The Effect of Self-Knowledge of IQ Score on Academic Self-Concept in College Students

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Brian

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THE EFFECT OF SELF-KNOWLEDGE OF IQ SCORE ON ACADEMIC SELF-CONCEPT IN COLLEGE STUDENTS

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of the Requirements for the Degree
Master of Arts

by
Brian Piispanen
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THE EFFECT OF SELF-KNOWLEDGE OF IQ SCORE ON ACADEMIC SELF-CONCEPT IN COLLEGE STUDENTS

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Director of Thesis

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(Date)

Dean of the Graduate College
Acknowledgements

At a time when seriousness is not appropriate, I am reminded of a quote. "If a fool is persistent in his folly, he will become wise." While doubting the latter, I can whole-heartedly accept the former as truth. I did it and take a bow. I would like to thank the following persons: Dr. Harry Robe, my chairperson and often my mentor, for his time, patience and guidance, Dr. Dan Roenker, my coach, third-baseman, and statistical whiz, for his support, and Dr. Sam McFarland, for his patience and helpfulness. I would also like to thank Dr. David Shiek, who taught me that one does not have to lose his sense of humor and wit to become a School Psychologist, and Don Kapp, my outfielder, friend, and the person who turned an orphan group of ideas into a decent thesis. I would also like to express my gratitude to the rest of the faculty at WKU for their support and help and to the exceptional group of graduate students who made these past two years the best of my life. Special thanks goes to John Horan, who showed me "what it is" and to Gail Stevens, who made me appreciative and thankful for what I have. One last thank you to Biff, wherever you are, we made it.
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This study was conducted to examine the effects of self-knowledge of IQ on the academic self-concept of college students. More specifically, the effects of confirmation or disconfirmation of one's expectation of IQ score were investigated. After predicting what their IQ scores would be, 93 undergraduates from Introduction to Psychology classes at Western Kentucky University were administered the Stanford-Binet Intelligence Scale (Form L-M). After the subjects were told their obtained IQ scores, they were given the Academic Choices Questionnaire (ACQ), an instrument specifically created for this study to measure academic self-concept. The experimental group was divided into four groups: 1) those who overestimated their obtained IQs, 2) those who underestimated, 3) those who were exact in their estimation, and 4) those who were given the ACQ before they found out their IQ scores. The control group consisted of 214 W.K.U. undergraduates on which the ACQ was normed. No significant differences on the ACQ were found between the experimental and control groups. Thus, self-knowledge of IQ had no immediate or discernible effect on the academic self-concept of college students.
Introduction

The effect knowledge of a person's IQ score has on that individual and his significant others (i.e., parents, teachers, etc.) has raised concerns in the fields of psychology and education. These concerns center on the possible negative or detrimental effects. This study will examine the possible effects self-knowledge of IQ have on people.

The psychology profession deems this issue as being critical. It contends that only highly trained individuals should be able to administer intelligence tests and that the results should be kept confidential. Psychologists feel that the results should only be given to the "appropriate persons." In an educational setting, the issue arises as to who are the appropriate persons. Is it only the person who requested the child tested or is it all the people responsible for working with that child? Should the parents and the child be told the results of the tests? What effect will knowledge of a person's IQ have on these people, especially the child himself? Because of the confusion over what IQ scores may represent, many feel that lay people may not understand or correctly interpret them.

The concern over this issue is compounded by reports that some people feel that IQ represents an inborn, hereditary characteristic by which a person's intellectual ability is
predetermined (Anastasi, 1968; Brim, 1965). If this is the case, it becomes more obvious why the professions of education and psychology are opposed to persons acquiring knowledge of their own IQs. This fear is greatest concerning those who find out that their IQs are below 100, which is often considered as being low.

Psychologists and educators fear that knowledge of IQ scores will cause the students to have low self-esteem, low motivation, and low self-concept of themselves as learners (academic self-concept). Psychologists are also concerned about the possibility of a self-fulfilling prophecy. If people believe that IQ is inborn and they discover that they have low IQs, then they may feel that they cannot accomplish much in life. They may, therefore, lose their motivation to achieve. On the other hand, if students found out that their IQs were high, that knowledge may cause feelings of false security. Flook and Saggar (1968) thought that the Yerkes-Dodson principle might apply in these situations. That is, students who knew their test scores were low would be seriously hindered by overanxiety in their later school work. Students who knew their scores were high would become immersed in feeling good about themselves and would fall below the median level of anxiety needed to incite them to perform at their best level. Goode (1972, p. 1762) sums up the concerns over students knowing their own IQs in the following manner:

Regarding the provision of feedback of scores to children, it has been claimed that they would be unable to comprehend the technical
complexities and interpretations of test scores. Moreover, it has been suggested that giving them intelligence test results may decrease their motivation to learn and have a detrimental effect on achievement.

In sum, psychologists and educators are uncertain and quite concerned about the possible negative effects the knowledge of a student's IQ score has on that student and his parents, teachers, and significant others. This concern focuses on the negative effects self-knowledge of IQ may have on a student's self-esteem, motivation, and academic self-concept.

