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GROUP PROCESSES AND INDIVIDUAL SCORES ON STANDARDIZED TESTS: A THEORETICAL NOTE AND BASIS FOR INVESTIGATION

Michael J. Lovaglia
Jeffrey W. Lucas

University of Iowa

ABSTRACT

Critical problems in the scientific investigation of intelligence include (1) specifying the social factors that determine intelligence and (2) explaining the continuing difference in standardized test scores--both IQ and achievement test scores--between African Americans and European Americans. Status characteristics theory, rational choice arguments, and social identity theory all may explain part of the variation in standardized test scores among individuals and perhaps much of the difference between groups. In particular, by adding an assumption to status characteristics theory, we can apply it to individual performances such as scores on ability tests. We describe experimental situations suitable for investigating possible effects of group processes on standardized test scores. Experimental settings are capable of controlling the confounding effects of genetics through random assignment of subjects to advantaged or disadvantaged social positions.

INTRODUCTION

Social scientists seek to identify the social--rather than genetic--determinants of intellectual ability. In its modern incarnation, the debate over whether intelligence is learned or inherited is encased in the views of John Stuart Mill and Francis Galton in the mid 1800s. (See Fancher 1985 for a balanced history of the debate.) Mill argued that social factors (nurture) were the main cause of intellectual ability while Galton believed that genetics (nature) was the overriding determinant. Since then the debate has been as often ideological as scientific and much early empirical work suffered from poor design. Recent research, though much better, has not resolved the problem. Rather than continue the debate, we identify several theories of group processes--status characteristics theory, rational choice arguments, and identity theory--that may explain

part of the variation in standardized test scores among individuals. Further, these processes may explain much of the difference in IQ between African Americans and European Americans.

Standardized tests are the main tools for investigating the relative contribution to intellectual performance of genetic and social factors. For instance, the Stanford-Binet and Wechsler IQ tests presume to measure an underlying stable potential for high intellectual performance. While general intelligence is a fascinating abstract topic, in practical terms, measured IQ or intellectual ability is a score on a test. Because ability test scores have serious implications for individuals in society, we seek the social factors that affect those scores. Test scores rise steadily with age until the late teens. They remain relatively stable through adulthood. Because IQ is stable over repeated tests and not easily changed (Snow 1995), proponents of IQ testing assume that IQ is in large part genetically determined (Herrnstein 1973, Jensen 1981). Makers of scholastic aptitude tests (e.g., SAT, ACT or GRE) shy away from such genetic determinism, while maintaining that their tests measure a stable underlying ability that resists improvement during crash study courses (Messick 1980).

Some standardized test items may be easier for privileged members of society to answer than for the less privileged, and the potential for such cultural biases has been a major concern for several decades. Whereas tests based on verbal and mathematical ability cannot be completely culture-free, it is more difficult to make a case for cultural bias in nonverbal tests of abstract reasoning such as the Raven Progressive Matrices. Despite years of trying to eliminate cultural bias from standardized tests and increased education for African Americans, members of this group still score lower than European Americans on standardized tests--including IQ and scholastic aptitude tests. The difference remains substantial, around three-quarters of a standard deviation for IQ (10 - 12 IQ points) and two-thirds of a standard deviation for scholastic aptitude tests (Herrnstein and Murray 1994). The gap persists despite attempts to statistically control socioeconomic status and other social factors (Herrnstein and Murray 1994, Jensen 1992). If social factors are responsible for such differences in test scores, then it is incumbent upon social scientists to identify those factors and demonstrate their impact on standardized test scores.

Researchers in several fields of social science have recently articulated the need for studies that specify the social determinants of individual scores on standardized tests. Neisser et al. (1996) in a thorough review of research on intelligence include among critical research problems: (1) Environmental factors contribute to the development of intelligence, but we do not know what those factors are or how they work. And (2), the difference between intelligence scores of African Americans and European Americans does not result from obvious test bias nor solely from differences in socioeconomic status. Explanations based on caste and culture have little empirical support. Yet there is little empirical support for a genetic interpretation. At present no one knows what causes the difference. Our research addresses these problems.

