

Predictors of self-efficacy for cognitive ability employment testing

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Abstract

This study examined predictors of initial levels and of changes in self-efficacy (S-E) for cognitive ability employment testing. The testing S-E of 287 job applicants at a utility company was measured before the test, immediately after, and again after pass/fail feedback. Being male, having been hired previously by cognitive ability tests, perceiving such tests as valid and fair, and general S-E were each positively related to initial levels of S-E (Time 1), but race was unrelated. From before- to after-test feedback, S-E increased for those who passed and decreased for those who failed. Failing had a greater negative effect on subsequent S-E for women and Whites (vs. men and minorities). Failing also had a smaller negative effect on S-E for those who had been hired previously by ability tests than for those who had never been hired by them before. Implications of these findings are discussed.

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1. Introduction

Self-efficacy (S-E) has become an increasingly important construct for understanding work behavior (Bandura, 1986, 1997; Gist, 1987). Self-efficacy “refers to beliefs in one’s capabilities to mobilize the motivation, cognitive resources, and courses of action necessary to meet situational demands” (Wood and Bandura, 1989, p. 408). In other words, S-E is an individual’s level of confidence that he or she can perform well on a certain task. Researchers have consistently found that S-E is positively related to performance on work tasks (Stajkovic and Luthans, 1998), even beyond the effects of task ability (Phillips and Gully, 1997). This positive relationship between S-E and performance has also been demonstrated with respect to cognitive ability employment tests (Bauer et al., 1998; Ryan et al., 1998). Thus, confidence can and does matter to ability-test perfor-

mance (e.g., Ackerman and Kanfer, 1993). Here, we focus on this kind of S-E, which is defined as applicants’ beliefs in their capabilities to perform well on cognitive ability employment tests.

With the relationship between S-E and test performance established, and with 15–20% of all organizations using cognitive ability tests for selection (Rowe et al., 1994) as highly valid predictors of performance (e.g., Hunter and Hunter, 1994), it is important to investigate the determinants of cognitive ability employment-test S-E. In this vein, it has been consistently found that African Americans and Latino Americans score lower (on average) on cognitive ability tests than other groups (e.g., Roth et al., 2001). One significant concern is that Black and Latino job applicants, recognizing stereotypes that are associated with (or that are reinforced by) these research findings, may experience reduced *personal* confidence for taking such tests. Research on this issue is currently absent but necessary. If minorities or women (Bussey and Bandura, 1999) do, in fact, experience lower S-E for such tests or experience differential changes in S-E, there are several important implications for researchers and managers. First, low pretest S-E or differ-

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ential drops in S-E may contribute to a negative cycle of low performance and reduced confidence for minorities or women known as efficacy-performance spirals (e.g., Lindsley et al., 1995; Shea and Howell, 2000). This could cause women and minorities to feel increasingly disadvantaged at organizations using cognitive ability tests, possibly prompting charges of discrimination. Second, low S-E may discourage minorities or women from applying for jobs where cognitive ability tests are used (e.g., Schmit and Ryan, 1997), inhibiting affirmative recruiting efforts. Third, to ensure fairness, such potential problems may need to be addressed through prehire management interventions to improve S-E (e.g., Gist, 1987). Finally, if minorities are shown to have lower S-E for cognitive ability tests, researchers should investigate whether this may actually contribute to or account for lower mean test scores for some minority groups (Sanchez et al., 2000).

These social justice and practical concerns for hiring women and minorities demand that researchers directly examine race and gender effects on cognitive ability test S-E. This is one purpose of the current study along with examining other theoretically relevant potential predictors. Specifically, we use a model of S-E development (i.e., Gist and Mitchell, 1992) to hypothesize effects for race, gender, past experiences (e.g., Bandura, 1997), and other relevant predictors on (1) initial levels of S-E prior to the employment test and (2) changes in S-E following (pass/fail) feedback on the cognitive ability test.

1.1. Hypotheses on initial levels of S-E

According to Gist and Mitchell (1992), three types of analyses mediate the development of S-E: (1) analysis of task requirements, (2) attributional analysis of past task experience, and (3) assessment of personal and situational constraints/resources. For example, difficult or ambiguous test requirements and internal attributions for failing a test may lower S-E, whereas easy requirements and internal attributions of ability may increase S-E. Perceived personal or situational constraints on performance also reduce S-E (Mathieu et al., 1993). In developing our hypotheses, we link race, gender, test experience, and other perceptions to Gist and Mitchell's (1992) the three types of assessments, and thereby to level of S-E.