Although much research has been done on the effect knowledge of a student's IQ score has on that student's significant others (e.g., Rosenthal, 1968), very little research has addressed the issue of the effects of self-knowledge of IQ. Some research has examined the effect of self-knowledge of test scores, other than IQ scores, and how those scores affect students' perceptions of themselves and their abilities as they relate to education. A part of these perceptions has been labeled academic self-concept.

For the purposes of this study, Fisher's (1973, p. 17) definition of academic self-concept will be used:

Academic self is defined as that specific self-image one has of himself which reflects his perceived competence as a student. The academic self-concept is assumed to be relatively stable and is determined by feedback from significant others. Confidence in one's academic self-concept is defined to be the degree of certainty in the academic self-image. Confidence may be related to emotional or personality variables that are situationally oriented.
The key phrases in this definition are "determined by feedback from significant others" and "confidence may be related to emotional and personality variables that are situationally oriented." If teachers and school administrators (including school psychologists and counselors) can be thought of as significant others, then their presentation of IQ scores to students could be considered "feedback from significant others." Thus, this feedback could have an effect on academic self-concept, and it might interact with the emotional and personality variables to cause changes in both academic confidence and self-concept.

Some researchers have used tests, other than IQ, to examine the effects of knowledge of test scores on academic self-concept. Fretz and Engle (1973) found that students, after receiving results of tests given as a part of a college psychology course, had significant changes on a measure of global self-concept, but not on a measure of academic self-concept. After giving false results from a fictitious perceptual discrimination test which supposedly related to the likelihood of college graduation, there were increases in self-acceptance for both those who were reported to be successful and not successful on the test (Solway & Fehr, 1969). The authors felt that the failure group increased their self-acceptance either as compensation for their failure or as defense for it.

There is some discrepancy in the literature as to whether feedback of this nature has, if any, a delayed effect. Lewin (1968) reported that after a failure situation, subjects
required more time to adjust their goals downward than they required to adjust their goals after a success experience. It appears to take time for people to adjust their levels of aspiration to line up with their levels of achievement. In working with college students, Flook and Saggar (1966) found that knowledge of test scores had a delayed effect on work habits. In this study, students seemed to take time to comprehend and act upon the results of the tests.

The possibility also exists of rationalization, forgetting, and possibly repression taking place with people who get feedback of test results. Froelich and Moser (1954) reported that students did not remember their scores on aptitude tests fifteen months later. Two weeks after receiving falsely reported scores on an aptitude test, Cutchins (1974) found no significant differences between two of the experimental groups and the control group on self-concept of ability. The author offered the following hypotheses: 1) students who were high on both performance and self-concept of ability tended to rationalize and not be affected by falsely reported low scores, and 2) students with average performance and self-concept were not affected by false high or low scores.

Taking an IQ test and receiving knowledge of IQ scores resembles situations under which students have experiences of success or failure. For example, suppose that a student was expecting to receive a certain IQ score, such as 100. If he was reported to have an IQ of 125, that person might react in the same way as he would if he had succeeded at
some task or test. It would be analogous to a situation in which a student who thought that he had gotten a "C" on a test found out that he had actually received an "A." On the other hand, if a student expected to receive an IQ score of 100 and in reality received a score of 75, he might react with failure in the same manner as if he had thought he had gotten a "C" on a test and actually received an "F."

To better understand what effect self-knowledge of IQ scores has on people, the issue of what effect positive and negative feedback, or success and failure, have on people and their self-concept needs to be explored.

There are two issues concerning success and failure that need exploration. The first concerns how people react after they find out that they have been successful or not successful on a task. Does it affect a person's self-concept? The second issue concerns how people integrate this information into their personalities. What effect does success and failure have on self-concept, and more generally, personality? How does this feedback become integrated into one's personality?

It is a common assumption that a person's success at a task or test will enhance and increase the person's self-concept. Diller (1954) found that after reported success on a test, a significant increase occurred in self-ratings of various personality traits and a tendency towards a rise in self-estimates of intelligence. Tillis (1975) reported that a student's history of academic performance was not a
factor in the expectation of success on a task. Tillis identified high school students with a history of academic failure and had them learn nonsense words. Before they started the task they predicted how successful they would be on it. That is, before the task started the subjects expressed their expectation of success. Even students who had a history of academic failure, and then had a success experience, felt they could have other success experiences. To put it in another way, success experiences seemed to increase or maintain people's self-confidence to a point where they felt they could be successful again. In the study by Cutchins (1974), students with low self-concept and low performance, raised their self-concept after receiving falsely reported high scores.