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These research problems are not only critical but difficult. Currently, it is possible for one group of researchers to conclude that racial differences in IQ are largely due to genetics (Levin 1994; Lynn 1994) and another group to conclude that there is little or no evidence for genetic causes for racial differences in IQ (Waldman, Weinberg and Scarr 1994), both groups basing their

positions on the same data from a single study recognized to be one of the best in the field. Udry (1995) points out that progress in assessing social factors requires controlling possible genetic effects. Eysenck (1995) and Turkheimer (1991) suggest an experimental approach because of the greater control and opportunities for causal inference made possible by experimental settings. However, they acknowledge the difficulty of the experimental approach with human populations. For example, a person cannot be randomly assigned to a race. The same holds for other genetic attributes. Thus, effects of genetic and social factors are confounded in currently used research designs(but see Steele and Aronson 1995 for progress in this regard).

After a brief review of recent research, we identify different group processes as factors that may contribute to scores on standardized tests and show how they may account for the difference in IQ scores for African Americans and European Americans. We then propose experimental settings that allow the investigation of group process effects on IQ and control the possibility of confounding genetic effects.

Research on Genetic and Environmental Contributions to IQ

Two kinds of empirical studies have been used in efforts to disentangle the relative contribution to intellectual ability of genetics and social factors: twin studies and adoption studies. Twin studies, for example, may compare intelligence scores of monozygotic twins--whose DNA is identical--reared apart (MZA) with those reared together (MZT). If standardized test scores correlate the same for MZA twins as for MZT twins, then a substantial contribution of heredity is inferred. The difference in test score correlation between MZA twins and MZT twins is used to indicate the relative contribution of social factors. A recent, well-designed, large-scale study comes down firmly in favor of heredity. The Minnesota study of twins reared apart (Bouchard et al. 1990) found that scores of MZA twins correlated about .70 while the scores of MZT have been found to correlate about .80. The study attempted to control several economic, educational and cultural factors. Because test scores for twins reared apart correlate nearly as highly as do scores for twins reared together, the results imply that intellectual ability is largely inherited.

Despite the evidence of twin studies, the debate continues. Twin studies make assumptions that cannot possibly be met in even the best research designs. Arguments over the robustness of findings under violations of these assumptions ensure that twin studies will never resolve the issue of relative contribution to intellectual ability of genetics and social factors. For example, twin studies assume that twins raised apart are separated at birth and have no subsequent contact with each other--a rare occurrence. It is also assumed that separated twins are placed in substantially different environments where the social factors in one twin's environment do not correlate with those in the other's. Again the assumption cannot be met. These and other assumptions of twin studies fuel the debate (see especially Eysenck and Kamin 1981).

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Adoption studies also attempt without success to disentangle the relative contributions to intellectual ability of genetics and social factors. The two most common types of adoption study design produce conflicting results (Turkheimer 1991). First there are individual-difference

studies in which the IQs of adopted children are related to the IQs of their biological parents and the social factors of their adopted home. Positive correlations between the IQs of adopted children and their biological parents indicate the contribution of genetics. Correlations between the IQ of children and the social factors of their adopted home indicate the contribution of social factors to intelligence. The IQ correlations of biological family members have been consistently found to overshadow social factors in these studies (Bouchard and McGue 1981). The startling conclusion drawn from these studies is that adopted children raised in the same family may be about as different from one another as children randomly selected from the population (Plomin and Daniels 1987). Second, there are group-difference studies that compare the IQs of children living in deprived settings with the IQs of children adopted from deprived settings into more affluent homes. These studies generally report increased IQ for children placed in enriched settings and little evidence for IQ heritability (Schiff et al. 1978). In sum, evidence from twin and adoption studies supports the conclusion that both genetics and social factors play roles in intellectual ability. However, these research designs are not capable of determining the relative contribution of each.

