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College Experience and Change in Locus of Control

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COLLEGE EXPERIENCE AND CHANGE IN LOCUS OF CONTROL

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ABSTRACT

Ninety-one college students were administered The DeKalb Survey Test during their freshman and junior years to assess possible changes in locus of control. On the basis of their freshman scores, subjects were assigned to an internal group, an internal-external group, or an external group.

The greatest change occurred for the external group in the predicted internal direction. The internal-external group changed in the internal direction, but not as much as did externals. Although the internal group became more external, none of the three groups could be classified as externally oriented by their junior year. The higher achieving students and those from an urban background also changed significantly in the internal direction and were more internal as juniors than were the less achieving students and those from a rural background.

CHAPTER I

INTRODUCTION

Our behavior is assumed to be largely a result of learning and since many learning theories regard reinforcement as playing a prominent role in accounting for behavior, it seems important to investigate the part individual differences play in the perception of various reinforcements. The effect a particular reinforcement has on an individual is considered by Rotter (1966) to depend " . . . upon whether or not the person perceives a causal relationship between his own behavior and the reward [p. 1]." In other words, does the individual perceive the reward as being contingent upon his own actions or does he perceive the reward's occurrence as being totally independent of his own behavior? A person is regarded as having a belief in internal control if he perceives the reinforcement as being contingent upon his own behavior. However, if he perceives the reinforcement as being the result of chance and not as a consequence of his own behavior, he is regarded as having a belief in external control.

Can locus of control aid us in furthering our knowledge and understanding of the learning process and can we determine the effects, if any, this variable has in different learning situations? According to Rotter (1966), " . . . consistent individual differences exist among individuals in the degree to which they are likely to attribute

personal control to reward in the same situation [p. 1]." Thus, the way an individual responds in a given situation is a result of how he perceives the reinforcement. Since internals believe a particular reinforcement is contingent upon their own behavior, they are far more likely to place a greater importance on skill than externals, who regard the same reinforcement as the result of chance.

CHAPTER II

REVIEW OF THE LITERATURE

A review of the literature on locus of control reveals the investigation of two aspects of the concept of internal-external control. The first of these refers to the nature of the task itself (I_t-E_t); while the second is concerned with perceived control as a personality characteristic (I_p-E_p).

Task Structure

The first aspect (I_t-E_t) originated in learning theory and is independent of any personality variables. Tasks themselves can be characterized as internal (I_t) or external (E_t) and can be ordered on a continuum ranging from highly internal tasks involving a great deal of individual control to highly external tasks involving only minimal control by the individual. Many athletic skills are contingent upon the person's own actions. Classical or Pavlovian conditioning, on the other hand, would illustrate a highly external task or one in which reinforcement was controlled entirely by the experimenter and was not dependent upon the individual's own behavior.

Phares (1957) published the first experiment in this area and was interested in the difference between skill and chance learning. Two ambiguous tasks, color matching and line matching, were used and

while half of his subjects were instructed that success would be the result of skill, the remaining half were informed that success would be purely the result of luck or chance. Reinforcement was the same for each group and expectancy was measured by how many chips a subject was willing to bet on the probability of his being correct on each succeeding trial.

Phares found that subjects given skill instructions changed their expectancies as a result of previous experience to a greater extent than did subjects given chance instructions. Thus, he confirmed his hypothesis that increments following success and decrements following failure would be greater for the group given skill instructions. Phares also found these subjects varied their expectancies to a greater extent than did subjects presented with chance instructions. However, the latter group of subjects revealed a strong tendency toward unusual shifts in expectancies.

In his unpublished doctoral dissertation, James (1957) employed both a line matching and an angle matching task to investigate the generalization and spontaneous recovery of expectancies. One group presented with skill instructions and a second group presented with chance instructions were both given 75 percent reinforcement during eight training trials. To test for generalization of expectancies, both of these groups were then given a single trial on another task. Two additional groups, each presented with either skill or chance instructions and 75 percent reinforcement during the eight training trials, were tested for spontaneous recovery by having a five minute rest period before being given two more trials on the same task. The skill group

revealed significantly greater generalization of expectancies and although not significantly, they revealed a greater degree of spontaneous recovery than did the chance group.

James and Rotter (1958) then studied the effects of partial versus complete reinforcement schedules on trials to extinction for both skill and chance groups. Although success on the card guessing task employed was controlled entirely by the experimenter, one of the two skill groups was given 50 percent partial reinforcement; while the second group was given 100 percent reinforcement. Similarly, one chance group of subjects was given 50 percent partial reinforcement and the second was given 100 percent reinforcement. Each subject was required to rate his expectancy of success on a scale from 1 to 10, and James and Rotter defined extinction as giving an expectancy of 0 or 1 for three consecutive trials. At the end of the ten training trials presented, a significant difference was found between the skill and chance groups in the number of trials necessary for extinction.

James and Rotter had hypothesized that extinction would quickly occur in the chance group given 100 percent reinforcement, but would be slower for the chance group given only 50 percent partial reinforcement. They also hypothesized that no difference in resistance to extinction should be found for the skill group under either reinforcement schedule.

Their results contradicted previous findings in which partial reinforcement has usually been found to surpass 100 percent reinforcement in resistance to extinction. James and Rotter found this to be true for the chance groups, but in the skill groups, they found that subjects given 100 percent reinforcement revealed slightly more

resistance to extinction than subjects given only 50 percent partial reinforcement. Subjects presented with chance instructions under partial reinforcement revealed significantly greater resistance to extinction than those presented with skill instructions. However, the more reinforcement given to subjects in the skill groups, the more persistent they were and under 100 percent reinforcement, significantly greater resistance to extinction was shown by the skill group than by the corresponding chance group.

Rotter, Liverant, and Crowne (1961) confirmed the previous findings of James and Rotter without utilizing the same highly verbalized instructions. Instead of presenting the skill and chance conditions through different instructions, all subjects received the same instructions, and the skill and chance conditions were produced by employing tasks which the subjects would regard as skill or chance as a result of previous experience: a motor task for the skill condition and a card guessing task for the chance condition. The eight groups used consisted of females with a skill and chance group being given 25 percent, 50 percent, 75 percent, or 100 percent reinforcement schedules. Their investigations found that increments following success and decrements following failure during the eight training trials were significantly greater for the skill groups than for the chance groups for all but the 100 percent reinforcement groups. As did James and Rotter (1958), they also found that extinction was significantly slower for the skill group given 100 percent reinforcement and that 50

percent reinforcement was more resistant to extinction only with the chance group. However, with 25 percent and 75 percent reinforcement schedules, differences between the skill and chance groups in the number of trials necessary for extinction were smaller than at the 50 percent levels of reinforcement.