1.1.1. Race

Blacks and Latinos have generally demonstrated lower mean scores on cognitive ability tests than Whites and Asians (Hunter and Hunter, 1994; Roth et al., 2001; Sanchez et al., 2000). If Black and Latino applicants are aware of these subgroup mean differences or popular interpretations of them, they may perceive, through race bias in the test or negative-stereotype threat (Steele and Aronson, 1995), that their group membership is a constraint to test performance, leading to lower S-E (Gist and Mitchell, 1992). Moreover, lower cognitive ability test motivation for

Blacks (Chan et al., 1997; DeShon et al., 1998; Helms, 1992) may indicate a general distrust of such tests that can lead to self-handicapping constraints (Sanchez et al., 2000) and thereby to lower S-E.

Hypothesis 1: Blacks and Latinos will have lower initial employment-testing S-E than Whites and Asians.

1.1.2. Gender

Research has found that gender may affect S-E on certain tasks (e.g., Lent et al., 1994). Women may have a weaker sense of efficacy that they can master the requirements of some traditionally male pursuits (Bussey and Bandura, 1999) including mathematics (Pajares and Miller, 1994), a usual component of cognitive ability tests. Although there is no reason to expect differences on verbal ability S-E (e.g., Silver et al., 1995), this still suggests higher perceived constraints to performance for women than for men on such tests and thereby less S-E (Gist and Mitchell, 1992). Moreover, women students have demonstrated lower average S-E for written ability tests than men (Mayo and Christenfeld, 1999). Thus:

Hypothesis 2: Females will have lower initial employment-testing S-E than males.

In addition to these likely demographic effects, we must hypothesize about and statistically control for other key antecedents of S-E from the literature including task experiences and perceptions and general S-E.

1.1.3. Previous test experience

“The most powerful influence on the development of individuals' S-E is their previous experience and performance in similar situations” (Thomas and Mathieu, 1994, p. 812). Previous employment–test experience influences the analyses of tasks and attributions discussed by Gist and Mitchell (1992). The understanding of task requirements may be enhanced simply by exposure to the task (Bandura, 1986). Also, being hired through employment testing in the past would increase the chance that attributions of high ability would be made (Silver et al., 1995), increasing S-E (Stajkovic and Sommer, 2000; Thomas and Mathieu, 1994). In contrast, there is less evidence that those who fail a test make self-enhancing (i.e., unstable or external) attributions of bad luck or task idiosyncrasies (Fiske and Taylor, 1991). In fact, these individuals seem to make attributions of low ability, implying lower S-E (Silver et al., 1995; Stajkovic and Sommer, 2000). Those with no previous experience with such tests are unlikely to have accurate or well-developed S-E beliefs (Stajkovic and Luthans, 1998), but there is no reason to expect that their S-E would be as high as applicants having been hired by past cognitive ability tests.

Hypothesis 3: Applicants with previous “hire” experiences with cognitive ability employment tests will have higher

initial S-E than those with only “no hire” or zero previous experiences.

1.1.4. General perceptions of tests

If applicants believe that cognitive ability employment tests are generally unfair or invalid (e.g., Bauer et al., 1998; Gilliland, 1994), they will likely believe that their personal chances of performing well are somewhat arbitrary and uncertain. While some applicants may feel that this arbitrariness will work in their favor, most will harbor doubts about their ability to pass, given an unfair or invalid test. Such doubts may act as situational constraints leading to lower S-E (Gist and Mitchell, 1992).

Hypothesis 4a: Perceived unfairness of tests will be negatively related to S-E.

Hypothesis 4b: Perceived invalidity of tests will be negatively related to S-E.

1.1.5. General S-E

In addition to Gist and Mitchell's (1992) antecedent processes, researchers have proposed that individuals have a “perception of their ability to perform across a variety of situations” (Judge et al., 1998, p.170). Researchers have supported that general S-E should be positively related to task S-E over time (e.g., Chen et al., 2001). Researchers have also found that general S-E may mitigate the effects of failures on subsequent S-E in an educational setting (Chen et al., 2001). For the first time, we examine these hypotheses in an actual employment-testing setting.