Rather than continuing the research program that attempts to determine the relative contributions of heredity and social factors to intelligence, it might be productive to isolate their separate effects. The role of social factors in determining intellectual ability is undoubtedly substantial. Proponents of genetic determinism interpret the results of the Minnesota twin study (Bouchard et al. 1990) to mean that genetics is responsible for at most 70% of differences in intellectual ability, social factors probably account for at least 30%. The debate continues over the proper contribution of genetics and other factors implied by these percentages. Other recent studies estimate a smaller role for genetics, a contribution of about 50% of the variation in IQ scores, suggesting a larger role for social factors (Chipuer, Rovine and Plomin 1990; Loehlin 1989; Rodgers, Rowe and May 1994; Scarr and Weinberg 1978; Scarr, Weinberg and Waldman 1993). We should be able to identify the social factors responsible for such a large effect.

Despite such indirect evidence for the impact of social factors, the goal of determining the social factors responsible for intellectual ability has proven elusive. Scarr and Weinberg (1978) found that for adopted children in their late teens, IQs of children raised in the same adoptive family correlated near zero. They concluded that a shared home environment does little to reduce inequality of intellectual ability. The apparent lack of effect of "shared environment" has led to the search for social factors that have different impacts on individual members of the same group. Plomin and Daniels (1987) termed these factors "nonshared environmental effects." If the environment has a substantial effect on intellectual ability, and if a "shared environment" has little effect, then "nonshared environmental" factors must be important. But little progress has been made in specifying which factors produce the effect, other than a small role noted for birth order and gender (Plomin and Daniels 1987). Also, the number of books owned by a child was found to correlate with IQ (Rodgers, Rowe and May 1994), but it is as likely that high IQ leads to the acquisition of books as that acquiring books improves IQ. There is considerable literature and debate on expectancy effects, especially with regard to students' performance in school (Rosenthal and Jacobson 1992). Students are rated higher when teachers have been led to expect superior performance from them. However, the size of the effect remains unknown even by proponents (Rosenthal 1994). In addition, there is substantial opposition to the claim that teacher

expectancies can influence learner intelligence (Snow 1995). Thus, the social factors or processes responsible for nonshared environmental effects have yet to be determined.

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We will identify how specific group processes may act as nonshared environmental effects on standardized test scores. In the following section, status characteristics theory, rational choice arguments and identity theory are used to explain differences in IQ that remain after factors such as race and social class have been controlled.

GROUP PROCESS EFFECTS ON IQ

Several theories of group process are obvious candidates to explain differences in test scores among social groups. In general, their explanations should complement rather than compete with each other. We will sketch theoretical developments using status characteristics theory and rational choice ideas that can be used to explain differences in test scores. We then describe an experimental setting that can be used to test those developments. Social identity theory also has obvious application to the problem and we will touch briefly on how it might be applied and a way to test it. Other group process theories may also apply.

Status in Groups and Individual Performance

The same processes that produce status hierarchies also produce different rewards and costs for achievement by people in different social strata. Thus, social stratification into status hierarchies produces opportunities where rational actors may be motivated by expected rewards and costs. They may perform less than optimally on tests when they are less highly rewarded than others for success or when they will bear higher costs for success than others. We briefly introduce status characteristics theory, extend its scope to apply to individual performance on standardize tests, then show how differential rewards and costs can further separate the IQ scores of high and low status actors.

Status refers to an individual's standing in the hierarchy of a group based on the prestige, honor and deference accorded her by other members. Status characteristics are features of individuals that influence group members' beliefs about each other. Different "states" of a status characteristic are assumed to have differential value, esteem and honor. For example, in the United States, European Americans are privileged over African Americans. Race is a diffuse status characteristic because it carries with it expectations for competence in a wide variety of situations. Status characteristics can also be as specific as grade point average in high school or score on a standardized test. Status characteristics help determine members' relative status by altering expectations for competence that group members hold for one another.

Status characteristics produce status rank through a chain of four logically connected assumptions:

(1) A status characteristic becomes salient in a task situation if it differentiates among group members or is directly related to the task. (2) Salient status characteristics, even if not directly related to the task, will become relevant unless they are specifically dissociated from the task. (3) The effects of relevant status characteristics combine to form an aggregated performance expectation for each member. (4) Status rank is a direct function of the aggregated performance expectations of group members: The higher the aggregated performance expectation for a member, the higher is that member's status rank in the group.

