 compared with 28.5% of them who were self-confident in 1971, the change was a positive 21.1%. Likewise, for the 60.8% of black students who were self-confident in 1980 compared with 33.7% of them who were self-confident in 1971, the change was a positive 27.1%.

We combined three tables together to show which variables have predictive weight on the outcome variable. Two of them have been showed above, the third table was constructed in the same way as the other two. However, the pretest

Table 4 Changes between Self-Confidence in 1971 and 1980 by Sex

| | 1971 | | | | 1980 | | | | Change | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Male | | Female | | Male | | Female | | Male | Female |
| | N | % | N | % | N | % | N | % | % | % |
| Self-Confidence (Intellectual) | | | | | | | | | | |
| Below Average | 46 | 8.1 | 80 | 11.1 | 16 | 2.9 | 43 | 6.0 | −5.2 | −5.1 |
| Average | 242 | 42.4 | 376 | 52.3 | 122 | 21.8 | 238 | 33.3 | −20.6 | −21.0 |
| Above Average | 283 | 49.6 | 263 | 36.6 | 422 | 75.4 | 434 | 60.7 | +25.8 | +24.1 |
| Total | 571 | | 719 | | 560 | | 715 | | | |
| Self-Confidence (Social) | | | | | | | | | | |
| Below Average | 108 | 18.9 | 169 | 23.5 | 59 | 10.5 | 97 | 13.6 | −8.4 | −9.9 |
| Average | 292 | 51.1 | 350 | 48.7 | 181 | 32.3 | 278 | 39.0 | −18.8 | −9.7 |
| Above Average | 171 | 29.9 | 200 | 27.8 | 320 | 57.1 | 338 | 47.4 | +27.2 | +19.6 |
| Total | 571 | | 719 | | 560 | | 713 | | | |

Table 5 Changes between Self-Confidence in 1971 and 1980 by Race (White and Black)

| | 1971 | | | | 1980 | | | | Change | |
|---|---|---|---|---|---|---|---|---|---|---|
| | White | | Black | | White | | Black | | White | Black |
| | N | % | N | % | N | % | N | % | % | % |
| Self-Confidence (Intellectual) | | | | | | | | | | |
| Below Average | 98 | 9.5 | 12 | 6.5 | 53 | 5.2 | 4 | 2.2 | –4.3 | –4.3 |
| Average | 477 | 46.3 | 100 | 54.3 | 275 | 27.0 | 54 | 29.8 | –19.3 | –24.5 |
| Above Average | 455 | 44.2 | 72 | 39.1 | 691 | 67.8 | 123 | 68.0 | +23.6 | +28.9 |
| Total | 1030 | | 184 | | 1019 | | 181 | | | |
| Self-Confidence (Social) | | | | | | | | | | |
| Below Average | 235 | 22.8 | 25 | 13.6 | 134 | 13.2 | 13 | 7.2 | –9.6 | –6.4 |
| Average | 501 | 48.6 | 97 | 52.7 | 379 | 37.2 | 58 | 32.0 | –11.4 | –20.7 |
| Above Average | 294 | 28.5 | 62 | 33.7 | 506 | 49.7 | 110 | 60.8 | +21.2 | +27.1 |
| Total | 1030 | | 184 | | 1019 | | 181 | | | |

independent variable and the outcome dependent variable were the scale of students' self-rating in 1971 and 1980 on eleven questions which were mentioned above. A similar regression analysis was performed. We combined all significant predictive variables from three regression tables and put them on Table 6.

From Table 6, all variables in the self-rating scale table which showed significant association with the dependent variable also showed some association with either intellectual or social self-confidence. The directions of the sign were the same. Female student, white student, major plan in education, part-time students, pre-professional major which were negatively associated with self-confidence outcome also showed negative association with the scale of total self-rating.

**Discussion**

Some observations and findings based on the above tables need to be discussed further.