Hypothesis 5a: General S-E will be positively related to S-E at Times 1, 2, and 3.

Hypothesis 5b: General S-E will interact with past test (pass/fail) performance to predict S-E.

1.2. Hypotheses on changes in S-E

We might expect to see changes in S-E levels from before to after taking an employment test, presumably due to exposure to the test-taking task (e.g., Bandura, 1986, 1997; Gist, 1987; Wood and Bandura, 1989). Primarily though, an applicant will have more or less confidence depending on how well they think they did on the test (e.g., Chan et al., 1998). Such evaluations are far less predictable when the applicant has received no performance feedback (Silver et al., 1995). We also take seriously the admonition by Chan et al. (1998) that pre- and posttest reactions may not be directly comparable. Thus, we focus on changes in S-E from test administration to after pass/fail feedback is received (Time 2–Time 3), not from Time 1 to 2.

1.2.1. Pass/fail performance

Posttest reactions to cognitive ability tests are likely to be influenced by performance on the test and not as much by general beliefs about these tests (Chan et al., 1998). Spe-

cifically, after an applicant finds out that he or she passed the test (at Time 3), internal attributions of high ability are more likely and should lead to increased testing S-E (Gist and Mitchell, 1992; Silver et al., 1995; Stajkovic and Sommer, 2000). For those who do not pass, attributions of low ability or attributions of personal/situational constraints would be likely (Fiske and Taylor, 1991; cf., Stajkovic and Sommer, 2000). Either could lead to lower subsequent testing S-E (Gist and Mitchell, 1992; Silver et al., 1995).

Hypothesis 6: After receiving pass/fail feedback, cognitive ability employment-testing S-E will increase for those who pass and will decrease for those who fail the test.

1.2.2. Previous Experience \times Performance interaction

We might expect that this effect of passing/failing on S-E might be exacerbated or mitigated by pre-Time 1 test experience. In particular, multiple instances of success or failure should increase the chance of making internal attributions for passing or failing the test (Thomas and Mathieu, 1994). Thus, the drop in S-E for those failing may be less for those with previous success than for those with only “no hire” or zero experience with such employment tests previously.

Hypothesis 7: Past test experience will interact with pass/fail performance to predict changes in S-E.

1.2.3. Demographics \times Performance interactions

Women and minorities may react differently in terms of S-E to test failure than men and nonminorities do (Stewart and Shapiro, 2000). For example, African Americans who may have higher anxiety for employment tests than Whites (Schmit and Ryan, 1997) or who may experience negative stereotype threat (Steele and Aronson, 1995) may be more likely to make internal attributions for failure than Whites, differentially lowering residual S-E (Silver et al., 1995). However, Stewart and Shapiro (2000) found that African Americans raised their self-esteem following negative performance feedback and rated their ability levels higher relative to Whites after being informed of failure on a written spatial ability test. Although less research exists on Latinos and Asians, and ambiguity in findings prevents exact predictions for Blacks and Whites, there is evidence to investigate an exploratory hypothesis of a Race \times Performance interaction on postfeedback changes in S-E.

Hypothesis 8: Race will interact with pass/fail performance to predict changes in S-E.

Research also suggests that women may respond more strongly and negatively in terms of S-E to negative performance feedback than men do (Stewart and Shapiro, 2000). This suggests a specific Gender \times Performance interaction for employment-testing S-E:

Hypothesis 9: Women will have greater reductions in subsequent S-E after test failure than men.

2. Method

2.1. Sample

Participants were 287 applicants for a meter-reader position in a large private utility organization in the western United States. Participants ranged in age from 18 to 61 (mean = 33.0; S.D. = 9.4). The sample consisted of 61% men and 39% women. The sample was 28% White, 34% African American, 29% Latino, 7% Asian, and 2% other ethnic groups. Three percent (3%) did not hold a high school degree, 71% held a high school degree or equivalent, 19% had a two-year degree, and 7% had a four-year college degree.