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The scope of status characteristics theory is confined to task-oriented groups where the contributions of all members are needed to accomplish some task, i.e., collective orientation and task orientation. In groups meeting its scope conditions, the theory states that a status hierarchy will form consistent with statuses that members possess in society at large. (See Note 1.) High status members: (1) are given more opportunities to perform, (2) perform more, (3) are given higher evaluations for their performances, and (4) have more influence over group decisions than low status members (Berger, Rosenholz, and Zelditch 1980). These status processes produce a self-fulfilling prophecy. Expectations for competence determine status rank and high status members are evaluated as more competent because they are high status. While group members expect superior performance of high status members and evaluate their performance as superior, the theory makes no prediction as to the objective level of group members' performances. In particular, status effects on individual performance on standardized tests have been ruled out because such situations lack collective orientation and thus fall outside the scope of the theory. That is, because individual performance on standardized tests is independent of the contributions of other group members, the theory cannot predict that status information will alter the performance of test takers. To use the theory to predict IQ differences, we must extend its scope to include individual performance on standardized tests.

Hints of a role for status processes in performance on ability tests can be found in the research literature. Elizabeth Cohen and her colleagues have designed school programs to integrate students of diverse backgrounds in a cohesive classroom (Cohen 1986, 1993; Cohen, Lotan and Leechor 1989). They succeed by carefully controlling status processes and by breaking down existing status distinctions (Cohen and Roper 1972, 1985; Rosenholtz 1985; Rosenholtz and Cohen 1985). An interesting byproduct of the program is improved performance on standardized achievement tests for all students but especially for lower status students (Cohen, Lotan and Leechor 1989).

IQ gains made by children adopted into enriched environments have been found to fade by early adulthood (Scarr and Weinberg 1978). This has been seen as evidence of the genetic basis for intelligence (Herrnstein and Murray 1994). However, it is at least as likely that the IQ gains of young adoptees fade because status processes in school and work situations become more important as children age and counter the effects of an enriched home environment.

Steele and Aronson (1995) gave African-American and European-American students a test composed of items from the verbal GRE. In one condition, students were told the test was diagnostic of their verbal ability. In another condition, students were told the test was merely a

means of familiarizing them with verbal problems they might run into. European-American students did equally well on the test in both conditions. In contrast, African-American students did worse when told the test was diagnostic of their ability than when it was nondiagnostic. This suggests that the status of African Americans plays a role in their performance on standardized tests: Their scores may drop when they know the results can be used compare their performance with that of European Americans. Our goal is to explain the mechanism behind such stereotype vulnerability.

To explain differences in standardized test scores for members of different status groups, we propose the following extension to status characteristics theory: Collective orientation prevails when individual performance on a task has implications for status processes in future group interaction. Standardized test scores have significant impact on the future academic and work careers of Americans. Thus collective orientation exists and status processes will affect test scores in the United States. There are several ways this could occur.

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A good example of the effects of status on individual performance was documented by William Foote Whyte in his classic Street Corner Society—the story of Doc and the bowling league. Doc was the leader of an Italian-American gang in Boston's North End in the late 1930s. At one point, the gang started bowling regularly. It turned out that gang members' bowling scores correlated highly with their status rank in the gang. Even though some low-status members of the gang bowled better than the leaders when bowling elsewhere, when the gang bowled together, low status members could not bowl well. This was not for lack of effort, as they were often determined to bowl better and show up the leaders. They rarely did so. If by chance a low-status member did beat one of the leaders, the low-status member could be taunted, ridiculed, and talked into losing a return match. This reaffirmed the status hierarchy of the group. An individual's bowling score is not dependent on a collective process and so would fall outside the scope of status characteristics theory, yet status processes seem to operate. It could be argued that there is a larger collective task beyond the simple aggregation of team members' scores. For example, a goal of bowling may be maintenance of status hierarchies, just as a goal of ability testing is the maintenance of status hierarchies. Thus, the same processes that affected bowling scores could affect scores on standardized tests.

