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Low-Anxious, High-Anxious, and Repressive Coping Styles: Psychometric Patterns and Behavioral and Physiological Responses to Stress

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A long-standing problem in stress research has been that individuals' reports of their tendencies to become anxious are often inconsistent with relevant behavioral and physiological indices. This study investigated the distinction between (a) truly low-anxious subjects, who report low trait anxiety on the Taylor scale and low defensiveness on the Marlowe-Crowne scale and (b) repressors, who report low anxiety but high defensiveness. These groups were compared with a moderately high-anxious one. Heart rate, spontaneous skin resistance responses and forehead muscle tension were recorded from 40 male college students during a phrase association task. Significant differences in the three physiological measures as well as in three behavioral ones (reaction time, content avoidance, and verbal interference) all indicated that the repressors were more stressed than the low-anxious subjects despite their claims of lower trait anxiety. The high-anxious group exhibited a third pattern suggesting an intermediate level of anxious responding. These data document the need to distinguish between repressors and truly low-anxious persons in research concerned with relations between self-reported anxiety and behavioral and physiological responses to stress.

Individual differences in the tendency to become anxious continue to be an important dimension in theories of neurosis and stress-related disorders. However, widespread disillusionment has resulted from discrepancies between reports on trait anxiety scales and actual behavioral and physiological responding (see Hodges, 1976; Levitt, 1967).

One source of these discrepancies may be that certain individuals are predictably inaccurate in their self-perceptions (see Sackheim & Gur, 1978). Persons with a repressive coping style typically deny having elevated levels of anxiety, even though they often respond nonverbally as if they were highly anxious. Is it possible to distinguish truly low-anxious persons (see Spielberger, 1972) from repressors, who report low anxiety though their behavior and physiology appear otherwise?

Repressors, traditionally defined as persons manifesting heightened recognition thresholds for anxiety-provoking stimuli, consistently avoid disturbing cognitions across a variety of perceptual, projective, and learning tasks (see Brown, 1961; Eriksen, 1966). Not surprisingly, persons with this defensive style

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report little tendency to become anxious on measures such as the Taylor (1953) Manifest Anxiety Scale (e.g., Eriksen & Davids, 1955). However, this style also correlates with high scores on projective measures of maladjustment and with inaccurate self-descriptions (according to clinical assessment protocols; Chodorkoff, 1954). Repressors' defensiveness and preoccupation with avoiding awareness of anxiety often may interfere with effective coping and, paradoxically, promote behavioral and physiological responses indicative of high anxiety.

Since the early 1960s, the Byrne Repression–Sensitization (R–S) scale (Byrne, Barry, & Nelson, 1963) has been widely used to operationalize the concept of the repressor. Unfortunately, this scale has not facilitated the differentiation between repressors and truly low-anxious persons. The Byrne scale correlates very highly with measures such as the Taylor Manifest Anxiety Scale (MAS), the Cattell Institute for Ability and Personality Testing (IPAT) Anxiety Scale, the Spielberger A-Trait Scale of the State–Trait Anxiety Inventory, and the Eysenck Neuroticism Scale. For example, Golin, Herron, Lakota, and Reineck (1967) concluded that the .87 correlation between the Taylor MAS and the Byrne R–S scale was "attenuated only by errors of measurement and not by their measuring different attributes" (p. 568). In addition, the Byrne scale and trait anxiety measures have very high loadings on the First factor of the Minnesota Multiphasic Personality Inventory (MMPI; see Millimet, 1970).

Despite the compelling evidence that all of these scales are largely assessing a similar dimension, the scales continue to be used in separate literatures as if they were measuring different constructs. When these literatures are combined, the findings indicate that a considerable number of persons labeled *low anxious* on trait anxiety scales should be relabeled *repressors*. For example, some studies (e.g., Cohen, 1975; Scarpetti, 1973) have found that low scorers on the First factor of the MMPI (designated low anxious, low neurotic, or repressors) actually show greater physiological response to stress than high scorers (designated high anxious, high neurotic, or sensitizers). In other studies, low scorers have been found to underestimate their aggressive behavior according to impartial observers and physiological measures (Parsons, Fulgenzi, & Edelberg, 1969) and to provide impoverished descriptions of their emotional experience (e.g., Carroll, 1972). In addition, they are prone to hysterical conversion symptoms and physical disease (e.g., Blackburn, 1965), including hypertension (Davies, 1970) and cancer (Kissen, 1966).

