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ABSTRACT

Evidence points to a pervasive tendency for persons to behave to maintain their existing cognitive structures. One strategy by which this self-verification is made more probable involves information processing. Through attention, encoding and retrieval, and the interpretation of events, persons process information so that self-confirmatory information tends to be over-represented. To investigate self-verification in a performance setting two studies examined the role of memory for performance outcomes in revisions of self-concept of ability. Self-estimates of ability were obtained from 151 undergraduates prior and subsequent to a controlled performance sequence and a measure of performance recall. The results indicated that performance memory bias (recall of success as compared to success indicated when performing) was related to post-performance ability estimates in both studies. A self-estimate of ability in several task-related skill areas was related to performance recall bias. Path analysis revealed a significant indirect path from pre-performance ability through recall bias to post-performance ability estimates. Ability estimates subsequent to performance were biased upward in direct proportion to pre-performance estimates by virtue of biased performance recall. The results support a tendency for information-processing to preserve existing cognitive structures. (Author/NRB)

Self-Verification of Ability Through Biased Performance Memory

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Abstract

Two studies (Total N = 151) investigated the role of memory for performance outcomes in revisions of self-concept of ability. Self-estimates of ability were obtained prior and subsequent to a controlled performance sequence and a measure of performance recall. Performance memory bias (recall of successes - successes indicated when performing) was related to post-performance ability estimates in both studies. Further, a self-estimate of ability in several task-related skill areas was related to performance recall bias. Path analysis revealed a significant indirect path from pre-performance ability through recall bias to post-performance ability estimates. Ability estimates subsequent to performance were biased upward in direct proportion to pre-performance estimates by virtue of biased performance recall. The results were interpreted as support for a general tendency for information-processing to preserve existing cognitive structures.

Evidence now accumulating points to a pervasive tendency for persons to behave so as to maintain their existing cognitive structures. William Swann (1983, 1984, 1985) has outlined two general strategies by which what Swann & Read (1981) have labeled "self-verification" is made more probable. One is that persons develop an opportunity structure, selecting only social settings that are likely to support their self-concepts. The second, which is the subject of the present studies, involves information processing. Through attention, enoding and retrieval, and the interpretation of events, persons process information so that self-confirmatory information tends to be over-represented. Several studies support this tendency in a number of contexts (cf. Swann, 1983) such as the recall of more favorable self-relevant information by persons high in self-esteem and self-depricating information by those with low self-esteem (Swann & Read, 1981).

The present studies investigated self-verification in a performance setting. According to the principle of conservative information processing, it was expected that memory for performance outcomes (i.e. success and failure) would tend to preserve beliefs that persons held prior to performing. This can be viewed as a two-step process. First, prior beliefs about performance, such as self-concept of ability, bias memory for performance outcomes in direct proportion to perceived ability. The biased encoded information then serves as the basis for any revision of self-concept. A direct test of this process was conducted by obtaining self-estimates of task ability before and

after performance and performance recall. The two-step process of self-verification is shown in the causal model depicted in Figure 1. Support for the hypothesized influence of memory requires evidence of an indirect path from pre-performance ability beliefs (AB1) to performance memory bias and from bias to post-performance ability estimates (AB2). Notice that the influence of bias on AB2 must be independent of the expected direct influence from AB1 to AB2.

Performance anxiety was included in the present model to investigate its possible influence on performance memory and the self-verification process. It was included in view of several studies relating various person variables to performance memory. Evidence indicates that depression (e.g., Buchwald, 1977; Nelson & Craighead, 1977; Kuiper, 1978) and helplessness (Deiner & Dweck, 1980) are related to lower recall of positive and higher recall of negative performance outcomes. Performance anxiety, a correlative of depression and helplessness, was used in the present study based on the belief that it might manifest stronger relations to recall than the more global dimensions of depression and helplessness. A negative relation was expected between anxiety and AB1, bias, and AB2. However, whereas anxiety was assumed to influence bias and AB2, it was not assumed to be causally prior to AB1.

Study 1

By way of overview, persons rated their ability to perform a

series of novel tasks after having received familiarizing instructions and limited practice. An extended controlled performance series followed, a measure of performance memory, then a second ability self-estimate.