2.2. Measures

Employment-testing S-E was measured using four items (e.g., “I am confident in my written employment test-taking abilities”). Although many studies have used two-step measures of S-E, Likert-type scales like the one used here have been found to be comparable to the traditional format in terms of reliability–error variance, prediction ability, factor structure, and discriminability (Maurer and Pierce, 1998). *Perceived fairness of cognitive ability employment tests* was measured (Time 1) using three items (e.g., “I think that written ability tests are a fair way to hire people for jobs”). *Perceived validity of cognitive ability employment tests* was measured (Time 1) with three items (e.g., “I think that

Table 1
Reliabilities, means, standard deviations, and intercorrelations among study variables

Variable	Mean	S.D.	#1	#2	#3	#4	#5	#6	#7
1) Testing S-E (Time 1)	4.02	0.63	.88						
2) Testing S-E (Time 2) ^a	3.76	0.73	.51**	.88					
3) Testing S-E (Time 3) ^b	3.83	0.76	.55**	.70**	.86				
4) Gender	0.61	0.49	.08	.11	.24**	–			
5) Perceived testing validity	3.27	0.83	.29**	.19**	.21**	–.01	.75		
6) Perceived testing fairness	3.95	0.82	.44**	.22**	.06	.00	.52**	.86	
7) General S-E	4.52	0.57	.48**	.09	.17*	–.05	.12*	.23**	.88
8) Pass/fail performance	0.40	0.49	.21**	.25**	.48**	–.07	.07	.10	.09

Alpha internal consistency reliabilities appear on the diagonal. For other variables' correlations (unmarked), $n = 281–287$.

^a $n = 278$.

^b $n = 170$.

* $P < .05$.

** $P < .01$.

Table 2
ANOVA results for Time 1 S-E

Source/factor	Sum of squares	df	Mean square	F
Previous test experience	1.28	2	0.64	2.92*
Race	0.52	3	0.17	0.80
Gender	1.59	1	1.59	7.25***
Perceived testing validity	5.81	12	0.48	2.21**
Perceived testing fairness	14.04	11	1.28	5.82***
General S-E	8.54	5	1.71	7.79***
Previous Test Experience × General S-E	1.50	6	0.25	1.14
Error	48.88	223	0.22	–
Total	104.29	263	–	–

$R^2 = .53$; Adjusted $R^2 = .45$.

* $P = .055$.

** $P < .05$.

*** $P < .01$.

written ability employment tests measure abilities needed on the job”). *General S-E* was measured (Time 1) with two items (e.g., “I am able to do things as well as most other people”). All were adapted from Bauer et al. (1998) and used the same 5-point, *strongly agree to strongly disagree* response format. *Experience with employment tests* was coded as “0” for no previous experience, “1” for past experience but never hired, and “2” for previously hired by a written ability employment test. *Race* was coded “1” for African American, “2” for Latino, “3” for White, and “4” for Asian. Those not in one of these categories were treated as missing due to extremely small numbers. *Gender* was coded “0” for female and “1” for male. The cognitive ability test involved four, timed (5-min) subtests primarily measuring quantitative and analytical abilities. Unfortunately, actual applicant scores on the ability test were not made available to us or to the applicants. Pass/Fail feedback/performance was coded “1” if the applicant earned a passing score and “0” if the applicant earned a failing score. Forty percent (40%) of all respondents passed the test and moved on to the final hurdle, a 2-min bicycle endurance test.

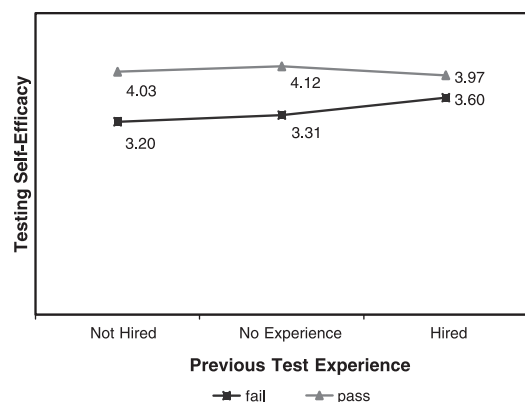


Fig. 1. Interaction of test experience and pass/fail performance on Time 3 S-E.