These findings conflict with studies by Oziel and Berwick (1974) and Hatmaker (1977), which reported that those with low self-concept of ability did not change after success experiences. When feedback and reinforcement were positive, people with low self-concept showed no changes on a measure of self-concept. When the feedback was negative, people with high self-concept at first doubted themselves and then decided that the person giving the feedback was mistaken. The authors hypothesized that people lower in self-concept are likely to accept the negative feedback and downgrade themselves. It appeared that people high in self-concept were more likely to accept positive feedback and reject negative feedback, while people with low self-concept seemed
to reject positive feedback and accept negative feedback (Oziel & Berwick, 1974). Hatmaker (1977), in reporting similar findings, found that subjects with higher reading ability integrated positive feedback from their teachers and showed increases in self-esteem after doing so. Subjects with low reading ability rejected positive feedback from their teachers in order to remain consistent with their low concept of their ability. So, there is some evidence to suggest that success and positive feedback may have a positive effect on those already high in self-concept, but may not have a positive effect with people with low self-concept because they cannot or will not accept it. As Chapman and Volkmann (1939, p. 236) stated, "The extensive knowledge the subjects had of their past performance made their frame of reference quite determinate (structured) and prevented new information from being utilized as anchor points."

The differences in the findings of Tillis and Cutchins, from those of Hatmaker and Oziel and Berwick, may be accounted for by differences in methodology. Tillis had students perform a specific task and then give their expectations of success on the next task. The changes in the level of expectations were measured. Cutchins' was the only study which actually involved students taking an achievement test and getting feedback. Unlike the Cutchins study, the studies by Hatmaker, and Oziel and Berwick used tasks that may have had little or no meaning to the students. They also used more indirect measures of self-concept than did Tillis (e.g., California Personality Inventory).
Just as it is assumed that after success experiences self-concept will increase, it is also assumed that after failure at a task or test people's self-concepts will decrease. Gibby and Gibby (1967) introduced failure experiences to academically superior children. After these failure experiences, the children decreased in self-esteem, believed that people around them also decreased in their positive feelings about them, and these children decreased in their academic productivity. Diller (1954), on the other hand, reported that after failure experiences there were no significant changes in self-ratings of intelligence or of various personality traits. The conflicting findings in these two studies may be explained by the fact that Gibby and Gibby used seventh graders while Diller used college students. Failure experiences may have more impact on younger children because their self-concept is less structured. In addition, in the Gibby and Gibby study, the child's teacher gave the negative feedback. A child's teacher would probably have more impact on a student than an outsider, such as a psychologist or researcher.

What are the processes involved when someone has a failure experience or receives negative feedback? What would happen if someone expected to get an IQ of 100 and obtained an IQ of 75? In other words, what happens when there are discrepancies between self-concept and actual performance? Zajonc and Brickman (1969, p. 148) suggested that "disconfirmation of an expectation is itself a source of psychological
tension that subjects will strive to reduce or avoid." This would hold true if the results of an IQ test were higher or lower than a person's expectation. Lecky (1945, p. 215) suggests in the following what effect a stimulus of this nature might have on a person and his personality:

The significance of a stimulus to the organism depends primarily on the dynamic state of the organism at the time the stimulus is received. If the dynamic state existing at the moment is not easily dislodged, stimuli which would evoke conflicting motives will tend to be disregarded. If the motive present is not strongly organized or if the stimulus is one which cannot be disregarded or revalued, the organism will be motivated in a new direction and if the former motive persists, a condition of temporary conflict ensues.

If a person is presented feedback that is consistent with his past experiences or his self-concept, that feedback will usually be incorporated into his self-concept. If the feedback is contrary to his past experience or self-concept, the feedback could be rejected. However, if the structure that makes up his self-concept is unestablished or unstable in the area which the feedback concerns, the person will have to deal in some manner with the stimulus. Also, if the feedback is inconsistent and strong enough, the person will have to reorganize the structure involved to integrate the feedback. Miller, Galanter, and Pribram (1970) have proposed a similar theory of how a person may deal with inconsistent feedback. When information of feedback presents itself to a person, it is tested for consistency with some existing structure or standard. If the feedback
proves to be inconsistent with that structure, operations are performed on the feedback until the inconsistency no longer exists.

Several researchers have suggested types of operations that a person may perform on feedback that appears discrepant and inconsistent. Jacobs and Maas (1969) felt that two processes could take place when discrepancies occurred: 1) it could lead the person to change in the direction of congruity and increased awareness, or 2) it could result in defensiveness and end in the rejection of the information. They also reported that people with high self-concepts of their abilities, in the face of negative feedback, may maintain their high self-concept by discounting evidence that makes those abilities seem lesser. Bem (1970, p. 28-29) has suggested three methods of reducing discrepancies or inconsistencies: 1) denial, 2) strengthening one of the attitudes by finding supporting evidence for it, and, as Bem puts it, "swamp the inconsistency," and 3) separate the inconsistency into separate parts, where one of the parts could be accepted without necessarily accepting the other. Harvey, Kelly, and Shapiro (1957) suggested two other strategies for dealing with inconsistent data: 1) devalue the source, and 2) distort the recall of the feedback. In intelligence testing, a person could devalue the source by holding to the somewhat common belief that IQ tests have no validity. If a person discredits the feedback, changes in his personality and self-concept will be minimized (Jacobs & Maas, 1969).
This might be the case if a person were to find that he had a lower IQ score than expected. This is a possible explanation for what happened in a study by Goode (1972). In the only reported study involving the effects of students knowing their own IQ scores, Goode told sixth grade students their IQ scores after the students had estimated what their IQs might be. He reported that self-estimates of ability did not change six weeks after the feedback of scores for either those who were accurate in the estimations or for those who over and under estimated their IQs.