1. When we took out three variables which diminished their significant effect when other related variables entered, twelve variables were left which had impact on intellectual self-confidence. This means that many personal characteristics and environmental variables would influence one's growth in self-confidence. By regression equation, some permanent features of personality definitely had great impact. Being female students had negative association with their growth in self-confidence. It seems that female students would be less self-confident than male students. When high school grade point average entered the equation, a suppressor effect showed that female students who had a higher GPA would actually be more self-confident. Also, when other variables entered the equation, the correlation between female students and the self-confident rating became stronger. Especially when college grade point average and women's college entered the equation, the impact of being female on the growth of self-confidence diminished. This showed that the thought some female students held that being female would make them

Table 6: Different Variables with Impact on Intellectual and Social Self-confidence and Self-Rating Scale

| | Simple Correlation With | | |
|---|---|---|---|
| Variables | Intellectual Self-confidence | Social Self-confidence | Self-Rating Scale |
| Input Variables | | | |
| Pretest in 1971 | .382 | .357 | .492 |
| Female Students | -.177 | -.091 | -.173 |
| White Students | | -.100 | -.013 |
| Black Students | .019 | | |
| High School GPA | .179 | | .189 |
| Parents' Income | | .060 | .149 |
| Father's Educational Level | .106 | | |
| Mother's Educational Level | | | .131 |
| Career Plan-Lawyer | | .102 | |
| Career Plan-Educator | | .031 | |
| Major Plan-Education | -.137 | | -.149 |
| Part-Time Students | -.094 | | -.101 |
| College GPA | .195 | | .187 |
| College Major-Social Science | | .070 | |
| College Major-Political Science | | .090 | |
| College Major-Pre-professional | -.128 | | -.139 |
| Environmental Variables | | | |
| College Selectivity | .218 | | |
| College Sex-Female | .034 | | |
| College Activity-As President of Std Organ. | .124 | | |
| College Activity-Have Served on Univ. Committee | | .099 | .122 |
| Satisfaction with Intellectual Environment | .132 | .105 | .147 |
| Satisfaction with Friendship with Students | | .146 | |
| Satisfaction with Faculty-Student Relation | .134 | | |
| Satisfaction with College Administration | -.001 | | |

feel less self-confident was a misconception.

The similar but reversed sign situation happened in the variable of being black students. Black students had positive association with the growth of intellectual self-confidence. That means that black students had a higher self-confidence rating nine years after they enrolled in colleges. However, the simple correlation between black students and the outcome variable was very small. It would be easy to make a Type II error if we did not use stepwise regression measurement. When we gradually controlled other variables, being a black student had a suppressor effect on the outcome. We observed that with each step being added for black students, the correlation got stronger. This means that when we controlled students being black, the correlation between other variables and the outcome become stronger. In other words, black students should have weaker impact on the development of intellectual self-confidence. When the effect of female students was removed, the black students became more self-confident.

This situation also happened on the 11th and 14th steps. It is obvious that female students who went to a women's college would show more confidence. However, when the variable of being female was not controlled, the impact of women's college would not appear nor enter the equation. Students' satisfaction with college administration in fact should have a negative association with their self-confidence. However, the simple correlation coefficient did not reflect this fact at all. When we controlled all other variables of the previous four blocks, we found that this variable began to show significant impact on the outcome. In other words, students who were less satisfied with college administration would be more self-confident.

2. As we mentioned before, since some input and environmental variables were highly correlated with each other, when the later one entered the equation, it cancelled out the significance of the earlier variables. The high school grade point average is always the best predictor for college grade point average. They are closely related. Thus, when the

college grade point average entered the regression equation, the significance of high school grade point average would not exist anymore. When college selectivity entered the equation, the significance showed by the variables of father's educational level and being part-time students diminished. This means that when students went to higher selectivity colleges they would become more self-confident without any influences from their fathers' educational level, and being part-time students would not affect their growth of intellectual self-confidence either.