The Marlowe-Crowne Social Desirability Scale (Crowne & Marlowe, 1964) may provide a major step toward discriminating truly low-anxious persons from repressors. It actually assesses repressive defensiveness as a dimension separate from the one measured by trait anxiety scales. (Correlations are usually in the −.2 to −.45 range; e.g., Millimet, 1970.) Crowne and Marlowe collected considerable evidence that their scale was measuring affect inhibition, "defensiveness and protection of self-esteem" (1964, p. 206). Furthermore, it is essential to note that numerous studies have concluded that the Marlowe-Crowne Social Desirability Scale is unrelated to the construct that it is usually thought to measure, namely, "conformity behavior or tendencies to respond to questionnaires in a socially desirable direction" (e.g., Wiesenthal, 1974, p. 39).

Using the Marlowe-Crowne scale and a trait anxiety scale such as the MAS (or R–S scale), a 2×2 table can be constructed differentiating four coping styles. Previous studies of these groupings have employed various sets of labels including conceptually self-contradictory terms such as *nondefensive repressors* (e.g., Holroyd, 1972). To maximize clarity, we propose the following new designations be used: *repressor*[1] (low MAS – high Marlowe-Crowne), *low anxious* (low MAS – low Marlowe-Crowne), *high anxious* (high MAS – low Marlowe-Crowne), and *defensive high anxious* (high MAS – high Marlowe-Crowne).

[1] Although we propose retaining the term *repressor* because of its use in the literature, the extent to which this defensive style is characterized by the use of repression relative to other defenses such as denial, negation (see Mahl, 1971) and suppression is not currently known.

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When the current literature is reviewed using this terminology, the findings are consistent with our designations. For example, Holroyd (1972) demonstrated that low-anxious subjects show significantly higher recognition thresholds than high-anxious subjects and significantly lower thresholds than repressors for stimuli associated with sexual versus nonsexual pictures. His data indicated that low-anxious subjects are neither perceptual repressors nor sensitizers. Furthermore, Boor and Schill (1967) found that low-anxious subjects, unlike repressors, scored significantly better than a combined high-anxious group on a timed psychomotor task in which anxiety may disrupt performance.

Interestingly, according to Kahn and Schill's (1971) investigation of Cattell IPAT scores, repressors actually report significantly lower trait anxiety than low-anxious persons. In addition, defensive high-anxious persons may be fairly rare (e.g., Boor & Schill, 1967). Thus, when a scale such as the MAS is used, very low scorers tend to correspond to repressors, low-middle scorers to low-anxious, and high scorers to high-anxious persons. This is consistent with the often found curvilinear relationship between trait anxiety and various dependent measures (e.g., Martens & Landers, 1970).

To date, studies differentiating high-anxious, low-anxious, and repressive coping styles have not included physiological measures. A potentially useful procedure for simultaneously assessing physiological and behavioral responses to stress was developed by Mandler, Mandler, Kremen, and Sholiton (1961). Using a version of the Heath (1960) Phrase Association Test, Mandler et al. found strong relations between psychophysiological (largely cardiovascular) changes and verbal signs of disturbance. In a second experiment, they discovered a significant −.45 correlation between verbal disturbance during the phrase associations and the appearance of affective imagery on the Rorschach (which may be inversely related to defensiveness). Thus, persons with a repressive style may have been particularly threatened by the association task.

These findings led us to the following hypotheses: During a phrase association task, repressors compared to low-anxious subjects should have longer reaction times, higher verbal disturbance scores (which include avoiding the content of the phrases and interference in the production of the response), and larger increases in palmar sweat gland activity, heart rate, and forehead muscle tension (assessing three systems typically associated with anxiety). These effects may be found across phrase types but may be particularly pronounced when phrases contain sexual or aggressive material. Moderately high-anxious subjects should show an intermediate level of stress but should not display the repressors' avoidance of phrase content.