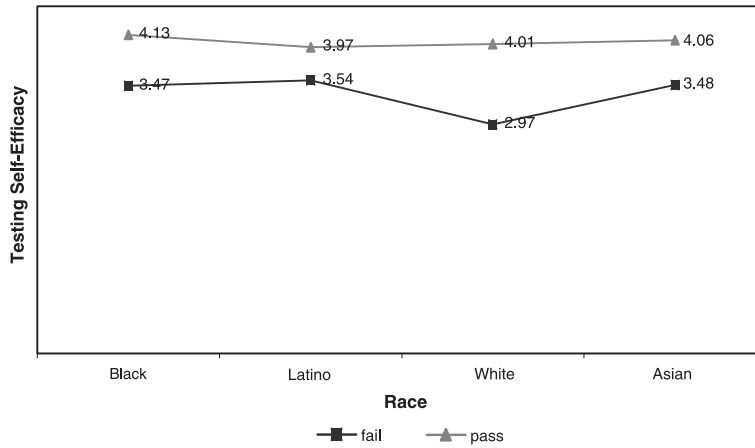


Fig. 2. Interaction of race and pass/fail performance on Time 3 S-E.

2.3. Procedure

A battery of four 5-min cognitive ability tests was administered in a standardized setting to all applicants in small groups. Applicants were told that they would be tested and some had to wait for over an hour to take the test. The S-E measure was administered at three different times on the day of testing: Time 1, about 30 min prior to administration of the test; Time 2, immediately after applicants had completed the test; and Time 3, within an hour of receiving pass/fail feedback. Applicants were assured that survey measures were voluntary and for research purposes only, would not be seen within the company, and would not influence the hiring process. Respondents were entered into a prize drawing.

3. Results

Continuous measures were factor analyzed using principal components with an oblique (oblimin) rotation. Each scale item (S-E across three time periods) loaded on its own factor at .70 or greater with no cross-

loadings >.10. All internal consistency reliabilities were also adequate (S-E across three time periods), as in Bauer et al. (1998). The alphas, means, standard deviations, and correlations among study variables are presented in Table 1. Time 1 S-E was positively related to pass/fail test performance controlling for previous hire/no hire test performance (partial $r=.23$; 220 *df*; $P<.001$). Thus, earlier findings that S-E is related to test performance were confirmed (Ryan et al., 1998), supporting the relevance of testing S-E.

3.1. Hypothesis tests

We tested the hypotheses on determinants of initial S-E using ANOVA (see Table 2). Hypothesis 1 predicted lower initial S-E for African Americans and Latinos than for Whites and Asians. Unexpectedly, this was not supported. However, being Black or Latino (vs. White or Asian) was negatively related to passing the test ($r=-.13$; $P<.05$; $n=283$). Hypothesis 2, where we predicted lower initial S-E for women than for men, was supported. Hypothesis 3 was supported. The test experience effect was significant at the $P<.10$ level. Tukey post hoc comparisons revealed that

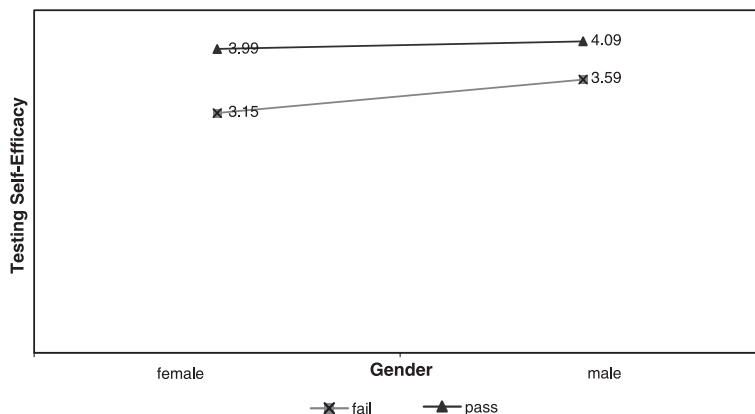


Fig. 3. Interaction of gender and pass/fail performance on Time 3 S-E.

those with a previous hire experience with such tests had higher S-E than those with no previous experience ($P < .01$, one-tailed) and those with only “no hire” experiences ($P < .05$, one-tailed). Supporting Hypotheses 4a and b, perceived testing fairness and testing validity were positively related to initial S-E. General S-E was positively related to testing S-E at Times 1 and 3, but not at Time 2. However, the Performance \times General S-E interaction was not supported at Time 1, nor in the ANCOVA results on Times 2–3 S-E changes. Thus, Hypothesis 5a was partially supported and 5b was not supported (see Figs 1–3).

