

**TITLE:** Accelerated Desensitization and Adaptive Attitudes Interventions and Test Gains with Academic Probation Students

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**DESCRIPTORS:** Test Anxiety; Academic Probation; Academic Failure; Anxiety Reduction; Stress Management; Desensitization; Conditioning; Exercise

**ABSTRACT:**

The study evaluates the test-gain benefits of an accelerated desensitization and adaptive attitudes intervention for test-anxious students. College students were screened for high test anxiety. Twenty anxious students, half of them on academic probation, were assigned to an Intervention or to a minimal treatment Control group. The Intervention was a desensitization protocol which included stretch-tense, deep breath, release-relax, and positive suggestion sequences to expedite anxiety reduction and also positive adaptive attitudes associated to each of eight learning, review, and testing scenes. The intervention was presented via a 31 minute recording, which students reviewed an average of two times. Test gains were calculated from final tests and final grades after the intervention, minus the midterm scores from before the intervention. The Intervention group attained significant test gains over the Controls, with considerably stronger gains among academic probation students as compared to students in good standing. Test gains correlated positively to anxiety-reduction benefits. Methodological limitations warrant some caution in interpreting the findings, although the strength of the attained benefits do suggest that the accelerated desensitization does improve test scores for struggling students with high test anxiety. The use of the recorded intervention is seen to vastly reduce the amount of training and the number of professional hours required for an anxiety-reduction program. It seems reasonable to recommend that college retention programs for probation students screen for test anxiety and intervene with highly test-anxious students.

# Accelerated Desensitization and Adaptive Attitudes Interventions and Test Gains with Academic Probation Students

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## Abstract

The study evaluates the test-gain benefits of an accelerated desensitization and adaptive attitudes intervention for test-anxious students. College students were screened for high test anxiety. Twenty anxious students, half of them on academic probation, were assigned to an Intervention or to a minimal treatment Control group. The Intervention was a desensitization protocol which included stretch-tense, deep breath, release-relax, and positive suggestion sequences to expedite anxiety reduction and also positive adaptive attitudes associated to each of eight learning, review, and testing scenes. The intervention was presented via a 31 minute recording, which students reviewed an average of two times. Test gains were calculated from final tests and final grades after the intervention, minus the midterm scores from before the intervention. The Intervention group attained significant test gains over the Controls, with considerably stronger gains among academic probation students as compared to students in good standing. Test gains correlated positively to anxiety-reduction benefits. Methodological limitations warrant some caution in interpreting the findings, although the strength of the attained benefits do suggest that the accelerated desensitization does improve test scores for struggling students with high test anxiety. The use of the recorded intervention is seen to vastly reduce the amount of training and the number of professional hours required for an anxiety-reduction program. It seems reasonable to recommended that college retention programs for probation students screen for test anxiety and intervene with highly test-anxious students.

About 18% of college students are handicapped by high test anxiety, according to various surveys (Hill & Wigfield, 1984), and an additional 16% may be somewhat handicapped by "moderately high" anxiety. Anxieties do appear to be increasing in step with the increased national emphasis on testing (McDonald 2001). High test anxiety reduces working memory and impairs concentration and reasoning, and highly anxious students scores about

12 percentile points below their low anxiety peers (Hembree, 1988; Cassady & Johnson 2001; McDonald 2001). High anxiety also reduces ability to comprehend and retain material (Tobias, 1980). Left untreated, performance anxieties continue into adulthood where they restrict career choices and lower quality of life (Topp, 1989; Krohne & Laux, 1982).

Test-anxiety reduction interventions have been found to lower anxiety and to improve test performance by as much as 12 percentile points (Hembree, 1988), although a more recent overview suggests gains are considerably more modest or even negligible (cf. Spielberger & Vagg, 1995). In the absence of a satisfactory overview, a current estimate of test score gains is not available.

Treating the 18 % or so of students who are most test anxious would appear to be an overwhelming task. The better interventions take between 3.5 and 8 hours, according to a recent meta-analysis (Ergene, 2003), while those taking an hour or less are much less effective.

### Probation programs

All students, but particularly those who are test-anxious do worse in competitive classrooms which place a premium on threatening evaluations (Hancock, 2001). Early research by S.B. Sarason and his colleagues showed convincingly that emphasis on evaluation and feedback about failures impaired performance more for highly test-anxious students than for their low test-anxious peers (reviewed by Spielberger & Vagg, 1995). Zatz & Chassin (1985) found that only in classes perceived as highly evaluative do students with high test anxiety perform more poorly on tests compared to those with low or medium test anxiety. Similarly, Helmke (1988) found that anxiety is especially debilitating when concerns about success and failure are prominent. In situations designed to allay anxiety, highly test-anxious students have shown improved performance (I.G. Sarason, 1958).