The manner in which students react to the knowledge of their IQ scores may depend on the IQ scores the students are told they have and how they incorporate that knowledge into their personalities. If students feel their IQ scores are low when compared to other students or lower than they expected, they may be less willing to participate in class, may put less effort into school, may feel less sure about themselves in an academic setting, and may lower their academic and occupational aspirations. If students feel the IQ score they receive is high when compared to other students or higher than they expected, they may react in an opposite direction by increasing in academic and occupational aspirations.

In the present study, the effects of confirmation or disconfirmation of one's expectation of IQ score were examined. Three different groups were studied, those who overestimated their actual IQ score, those who underesti-
mated their actual IQ score, and those who correctly predicted their IQ score. The prediction is made that the academic self-concept of the overestimators will decrease, while the academic self-concept of the underestimators will increase, and those who correctly predicted their IQ will not change.
Method

Subjects. The experimental group consisted of 93 volunteers chosen from several Introduction to Psychology courses at Western Kentucky University (W.K.U.). This psychology class is a popular one for the fulfillment of the general education requirements. The subjects used were told that they were going to be administered an individual intelligence test. They were given the Stanford-Binet (Form L-M) and the Academic Choices Questionnaire (ACQ). The experimental group consisted of 61.1% freshmen, 23.3% sophomores, 14.5% juniors, and 1.1% seniors. There were 41.1% males and 58.9% females, with the mean age being 19.17 years.

Instruments. The Academic Choices Questionnaire (See Appendix A) was developed to measure the academic self-concept of college students. It was in the form of a 24 forced-choice item questionnaire. A situation was described and the student was asked to circle one of the two possible answers that would describe what he would do or would have done in the given situation.

The ACQ was initially given to 27 W.K.U. undergraduates enrolled in an Introduction to Psychology class. These 27 questionnaires were examined as far as the distribution of the subjects' responses and some changes in the instrument were made. Items in which most of the 27 subjects answered
similarly were altered to increase the variance that the item may add to the total scale. Six items were slightly reworded. After these changes were made, the final form was printed. The final form of the ACQ was administered to 214 undergraduates from W.K.U. to establish a norm group. They were enrolled in either a Freshman English course or an undergraduate History course that are both part of the general education requirements. Altogether there were five English classes and eight History classes sampled. The norm group consisted of 68.7% freshmen, 20.6% sophomores, 7.9% juniors, and 2.8% seniors. There were 46.7% males and 53.3% females, with the mean age being 19.73 years. This group acted as the control group. The composition of this group was similar to the experimental group in terms of sex, age, and year in college.

After the norm group was established, a statistical analysis was performed on the ACQ. Five items (item numbers 2, 5, 10, 17, and 24; see Appendix A) out of the original 24 were found to have low inter-item correlations (ranging from .1353 to -.0121) and were eliminated from the scale. Although all twenty-four items were given to all of the experimental and control subjects, only nineteen were used for further analysis. The alpha reliability was found to be .6927, while the Guttman reliability procedure produced lambdas of .6562 to .7240. These reported reliabilities are within the level that is commonly accepted for the establishment of a reliable instrument. The control group mean of the nineteen item scale was 11.939, with a standard deviation of 3.408.
A Pearson product-moment correlation was done with the entire sample, correlating the total score on the ACQ with grade point average (GPA) and IQ. For this specific analysis, the total group was divided into two groups, those who reported their high school GPA's and those who reported their GPA's from college. The division into two groups was done because the high school GPA's were highly inflated compared to the GPA's from college. The total score on the ACQ correlated $r = -0.0017, p \leq 0.05$, with GPA's for the college group, and $r = 0.0258, p \leq 0.05$, with GPA's from high school. The ACQ correlated $r = 0.0258, p \leq 0.05$, with IQ for the college group and $r = 0.0513, p \leq 0.05$, with IQ for the high school group. These correlations seem to indicate that the ACQ does not measure the same constructs as IQ, as measured by the Stanford-Binet (Form L-M), or GPA.

The Stanford-Binet Intelligence Scale (Form L-M) was used to give a measure of intelligence (Terman and Merrill, 1973). The Stanford-Binet (Form L-M) yields a deviation IQ. A given IQ represents the same level of ability at each different age level. Each subject's score is compared to scores of subjects his own age. This IQ score is a standard score with a mean of 100 and a standard deviation of 16.

**Procedure.** The thirteen people who administered the Stanford-Binet were trained examiners. They were instructed on the importance or adhering to the standardized procedure and were closely supervised. The examiners were briefed several times on the details of the research project and were given specific directions about the standardized intelligence score feedback procedure.
The examiners contacted by phone those students who signed a list (in their psychology class) to volunteer to take an intelligence test. The subjects were told there would be two sessions, one to administer the test and one to give feedback of the results. They were told that each session would take approximately an hour to an hour and a half.