Holden and Rotter (1962) examined a nonverbal measure of expectancy to see if differences in extinction patterns with a behavioral criterion would be similar to those found with the verbal measures of expectancy used in the earlier studies. Three groups of subjects were used and each group received skill, chance, or ambiguous instructions. A card guessing task was again employed and betting was used as the nonverbal measure of expectancy. Each subject was supplied with two dollars in nickels and informed that he could bet a nickel on his expectancy of success on each trial. Each group received only 50 percent partial reinforcement and subjects were told that they could bet until all their nickels were used up or they could stop at any time and keep their remaining money. Holden and Rotter defined extinction as voluntarily terminating the experiment and as in the earlier studies, found that extinction was significantly slower with the chance and ambiguous groups than with the group given skill instructions.

Blackman (1962) employed red and green flashing lights appearing in supposedly random sequences, and the task was to predict the color which would appear on each succeeding trial. The length of the sequences and the patterning of the lights were varied from longer sequences with easily recognized patterns to short sequences with

complicated patterns or random occurrence. The subjects were put on a 50 percent reinforcement schedule followed by extinction. Training ended when the red light no longer went on and extinction was defined as the subject's predicting only green lights. The results suggest that subjects were able to perceive that the task was not in fact chance controlled. The longest sequences and the easy pattern extinguished most rapidly, and indicate that the subjects realized that these were controlled by an experimenter. Extinction was much slower when subjects perceived the task as random.

In a study of perceptual thresholds, Phares (1962) employed a tachistoscope to expose nonsense syllables to two groups of subjects. Although only some of the nonsense syllables were accompanied by shock, the skill group was informed that they could avoid the shock if they learned to press the correct button. The chance group, on the other hand, was informed that although they could press any sequence of buttons, whether the shock would be avoided depended entirely on chance. During the ten training trials presented, both groups received the same number of shocks given on the same trials. Recognition thresholds were recorded before and after training, and the results showed a significantly greater drop in threshold for the skill instructed group than for the group receiving chance instructions.

James, Senn, and Lotsof (1965) used children and devised an electronic rifle set for the skill group and a gumball dispenser for the chance group. Both these tasks were controlled by an experimenter and 50 percent and 100 percent reinforcement levels were presented. There was a maximum of thirty extinction trials preceded by twelve

acquisition trials, and the number of tokens bet before each trial served as the dependent variable. The results were in contradiction with the previous findings of James and Rotter (1958) and Rotter, Liverant, and Crowne (1961) in revealing more resistance to extinction in the skill group presented with 50 percent partial reinforcement.

Personality Variable

It is also possible to place individuals on a continuum based on the degree to which they typically perceive events as being controlled by themselves or by chance, and this second aspect (I_p-E_p) refers to perceived control as a personality variable. An individual on the extreme internal point of the continuum would be a person who perceives himself as controlling most reinforcements and attributes most reinforcing events to factors intrinsic to himself. An individual on the extreme external end, on the other hand, would be a person who attributes most reinforcing events to fate, chance, and other extrinsic factors.

In an attempt to determine the degree to which individuals perceive reinforcements as being internally or externally controlled, Phares (1955) developed a twenty-six item Likert type scale with half of the items expressed in the internal direction and the remaining half expressed as external items. Although this first attempt to measure individual differences in locus of control as a personality variable was not entirely successful, Phares did find that individuals scoring in the external direction tended to reveal fewer but more unusual

shifts in expectancy, generally responding similarly to individuals placed in an external or chance situation.

In 1957, James revised the Phares scale and although continuing to employ a Likert type scale, he added filler items. He had groups differentially receiving skill and chance instructions and since the behavior of subjects presented with skill instructions differs from that of subjects presented with chance instructions, James also hypothesized that persons scoring in the extreme internal direction would not respond in each group in the same way as those scoring in the extreme external direction. Although numerically small, the correlations between behavior in the task situation and his test were significant. Internals generalized more from one task to another and recovered more following extinction than did externals. Although increments and decrements following success and failure were generally smaller for externals, they also showed more unusual shifts in expectancy. In 1963, James revised and restandardized his original scale and to disguise the test's purpose, he entitled it "The DeKalb Survey Test - Form I.E. - 1." The sixty item Likert type scale consists of thirty relevant items and thirty fillers.

Another scale was developed by Rotter, Seeman, and Liverant (1962) which included subscales for achievement, affection, and general social and political attitudes. To control for social desirability, a forced choice format was used, with each item consisting of an internal belief or attitude paired with an external belief. Although the original scale contained one hundred items, the final version (Rotter, 1966) contained only twenty-nine items including six fillers. Since the items are concerned with the person's belief about the nature of the world, the scale is only intended to be a measure of a generalized

expectancy and " . . . none of the items is directly addressed to the preference for internal or external control [p. 10]." Although estimates of internal consistency for the scale are only moderately high, they are relatively stable and the scale has been found to have good discriminant and construct validity. Correlations with the Marlowe-Crowne Social Desirability Scale were moderately low and low correlations were also found with intelligence, sex differences, and adjustment. Correlations with the earlier James-Phares Likert type scale ranged from .55 to .60, and Cardi (1962) found a correlation of .61 between I-E scores and judges' ratings of a subject's internal-external control during a semi-structured interview. Adams-Webber (1963) found a significant correlation between I-E scores and a story completion test measuring internal-external control.

Bialer (1961) was the first to develop a scale measuring internal-external control in children. The Locus of Control Scale for Children is a modified version of the James-Phares Scale and contains twenty-three items answered either "yes" or "no." It can be presented in written form or can be administered orally. The Intellectual Achievement Responsibility Scale (IAR) is a forced choice scale developed by Crandall, Katkovsky, and Preston (1962) and measures the extent to which children feel responsible for the successes and failures they encounter in intellectual achievement situations. Although more projective in nature, the Children's Picture Test of Internal-External Control, developed by Battle and Rotter (1963), represents a third attempt to measure internal-external control in children. Comparison with

Bialer's Locus of Control Scale for Children yielded a significant correlation of .42.

To study the relationship between locus of control and risk taking, preferences for bets were investigated by Liverant and Scodel (1960). They used a dice throwing task and found that internals favored bets of intermediate probability rather than either extremely safe bets or long shots. When compared with externals, internals were inclined to wager more money on a safe bet than on bets of low probability. Lefcourt (1965) hypothesized that Negroes would be less defensive and less external with a chance task than in a skill situation. He found that Negro subjects wagered fewer low probability bets than did white subjects and were less willing to take risks in a chance situation.