With respect to Hypotheses 6–9, S-E changes from Time 2 to Time 3 using ANCOVA (see Table 3) and paired t tests. For interactions, we plotted estimated marginal means for Time 3 S-E with Time 2 S-E as a covariate, representing Time 2 to Time 3 changes in S-E (see Figs. 1–3). Although we did not hypothesize a direction for change in S-E from Time 1 to 2, the mean change was -0.26 ($t = -6.39$, 271 df , $P < .001$). Thus, there was a significant drop in S-E following test administration, consistent with Bauer et al. (1998). Hypothesis 6 predicted that pass/fail performance would affect post test S-E changes; it was supported. For passers, S-E increased by an average of 0.13 ($t = 3.12$, 107 df , $P < .01$; one-tailed). For failers, S-E decreased by an average of -0.15 ($t = -1.69$, 59 df , $P < .05$; one-tailed). The Hypothesis 7 interaction was supported. The negative effect of failing on S-E change was lower for those hired by tests previously than for those with only “no hire” or zero experience. The race interaction (Hypothesis 8) was also significant. The difference on S-E between passers and failers was greatest among Whites as compared to other race groups. Supporting Hypothesis 9, the Gender \times Performance interaction was significant ($P = .051$). S-E drops for those who failed the test were greater for women than for men.

Table 3
ANCOVA results for Time 3 S-E with Time 2 S-E as the covariate

Source/factor	Sum of squares	df	Mean square	F
Pass/fail performance	1.75	1	1.75	7.46***
Previous test experience	0.59	2	0.30	1.27
Race	2.50	3	0.83	3.55**
Gender	2.17	1	2.17	9.24***
General S-E	0.70	4	0.18	0.75
Previous Test Experience \times Pass/Fail Performance	1.45	2	0.73	3.09**
Race \times Pass/Fail Performance	2.04	3	0.68	2.89**
Gender \times Pass/Fail Performance	0.91	1	0.91	3.88*
General S-E \times Pass/Fail Performance	0.18	3	0.06	0.25
Testing S-E (Time 2)-covariate	19.54	1	19.54	83.22***
Error	32.40	138	0.23	–
Corrected total	92.67	159	–	–

$R^2 = .65$; Adjusted $R^2 = .60$.

* $P = .051$.

** $P < .05$.

*** $P < .01$.

4. Discussion

Generally, these findings contribute key knowledge about determinants of S-E in cognitive ability employment testing. Evidently, past test successes can positively affect analysis of task requirements and attributional analyses, while gender and perceived unfairness and invalidity may act as personal or situational constraints, indicating some support for Gist and Mitchell's (1992) model of S-E determinants. Specifically, contrary to Hypothesis 1, race did not explain differences in initial S-E. Even though Blacks and Latinos were less likely to pass the test, they may have bolstered their S-E by discounting the effect of race differences/bias on their individual situation. Perhaps, Black and Latino applicants were unaware of race differences in test scores and/or did not perceive race bias constraints to their testing performance. In any case, the lower means for African Americans and Latinos on cognitive ability tests and their reported negative reactions to such tests (e.g., DeShon et al., 1998; Helms, 1992; Sanchez et al., 2000; Schmit and Ryan, 1997) do not always translate into lower testing S-E. Thus, assertions that Blacks or Latinos have lower confidence than other races for cognitive ability employment tests remain questionable.

For Hypothesis 2, men had significantly higher levels of initial testing S-E than women (cf., Silver et al., 1995), even though a slightly higher percentage of women passed the test (44.5%) than men (37.3%). This indicates that, prior to the employment test, women may display less confidence and underestimate their capabilities relative to men. Future research should confirm this finding, investigating what socialization or other experiences (e.g., Bussey and Bandura, 1999) lead to women's lack of confidence on these tests (compared to men) and what management should do to address this discrepancy.

Supporting Hypotheses 3 and 6 confirms, in the employment-testing context, the positive linkage between past task success and subsequent S-E (e.g., Bandura, 1997; Vancouver et al., 2001). Our findings also constitute the first field evidence that a job applicant's experience on previous employment tests may carry over to affect S-E level going into a subsequent employment test, which is then affected by later test performance. This seems to affirm the reciprocal cycle of test performance and S-E found in other settings (e.g., Silver et al., 1995; Vancouver et al., 2001).