Two additional hypotheses were investigated. First, we predicted that the repressors' style of avoiding threatening cognitions should result in their reporting significantly less cognitive than somatic anxiety (Schwartz, Davidson, & Goleman, 1978) if asked to describe how they typically respond when they become anxious.

Second, we assessed whether participating in a stressful experiment results in differential changes in subjects' self-perceptions. In accordance with the concept of repression-sensitization, we predicted that following the experiment, high-anxious subjects might amplify and repressors might diminish their admissions of anxiety proneness relative to their initial reports 7 weeks earlier. Kendall, Finch, Auerbach, and Hooke (1976), using Spielberger's State–Trait Anxiety Inventory, have demonstrated that trait anxiety scores can be influenced by similar situational variables.

Method

Subjects

Pretest. Two hundred and one male undergraduates from a cross section of student dormitories were pretested 7 weeks before the experiment. The primary purpose of this procedure was to obtain a sample of persons reporting very low anxiety in combination with high or low defensiveness. In this way, the differences between repressors and low-anxious persons could be highlighted.

To keep the pretest brief, the Bendig (1956) Short Form of the Taylor MAS was selected as the measure of trait anxiety. A 38-item scale constructed specifically for this study was included as the measure of repressive defensiveness. It was based on the clinical

and empirical research on the characteristics of repressors.[2]

Twenty-eight subjects who scored in the lower fifth of the Bendig distribution were selected to participate in the study; 12 scored in the lower half and 16 in the upper quartile of the defensiveness distribution. Twelve additional subjects were selected near the median on both scales with the initial goal of investigating a moderately anxious group. Prior to the experiment, subjects had no knowledge of the criteria of their selection, and the experimenter was blind to individuals' pretest scores.

Final sample. The 40 preselected subjects were between the ages of 15 and 23 years. They were recontacted in a random order and asked to participate in the experiment. To allow the comparison of individuals' personality scores and responses to stress at approximately the same point in time, subjects were administered measures of trait anxiety and defensiveness immediately following their participation in the experimental procedure. Final groupings were based on these scores, rather than on the pretest, and were established after all subjects had completed the experiment.

The complete Taylor MAS was chosen as the final measure of anxiety, since it is more widely used than the Bendig Short Form. In addition, after the pretests were administered, we discovered that the Marlowe-Crowne was, in fact, a valid and already standardized measure of defensiveness. Hence, it was used instead of the experimental scale to distinguish between repressors and low-anxious persons.[3]

Analysis of the MAS scores revealed that 11 subjects scored above the normative median of 13 (e.g., Taylor, 1953). Accordingly, these subjects were defined as a moderately high-anxious group. The remaining 29 subjects were divided according to their Marlowe-Crowne scores into 14 repressors and 15 low-anxious persons. Repressors were defined as those with a score in the upper quartile of the normative distribution (Crowne & Marlowe, 1964). This high criterion was chosen because low anxiety scores per se predict somewhat elevated defensiveness scores.

Thus, the repressors (REP) and low-anxious subjects (LA) both scored 13 or below on the MAS, but the repressors also scored 19 or above on the Marlowe-Crowne. Like the low-anxious subjects, all of the high-anxious (HA) subjects had Marlowe-Crowne scores below 19.

Physiological Recordings

A Grass Model 7 polygraph was used to record (a) the electrocardiogram from lead plate electrodes, (b) skin resistance from 16 mm Ag/AgCl electrodes placed on the palm of the subject's nondominant hand, and (c) frontalis region electromyographic (EMG) activity from 11 mm Ag/AgCl electrodes. The EMG electrodes had an internal resistance of less than 5,000 ohms. EMG was recorded at a sensitivity of 30 μV/cm and a time constant of .1 sec and was summed by a resetting Grass integrator. Skin resistance was recorded using the electrode paste suggested by Lykken and Venables (1971). The output of the skin resistance level channel was displayed through a .1-sec time constant. This provided a high gain record that facilitated hand scoring of skin resistance responses. Grason-Stadler logic modules tabulated heart rate and summated EMG automatically by counting R spikes and integrator resets per 60 sec.