Seeman and Evans (1962) among others hypothesized that externals would make fewer attempts to control their environment than internals. They found that external tuberculosis patients were less informed about their condition, questioned the hospital staff less frequently, and were more satisfied with what they were told about their condition than were internal patients. In his study with the inmates of a reformatory, Seeman (1963) also found that internals remembered significantly more incidentally learned information concerning the actual operation of the reformatory and parole. In 1963, Gore and Rotter found that internal students in a southern Negro college were significantly more willing to attend and actually participate in a freedom ride or a march on the state capitol. Using workers in Sweden as subjects, Seeman (1964) found that internal workers were significantly more informed of

political affairs and more actively involved in unions than were externals. Strickland (1965) also found that activists in a Negro civil rights movement were significantly more internal than nonactivists. Phares (1965) found that internal subjects, who were instructed to act as experimenters and attempt to change the attitudes of other students toward maintaining sororities and fraternities on campus, were significantly more effective than external subjects in changing attitudes. A final study by Carlson, James, and Carriere (1966) also found that internals were significantly more informed about Viet Nam and were more willing to participate in social action behavior. All these investigators provided further evidence of the construct validity of locus of control in addition to studying its relationship with the extent to which people try to control their surrounding environment.

To study the relationship between locus of control and the degree to which individuals seek to control themselves, Straits and Sechrest (1963) found that individuals who smoked were significantly less internal than nonsmokers. In addition, James, Woodruff, and Werner (1965) found that more internals quit smoking subsequent to the report by the Surgeon General on smoking and lung cancer. However, the difference was only significant for males and they suggested that perhaps additional factors are influential in motivating females.

In studies relating locus of control with conformity, it was hypothesized that externals would be more inclined to reveal conforming types of behavior; while internals would be less influenced by external control and consequently less likely to conform. Crowne and Liverant (1963) investigated the behavior of both an internal and external group

of college students in an Asch conformity situation. Although the traditional Asch instructions were presented in one of the conditions, a second condition consisted of providing subjects with a certain amount of money and allowing them to wager on their judgments. The amount of the wager and the decision whether or not to bet on a particular judgment were optional. They found that when allowed to bet, externals yielded significantly more than internals. On independent trials, externals also wagered less money on themselves when betting against the majority than did internal subjects. Although externals also wagered significantly less money on independent trials than on trials on which they yielded, the difference between bets on independent and conforming trials was not significant for internals. No difference in amount of yielding, however, was found between internal and external subjects in the normal Asch condition.

In another study, Gore (1962) found that internals are resistive only when it is obvious that subtle attempts are being made to influence them. However, if they believe that conforming will be to their advantage and they will benefit in some way or if they are aware that they are being offered an alternative, they are more likely to conform. She presented TAT cards under three conditions and subjects were informed that the study was being conducted to find out which of the cards produced longer stories. In the first condition, she clearly influenced her subjects by indicating which of the cards she considered the best. However, the influence used in the second condition was only subtle and the third condition using no influence was included as a control condition. She found that internals composed significantly

shorter stories than did the external or control subjects when subtle suggestion was used. No differences, however, were found between internal and external subjects when either overt or no suggestion was used.

Although Strickland (1962) found that subjects who were aware of the reinforcement contingency and did condition were significantly less internal than subjects who were aware and did not condition, she failed to find any relationship between locus of control and conditionability. Getter (1962) found that the latent conditioners in his study were significantly more internal than subjects who conditioned during the training trials or those who failed to show any type of conditioning.

Crandall, Katkovsky, and Preston (1962) investigated the relationship between locus of control and achievement behavior using early grade school children as subjects. Although they hypothesized that achievement oriented behavior should be more apparent with internals, their findings were not true for girls. They did find, however, that boys scoring in the internal direction devoted more time to free play activities of an intellectual nature and received higher scores on intelligence tests, reading achievement tests, and arithmetic achievement tests. Franklin (1963) also investigated the relationship between locus of control and achievement behavior, and hypothesized relationships between internal-external control and reported evidence of achievement motivation. Using high school students as subjects, he found significant relationships in the predicted direction in fifteen of the seventeen relationships examined. Cellura (1964) found a relationship between the IAR scale and a questionnaire on achievement

behavior of lower socioeconomic status boys, but not for girls from the same social class. Since internals tend to assume their failures are the result of their own actions, one would hypothesize that they have more of a need to repress their failures and Efran (1963) found that internal high school students were significantly more prone to forget their failures than external students.

To test whether internals will take longer to make a difficult discrimination in a task which they perceive to be skill determined and whether externals will take longer to make a discrimination in a task which they perceive to be chance determined, Rotter and Mulry (1965) presented half of the subjects with internal instructions and the remaining half with external instructions. All 120 subjects were then given eight trials on an extremely difficult angle matching task and were not informed that they were being timed. Although internals presented with skill instructions required more time to complete the task than externals, externals required more time than internals when given chance instructions. Internals took significantly longer time with the skill instructions than with the chance instructions, indicating that internals become more highly involved in skill situations than in chance situations. Although the decision time for externals given chance instructions was longer than when given skill instructions, this difference was not significant.

Butterfield (1964) found a significant relationship between internality and constructive reaction to frustration and facilitating anxiety. He also found a significant relationship between externality and intropunitive reactions to frustration.

Cromwell, Rosenthal, Shakow, and Kahn (1961) compared normals and schizophrenics and found that normals were significantly less external than schizophrenics. Although both normals and schizophrenics had lower reaction times, normals seemed to prefer situations allowing autonomy and schizophrenics preferred situations involving external control.

Although Gore and Rotter (1963) did not find any significant social class differences in internal-external control with a homogeneous group of students at a southern Negro college, other studies using more heterogeneous groups as subjects have found significant differences. Franklin (1963) used a national stratified sample of 1000 subjects and found a significant relationship between internality and upper socioeconomic class. With Negro and white students in the sixth and eighth grade, Battle and Rotter (1963) found a significant social class effect while controlling for race and intellectual level. The effect of race was significant mainly because the lower class Negroes were considerably more external than either the middle class Negroes, lower class whites, or upper class whites. In a sample of whites, Spanish-Americans, and Indians, Graves (1961) found that Indians were the most external and whites were the least external of the three ethnic groups. Lefcourt and Ladwig (1965), hypothesizing that Negroes would be more external than whites, found Negro inmates to be significantly more external than white inmates in two correctional institutions.

Although many hypotheses have been made concerning the antecedents for developing internal or external attitudes, very little research has been done and knowledge in this area is still rather limited.

CHAPTER III

PURPOSE OF STUDY

Over recent years, the mean score on The DeKalb Survey Test (1963) has shown a slight increase in college populations, representing a gradual increase each year in external control. However, no attempt has been made to determine if any change in locus of control in an individual occurs with his increased exposure to a college environment.

In the present study, The DeKalb Survey Test was readministered to students during their junior year to assess possible changes in locus of control occurring since the original administration while beginning freshmen. A college atmosphere provides a competitive setting in which it is necessary for students to meet certain scholastic requirements and which provides an opportunity for students to become involved in varied campus activities and organizations. It is an atmosphere which usually requires greater responsibility on the part of students and is a setting in which individual initiative and achievement are stressed. With increased exposure to these kinds of influences, it seemed likely that students would become more internally controlled.