Method

American university students (26 females and 19 males) enrolled in introductory psychology participated at the request of their instructor during a regularly scheduled class session. The study was introduced as one concerned with how persons perform novel tasks under normal classroom conditions. Persons were informed they would attempt a series of puzzle tasks and were exhorted to do their best so that their performance could be taken as a true measure of their ability.

Task

The task consisted of Euler line puzzles that require tracing over a line figure without retacing any line segment or lifting the pencil from the paper. Two virtues of Euler tasks are: 1) they can be made unsolvable with a suitable arrangement of lines (more than two odd junctions); 2) success/failure is quite obvious and discontinuous. Eight of the 20 tasks in the performance series were made unsolvable to partially control for individual differences in actual ability. One minute was given for each attempted solution. Persons designated that they had been correct by placing an "X" in a box on the puzzle itself. A solution also required numbering the line segments in the order

they were traced. These procedures were used to render actual success or failure on each task as unambiguous as possible.

Measures and Procedure

After a general introduction, persons were given specific task instructions. They were then shown an example solution and allowed to solve one simple practice puzzle. Specific puzzle-solving ability was then assessed using a social comparison scale which asked persons to rate how good they thought they were at solving such puzzles compared with 100 randomly selected students (scale from 0 to 100). A measure of performance recall was obtained immediately after the 20 performance trials. Persons were informed that they had performed 20 puzzles and were asked to estimate, without going back to count, on how many of them they had been successful. They then rated their puzzle-solving abilities a second time, followed by a measure of performance anxiety using a variation of the Spielberger STAI (Spielberger, 1970) in which the students were asked how they reacted to normal classroom test situations.

Results

Performance. A summary of performance statistics is presented in Table 1. Tasks were first checked for false positive successes, i.e., persons indicating they had solved puzzles when not having done so. There were few instances of such discrepancies, and the mean actual performance (10.0) verified by subsequent inspection of the tasks, was only slightly lower

than the number that were checked as correct (10.6). In addition, the correlation between actual and indicated successes was virtually unity (r(43)=.93). The number of indicated successes was preferred for analyses since we were more interested in performance recall relative to the persons' perceived successes while performing rather than their actual successes.

The range of indicated performance (number of puzzles persons checked as correct while performing) ranged from 5 to 12. Performance memory, however, had a range of 2 to 17. Recall bias (recall minus perceived successes during actual performance) ranged from underestimates of 7 to overestimates of 5. Interestingly, mean performance recall (9.3) was marginally lower than actual performance (10.6). This may be interpreted as evidence against a general self-enhancement tendency.

Path analysis. Path coefficients for the proposed causal model are shown in Figure 2. Although in the predicted direction, memory bias was not significantly influenced by pre-performance ability estimates (AB1). However, as expected, the path from bias to post-performance ability (AB2) is significant. Thus memory bias influenced AB2 independent of AB1. There were no significant path coefficients involving performance anxiety.

Discussion

We may conclude that performance memory bias (deviations of memory from actual performance) influences post-performance self-

estimates of ability independent of specific task ability beliefs held prior to performance. However, despite a trend, Study 1 did not demonstrate the predicted impact of pre-performance beliefs on bias. One possibility is that pre-performance ability estimates (ABl) are not reliable indicators, perhaps due to persons having had such limited exposure to the novel task prior to providing that judgment. Therefore, a second study was conducted with a more general measure of self-assessed ability in several skill areas which were assumed to be relevant to performance on the task persons were asked to perform. It was hypothesized that persons would be more capable of making judgments based on their broader range of experience than for performance on a task with which they were not well acquainted. Since a second possibility for the lack of significant covariance between ABl and bias is low power, the second study used a larger N.

Study 2

Method

Study 2 was virtually identical to the first, with the exception of the additional general ability assessment. Persons were asked to rate their ability level in seven areas: 1) physical skill (e.g., athletics and sports); 2) social skills (e.g., ability to handle social relations and groups); 3) mental tasks (e.g., puzzles, games logic); 4) artistic ability (e.g., drawing, painting, music); 5) mathematical skills; 6) clerical

skills; and 7) mechanical skills (e.g., understanding and operating mechanical devices). Ratings were from 0 to 10 with anchors of low, average, and high at appropriate points. Scales 3 through 7 constituted the general ability index (GA) and were summed.