Phrase Association Stimuli

Fifteen phrases were selected from those used by Mandler et al. (1961). The phrases were equally divided among those with neutral content (e.g., the steel company made new equipment), sexual content (e.g., the prostitute slept with the student), and aggressive content (e.g., his roommate kicked him in the stomach). The items were grouped in five blocks of three. Sexual and aggressive phrases were counterbalanced following each neutral phrase.

Five different orders of the five blocks of phrases were created. This procedure made it possible to assess trial effects independent of specific phrase content. A female assistant made tape recordings of each of the five orders. She read the phrases in a uniform manner and spaced them within each order at 75-sec intervals. Spacing was signaled by 100-msec tones that were also recorded on the tapes.

Design and Procedure

Overall procedure. The design included two major experimental procedures: (a) a phrase association task and (b) a heart rate biofeedback task (which will be presented in detail elsewhere).

Following an initial 2-min adaptation period, three 1-min resting baselines were obtained for all physiological measures. Then 20 subjects were administered the phrase associations, and the remainder were first administered the biofeedback trials. Upon completion of both procedures, all subjects were again asked to rest quietly. After another 2-min adaptation period, two final 1-min baselines were recorded. Subjects then completed a number of pencil-and-paper measures.

Phrase association procedure. For the phrase association task, subjects were instructed to respond to each stimulus as rapidly as possible with a phrase (more than two words) or sentence that completed the thought. They were assured that there were no other rules constraining their responses. A couple of practice phrases were given, and subjects were informed that some phrases would contain sexual or aggressive content. Subjects were asked to keep still, to speak loudly, and to relax between presentations.

[2] A copy of the experimental scale used in the pretest is available from the authors.

[3] The 7-week test–retest reliability of the experimental defensiveness scale was .74; it correlated .78 with the Marlowe-Crowne (in the laboratory), supporting the hypothesis that the scales are measuring a similar dimension.

The first eight subjects were given the first taj order, the next eight the second, and so forth. Tl phrases were presented through a speaker in front the subject that was attached to a Sony TC-1. cassette stereo in the experimenter's room. Subject responses were recorded over the intercom microphoi using a second cassette recorder.

Biofeedback procedure. The biofeedback task co sisted of 12 1-min trials—4 rest (1, 4, 7, 10), 4 increa (2, 6, 9, 11), and 4 decrease trials (3, 5, 8, 12). Subjec were given trial-by-trial instructions over the intercor Rest trial instructions were similar to those duri the pre- and postexperiment resting baselines. Duri all trials, subjects were instructed to keep eyes close to breathe normally, and to keep movement to minimum.

Dependent Measures

Physiological measures. Heart rate, number spontaneous skin resistance responses (SSRRs), ar integrated EMG were measured for comparable 1-m periods (a) during each of the 5 resting baseline (b) following the tone preceding each of the 15 phra presentations, and (c) during each of the 12 bi feedback trials. Skin resistance responses were scor as any change exceeding 100 ohms.

Reaction time and verbal disturbance scores. In a dition to the three physiological measures, reacti time and verbal disturbance scores were used evaluate subjects' responses to the phrase associati task. To assess reaction time, the time between t last sound of the prerecorded voice and the first sou of a subject's response was measured to the neare tenth of a second.

The recordings of subjects' responses were al transcribed. A simplified manual for scoring verb signs of disturbance was derived from the one us by Mandler et al. (1961).[4] (a) Stimulus avoidanc (b) recoding or denial, (c) rationalization, neutraliz tion, or intellectualization, and (d) personalizati were defined as degrees of avoiding or distanci oneself from the content of the stimulus. A fif category, interference, included disturbances in t production of the response other than reaction tir (e.g., less than a three-word response or changi one's response in midcourse).