Rational Choice

Individuals occupying different status ranks may come to expect quite different outcomes from the same performance on an objective, standardized test. These expectations may then affect how an individual performs on such a test. From a rational choice perspective, if people expect to receive large rewards for success on a test, they may do better on the test than they would if they expected a smaller reward. For example, some might expect a good score on the SAT test to eventually lead to a $500,000 a year job on Wall Street, or a position as a prominent doctor or lawyer. But others, coming from different backgrounds, might expect a more modest reward--a steady job with the post office or as a teacher.

On the other hand, if people expect to pay substantial costs for success on a test, they may do worse than they would if they expected costs to be trivial. For some the costs of success might be trivial. A high score and going off to college entails little disruption in the life of the son or daughter of a doctor. Others may expect much higher costs. For example, a minority student who does well on a test and plans to go to college might be shunned by family and friends for trying to be "too white." Moreover, going away to college would involve immersion in an alien culture, cut off from social support. For example, a five-year-old boy in foster care was asked where he wanted to go to college. He said, "I NEVER want to go to college. My uncle had to go to college, and I NEVER want to do ANYTHING like that." His aversion to college seemed to stem from the fact that his uncle had been sent to jail. Out of embarrassment, the boy's mother had told him his uncle was "away at college." The boy, who is quite intelligent, drew the reasonable inference that people were sent to college to be punished. Had he, at that point, been given a test and promised that if he got a high score he would go to college, he probably would not have done well. He would expect high costs and little reward to result from a high test score.

The examples above led us to propose an extension to status characteristics theory that allows its application to standardized ability testing. An individual's rank in the status hierarchy and the resulting rewards and costs associated with success on achievement tests may effect scores on such tests. When individual performance can affect status rank in future group interaction, high status individuals may outperform low status individuals. Several hypotheses follow.

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The extension of status characteristics theory to apply to standardized ability testing suggests:

Hypothesis 1. On a standardized ability test, individuals possessing the high state of a specific status characteristic will outperform those possessing the low state of the characteristic.

Hypothesis 2. On a standardized ability test, individuals possessing the high state of a diffuse status characteristic will outperform those possessing the low state of the characteristic.

The rational choice perspective that differential rewards and costs for success on standardized ability tests will affect test scores suggests:

Hypothesis 3. On a standardized ability test, individuals who are highly rewarded for a high score will outperform those who expect to receive a smaller reward.

Hypothesis 4. On a standardized ability test, individuals for whom a high score is costly will perform poorly compared to those for whom a high score is not costly.

Status information aggregates to determine overall status rank of individuals in groups and the theory has been extended to apply to standardized ability testing. This suggests:

Hypothesis 5. On a standardized ability test, the effects of status characteristics, rewards, and costs aggregate to determine test score.

A Setting to Investigate Group Process Effects on IQ

Testing the above hypotheses can be facilitated using a computerized experimental setting. Laboratory experiments can disentangle social and genetic factors that are inevitably confounded in twin and adoption studies. The laboratory allows investigation of group processes as factors determining standardized test scores while using random assignment of subjects to control the possibility that individual genetic differences intervene.

Existing diffuse status characteristics such as race are difficult to work with for several reasons. First, effects other than those being investigated cannot be ruled out because subjects cannot be randomly assigned to a race. Second, race has a wide variety of social and cultural meanings depending on the background of the individual. Third, race has both genetic and social implications; to identify the social factors affecting IQ, we must rule out the possibility of genetic influence in our studies.

One solution is to create a status characteristic in the laboratory. That way, we know exactly what social connotations the characteristic has and subjects can be randomly assigned to either a high or low status condition. Ridgeway (1991; Ridgeway, Boyle, Kuipers and Robinson 1995) developed the theory for constructing a status characteristic and has successfully produced one in the laboratory. Subjects first complete a task that they believe to be diagnostic of some stable characteristic of themselves called a "response style." Subjects believe they are assigned a response style based on their performance when in actuality their scores on the task are randomly assigned. Subjects can also interact with confederates who provide information that reinforces the status manipulation. For example, in a condition where Q is high status, confederates identified as Q act with certainty and confidence and those identified as S act with hesitancy and lack of confidence. Ridgeway et al. (1995) found that this manipulation created a strong status distinction that affected the behavior of subjects. By manipulating such status characteristics we can test hypotheses 1 and 2.