Hancock (2001) concludes that students with high test anxiety show significantly less motivation in classrooms perceived as highly evaluative compared to students with low test anxiety. In general, high test anxiety is more closely associated with lowered performance in low-ability students than in their high-ability counterparts (Hembree, 1988, p.65).

Many colleges have academic probation programs which attempt to improve performance for their students with unsatisfactory grades. The above findings are clearly pertinent to such programs. Students on academic probation might be expected to include at least an average proportion of highly test-anxious students, and perhaps more, as some identifiable handicap is apt to be contributing to the poor grades. Furthermore, academic probation is itself extremely threatening, as it portends failing out of college if grades are not

sufficiently improved. To a student invested in a better job or a professional career, it would be hard to imagine more personally intimidating circumstances.

Further, highly test-anxious probation students are apt to be more concerned about their plight than are their low-anxiety counterparts. Low-anxiety college students with poor performance may be simply uninterested in their schooling and unconcerned, or perhaps inadequately prepared. In contrast, those with high anxiety and poor performance would be expected to be concerned and perhaps overly concerned about school. Remove the impairment, and these students may show both the motivation and the ability to perform significantly better.

Many of us have seen a friend or school mate who has failed a critical qualifying exam or licensure exam, and is then too anxious and too unfocused to prepare well for the repeat exam. Highly anxious students on academic probation may be in a similar predicament.

So far as the above observations are correct, an effective test-anxiety reduction program should show comparatively stronger benefits for those anxious students on academic probation. The current investigation assesses the benefits of a test-anxiety reduction protocol on test-anxious academic probation students, in comparison to test-anxious students in good standing.

## Method

### Subjects

Students were selected in the Spring of 2004 from an academic probation program and a senior seminar at a small liberal arts college. Students were screened with the Westside Test Anxiety Scale, which emphasizes self-assessed performance impairment and interfering cognitions (Driscoll, 2004). Those found to have high or moderately-high anxiety were invited to join the study, and assigned to the Treatment group or the minimal treatment Control group.

Student assignment was mainly random but not completely so. The director of the learning center assigned several students to Intervention who were conscientiously seeking assistance but appeared not to be benefitting from it. Students assigned to Intervention had the option to participate, and about half declined, whereas students assigned to the placebo Control were asked to review anxiety reduction suggestions but were included whether they reviewed the material or not. Thus, the two groups were only loosely matched by initial assignment and by completion of the program after assignment.

As a compromise between the college's concern to benefit its high-anxiety students and the research requirement for a credible control group, more students were assigned to the Intervention than to the Control group. Twelve students were in the final Intervention

group, while eight were in the Control group. (Three originally assigned to the Intervention did not review the protocol and were dropped from the study.)

The final Intervention and Control groups were roughly equivalent in initial anxiety scores and initial grades. The initial anxiety scores ranged from 3.0–4.4, where 3.0–3.4 indicates moderately high anxiety and 3.5–5.0 is high to extremely high anxiety. The average initial anxiety for the Intervention and Control groups was 3.88 and 3.60 respectively, indicating a modest match with the Intervention group slightly more anxious.

The Intervention and Control groups had initial mean test grades of 77.1 and 78.3 respectively, indicating a close match between the two groups. The college uses a standard scale with 10 points per letter grade, where 75 is a middle "C."

The Intervention group had six probation and six regular-standing students, and the Control had four probation and four regular-standing students. One of the six Intervention probation students was a foreign science student not on formal probation but highly anxious about a psychology course and failing it.

## Intervention

The Intervention was a desensitization accelerated by stretch–tense–deep breath–release and relax sequences to curtail anxiety and augmented by imagined interest in the learning and testing scenes. The tense–relax sequences and additional instructions are used to produce a comfortable state in which students are more focused and more receptive to positive suggestions.

Students imagine an activity that they find especially interesting, and re-experience the sense of interest. Then, by suggestion, students imagine being interested in a series of eight learning, review, and testing scenes. Interest in school subjects contributes strongly to school performance, so an interested attitude is a plausible antidote to a fearful attitude.

Additional stretch–relax sequences are included between scenes, to curb any anxiety created and to reinstate the calmness and prepare students for the next scenes. The vivid experience of release and safety at the conclusion of a stressful scene is expected to condition participants to perceive the situation as safe and no longer frightening.

The procedure thus reframes the threatening situation as an interesting one, as in cognitive therapies, and then follows through with two additional steps: Students experience themselves being interested, and the sequence finishes with a sense of well-being and relaxation. The complete procedure is thus accelerated desensitization and adaptive attitudes.