3. There is a general belief that college selectivity has great impact on student development. Table 2 did show its effect on students' intellectual self-confidence. However, the simple correlation coefficient between college selectivity and outcome was a lot higher than the coefficient when other input variables were controlled first. This means that when stepwise regression was not used, it is easy to see that the second step the regression procedure would take was college selectivity. When the effect of all possible correlated input variables were removed, the correlation between selectivity and outcome became smaller. Based on this result, we would infer that college selectivity did have an impact on how students rated themselves. But we should not put too much emphasis on it. In other words, we could say that the highly selective school attracted highly competitive and competent students. Since they were so competitive, the rate of their growth in intellectual self-confidence was just a little higher than students from not so highly selective colleges.

4. It is interesting to compare the growth of a student's social self-confidence with intellectual self-confidence. Except three variables which also showed some predictive weight in the social self-confidence regression equation, the other eight variables were different from that which appeared in the intellectual self-confidence regression. The three variables were student's race, female student, and the satisfaction with intellectual environment. Six variables in the first block which entered the equation included the pretest, white student,

parents' income, female student, career plans of being a lawyer and being an educator. White student and female student both had negative association with the outcome.

There was some suppressor effect in white students when the variable of parent's income entered the equation. This means that being a white student should have had less effect on the growth of social self-confidence. In other words, being a white student actually has less influence on self-confidence when parent's income entered. Family income would help students to be more confident socially. The same situation happened when the satisfaction with friendship with other students entered the equation. This variable had a weak suppressor effect also. This means that satisfaction with the friendship with other students would help their growth of self confidence despite being white students. Likewise, if we looked at the third step and the 10th step, when white students entered the equation, the correlation coefficients between the variables of these steps and the outcome increased. Parents' income and satisfaction with friendship with other students became stronger in self-confidence development.

Female students also had a negative association with the outcome, but not much suppressor effect was showed. The correlation coefficients of other variables with the outcome showed normal regression effects. However, when the closely correlated variables entered the equation, the significance of the earlier variables was cancelled out. In this case, when the college major in political science entered the equation, it cancelled the effect of the freshmen career plan of being a lawyer. When the satisfaction with the intellectual environment entered the equation, the effect of the career plan of being an educator diminished which did not have a significant simple correlation coefficient in the first place. We would not make a Type II error here.

5. All the variables about non-personal environmental conditions did not enter the equation. The different size or selectivity of colleges students enrolled did not have any

effect on the development of social self-confidence. This result really defeated the popular belief that whether students would become more or less self-confident depends on what type or kind of institutions they attended. One speculation would be that the students' social life was always surrounded by their small group of close friends, fraternity or sorority societies, or classmates. The objective condition of the environment did not have much impact. This might be the reason why satisfaction with friendship with other students would enter and have significant effect on students' social self-confidence. When we looked at the significant table after the first step of the equation was performed, we found that even without blocking the variables, the selectivity of institutions would not enter the second step of the equation. It is obvious that other various college variables would not affect the growth of self-confidence.

6. The changes between 1971 and 1980 for both female and male students and for both black and white students which were showed on Table 4 and Table 5 were self-explanatory. It is obvious that all students became more self-confident after nine years. It also showed the change in female students in terms of social self-confidence was a lot less than in male students. On the other hand, black students showed a greater gain in self-confidence in both respects than white students.

7. From Table 6, we also noticed that when we combined eleven self-rating variables and calculated a self-rating scale, the predictive weight of pretest on posttest on the self-rating scale was explicitly higher than both intellectual and social self-confidence. All except one variable which entered the self-rating scale equation also entered either or both the intellectual or social self-confidence regression equations. Only mother's educational level entered the total scale equation. Since parents' educational levels were closely correlated and father's educational level entered the intellectual self-confidence equation, we would not emphasize the significance of mother's educational level in this table. College selectivity and other objective college environmental variables did not

enter the equation of the self-rating scale. This means that students' self-rating did not differ because of the different type or kind of institutions they went to.