Pay levels can be manipulated based on subjects' response styles to test hypotheses 3 and 4. For example, subjects might be informed that because they have a "Q" response style they will be paid $6 and subjects with "S" response styles will be paid $11. In another condition, subjects could be informed that those with the S response style will be paid the higher amount and those with the Q response style the lower amount. Thus subjects are manipulated to believe that one level of the characteristic is more highly valued than the other level of the characteristic. Costs could also be manipulated by imposing some penalty for success on students from one group rather than another.

Combining all the above manipulations tests hypothesis 5. If scores on a standardized test are higher for subjects randomly assigned to a high level of a status characteristic, high rewards, and low costs, then we would be justified in concluding that these group processes caused the difference in test scores.

This brings up the problem of generalizing experimental results from small homogeneous samples to some larger population. Suppose that status processes created in the laboratory can be demonstrated to affect standardized test scores, can we then conclude anything about race and standardized test scores in the larger population? And suppose no effect of status processes on test scores is found in an experiment. Do we then conclude that status processes have no effect on test scores in general?

Experimental results do not generalize to larger populations directly in the way that survey results do when the survey sample is randomly chosen from a population. Experimental results are best interpreted as supporting or failing to support theories (Mook 1983). A well-supported theory can be expected to yield valid predictions in situations that fall within its scope (Webster and Kervin 1971). Thus, to the extent that race operates as a status characteristic in society and the testing situation conforms to the scope conditions of the theory (that is, test takers are task oriented and collectively oriented), race should affect test scores as predicted by the theory.

Size of effect is another area where experimental results do not directly correspond to society at large. Due to ethical and financial considerations, experiments in social psychology usually produce mild and transient effects. Subjects cannot be confined to a laboratory for months or years and subjected at random to the common experiences of African Americans or European Americans. Instead, mild forms of status differences, rewards and costs are used in experiments that usually last at most a few hours. It is possible to detect subtle effects produced by mild experimental manipulations because of the restricted variance in a homogeneous subject pool and sensitive instruments. Thus, effect sizes found in society can be quite different than those in the laboratory, even in situations where the scope conditions of a valid theory operate. After an effect is demonstrated in the lab, other research methods may be necessary to measure effect sizes found in society.

Caution is also warranted when interpreting experiments that produce no detectable effect. Failure to detect an effect implies only that no effect was found, not that the effect does not exist. The experimental setting may have been inadequate to produce the effect, or the instrument used may have been incapable of detecting a subtle effect produced. However, when an experiment successfully demonstrates a theoretically predicted effect, it can elucidate causal mechanisms more powerfully than other research methods.

While keeping in mind the caution required when interpreting experimental results, we can investigate group processes and standardized test scores in the laboratory. Rewards and costs of getting a high test score can be manipulated in ways analogous to the different rewards and costs expected by African Americans and European Americans. In addition to high-status subjects expecting higher pay to result from success on the test, there could be higher costs related to high scores by low-status subjects. For example, subjects could be informed that low status subjects, who do well on the test and are assigned to leadership positions in a group, are harassed and isolated by other group members.

Identity and IQ

In addition to being ranked in status hierarchies, we are also socialized to identify with various social roles. Identities link self-concept to performance in roles that individuals identify with themselves (Burke and Reitzes 1981). The relationship between identity and behavior is reflexive. The self operates to choose behaviors that reinforce the self (Burke and Reitzes 1981). A person's role/identity may or may not be reinforced by achieving a high score on a standardized test. For example, those students in high school carrying heavy book bags who read during recess may identify themselves as "brains" or "nerds." A high score on an IQ test would reinforce this identity. Conversely, a high score on a standardized test would conflict with the identity of a gang banger. Owens' (1995) recent work demonstrates the importance of self-concept to behavioral outcomes.