Hypothesis:

> Students will become more internally controlled (a student's I-E score will decrease) with increased time in a university or college setting (freshman versus junior year).

The present study also attempted to investigate whether grade point average, college of enrollment within the university, and urban or rural background were related to changes in locus of control.

CHAPTER IV

METHOD

Subjects

Sixty females and thirty-one males were selected from undergraduate psychology classes at the University of North Dakota. The only criterion for selection as a subject was that he previously had been administered The DeKalb Survey Test (1963) during his freshman year in 1967. The mean I-E score for all female freshmen in 1967 was 38.66 with a standard deviation of 9.27. The mean for all male freshmen that year was 39.50 with a standard deviation of 9.50. On the basis of their freshman scores, subjects were assigned to an internal group (I group), an intermediate group (I-E group), or an external group (E group). The I group (scores of 33 and below) consisted of 16 females and 8 males, the I-E group (scores ranging from 34 to 44) consisted of 27 females and 15 males, and the E group (scores of 45 and above) consisted of 17 females and 8 males.

Instruments

The DeKalb Survey Test (1963) is a slightly modified version of the original scale developed by James in 1957. The scale provides a measure of the extent to which an individual perceives events as determined by factors intrinsic to himself (internal control) versus the

extent to which he perceives events as determined by factors extrinsic to himself such as fate, chance, and the manipulation of others (external control). In order to disguise the purpose of the scale, the author entitled it "The DeKalb Survey Test - Form I.E. - 1." It is a sixty item Likert type scale (see Appendix) on which subjects are required to indicate whether they strongly agree, agree, disagree, or strongly disagree with each statement. Only the thirty even numbered items are scored and the thirty odd numbered items are filler items. The scale is scored in the direction of external control and scores can range from zero to ninety (lower scores indicate internal control and higher scores indicate external control). Split-half reliabilities on the scale range from .84 to .96 and test-retest reliabilities have been obtained ranging from .71 (one year period) to .86 (three month period).

Procedure

Each subject was readministered The DeKalb Survey Test during his junior year. Subjects also were requested to fill out a questionnaire (see Appendix) indicating their grade point average, their college of enrollment within the University, and whether they were from an urban or rural area. Subjects were required merely to check an urban or rural category provided on the questionnaire and no objective definition of urban or rural area was provided. Although subjects were also requested to indicate their major area, intended major as freshmen, father's occupation, their intended occupation, religious preference, and degree of active religious involvement, this information was not used in the final analysis of the data.

Design

A 3x2 analysis of variance was the basic design employed in the present study. The two independent variables used were three levels of perceived locus of control (an I group, an I-E group, and an E group) and sex. The dependent variable was the difference score for each subject derived by subtracting the I-E score each subject received during his junior year from his freshman score. This procedure yielded a positive score if the change occurred in the predicted internal direction.

Also *t* tests were computed between freshman and junior I-E scores for groups differing in grade point average, college, and background.

CHAPTER V

RESULTS AND DISCUSSION

The results of the analysis of variance of difference scores presented in Table 1 did not reveal a significant interaction of locus of control by sex (F=.99). The sex variable (F=.04) also was not significant and indicates that males and females were not significantly different in their difference scores. However, the locus of control variable (F=12.85; df=2,85; p<.001) was significant. The means and standard deviations of difference scores for these factors are presented in Tables 2 and 3 (raw data can be found in the Appendix).

An examination of the t tests presented in Table 4 reveals that the differences between the means of all three groups are significant. However, the greatest difference was between the means of the internal and the external groups (p<.001). The difference between the means of the internal and intermediate groups and the difference between the means of the external and intermediate groups were both significant at the .01 level.

Examination of the means in Table 2 reveals that the greatest change in the predicted internal direction occurred for those subjects classified as externals on the basis of their freshman scores (mean change=9.36). The 99 percent confidence interval for this mean was computed to be 5.06 to 13.72 and indicates that the change for externals

TABLE 1

ANALYSIS OF VARIANCE OF DIFFERENCE SCORES

Source	Sum of Squares	df	Mean Squares	F
Total	9148.43	90		
I-E	2068.44	2	1034.22	12.85***
Sex	3.01	1	3.01	.04
I-E X Sex	160.42	2	80.21	.99
Error	6916.56	85	81.37	

***$p<.001$.

TABLE 2

MEANS AND STANDARD DEVIATIONS OF DIFFERENCE SCORES
FOR MAIN EFFECTS OF LOCUS OF CONTROL AND SEX

Main Effect	Mean	Standard Deviation
I	-3.79	9.36
I-E	2.78	8.62
E	9.36	8.27
Male	3.26	10.70
Female	2.65	9.56

TABLE 3

MEANS AND STANDARD DEVIATIONS FOR EACH CELL

Cell	Mean	Standard Deviation
I Male	-2.13	9.44
I Female	-4.63	9.21
I-E Male	1.60	10.02
I-E Female	3.44	7.65
E Male	11.75	7.77
E Female	8.24	9.19

TABLE 4

SUMMARY OF *t* TESTS AFTER THE ANALYSIS OF VARIANCE OF DIFFERENCE SCORES

t Test	*t*
$t_{I \text{ vs. } I-E}$	2.88**
$t_{E \text{ vs. } I-E}$	2.90**
$t_{I \text{ vs. } E}$	5.12***

**$p<.01$.
***$p<.001$.

was significantly greater than zero. The intermediate I-E group also changed in the predicted internal direction (mean change=2.78), but their change was not as great as externals. The 99 percent confidence interval is -.68 to 6.26 and indicates the possibility of no change. Although the internal group changed in the external direction (mean

change=-3.79), their change was also less than that of externals in the internal direction. The 99 percent confidence interval is -8.83 to 1.24. Since the latter two confidence intervals include zero, we can conclude that the mean change scores for the intermediate and internal groups are not significantly different from zero and that no significant change in scores occurred for either of these two groups.

Table 5 contains the means and appropriate t tests calculated between freshman and junior I-E scores for each of the three groups (I, I-E, and E). Significant differences were found for all the groups. The largest change between freshman and junior I-E scores occurred again in the external group ($p<.001$). The internal and intermediate groups also changed significantly between their freshman and junior years, but the possibility of this occurring by chance was greater ($p<.05$). Although internals were somewhat closer to the mean (more external) by their junior year than they were as freshmen, they were still found to be more internally oriented than were externals in their junior year. It should also be noted that none of the three groups could be classified as externally oriented by their junior year. The mean freshman and junior I-E scores for the three groups are graphically displayed in Figure 1.