Each response could be scored twice, once f avoidance of content and once for interference in t production of the response. To be scored, a respon had to clearly correspond to a particular categor Five randomly selected protocols were scored by second judge to establish reliability. The strict criteri used by Mandler et al. (1961) was employed. Pe centage of agreement was computed by the followi formula: twice the number of agreements divided b the total number of indices scored by the two judge Using this procedure, reliability was .88. The scori was conducted while the judges were blind to subject personality scores.

Pencil-and-paper measures. Immediately followi the phrase association task, subjects were asked estimate (on a 1–9 scale) their awareness of each 16 bodily reactions (e.g., increased heart rate, rap

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The first eight subjects were given the first tape order, the next eight the second, and so forth. The phrases were presented through a speaker in front of the subject that was attached to a Sony TC-130 cassette stereo in the experimenter's room. Subjects' responses were recorded over the intercom microphone using a second cassette recorder.

Biofeedback procedure. The biofeedback task consisted of 12 1-min trials—4 rest (1, 4, 7, 10), 4 increase (2, 6, 9, 11), and 4 decrease trials (3, 5, 8, 12). Subjects were given trial-by-trial instructions over the intercom. Rest trial instructions were similar to those during the pre- and postexperiment resting baselines. During all trials, subjects were instructed to keep eyes closed, to breathe normally, and to keep movement to a minimum.

Dependent Measures

Physiological measures. Heart rate, number of spontaneous skin resistance responses (SSRRs), and integrated EMG were measured for comparable 1-min periods (a) during each of the 5 resting baselines, (b) following the tone preceding each of the 15 phrase presentations, and (c) during each of the 12 biofeedback trials. Skin resistance responses were scored as any change exceeding 100 ohms.

Reaction time and verbal disturbance scores. In addition to the three physiological measures, reaction time and verbal disturbance scores were used to evaluate subjects' responses to the phrase association task. To assess reaction time, the time between the last sound of the prerecorded voice and the first sound of a subject's response was measured to the nearest tenth of a second.

The recordings of subjects' responses were also transcribed. A simplified manual for scoring verbal signs of disturbance was derived from the one used by Mandler et al. (1961).[4] (a) Stimulus avoidance, (b) recoding or denial, (c) rationalization, neutralization, or intellectualization, and (d) personalization were defined as degrees of avoiding or distancing oneself from the content of the stimulus. A fifth category, interference, included disturbances in the production of the response other than reaction time (e.g., less than a three-word response or changing one's response in midcourse).

Each response could be scored twice, once for avoidance of content and once for interference in the production of the response. To be scored, a response had to clearly correspond to a particular category. Five randomly selected protocols were scored by a second judge to establish reliability. The strict criterion used by Mandler et al. (1961) was employed. Percentage of agreement was computed by the following formula: twice the number of agreements divided by the total number of indices scored by the two judges. Using this procedure, reliability was .88. The scoring was conducted while the judges were blind to subjects' personality scores.

Pencil-and-paper measures. Immediately following the phrase association task, subjects were asked to estimate (on a 1–9 scale) their awareness of each of 16 bodily reactions (e.g., increased heart rate, rapid breathing) in accordance with how they had felt while responding to the task most intensely.

After subjects finished the experiment, they completed a 274-item composite of the revised R–S scale (Byrne et al., 1963), the Taylor MAS, the Marlowe-Crowne scale, and the defensiveness scale developed for the pretest. Fifteen additional items were interspersed as fillers. Subjects also completed a trait version of the Cognitive–Somatic Anxiety Questionnaire (Schwartz et al., 1978) and were asked to describe in a few words "the most outstanding or important characteristics" of their personality.

Statistical Comparisons

Within the various analyses, all t tests in which direction was specifically predicted are reported using one-tailed criteria. Among these are all independent t tests between low-anxious subjects and repressors and between low-anxious and high-anxious subjects. The few t tests in which direction was not predicted a priori are reported and explicitly labeled *two-tailed*

Results

Taylor MAS and Byrne R–S Scores

Consistent with Kahn and Schill's (1971) findings, the repressors had lower trait anxiety scores on the MAS than the low-anxious group, $t(27) = 2.62$, $p < .01$. They also had lower R–S scores, $t(27) = 3.10$, $p < .005$. The repressors' mean MAS ($M = 5.3$) and R–S ($M = 17.3$) scores corresponded to the 10th percentile of the normative distribution (Cosentino & Kahn, 1967; Taylor, 1953) compared to the 25th percentile for the low-anxious group (MAS, $M = 8.6$; R–S, $M = 26.1$). The means for the high-anxious group (MAS, $M = 20.6$; R–S, $M = 53.5$) were at the 75th percentile. Among all 40 subjects, the product-moment correlation between MAS and R–S scores was .94.