Supporting Hypotheses 4a and b, general attitudes toward cognitive ability employment testing were related to S-E. Evidently, perceived unfairness or lack of validity may cause applicants to doubt their ability to perform even if they exert a good effort (Bauer et al., 1998). We also tested race and gender effects on perceived testing fairness and validity. Neither the multivariate Wilks' lambda nor any of the four individual F tests were significant. Blacks were not more likely than other groups to perceive ability testing as unfair or invalid, contrary to some earlier findings where S-E was not controlled (Chan, 1997; Chan et al., 1997; Schmit

and Ryan, 1997). Along with Hypothesis 1 results, this finding offers no evidence that race differences in S-E help explain race differences in cognitive ability-test scores and their associated adverse impact in employee selection (Roth et al., 2001).

Support for Hypothesis 8 is consistent with the findings that Whites rated their leadership abilities lower than Blacks after failing a written ability test (Stewart and Shapiro, 2000), but inconsistent with findings of invariant relationships between performance and posttest reactions for Blacks and Whites (Chan et al., 1998). Perhaps Whites put a higher priority on written employment-test performance than other groups and therefore internalize failure more, causing relatively larger drops in S-E. This finding and its implications should be investigated in future studies.

As expected in Hypothesis 9, failing had a greater negative effect on women's S-E than on men's (see also, Stewart and Shapiro, 2000). This may have occurred because of differentially negative social learning or reinforcement experiences for women regarding cognitive ability tests (Bussey and Bandura, 1999; Lent et al., 1994). Maybe girls are punished or embarrassed more than boys after performing poorly on standardized tests. This could exacerbate the effect of failure on S-E for women. These findings also imply, that if downward efficacy-performance spirals exist in testing contexts (e.g., Lindsley et al., 1995), they may be more likely in Whites (vs. non-Whites) and in women (vs. men). However, to directly address efficacy spirals in cognitive ability employment testing, researchers would have to track S-E changes within and across employment situations, applying proper controls for race, gender, past test performance, general perceptions about tests, general S-E, and latent cognitive ability.

If replicated, the current findings suggest several practical implications. Managers can have some confidence that low S-E is not driving adverse impact on cognitive ability tests for Blacks and Latinos. However, women have lower initial S-E than men and are more adversely affected by test failure. This is bothersome and could even lead to relatively fewer women remaining in the applicant pool in organizations using cognitive ability tests. Moreover, those who fail and experience significant reductions in S-E might tell others that the test was especially hard and discourage potential applicants. Organizations wanting to "level the playing field" should consider attributional or other interventions to bolster S-E (Gist, 1987; Thomas and Mathieu, 1994). Such interventions have potential to help improve postfailure reductions in S-E, particularly for Whites and women. Another way for management to affect testing S-E may be through interventions to increase perceptions of fairness and test validity. For example, management should explicitly follow procedural justice rules in selection practices (Gilliland, 1993) and emphasize (in a pretest preparation session) the proven validity of the test for predicting job performance. Such interventions may also be useful for

improving applicant attraction and intentions toward the organization (Bauer et al., 1998).

4.1. Limitations and conclusion

There are several limitations to this study. First, there may have been some inflation of change effects for gender and pass/fail performance because of the directional ANCOVA bias, but normally preferred difference scores were inappropriate because of some skewness in our data (Cribbie and Jamieson, 2000). ANCOVA bias probably did not greatly affect results because the pattern and significance level of all the hypothesized effects were the same when Time 2 S-E was not controlled. Second, over 90% of our sample were not college graduates and were applying for a relatively low-skill job. Caution must be exercised in generalizing findings to any highly educated professional or managerial samples. Third, our measure of past test experience was categorical: no experience/hire/no hire, not capturing the frequency or timing of experiences. This may have attenuated effects of this variable. Discussion among applicants between survey administrations may have affected S-E changes and threatened the internal validity of some findings. We could not establish measurement invariance across all predictor groups due to small subsamples and the related lack of power. Finally, there may be other determinants of S-E not measured or controlled in this study. However, this criticism is not as serious as it might have been because we chose to develop and test hypotheses, rather than develop a comprehensive causal model. Hopefully, our findings will provide useful inputs to and inspire such future causal modeling efforts on employment-testing S-E. Finally, we make several other notable contributions with this study by presenting first evidence that there may be no direct race effects on cognitive ability testing S-E and by presenting first evidence that Whites and women appear to lower their S-E more than other race groups after employment-test failure.

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