The smaller shift displayed by internals in the opposite direction than was predicted might be a reflection of regression towards the mean or might reflect a smaller initial deviation than externals from their original freshman mean of 39. The absolute difference from the mean of 39 was calculated for both groups during the two testing times. Internals were not found to be any more or less divergent from the mean

TABLE 5

SUMMARY OF *t* TESTS BETWEEN FRESHMAN AND JUNIOR I-E SCORES FOR I, I-E, AND E GROUPS

Groups	Mean	*N*	Difference	*t*
I				
Freshman	28.50	24	-5.04	2.58*
Junior	33.54			
I-E				
Freshman	38.36	42	2.79	2.07*
Junior	35.57			
E				
Freshman	49.12	25	8.64	4.69***
Junior	40.48			

*$p<.05$.
***$p<.001$.

than externals at either time (Time 1: $t=-.30$, $df=47$, $p>.05$; Time 2: $t=1.49$, $df=47$, $p>.05$). Since the freshman scores for both groups were equally divergent from the mean, the greater change for externals in the predicted internal direction appears even more significant.

Subjects were also classified according to grade point average (2.00 to 2.99 versus 3.00 to 3.99), college within the university (Arts and Sciences versus Education), and background (urban versus rural). Within each of these classifications, *t* tests were computed between freshman and junior I-E scores. As indicated in Table 6, significant differences were found between the freshman and junior I-E scores for subjects with a grade point average ranging from 3.00 to 3.99 and for subjects from an urban background. Although the mean differences for the remaining four classifications were not significant, all changes in

Fig. 1--Mean freshman and junior I-E scores for the I, I-E, and E groups.

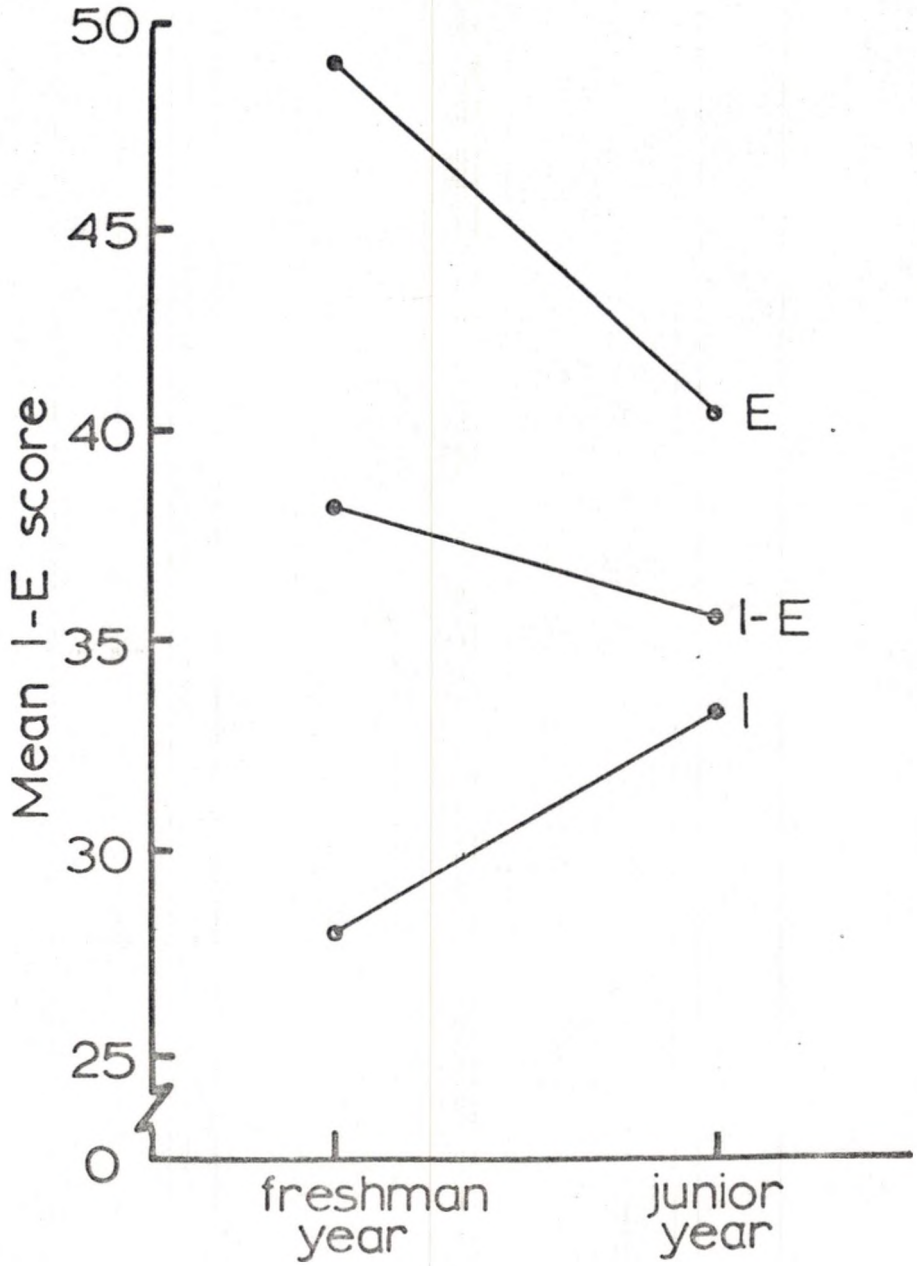

50
45
40
35
30
25
0
Mean I-E score
E
I-E
I
freshman year
junior year

TABLE 6

SUMMARY OF t TESTS BETWEEN FRESHMAN AND JUNIOR I-E SCORES FOR GPA, COLLEGE, AND BACKGROUND

Groups	Mean	N	Difference	t
GPA				
2.00-2.99				
Freshman	38.30	47	.79	.55
Junior	37.51			
3.00-3.99				
Freshman	39.27	37	5.14	3.02**
Junior	34.14			
COLLEGE				
Arts and Sciences				
Freshman	37.70	34	2.74	1.36
Junior	34.97			
Education				
Freshman	38.23	35	1.06	.65
Junior	37.17			
BACKGROUND				
Urban				
Freshman	40.02	49	4.28	3.13**
Junior	35.73			
Rural				
Freshman	37.19	42	.76	.47
Junior	36.43			

**$p<.01$.

the mean scores were in the predicted internal direction. The mean freshman and junior I-E scores for grade point average and background are graphically displayed in Figures 2 and 3, respectively.

Even though subjects with a grade point average ranging from 3.00 to 3.99 were initially somewhat more external (M=39.27) than were subjects (M=38.30) with a grade point average ranging from 2.00 to 2.99, the former group of subjects changed significantly in the

Fig. 2--Mean freshman and junior I-E scores for grade point average.