When the subjects came in for the first time they were presented with an informed consent form (See Appendix B). The top part of the form reported that the examiner was a psychologist-in-training and that the results of the test were confidential. The bottom half of the form contained a distribution of IQ scores for the general population and a number of ranges of IQ scores. The examiner explained the distribution of IQ scores and that the mean for the general population was 100. Any questions the subjects had were answered at that time. From the list of IQ scores in four point intervals (e.g., 90-94), the subjects were asked to predict the IQ score that they would obtain on the intelligence test. After the subjects predicted their IQ scores, the Stanford-Binet was administered. Following this, the examiner made an appointment three to four days later for the feedback session.

When the subjects came back for the feedback, the examiners had a structured routine to follow. The examiner presented the feedback form (See Appendix C) with the subjects' ranges of obtained IQ scores written in. The examiner was asked to explain only what was on the form, the range of
scores, classification, relation to the general population, and intellectual strengths and weaknesses based on the test. The examiner did answer any questions the subjects might have had concerning their scores. The subjects were then presented with a reaction sheet (See Appendix D), on which they were asked to respond as to where their obtained scores fell in relation to their expected scores. This reaction was based on a five point scale ranging from much lower than expected to much higher than expected.

At this point the examiner told the subjects that a fellow graduate student was conducting some research and would like their participation. The subjects were led across a hallway to another room. They were asked to fill out the ACQ, and the Edwards Personal Preference Schedule, which was used in another study.

Based on the subject's prediction of IQ scores and actual obtained IQ score, the experimental group was divided into four groups: 1) those who received scores higher than they predicted (underestimators, n=40), 2) those who obtained exactly what they expected (exacts, n=16), 3) those who received scores lower than they expected (overestimators, n=18), and 4) those to whom the presentation of feedback and administration of the ACQ was reversed (reversed, n=19). This fourth group was given the ACQ and Edwards just after the administration of the Stanford-Binet and before the feedback of results. This was done to see if just taking an IQ test had an effect on academic self-concept.
Design. The four experimental group means were compared to the control group mean to determine if any further analysis was necessary. If any of the experimental group means were more than one standard deviation (standard deviation for the control group = 3.408) away from the control group mean, further analysis to determine the significance of the difference would have been carried out. The level of significance for this analysis was set at the \( p \leq .05 \) level.

Dunnet's (1955) multiple comparison procedure was used to determine whether any of the means for a particular item on the ACQ of the four experimental groups were different from the mean on that item of the control group. This method was chosen to reduce the problem of pyramiding often associated with multiple comparisons. The \( p \leq .05 \) level of significance was also set for this procedure.
Results

The hypothesis was made that knowledge of IQ would have the following effects on academic self-concept:
1) would increase self-concept of underestimators, 2) decrease self-concept of overestimators, and 3) have no effects on exacts. Therefore, differences should exist between the group means of the over and underestimators and the group mean of the control group on the measure of academic self-concept. Table 1 shows that a comparison of the four experimental group means on the ACQ to the control group revealed no important differences. All of the experimental

| Table 1 |
|-------------------|------------------|---------------------|
| Comparison of Group Means on ACQ |

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>214</td>
<td>11.939</td>
<td>3.408</td>
</tr>
<tr>
<td>Underestimators</td>
<td>40</td>
<td>11.950</td>
<td>2.917</td>
</tr>
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<td>Exact</td>
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<td>12.938</td>
<td>3.415</td>
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<td>12.176</td>
<td>2.984</td>
</tr>
<tr>
<td>Reversed</td>
<td>19</td>
<td>12.579</td>
<td>2.411</td>
</tr>
</tbody>
</table>

groups means were within less than one-third of a standard deviation of the control group mean. This data supports the hypothesis that knowledge of IQ has no important effect
on the exact group. However, the data does not support the hypothesis that knowledge of IQ would increase or decrease academic self-concept. This is consistent with the findings of Goode (1972).

Because of the hypothesized changes in academic self-concept after knowledge of IQ scores, it was thought that the experimental groups would respond differently from the control group on a number of items on the ACQ. The results of Dunnett's multiple comparison procedure revealed that the overestimators responded significantly different ($p \leq .05$) from the control group on one item out of the 19, the reversed group responded significantly different ($p \leq .05$) on two items, and the underestimators responded significantly different ($p \leq .05$) on three items (See Appendix E). The number of significantly different responses is small enough to claim that none of the four experimental groups responded differently on the ACQ than the control group.

A further examination was conducted comparing the mean IQs of the experimental groups. When the average obtained IQs for the four experimental groups were examined, the mean IQ of the overestimators ($X=102.71$) was numerically lower than that of the underestimators ($X=112.28$), the exacts ($X=113.25$), and the reversed group ($X=111.37$).