Resting Baselines

The five 1-min resting baselines were analyzed in a Group × Experiment Order (phrase association first vs. second) × Baseline Condition (pre- vs. postexperiment) analysis of variance with repeated measures on the last factor.[5] This $3 \times 2 \times 2$ analysis was per-

[2] A copy of the experimental scale used in the retest is available from the authors.

[3] The 7-week test–retest reliability of the experiental defensiveness scale was .74; it correlated .78 ith the Marlowe-Crowne (in the laboratory), suporting the hypothesis that the scales are measuring similar dimension.

[4] A copy of the revised scoring manual is available from the first author.

[5] The data of two subjects who did not participate in the postexperiment baseline were excluded from this analysis.

formed separately for heart rate, SSRRs, and EMG.

The analysis of heart rate revealed a significant effect only for baseline condition, $F(1, 32) = 4.60$, $p = .04$, with all groups having lower heart rates following the experiment. Similarly, there were fewer SSRRs following the experiment, $F(1, 32) = 15.71$, $p < .001$. In addition, marginal group, $F(2, 32) = 2.94$, $p = .068$, and Group × Order effects, $F(2, 32) = 3.10$, $p = .059$, indicated that the repressors, and particularly those who participated in the phrase association first, tended to have the largest number of SSRRs (M per minute = 4.2, REP; 3.0, HA; and 2.7, LA). For EMG, the group effect was the only significant one, $F(2, 32) = 3.93$, $p = .03$. Repressors had the most and high-anxious subjects the least EMG activity during the resting minutes (in relative units $M = 12.3$, REP; 10.9, LA; and 8.9, HA).

For each physiological measure, the lowest two of the five baseline values were averaged to establish a better estimate of resting activity during minimal stress. Using this index in a one-way analysis of the group factor, no significant differences were found within any of the measures. Heart rates during the minimum baselines were virtually identical ($M = 67.6$, REP; 67.4, LA; and 68.1, HA). Similarly, there were no differences in the numbers of SSRRs ($M = 1.7$, REP; 1.7, LA; and 1.3, HA).

The group differences in baseline EMG also were no longer significant ($M = 10.1$, REP; 8.9, LA; and 7.6, HA). However, the group means seemed discrepant with those obtained during the rest trials of the biofeedback task. To ascertain a more accurate measure of resting EMG, a Group × Rest Condition analysis of variance was performed. The lowest 2 min of EMG activity during the five resting baselines and during the four rest trials were compared. A significant main effect for rest condition, $F(1, 37) = 12.25$, $p = .001$, resulted from lower values during the minimum rest trials. However, the repressors differentially contributed to this effect as revealed in a Group × Rest Condition interaction, $F(2, 37) = 3.99$, $p = .027$. The repressors, unlike the other groups, generated significantly less EMG ($M = 10.1$ vs. 7.4) during the minimum rest trials than during the minimum baselines, $t(13) = 3.64$, $p < .003$, two-tailed. The mean EMG values during the minimum rest trials were very similar ($M = 7.4$, REP; 7.9, LA; and 7.4, HA), suggesting that the differences found in the resting baselines resulted from a tendency for the repressors to have relative difficulty relaxing.

Phrase Association Task

The five major dependent measures in the phrase association task (reaction time, verbal disturbance, heart rate, skin resistance responses, and EMG) were each analyzed using two 3 × 3 mixed-design analyses of variance. First, a Group × Phrase Type (neutral, sexual, aggressive) analysis investigated the effects of particular categories of phrase content. Second, a Group × Trial (phrases 1–5, 6–10, 11–15, in order of presentation) analysis assessed behavioral responding and physiological habituation over time regardless of phrase content.