The process of regulating identity and behavior is a control system analogous to a thermostat. Just as when the furnace comes on after the temperature drops too far below a set standard, a person will choose actions that reestablish an identity if self perceptions vary too much from an initial identity standard (Burke 1991). To regulate identities, meanings of roles and behavior are compared. Behaviors are chosen that have the same meaning for the self as does the identity. Behaviors that have meanings for the self different from the identity produce stress. "This model of the identity process builds on current evidence that people feel some level of distress when they receive feedback that is incongruent with their identity, even if that feedback is more positive than their identity" (Burke 1991, p. 839, italics original). For example, a common anecdote of teachers is that students grade themselves. C average students who do well early in a school term often seem to slack off if it looks like they may get a grade much higher than a C. Robinson and Smith-Lovin (1992) demonstrate this self-maintenance process; participants selected partners who provided identity-consistent feedback. In the same way, if high performance on a standardized test conflicts with a person’s identity, the potential for distress may result in lower test scores. Conversely, if a person’s identity mandates a high test score, performance is likely to be high.

Burke's (1991) theory suggests that people may compare the expected outcomes of their performances with their identity, and when a large difference between identity and performance exists, the resulting stress causes them to alter their performance to more closely approximate their identity. Thus, one way to test effects of identity on test scores is to compare the performance of individuals who believe a test is importantly related to their identity with the performance of individuals who believe a test has little relevance to their identity:

Hypothesis 6. Individuals who believe a high score on a standardized test is diagnostic of ability congruent with a salient role will score higher than will individuals who believe a high score is diagnostic of ability incongruent with a salient role.

Testing the Social Identity Hypothesis

Identities can be manipulated through tailoring information to specific subject subpopulations. For example, the identity of a business major could be expected to include competence at running a profitable business. Such tasks as cutting prices to drive a competitor out of business

or laying off long-term employees to trim costs should not conflict with a business major's identity. Social work majors, however, might find such tasks troublesome and in conflict with their identities. They may find tasks such as leading a therapy group or helping to solve a client's family crisis more compatible with their identities. The subject pool could consist equally of business majors and social work majors. Subjects could be randomly assigned to conditions in which a standardized test is portrayed as diagnostic of the subject's ability to succeed in the kind of business tasks or social work tasks just described. We would expect subjects, whether business or social work majors, to score more highly on the test when it was portrayed as diagnostic of an ability compatible with their identities.

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As with all social studies of intelligence, it is necessary to control genetic and other possible effects. For example, business majors might be more or less intelligent than social work majors. The proposed experiment uses the technique employed by Steele and Aronson (1995) to avoid the problem. Steel and Aronson found that by altering test instructions they could change test scores of African Americans and European Americans separately. When students thought they would be compared to a national sample, the difference in scores between racial groups was as found in society. However, with altered instructions, African Americans scored about the same as did European Americans. In other words, African American scores improved in response to the change in instructions but European American scores did not. Similarly, when testing the social identity hypothesis, we can compare responses to the experimental manipulations for business majors and social work majors separately. Are scores of social work majors better when they think their social work skills are being tested as opposed to their business skills? And, is it also true that scores of business majors are better when they think their business skills are being tested as opposed to their social work skills? If so, then the effect is due to the experiment and not to the composition of the different groups. By focusing on different responses to experimental manipulations in homogeneous groups, we control between-group differences.

Choosing a Standardized Test

Selecting an appropriate standardized test presents problems similar to those for selecting a status characteristic. Subjects are likely to be drawn from the usual undergraduate college population. These students are thoroughly familiar with achievement tests such as the SAT and ACT. Because their scores on such tests got them into college, their test scores are especially salient and bound up with students' identities. As Burke (1991) points out, people resist situations that threaten to alter their identities. When taking tests of verbal or quantitative aptitude, it is likely that subjects' identities as students with known levels of ability on these tests will override a laboratory manipulation. The solution is to choose tests less familiar to subjects, so that subjects do not know what score to expect. Students are not as likely to have a definite idea of their ability on tests of abstract puzzle-solving ability such as the Raven Progressive Matrices or Porteus Mazes. However, this restriction is not a major disadvantage because IQ scores from these tests are thought to closely reflect g or general intelligence by their proponents (Herrnstein and Murray 1993; Jensen 1987). If group processes can be shown to alter scores on tests that are presumed to reflect pure intelligence and that are relatively free of cultural bias,

then a strong case will have been made that these processes are fundamental determinants of standardized test scores.