Another secondary investigation was conducted examining the accuracy of the under and overestimators in predicting their obtained IQ scores. The distribution of the subjects in the two groups was examined according to the number of
IQ points they missed when predicting their actual IQs. Of those who underestimated, 36.8% missed predicting their actual score by one to six points, 31.6% missed by seven to fourteen points, and 31.6% predicted that they would get fifteen or more points lower than they actually did (See Appendix F). Of those who overestimated, 56.8% predicted one to six points higher than their actual IQ, 23.5% predicted seven to fourteen points higher, and 17.7% predicted they would get fifteen or more points higher than they actually did. A large proportion of these two groups (43.6%) missed predicting their actual IQ score by one to six points.

An investigation was done comparing the means of the experimental groups on the ACQ to the mean of the twelve underestimators who missed predicting their IQ score by 15 points or more. This investigation was undertaken to determine the effects knowledge of IQ scores had on people who found out that their scores were very different from what they expected. The mean of this group (12.75) did not differ importantly from the other experimental groups.
Discussion

The present study was conducted to determine whether self-knowledge of IQ had an effect on academic self-concept. Based on the results of this study, knowledge of IQ appears to have no discernible of immediate effect on the academic self-concept of college students. Knowledge of IQ had no effects even upon the group psychologists and educators feared it might have the most negative effects on--those who found out their IQs were lower than they had expected. This group had a much lower obtained mean IQ than the other groups. Therefore, they could have had a lower academic self-concept than the other groups to begin with. As is reported in the literature, these subjects with lower self-concepts seem to be more able to accept and possibly integrate this negative feedback (i.e., low IQ scores). Because they accepted the negative feedback, it would have caused no change in their academic self-concept. Knowledge of IQ did not have a positive effect on those whose IQs were higher than they expected. There may have been a tendency for some of the underestimators to under-predict what they thought their actual IQs would be so as not to be disappointed or that to be modest of one's abilities is the socially desirable thing to do. Thus, they appeared to receive higher scores
than they predicted, but in reality they expected to get the score they obtained. This score would have reinforced their existing self-concept and caused no change in it. Another explanation for the lack of change in the over and underestimators is that only 27.3% of them received IQ scores more than fifteen points different from what they predicted. A score this discrepant would not be expected to be integrated easily into one's self-concept and may be expected to cause some change in it. Of the over and underestimators, 43.6% received scores within one to six points of what they expected. It would not be expected that these subjects would change much in their academic self-concept. This type of feedback could be integrated fairly easily into one's self-concept.

Several other explanations exist for why self-knowledge of IQ had no immediate effect on academic self-concept. It may take some time, as Lewin (1968) suggested, for information of this possible significance to be integrated into one's personality. The operations, suggested by Miller, et al. (1960), and still others, that people use on inconsistent data may take time to perform. If this is the case, then what may happen is either immediate integration or rejection of this feedback, neither of which would cause immediate changes in self-concept. These immediate processes may take place until the person has time to operate more comprehensively on the inconsistent data.
By the time students reach college, their academic self-concepts are very structured. The more organized a structure like self-concept is, the harder it becomes to fit new and inconsistent data into it. If a person had an existing high self-concept and obtained a higher than expected IQ score, that score would serve to reinforce that high self-concept and cause no change in it. If a person had an existing low self-concept and obtained a lower than expected IQ score, that score would also serve to reinforce the low self-concept and no change would occur.

A college student has also acquired techniques and operations that could be used on inconsistent feedback. According to Piaget (1952), after about twelve years of age, a person reaches the formal operation level of thinking. At this level a person is able to isolate parts of a problem and consider many logical possibilities in order to solve a problem situation. This would permit the person to separate the inconsistent feedback into different parts, in order to integrate the inconsistency, as Bem (1972) suggested. This person is also able to think reflectively. All of these attributes may allow a person to handle inconsistent data about himself better than the child under eleven years of age who does not possess formal thought.

The college student has also probably developed an extensive chain of logic to handle consistent and inconsistent data. There exist many methods of rationalization that a student could use to immediately reject inconsis-
tencies caused by the knowledge if IQ scores. The following is a sample: 1) IQ tests are not valid, they have no meaning, 2) IQ tests are culturally biased, 3) IQ tests only tap a very limited kind of intelligence, 4) place the blame on situational factors—sickness, lack of interest, lack of effort, etc., and 5) devaluation of the examiner as only a "psychologist-in-training." These sorts of rationalizations may be used until other processes and operations can be used to integrate the feedback. If any changes do occur in academic self-concept as a result of knowledge of IQ scores, it would appear that it would be sometime long after the feedback of score.

If the academic self-concept of college students is not affected by knowledge of IQ scores because it is highly structured, it would seem that younger students would be more vulnerable to having knowledge of IQ scores have an effect on self-concept. This knowledge may have the strongest possible effect with children ages six to ten. At this age the academic self-concept is still unstable and in the formative stage. A child of this age does not have the benefit of formal operational thought to help deal with the inconsistent data. The student may not as yet have established the extensive chain of logic and rationalizations of the college student. Giving IQ scores to sixth graders (ages eleven and twelve) did not change those students' self-concepts of ability (Goode, 1972). Maybe the academic self-concept and the chain of logical thinking and ratio-
nalizations are established by age eleven. The possibility still exists that knowledge of IQ scores could have an effect with younger children or at some longer period of time after the feedback. These two issues need to be explored further.