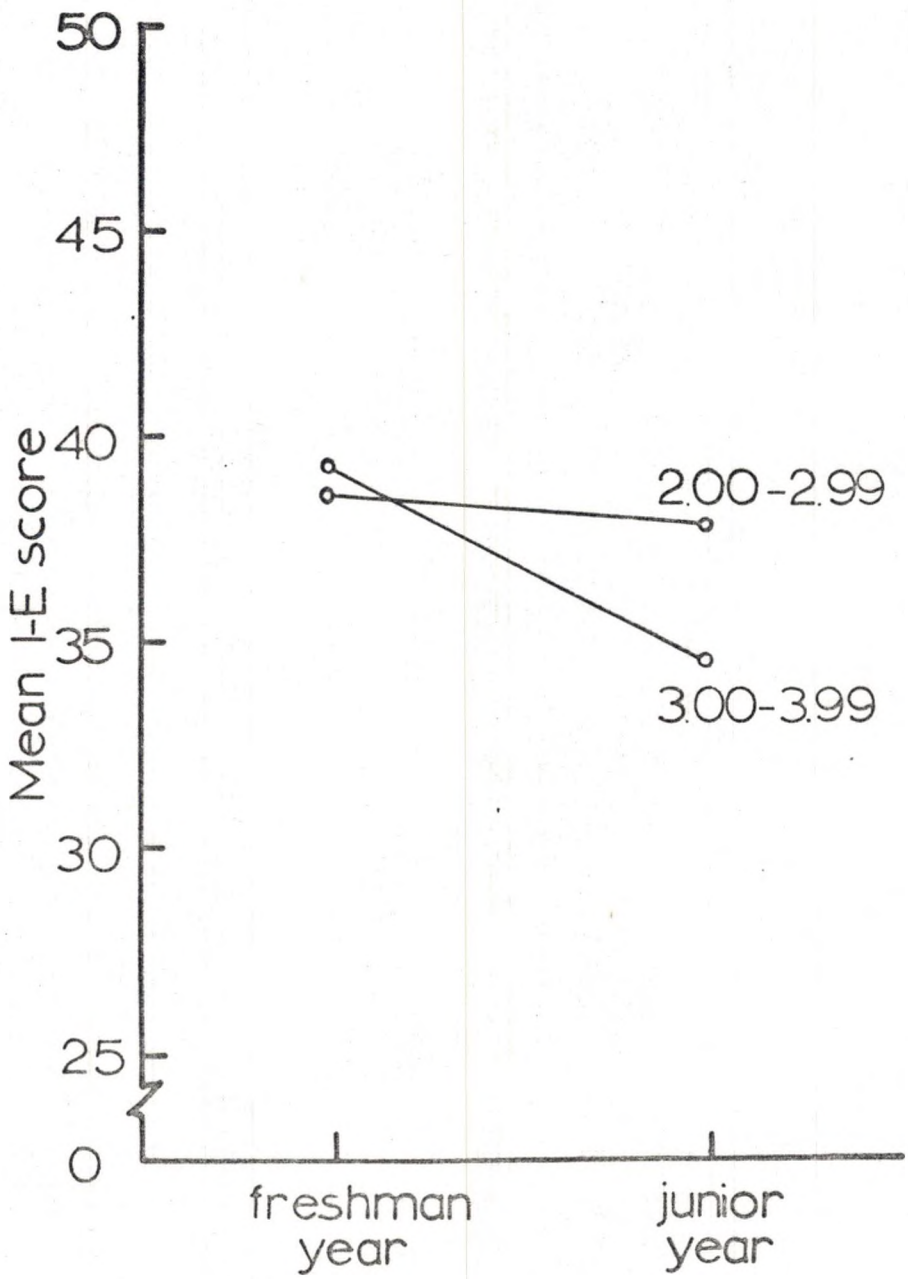
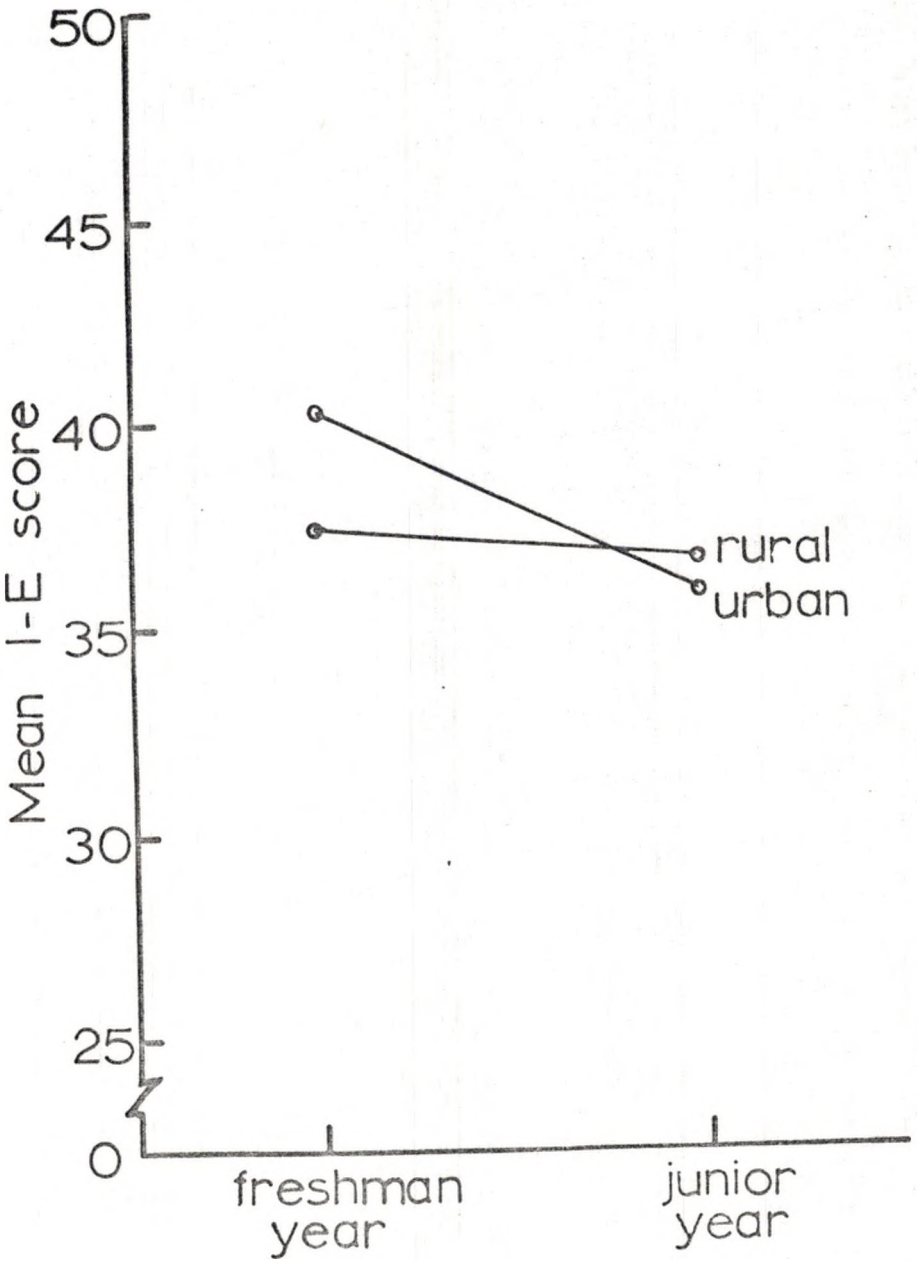

50
45
40
35
30
25
0
Mean I-E score
2.00-2.99
3.00-3.99
freshman year
junior year

Fig. 3--Mean freshman and junior I-E scores for rural and urban backgrounds.