8. We can also discuss our findings along with findings reported in Astin's "Four Critical Years." Astin's analysis was based on a sample collected from 1961 to 1974, which included 10 sets of longitudinal studies (p. 16, 1977). Statistical regression method was used and the input and environmental variables were separated and divided into stages for stepwise regression equations. Although a lot smaller sample size was used in the present study, similar variables were gathered and stepwise regression statistical method was also used here. Our results for the most part were similar to Astin's findings. For instance, Astin's study failed to confirm the results of earlier studies which indicated that college prestige had a negative effect on student's intellectual self-esteem. Astin drew a conclusion that college selectivity did not have any effect on the able students' intellectual self-esteem and there was even a positive relation between college selectivity and student's self-esteem. This point was also presented in our study. However, our study showed that the college major did not have any significant effect on intellectual self-esteem. There was even negative association between majors in pre-prefessional area and the outcome. This point did not present in Astin's study. He found that majoring in one of three fields–mathematics, physical science, or engineering–was positively associated with increased intellectual self-esteem. This was not confirmed here either. Two points can be mentioned and discussed further.

(1) The correlation ($r = .66$) between pretest and posttest for self-rating reported in "Four Critical Years" was substantially higher than the correlation observed in this study ($r = .49$). The same situation was observed in the growth of social self-confidence. The correlation coefficient reported in "Four Critical Years" was .57, but it was .35 in our study. We can speculate on the reason for the lower correlation in the present study. The length of time between two tests would contri-

bute a lot of the discrepancies in the two correlation rates. The studies on which "Four Critical Years" was based were done in the students' freshmen years and their senior years. It covered almost four whole years of college. When the questions about self-confidence was asked in their senior year, they recognized that they had gone a long way to finish school and would be proud of themselves. Thus, the predictive weight of pretest was high. However, the 1980 sample was collected nine years after the students' freshmen year. Between their graduation from college and the time the posttest was taken, many other conditions were involved in personal feeling about themselves. Thus we had a relatively lower correlation coefficient.

(2) According to the findings reported in "Four Critical Years," students' majors were observed as having some degree of predictive weight in their development of intellectual self-esteem. Our study failed to explain this result. Planning to major in education was negatively associated with intellectual self-confidence. This explained the trend of the change in students' interest which was reported by Astin's 20-year study on college freshmen (1987). The loss of interest in education, traditional liberal arts and science fields, the humanities, fine and performing arts, social sciences and the natural sciences was observed.

9. Empirical study is always a post factor study. The conclusion we reached might not be appropriate to predict accurately the exact future trends. However, if more empirical studies have the same conclusions, we will have better predictive power. This study confirmed and remedied some previous studies' results, for instance, the findings in Erwin and Kelly's longitudinal study (1985). Even though in some sense we replicated other studies, we contributed positively to knowledge about college students' self-concept.

## V. CONCLUSION

Based on our study results, we can draw some conclusions:

1. Most studies which dealt with students' self-concept concentrated their studies on a single element or a few elements of certain aspects of people's characteristics. The researchers always adhered to a quite convincing rationale in terms of studying that particular aspect of human behavior. When they obtained significant results, they would make a lot of causal inference which we think was biased. When we considered human beings' behavior, we should realize that there are a lot of reasons to cause one's behavior. These reasons might come from the individual personality, or from the surrounding situation. If we chose only one aspect to investigate and concluded that this characteristic contributed to the persons's behavior without considering and controlling other causes of the behavior first, we would easily make a biased conclusion. In statistical term we would make a Type I error. Thus, it is necessary that before doing more specific study on the development of self-concept, a screening investigation should be done first. This is the first purpose of our study. We found that the growth of students' self-confidence depended on various variables. For each aspect of self-confidence being studied, more than ten steps were taken by regression equation. This means that there are many conditions behind people's self-rating of themselves or the formation of certain concepts. For college students, the growth of their self-confidence was attributed to many input and environmental variables. It is obvious that students' sex and students' race, the academic accomplishment, even having been presidents for student organization had effect on student's growth of intellectual self-confidence. Students' sex and students' race also contributed some weight to the growth of their social self-confidence. But other effective elements were different. Thus, we had different sources to the two aspects of self-confidence. This proved that the growth of different aspects of one general concept would depend on different personal or environmental characteristics. If we only tested one influential aspect of the behavior and drew conclusions from it, we would be biased. By dividing input