Students in the Intervention group were given the protocol on recorded CD (Driscoll, 2003), along with instructions, and asked to listen to the CD on their own at least twice. Twelve reviewed the CD, most of them twice, usually in their dorm rooms. Thus, the

Intervention consisted of instructions and then listening to an average of two 30 minute recorded sessions.

While various anxious students may do well with one or two intervention components (Hiebert, 2000), the composite approach used here addresses both the cognitive and emotional aspects of anxiety and should be expected to benefit a broader range of individuals (Sapp, 1996).

An early component analysis indicates that exposure, strenuous activity, and positive images can all contribute significantly to overall anxiety-reduction benefits (Driscoll, 1976).

The Controls received a minimal treatment package consisting of information from the popular University of Illinois test anxiety management website (1996/2004). Students were asked to review it twice.

### Recorded protocols

Use of a recorded treatment protocol can reduce the professional resources required. Yet anxiety tolerances vary, and the pacing is critical. Exposure scenes which are appropriately challenging for one student may be overwhelming for another, resulting in less satisfactory outcomes. Recorded systematic desensitization has been found to produce on average only 55% of the benefits produced by professionally administered versions (Hembree, 1988, p.68).

The use of stretch-tense, deep breath, release-relax sequences to curb anxiety, before and after exposure scenes, appears to provide a promising solution. The stretching and muscle tension are thought to consume the physiological components of arousal, and the deep breaths counter the shallow breathing often associated with high anxiety. Tensed muscles fatigue quickly, and relaxation follows naturally as students release their air and release their muscles, and experience their muscles relaxing.

Anxiety tolerances are believed to be not so critical here, as the stretch-tense segments are thought to counter even strong surges of anxiety and cannot be overwhelmed or inhibited by such surges. Recorded versions of the protocol have been found to produce strong anxiety-reduction results across several samples that compare favorably to professionally-administered protocols (see Driscoll, 2006, for wording and anxiety-reduction findings).

### Performance measures

The interventions occurred in the Spring of 2004, after midterms but before finals. Change scores were calculated as post-intervention scores (finals) minus pre-intervention scores

(midterms). Every attempt was made to match midterm and final test scores from the same course for the pre- and post- measures, although final scores were estimated from final course grades when the final test scores were not available. Therefore, the scores used here were often "best estimates" and thus approximation of the actual test scores.

## Results

Several of the Control students reported that the information was helpful, but added that they had seen most of it before. The Control package thus seems to have served its purpose as a minimal treatment control, maintaining morale without introducing a competitive intervention.

### Intervention test gains

The Intervention group improved 8.3 test points as opposed to 2.0 points for the Control group, resulting in a 6.3 net gain (see Figure 1). Thus, the Intervention group showed just over a six-tenths of a letter grade gain over the Controls. The comparison was statistically significant ( $t=3.21$ ,  $df=18$ ,  $p<.005$ ).

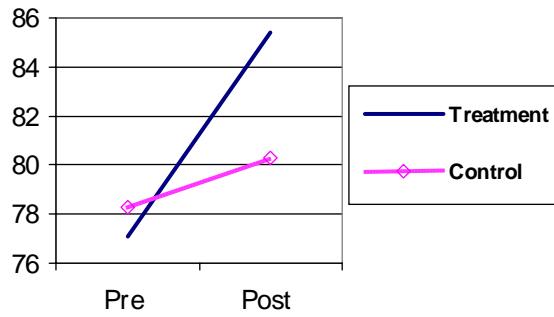


Figure 1: Treatment and Control Pre- and Post- Scores

The treatment effect size was .75 SD, calculated as net gain divided by the standard deviation of pre-treatment grades ( $SD=8.4$ ). The effect size here compares favorably to the .5 SD average effect size for the test anxiety interventions summarized by Hembree (1988), suggesting that the present protocol holds its own against professionally-administered protocols. The .75 SD gain corresponds to an 18 percentile net gain in class rank for the treated students over the controls.

## Probation vs. Regular Standing

The Intervention net gain was 10.1 points for the six probation students, and 2.6 points for the six regular status students (See Table 1).

	Academic Standing			
Gains	All	Probation	Regular	Difference
in test points	6.3	10.1	2.6	7.5
in percentile	18.0	28.9	7.4	21.5

Table 1: Net Grade Gains for Probation vs Regular Students

Thus, the protocol produced a major full-grade gain for the lower-performing students, but a more modest quarter-grade gain for the higher-performing students. The Intervention gains for the probation students were higher statistically than those for the regular status students ( $t = 4.34$ ,  $df = 10$ ,  $p < .001$ ). The difference was or 21.5 percentile points.