There were 106 performers (79 females and 27 males) who participated in group settings of 25 or more.

Results

Performance. Overall, performance and recall were similar to Study 1. The number of tasks persons indicated as correct averaged 10.1 (range = 5 to 15), the average number actually correct was 9.3 (range = 5 to 12), and the correlation between them .88. Furthermore, average recall following performance was 9.2 (range = 2 to 17) was again below the number indicated during performance for an average negative bias of -.9 (range = -9 to +5).

Path analysis. Results of a path analysis for the data in Study 2 are shown in Figure 3. Note that no directional assumption was made for the relation between performance anxiety and general skills. However, general skills were assumed causally prior to AB1, recall bias, and AB2. All other aspects of the analysis are identical to Study 1.

As in Study 1, the path from AB1 to recall bias is not significant ($p = -.04$) and in fact is opposite in sign to prediction. The paths from AB1 to AB2 ($p = .43$ $p < .001$) and from recall bias to AB2 $p = .35$, $p < .001$) are significant

and therefore consistent with Study 1. Once again, therefore, no indirect path exists linking specific task ability self estimates prior to performance (AB1) to those following performance (AB2) as a consequence of memory bias. However, the measure of general skills does provide confirming evidence given the highly significant path coefficient from general skills to memory bias, as predicted ($p = .35$, $p < .001$). The value of the indirect path from GA through memory bias to AB2 is .15.

Paths involving performance anxiety were somewhat different than in Study 1 in that the path from anxiety to AB1 is significant ($p = -.20$, $p < .05$); however, that from anxiety to recall bias was not ($p = -.09$), although in the predicted direction.

General Discussion

The data from Study 2 thus provide support for the role of memory in preserving persons' ability-related beliefs, and constitutes more evidence for self-verification tendencies. There is certainly nothing novel about memory affecting subsequent ability self-estimates (i.e. bias to AB2). What is important is demonstrating the influence of pre-performance beliefs on performance memory, which, at least in this controlled setting, appears substantial. It should be further noted that although a rapid and lengthy performance series was used to provide a sufficient memory load for this effect to be detected, the individual trial outcomes were quite unambiguous. If

individual outcomes were more ambiguous the performance memory bias effect might have been even greater.

In addition to the many other factors that hamper persons with low ability beliefs, such as self-defeating exacerbation cycles that involve depricating attributions, we may add the factor of performance memory whereby they tend to underestimate their objective accomplishments. On the other hand, the present studies suggest that persons who believe they possess high ability will tend to recall having performed better than the objective evidence indicates and preserve those positive beliefs. In each case, the role of performance memory is conservative. To be discerned are the variables that influence the extent of this effect.

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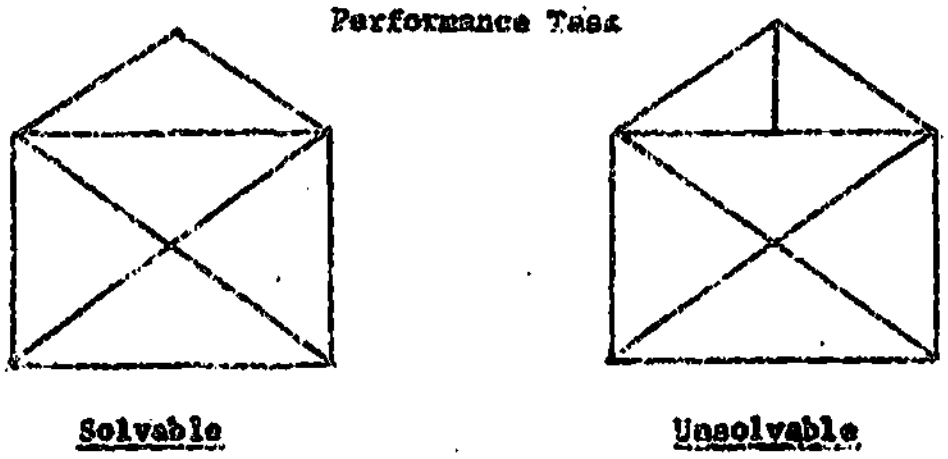
TABLE 1. Descriptive Statistics for Performance, Recall, and Bias