and environmental variables and putting them into different stages to find out which variable showed effective weight, we did a comprehensive investigation of a certain group of young people on their development of self-confidence. We found that many variables had impact on their growth of intellectural but not on that of social self-confidence. Our study also provided some evidences that student's input and environmental variables should be tesed separately and accordingly by the stepwise regression method.

2. In our study, we put the questions about students' perception of the environment in the last block of regression testing. The reason was stated earlier. Their satisfaction with the environment and their self-concept have a close relationship. The inference could go either way. It is possible to say that persons increased their self-confidence because they were satisfied with their environment. Or it is possible that because they were confident about themselves they were satisfied with their environment. Thus, some studies which drew a conclusion that satisfaction with environment was the best predictor of student's self-concept would have to be challenged on their causal inference. By using other influential variables, we could provide more convincing evidence to help in their causal inference. For instance, the satisfaction with friendship with other students as well as majoring in social science and political science which deal with human society and human relation would have effect on students' social self-confidence. This is a logical inference. College academic achievement as well as satisfaction with the intellectual environment would have impact on the increase of intellectual self-confidence. This also is a logical interpretation. Once more, we proved that the longitudinal study of the changes of students' behavior should take all influential elements into consideration and apply the stepwise regression method.

3. About future study we have a thought. Numerous studies have been done on students and a lot of these results have been published. However, we all know that there are a lot of successful people who are in high positions and earning

a lot of money but did not go to colleges or receive any college diploma. How they perceive themselves in terms of self-confidence or other human characteristics would be very interesting to study. This group of people who have not been to any college would create a controlled group in studying college impact on students. This kind of study seems impossible to execute. But if the technical problem can be solved and a study can be done, then more information would help us to improve our college student personnel work. It would also increase our knowledge about what affects people's self-concept.

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# 大學環境對大學生自信心成長的影響之研究

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## 摘 要

許多對大學生在自我了解成長的長程研究都遭遇兩個問題。雖然這些研究成果均登在各類高等教育的期刊上，但均未能完全解決此二問題。第一，學生行為是受許多方面的影響，除了學生本身的個性，家庭，高中教育背景之外，大學環境也是很重要的因素。若想真正了解環境對個人成長的影響，必須先將個人因素加以控制。然而許多研究未能做到此，產生了在結論上，影響因素不知應歸屬於環境還是個人背景的問題。Dr.Astin提出其三邊模式（IEO Model），協助我們分開研究個人、環境及結果的關係。並利用逐步迴歸統計方法（Stepwise Regression Statistics）找出影響個人成長的環境因素。本文利用Dr.Astin提供的1971與1980追蹤研究的資料庫，研究有關大學生自信心在智能及社交兩方面成長的環境影響因素。

第二，最近的研究顯示個人對環境滿意的程度是大學生自信心成長的重要因素。此項結論需進一步檢討。因為自信心之成長與環境的滿意程度有相互解釋的關係。對環境愈滿意自會增加個人自信心，同時也可能因個人有自信而增加對環境的滿意程度。因此，上述結論的正確性令人懷疑。若在研究二者因果關係時，增加其他條件的參與因素，發現其他個人與環境因素影響了個人自信心的成長，則上述的混淆將不會發生。本文很清楚的修正上述研究之不是。在大學生自信心成長上，除了個人對環境之滿意

程度之外，學生性別，種族，主要科系及其他因素都有其影響力。

本研究是少數人以長期性全國性資料對學生自信心成長的因素以迴歸統計方法的研究之一。