50
45
40
35
30
25
0
Mean I-E score
rural
urban
freshman year
junior year

internal direction and were even more internal than the latter group of subjects by their junior year. Subjects from an urban background also were initially more external (M=40.02) than were rural subjects (M=37.19). However, urban subjects also changed significantly in the internal direction and were more internal than were rural subjects by their junior year. Thus, the college experience is likely to be a greater source of increasing internalization for the more achieving students and those from an urban background. Although it is not possible to attribute the changes in perceived locus of control to the college experience per se, the differences observed among the various classifications of students does indicate that these changes may very well be a result of the college environment and not merely a function of the passage of time.

Since Rotter (1971) has reported that "lower-class children tend to be external; children from richer, better-educated families tend to have more belief in their own potential to determine what happens to them [p. 58]," the present researcher thought it interesting that the more achieving students and those from an urban background were initially found to be more external than the somewhat less achieving students and those from a rural background. However, it seemed likely that the more achieving urban student might be more inquisitive and less set in his ways than the less achieving rural student and, thus, be more likely to join varied campus organizations and activist student groups. It also seemed likely that such involvement would enable a student to become more internally controlled and generate the

belief that he could control his future and improve the society in which he lives.

Rotter (1971) also reported that college students are showing an increase each year in externality. Rotter states:

> . . . that between 1962 and 1971 there was a large increase in externality on college campuses. . . . The increase in externality has been somewhat less in Midwest colleges than in universities on the coasts, but there is little doubt that, overall, college students feel more powerless to change the world and control their own destinies now than they did 10 years ago [p. 59].

However, the present study has shown that students, who were external as beginning freshmen, changed significantly in the internal direction and that none of the three groups would have been classified as externally oriented by their junior year.

APPENDIX

DE KALB SURVEY TESTS

Student Opinion Survey - Form I-E, 1

Name_____Age____Date____Male___Female___

Major area_____Current Address_____

Home Address_____

Instructions

Below are a number of statements about various topics. They have been collected from different groups of people and represent a variety of opinions. There are no right or wrong answers to this questionnaire for every statement there are large numbers of people who agree and disagree. Please indicate whether you agree or disagree with each statement as follows:

Circle SA if you strongly agree
Circle A if you agree
Circle D if you disagree
Circle SD if you strongly disagree

Please read each item carefully and be sure that you indicate the response which most closely corresponds to the way which you personally feel.

SA A D SD 1. I like to read newspaper editorials whether I agree with them or not.

SA A D SD 2. Wars between countries seem inevitable despite efforts to prevent them.

SA A D SD 3. I believe the government should encourage more young people to make science a career.

SA A D SD 4. It is usually true of successful people that their good breaks far outweighed their bad breaks.

SA A D SD 5. I believe that moderation in all things is the key to happiness.

SA A D SD 6. Many times I feel that we might just as well make many of our decisions by flipping a coin.

SA A D SD 7. I disapprove of girls who smoke cigarettes in public places.

SA A D SD 8. The actions of other people toward me many times have me baffled.

SA A D SD 9. I believe it is more important for a person to like his work than to make money at it.

SA A D SD 10. Getting a good job seems to be largely a matter of being lucky enough to be in the right place at the right time.

SA A D SD 11. It's not what you know but who you know that really counts in getting ahead.

SA A D SD 12. A great deal that happens to me is probably just a matter of chance.

SA A D SD 13. I don't believe that the presidents of our country should serve for more than two terms.

SA A D SD 14. I feel that I have little influence over the way people behave.

SA A D SD 15. It is difficult for me to keep well-informed about foreign affairs.

SA A D SD 16. Much of the time the future seems uncertain to me.

SA A D SD 17. I think the world is much more unsettled now than it was in our grandfathers' times.

SA A D SD 18. Some people seem born to fail while others seem born for success no matter what they do.

SA A D SD 19. I believe there should be less emphasis on spectator sports and more on athletic participation.

SA A D SD 20. It is difficult for ordinary people to have much control over what politicians do in office.

SA A D SD 21. I enjoy reading a good book more than watching television.

SA A D SD 22. I feel that many people could be described as victims of circumstances beyond their control.

SA A D SD 23. Hollywood movies do not seem as good as they used to be.

SA A D SD 24. It seems many times that the grades one gets in school are more dependent on the teachers' whims than on what the student can really do.

SA A D SD 25. Money shouldn't be a person's main consideration in choosing a job.

SA A D SD 26. It isn't wise to plan too far ahead because most things turn out to be a matter of good or bad fortune anyhow.

SA A D SD 27. At one time I wanted to become a newspaper reporter.

SA A D SD 28. I can't understand how it is possible to predict other people's behavior.

SA A D SD 29. I believe that the U.S. needs a more conservative foreign policy.

SA A D SD 30. When things are going well for me I consider it due to a run of good luck.

SA A D SD 31. I believe the government has been taking over too many of the affairs of private industrial management.

SA A D SD 32. There's not much use in trying to predict which questions a teacher is going to ask on an examination.

SA A D SD 33. I get more ideas from talking about things than reading about them.

SA A D SD 34. Most people don't realize the extent to which their lives are controlled by accidental happenings.

SA A D SD 35. At one time I wanted to be an actor (or actress).

SA A D SD 36. I have usually found that what is going to happen will happen, regardless of my actions.

SA A D SD 37. Life in a small town offers more real satisfactions than life in a large city.

SA A D SD 38. Most of the disappointing things in my life have contained a large element of chance.

SA A D SD 39. I would rather be a successful teacher than a successful business man.

SA A D SD 40. I don't believe that a person can really be a master of his fate.

SA A D SD 41. I find mathematics easier to study than literature.

SA A D SD 42. Success is mostly a matter of getting good breaks.

SA A D SD 43. I think it is more important to be respected by people than to be liked by them.