Typically, college-student subjects are isolated in a lab room at a computer terminal. Subjects can be informed that they will take a standardized test then work with other students in a task group. To satisfy the revised collective orientation scope condition, subjects can be informed that their test scores will be used to determine the role they play in subsequent group interaction. Before subjects take the standardized test, computerized instructions can operationalize various experimental conditions: high vs. low status, high vs. low rewards and costs, business task vs. social work task. The experiment can end after a subject completes the standardized test.

In sum, subjects can be randomly assigned to a status, to reward and cost levels, and to conditions congruent or incongruent with their identities. Then they can take a standardized test that they expect will determine their pay and position on a group task, for example, a test of abstract intellectual ability. We can be confident that significant differences in test scores in the predicted direction result from manipulated group processes and not from subjects' individual genetic makeup.

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SUMMARY AND CONCLUSIONS

What social factors account for individual differences on IQ and achievement tests? What social factors can explain the difference between African American and European American scores on IQ and achievement tests? These are critical questions facing social scientists who wish to contribute to the study of human ability (Neisser et al. 1996). Studies by behavior geneticists conclude that genetics contributes at most about 70% and probably closer to 50% of individual differences in test scores (Loehlin 1978, Scarr and Weinberg 1989). There is little evidence that genetics are a factor in the difference in test scores between racial groups (Neisser et al. 1996). This leaves large differences in standardized test scores unexplained.

Group processes including status characteristics theory, rational choice arguments and identity theory may account for much individual difference in standardized tests including IQ tests. They may explain all of the difference between racial groups.

Status characteristics theory and the different rewards and costs accruing to those occupying different status positions may affect individual test scores. To apply status characteristics theory it is necessary to extend its scope. Individual test situations fall outside the requirement that status characteristics operate to influence behavior in situations governed by cooperative, collective tasks. The proposed extension suggests that status characteristics may affect individual test scores when test takers expect that their scores on a standardized test will affect their relationships with group members in future cooperative task situations. For example, a high score on the SAT test determines which college a person goes to and how they are treated when working with others. African Americans who score highly on the SAT and go off to a prestigious college may feel isolated from family, friends and their new peers in ways not experienced by

European Americans who score high on the test. The resulting ambivalence on the part of African Americans may contribute to test score differences between African Americans and European Americans. Ambivalence and stress also result when the prospect of a high score on a standardized test is incompatible with an individual's identity.

Tests of these ideas may best be conducted in a laboratory setting where confounding genetic factors can be controlled by randomly assigning subjects to status conditions. This requires the creation of status characteristics. Results likely will be most convincing if abstract, puzzle-solving tests of mental ability rather than achievement tests of verbal and mathematical ability are used.

While the three kinds of group processes described here--status, rational choice, and identity--are not the only ones capable of altering individual scores on standardized tests, they have a high likelihood of doing so. The possibility that group processes may have major effects of standardized test scores has been neglected. Most researchers have concentrated on individual biological and psychological differences or on large-scale social categories such as socioeconomic status or parental education. Given the importance of the research problem, it would be advantageous for those researchers in the field of group processes who are capable to apply their expertise to the problem.

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NOTE

1. We present only those parts of status characteristics theory necessary to our argument. For more thorough exposition see Berger, Fisek, Norman, and Zelditch 1977; Markovsky, Smith and Berger 1984; Webster and Foschi 1988; Berger, Fisek, and Norman 1989; or Berger, Norman, Balkwell, and Smith 1992.

AUTHOR BIOGRAPHIES

Michael J. Lovaglia is assistant professor of sociology at the University of Iowa. His work in group processes investigates the interrelationships among status, power, and emotion. Other research interests include the sociology of science and substance abuse. His email address is michael-lovaglia@uiowa.edu

Jeffrey W. Lucas is a doctoral candidate in sociology at the University of Iowa. His specialties include group processes and organizations. He is currently investigating the importance of job titles in the satisfaction and retention of high-performance workers. His email address is jeffrey-lucas@uiowa.edu