In a related analysis, initial grades correlated  $r = -.80$  with grade gains in the Intervention group ( $t = 4.23$ ,  $df = 10$ ,  $p < .002$ ). For the Control group, initial grades appear unrelated to grade gains ( $r = .10$ ). The figures show again that the Intervention improved grades for lower-performing students much more than for higher-performing students.

Given the especially strong results from the struggling students, we would expect clear benefits among those on academic probation. Overall, 78 second semester freshmen were on academic probation (out of 340 freshmen). Of the five formal probation students in the Intervention group, four regained regular standing and one remained on probation. Of the remaining 73 not treated, 30% regained regular standing at the end of the semester, while 43% continued on probation, 20% were suspended, and the remaining 7% withdrew. While the sample size is small, the 80% of Intervention students who regained regular status compares favorably with the 30% average for the untreated probation students.

## Initial anxiety

The initial anxiety scores in the Intervention group correlated  $r = .34$  with grade gains, and  $r = -.12$  with grade gains adjusted for initial grades. These correlations are small, inconsistent, and neither approaches statistical significance. Thus, initial anxiety level was not found to predict grade improvement. Within the range of moderately high, high, and

extremely high test anxiety, the present protocol seems to produce approximately the same benefits regardless of initial anxiety level.

### Anxiety reduction & test gains.

Post-intervention anxiety measures were obtained from eleven of the students, seven from the Intervention group and four from the Control group. The correlation between anxiety reduction on the Westside scale and grade gains for these 11 students was .82 ( $t=4.37$ ,  $df=9$ ,  $p<.002$ ), indicating a close correspondence between changes on the scale and objective test gains.

## Discussion

### Limitations

The investigation was conducted as a pilot study, and fails to comply fully with rigorous research standards. The lack of tight random assignment introduces questions on whether Intervention and Control students were exactly matched on attributes that might affect improvement. Particularly, the Intervention students may be more compliant and more motivated, as these are the students who agreed to participate while others declined. In addition, some of the finals test scores used here were estimated from available information and may not exactly match the actual scores.

Because of these methodological limitations, the results must be interpreted with some caution. The findings might be considered as strongly suggesting rather than solidly confirming the apparent test gains.

### Initial performance

The Intervention yielded substantially stronger gains for probation students. The lower-performing students have more room to gain, of course. The initial averages for the probation and regular status students were "C–" and "B", respectively, and climbing a full letter grade from a "C–" (to a "B–") would be considerably easier than climbing from a middle "B" (to a perfect "A"). Thus, a ceiling effect may be limiting gains for some of the higher-performing students.

We might also expect that high-anxiety students who perform well on tests have found ways to manage and compensate for their high anxieties, yielding more modest performance impairments., while their high anxieties may be causing them to overestimate their actual impairments. So, while anxiety-reduction training makes these students feel more confident in tests, reducing their relatively modest impairments provides only modest test score gains.

Among underperforming students who are highly motivated, in contrast, high test anxiety appears to be a primary and critical impairment. Remove what is perhaps the major obstacle, or reduce it, and the grades improve dramatically.

Compared to the gain among the probation students, the gain for the regular students appears relatively modest. And yet, if it withstands replication, a quarter grade improvement among already well-functioning students is respectable and worthwhile.

These findings do suggest that test-anxiety reduction improves performance more for high-anxiety students performing substantially below their apparent potentials. It appears that screening and intervention among academic probation students might significantly improve academic outcomes.

We can also make recommendations, based on high vs. low anxiety and poor vs adequate school performance (see Table 2).

	High Anxious	Low Anxious
Poor Performance	Will gain the most from test anxiety reduction	Could benefit from goal-setting.
Satisfactory Performance	Will be more comfortable after test anxiety reduction and should show modest grade gains.	Are well adjusted to their academic tasks.

Table 2: Suggestions based on anxiety and performance

Low-performing students who are highly anxious will gain most from anxiety reduction. High-performing students with high anxiety will be more comfortable after anxiety reduction, and may show modest test gains.

### Initial anxiety levels

The finding that the protocol provides about the same benefits across the range of anxiety levels suggests that a program might benefit not only the approximate 18% of truly high-anxiety students, but those with moderately high anxiety as well, estimated here as an additional 14–16% based on surveys of 280 high school and college students. Thus, an anxiety-reduction program might benefit as many as 32–34% of the students in any school.

## Conclusions

Test-anxiety reduction is seen to provide stronger test gains to low-achieving probation students and more modest gains for higher-achieving students. A test-anxiety reduction program may significantly improve school performance for students on academic probation.

It is reasonable for colleges to teach not just information and reasoning, but also the ability to think clearly and perform well amid the competitive pressures that follow us throughout our lives. Test-anxiety reduction may have an important place in our educational institutions.

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