SA A D SD 44. Events in the world seem to be beyond the control of most people.

SA A D SD 45. I think that states should be allowed to handle racial problems without federal interference.

SA A D SD 46. I feel that most people can't really be held responsible for themselves since no one has much choice about where he was born or raised.

SA A D SD 47. I like to figure out problems and puzzles that other people have trouble with.

SA A D SD 48. Many times the reactions of people seem haphazard to me.

SA A D SD 49. I rarely lose when playing card games.

SA A D SD 50. There's not much use in worrying about things...what will be, will be.

SA A D SD 51. I think that everyone should belong to some kind of church.

SA A D SD 52. Success in dealing with people seems to be more a matter of the other person's moods and feelings at the time rather than one's own actions.

SA A D SD 53. One should not place too much faith in newspaper reports.

SA A D SD 54. I think that life is mostly a gamble.

SA A D SD 55. I am very stubborn when my mind is made up about something.

SA A D SD 56. Many times I feel that I have little influence over the things that happen to me.

SA A D SD 57. I like popular music better than classical music.

SA A D SD 58. Sometimes I feel that I don't have enough control over the direction my life is taking.

SA A D SD 59. I sometimes stick to difficult things too long even when I know they are hopeless.

SA A D SD 60. Life is too full of uncertainties.

STUDENT QUESTIONNAIRE

PLEASE SUPPLY THE FOLLOWING INFORMATION AS COMPLETELY AND ACCURATELY AS POSSIBLE. ALL INFORMATION GIVEN IS PURELY FOR RESEARCH PURPOSES AND WILL BE KEPT STRICTLY CONFIDENTIAL:

NAME_____ SEX_____ AGE____

GRAND FORKS
ADDRESS_____ TELEPHONE_____

COLLEGE_____ GPA_____

[MAJOR AREA_____ INTENDED MAJOR AS FRESHMAN_____

FATHER'S OCCUPATION_____ YOUR INTENDED OCCUPATION_____

RELIGIOUS PREFERENCE_____ (if none, leave blank).

IF A RELIGIOUS PREFERENCE IS SPECIFIED, INDICATE DEGREE OF ACTIVE INVOLVEMENT ON LINE BELOW (check category which applies):

_____/_____/_____/_____

NOT INVOLVED | MODERATELY INVOLVED | ACTIVELY INVOLVED]

ARE YOU AN INSTATE____OR OUT-OF-STATE____STUDENT (check one)?

IS YOUR HOME A RURAL____OR URBAN____AREA (check one)?

Note.-Bracketed information was not used in the final analysis of the data.

RAW DATA FROM EXPERIMENT

Cell	Freshman Score	Junior Score	GPA	College	Background
I Male	32	32	2.57	A & S	Rural
	25	25	2.72	Unknown	Rural
	33	36	3.20	A & S	Urban
	32	36	2.00	Unknown	Urban
	29	36	3.34	A & S	Rural
	31	48	3.05	A & S	Urban
	33	14	3.19	Education	Rural
	26	31	2.00	A & S	Urban
I Female	23	36	2.90	A & S	Rural
	27	33	Unknown	A & S	Urban
	32	57	2.60	Unknown	Rural
	33	20	1.90	A & S	Urban
	16	24	3.10	Education	Rural
	30	39	2.30	Education	Rural
	32	34	3.20	A & S	Rural
	32	25	2.80	A & S	Rural
	21	42	2.75	A & S	Rural
	32	35	2.40	Nursing	Urban
	28	30	2.50	Education	Rural
	31	35	2.90	Education	Urban
	31	36	3.50	Education	Rural
	20	18	2.53	Education	Urban
	27	27	2.00	A & S	Urban
	28	26	2.87	Unknown	Urban
I-E Male	36	43	2.10	Education	Rural
	44	51	Unknown	Education	Urban
	35	23	3.50	A & S	Rural
	37	42	3.10	Education	Rural
	41	45	2.10	Education	Rural
	34	30	3.10	A & S	Urban
	37	48	2.45	A & S	Urban
	41	48	3.10	A & S	Rural
	42	30	2.75	Education	Urban
	42	52	2.03	A & S	Urban
	36	27	3.50	A & S	Rural
	38	38	2.92	Education	Rural
	34	23	2.24	A & S	Urban
	44	42	2.48	A & S	Urban
	39	14	3.85	A & S	Urban

RAW DATA--Continued

Cell	Freshman Score	Junior Score	GPA	College	Background
I-E Female	40	33	3.50	Unknown	Urban
	38	37	2.40	A & S	Rural
	36	37	3.00	Unknown	Urban
	41	47	Unknown	Education	Rural
	37	32	3.50	Education	Urban
	38	30	3.20	Education	Urban
	38	35	2.40	Education	Rural
	34	27	2.20	Education	Urban
	40	33	3.30	Education	Rural
	41	45	3.60	Education	Urban
	35	34	3.20	Unknown	Rural
	42	42	3.10	Education	Urban
	35	31	3.57	Education	Urban
	42	46	2.22	Education	Urban
	40	10	3.20	A & S	Rural
	39	36	Unknown	A & S	Urban
	35	49	2.80	Unknown	Urban
	36	31	2.86	Education	Urban
	35	24	2.20	Education	Rural
	39	42	3.30	Unknown	Rural
	39	30	3.38	A & S	Rural
	41	42	2.95	Unknown	Urban
	36	38	3.80	A & S	Rural
	38	28	Unknown	A & S	Urban
	39	37	2.37	Nursing	Rural
	43	37	3.30	Unknown	Rural
	34	25	2.65	Unknown	Urban
E Male	48	35	2.41	Unknown	Urban
	45	45	2.10	Business	Rural
	50	48	3.20	Unknown	Rural
	48	40	2.50	Unknown	Urban
	46	36	3.05	Unknown	Urban
	47	28	2.10	Unknown	Urban
	58	35	2.92	A & S	Urban
	58	39	2.50	A & S	Urban
E Female	50	42	2.00	Education	Urban
	47	55	2.67	A & S	Urban
	57	44	3.00	A & S	Urban
	45	40	2.47	Unknown	Urban
	55	35	3.40	Education	Urban
	45	34	3.06	Education	Rural
	52	61	2.20	Education	Rural

RAW DATA--Continued

Cell	Freshman Score	Junior Score	GPA	College	Background
E Female-- Continued	47	37	2.99	Unknown	Urban
	46	37	3.55	A & S	Rural
	53	48	2.30	A & S	Urban
	50	38	2.60	Unknown	Urban
	48	40	Unknown	Education	Rural
	47	52	2.10	Education	Rural
	48	30	3.20	Unknown	Urban
	45	45	3.15	A & S	Rural
	47	47	3.00	Unknown	Rural
	46	21	3.19	Unknown	Rural

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