These findings should be viewed as tentative, as this study has some limitations. The obvious limitation is the use of only volunteer college students from Introduction to Psychology classes. Because of the apparent concreteness of college students' academic self-concept, this study may have yielded different results if a younger population was used. There may have also been problems in the instrument and its use. It is undetermined whether or not the ACQ measures academic self-concept. The ACQ appears to have face validity, but its construct validity is unknown at this time. The sensitivity of the ACQ in measuring changes in academic self-concept also needs to be explored. Another improvement in the study would have been to give each subject in the experimental group a pre and post measure of academic self-concept, instead of using the control group mean as a pre-measure. Using a pre and post measure for each subject would directly measure changes in self-concept. Using the control group mean as a pre-measure makes the rather large assumption that the control group mean is the same as the mean for the experimental groups before they take the IQ test. This assumption may be false. Because of the large number of examiners (13), it is hard to determine
if each examiner carried out the procedure in the same manner. So, there may be differing examiner effects. The examiners may have varied their presentation of the IQ scores to the subjects. These different presentations may have had differing effects on the reactions of the subjects to their IQ scores. The presentation of the examiners as psychologists-in-training may have lessened the credibility of the examiners. The examiners' dress ranged from blue jeans and tennis shoes to suits and ties. The range of dress may have also affected the credibility of the examiners. The subjects' views of IQ and IQ tests may have been biased by psychology teachers who presented IQ tests as not having any value or validity.

Despite these limitations, this study has some important implications. If the construct IQ had the powerful impact on people that some fear it did, then it would seem that knowledge of IQ would have had more of an immediate effect on academic self-concept than it did in this study. It seems that self-knowledge of IQ does not have the devastating effect that some professionals fear. It is implied by this study that IQ may not be as magical and awesome to lay people as educators and psychologists think it is. The argument that IQ scores should be kept confidential and not be kept in the cumulative school records because self-knowledge of IQ would have harmful effects seems to be contrary to the findings in the research. It seems to make no immediate difference whether a person does or does not know his IQ.
Professionals may not need to be nearly as concerned about the effects of self-knowledge of IQ scores.

The issue of possible effects of self-knowledge of IQ in younger children and the possibility of delayed effects needs exploration. It is suggested that a similar study be conducted with children ages six through ten to determine whether knowledge of IQ has an effect with younger subjects. The possibility of delayed effects could be explored by administering the ACQ six months to a year after subjects obtain IQ scores. If this study were to be conducted again with college students from Psychology classes, it is suggested that the teachers be asked not to discuss intelligence testing until the collection of data for the study is completed. If this study is repeated, one or two examiners should be used to keep the procedure as standardized as possible. The ACQ needs the following exploration: 1) determine its construct validity by correlating it with other established instruments that measure academic self-concept—such as the one developed by Brookover, Shailor, and Patterson (1962); 2) develop test-retest reliability to see if the ACQ could be given as a pre- and post measure; and 3) an alternative form could be developed for the purpose of pre- and posttesting on each subject.
Appendix A

Academic Choices Questionnaire

Directions: Based upon the way you feel about your academic ability right now, indicate which choice you would make by circling either the letter A or B.

1. You are required to take a difficult course for your major. Would you take it-

   A. This semester   B. Next semester

2. You have a test tomorrow, which you feel you are not prepared for. A good friend of yours comes over and wants you to go to a movie you really want to see. Would you-

   A. Go to the movie   B. Keep studying

3. Do you plan to go to graduate school?

   A. Yes   B. No

4. Your teacher has given you a choice as to what grade you would like to work towards in his class. The higher the grade you want the more work and requirements you would have to do. Would you work towards an-

   A. "A"   B. "B"

5. You are looking for a job. There are representatives from two companies holding interviews for positions open in their companies. Because they are coming on campus at the same time you can only have one interview. Rep. A is from a very well known company, whose hiring standards are very high, but the job pays very well. Rep. B is from a lesser known company which doesn't pay quite as well, but their hiring standards are low. Which interview would you choose?

6. You have a choice of taking Class A - which is mainly lecture and a small amount of class discussion and Class B - which you are graded on class participation and a class presentation. Which would you choose?

A. Class A  B. Class B

7. You have a comment to make during a class discussion. You are unsure of the reaction of the teacher and of the class. Would you -

A. Keep quiet  B. Make the comment

8. You are invited to go to a small group discussion in which a very notable person in your field of study will participate. Would you attend?

A. Yes  B. No

9. You are a senior who is eager to pursue a PhD in your major. You have been accepted by both University X and University Y. Univ. X has a world-wide reputation for excellence in your major. While a degree from Univ. X would signify outstanding achievement in this field, the standards are so rigorous that only a fraction of the degree candidates actually receive the degree. Univ. Y on the other hand, has much less of a reputation in your major, but almost everyone admitted is awarded the degree, though the degree has much less prestige than the corresponding degree from Univ. X. Which Univ. would you attend?