	Study 1	Study 2
Mean Actual Performance	10.0	9.3
Mean Indicated Performance	10.6	10.1
Mean Indicated Performance Range	5 - 12	5 - 15
Mean Performance Recall	9.3	9.2
Recall Range	2 - 17	2 - 17
Mean Bias	-1.3	-.9
Bias Range	-7 - +5	-9 - +5
N	45	106



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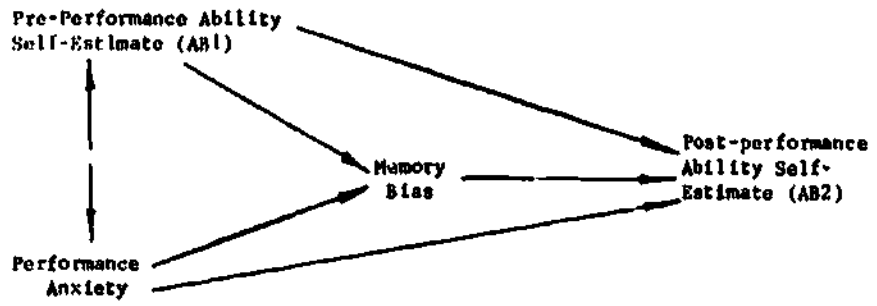

Figure 1. Proposed causal model for the mediating influence of memory bias.

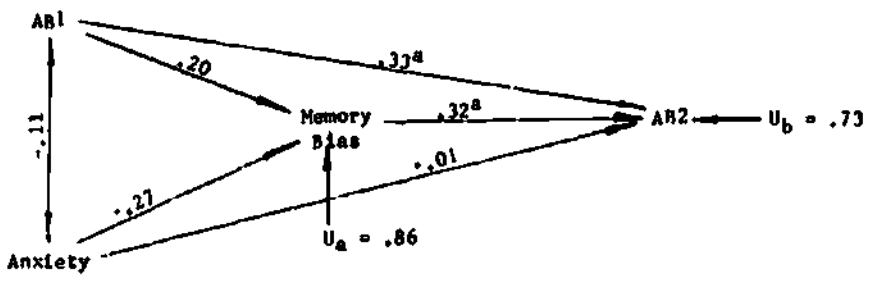

Figure 2. Path analysis of data from Study 1 - Path coeff cients are shown.

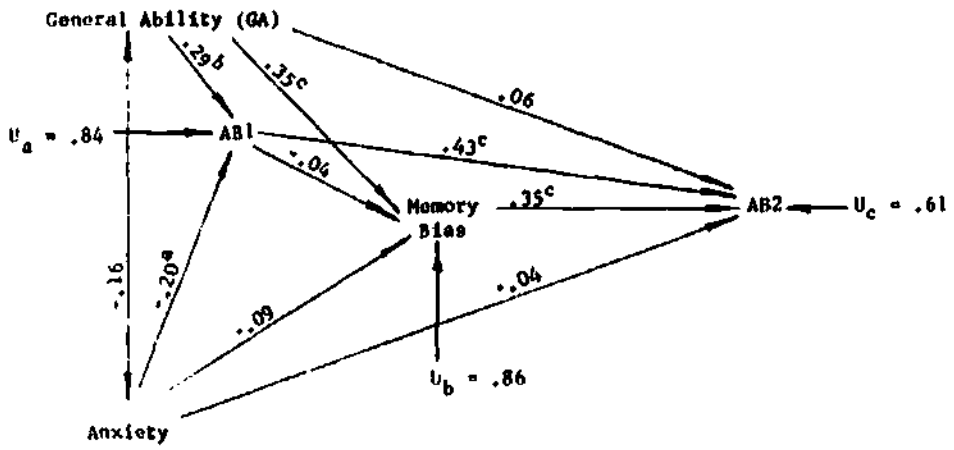

Figure 3. Path analysis of data from Study 2 - Path coefficients are shown.

$^{a}p < .05$ $^{b}p < .01$ $^{c}p < .001$