A. University X  B. University Y

10. You want to take a class, but it has a prerequisite that you have not had. The professor of the class told you that you could enroll, but you would have to work harder than most of the rest of the students. You would -

A. Not enroll  B. Enroll

11. You have a choice of two teachers for a class. Teacher A is very hard but you would learn much. Teacher B is very easy, but you might not learn as much. Which teacher would you take?

A. Teacher A  B. Teacher B

12. What do you expect your G.P.A. to be this semester?

A. 3.0  B. 2.0
13. You need some advice on what class to take. Would you talk to a professor about how much could be expected to be learned in the class?

A. Yes  B. No

14. How likely are you to talk to your friends to find out what are the easy classes and teachers?

A. Not very likely  B. Very likely

15. Would you like to subscribe to a journal or magazine concerning your major field of study?

A. Yes  B. No

16. You are invited to attend an informal dinner party where a number of your professors will also be attending. Would you attend?

A. Yes  B. No

17. I am as smart as I want to be.

A. Yes  B. No

18. You have been at a task for a long period of time. When you started you thought you could finish the task, but now you are not sure. What would you do?

A. Go on to other task  B. Keep at the task

19. How realistic do you feel the academic goals you have set for yourself are?

A. Somewhat unrealistic  B. Very realistic

20. You have one elective left to take. Your choice is - Class A which is very interesting and very difficult, or Class B which is an easy, uninteresting class. Which would you choose?

A. Class A  B. Class B

21. How successful do you think you will be in your chosen career?

A. About average  B. Very successful
22. A professor in one of your classes asks you if you would like to substitute for him for a day in an introductory class you have already taken. Would you do it?

A. Yes B. No

23. Do you ever wonder if a 2-year program would be more appropriate for you than a 4-year degree program?

A. Yes B. No

24. Would you be likely to offer advice to people who do not ask you for it, but you who feel could benefit from it?

A. Yes B. No
Please fill in the following information.

Name_________________________ Year in College______________________

Age_____ Sex___ Major______________________________

Current GPA (If you are a Freshman, your high school GPA)__

Hometown____________________________________________

Income of your parents

Under $5,000  
$5,000 - 10,000  ___

$10,000 - 15,000  ___

$15,000 - 20,000  ___

$20,000 - 25,000  ___

$25,000 - 30,000  ___

Above $30,000  ___

We will be contacting some students in the Spring semester to fill out another questionnaire. Please write your phone number and address.

Address at WKU______________________ Phone____________________
Appendix B

INFORMED CONSENT

You are about to take an intelligence test which is widely used by psychologists. The purpose of this testing session is practice for the psychologist-in-training in administering this test. We will be happy to share the results with you. The results of this test will be seen by the instructor in the course and by other psychologists-in-training. The name of the psychologist-in-training who will administer the test and provide feedback is ________________ ________________.

Signature
Social Security Number

The above "normal" curve is a representation of how the scores from this intelligence test would be distributed if everyone in the general population were to take it. The average score is 100 with the majority of people (approximately 68% of the population) receiving scores between 84 and 116.
With this in mind, which of the ranges of IQs listed below do you feel would contain your score? Circle one.

95-99
120-124
85-89
115-119
below 79
125-129
105-109

135-139
110-114
80-84
above 140
100-104
90-94
130-134
Appendix C

Psychological Clinic
Psychology Department
Western Kentucky University
Bowling Green, Kentucky 42101

Name ___________________________  Date of Test ________
Examiner __________________________

The Stanford-Binet Intelligence Scale was given as an assessment of current level of intellectual functioning. The estimate of intellectual functioning which was obtained would classify her/him as ______ when compared to the standardization population, which was representative of the U. S. population.

Based upon the score of _____ which was obtained on this particular administration of the Binet it would be expected that a true score would fall within the range of from _____ to _____ 68% of the time on repeated administrations of the test and from _____ to _____ 95% of the times. A score in this range would exceed _____% of the general population.

An examination of performance on the various items which make up the tests would suggest that ________________ ________________ is a strength and ________________ is possibly an area of weakness.
The testing environment would be classed as ________
and those results should be considered as ___________
estimate of __________________ general intellectual
functioning.
Appendix D
Reaction Sheet

Where does the estimate of your IQ you have just been given fall in relation to the score you expected to receive? Based upon your feelings, place an "X" at the appropriate point on the line below.

"This estimate was . . . . . . . . . . than I expected."

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Appendix E

Group Means for Individual Items on ACQ

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Significantly different from the control group mean at p ≤ .05

Significantly different from the control group mean at p ≤ .01
Appendix F

Distribution of Over and Underestimators Based on Accuracy of IQ Score Prediction

Number of IQ Points Difference Between Predicted IQ and Obtained IQ

○ = underestimators
+ = overestimators
References


Chapman, D. W., & Volkman, J. A. A social determinant of the level of aspiration. *Journal of Abnormal and Social Psychology*, 1939, 34, 225-238.


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