Difference scores were employed to evaluate changes within each of the physiological measures. Each subject's heart rate and skin resistance responses to each stimulus were referenced to his lowest 2 min of baseline activity. Because the repressors seemed to have difficulty relaxing their forehead muscles during the baselines, the minimum two EMG values during rest trials were substituted for all groups as the measure of resting activity.

Reaction time. As predicted, there was a reliable main effect for group in reaction time, $F(2, 37) = 3.94$, $p = .029$. The repressors responded most slowly to the phrases and the low-anxious subjects most rapidly (M in seconds = 3.7, REP; 2.3, LA; and 3.0, HA; see Figures 1 and 2). Figure 1 also illustrates a marginal phrase type effect, $F(2, 74) = 2.81$, $p = .067$. On the average, all subjects responded more rapidly to neutral phrases than to the other two phrase types.

For neutral phrases, the group differences did not reach significance. However, low-anxious subjects did respond more rapidly than repressors to aggressive phrases, $F(2, 37) = 5.0$, $p = .012$; LA vs. REP, $t(27) = 3.18$, $p < .001$, and more rapidly than both repressors and high-anxious subjects to sexual phrases, $F(2, 37) = 3.26$, $p < .05$; LA vs.

REP, $t(27) = 2.91$, $p < .005$; LA vs. $t(23) = 2.03$, $p < .03$.

Figure 2 shows that there was no effect for trial, but there was a highly nificant Group × Trial interaction, $F(4, = 4.59$, $p = .003$. During the first five t low-anxious subjects reacted reliably f than either high-anxious subjects or re sors, whose responses did not differ, $F(2, = 4.78$, $p = .015$; LA vs. REP, $t(27) = p < .01$; LA vs. HA, $t(24) = 3.14$, $p <$ By the next five trials, the high-anxious jects responded like the low-anxious ones, the repressors still tended to have lo reaction times, $F(2, 37) = 2.68$, $p = .083$ vs. REP, $t(27) = 1.82$, $p < .04$. During final five presentations, the low-anxious jects continued to react faster than the pressors, $F(2, 37) = 6.31$, $p < .005$; LA REP, $t(27) = 3.27$, $p < .001$.

Despite the counterbalancing of both ph types and the ordering of the sets of sp phrases, there was a tendency from the

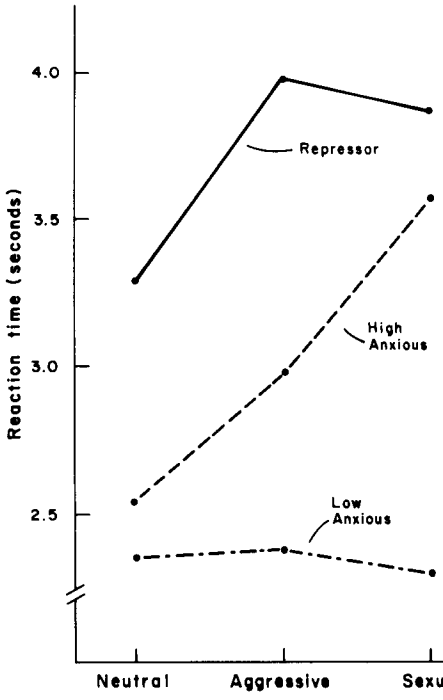

Figure 1. Mean reaction time in seconds to co balanced neutral, aggressive and sexual phrase ciation presentations separately for low-anxious jects ($n = 15$), high-anxious subjects ($n = 11$) repressors ($n = 14$).

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Despite the counterbalancing of both phrase types and the ordering of the sets of specific phrases, there was a tendency from the first to the second five trials for repressors to react more slowly, $t(13) = 1.91$, $p < .08$, two-tailed. In contrast, the high-anxious subjects tended to respond more quickly, $t(10) = 1.99$, $p < .08$, two-tailed, whereas the low-anxious subjects did not significantly change. During the last five trials, the repressors continued to respond increasingly slowly. Thirteen of 14 repressors had worse mean reaction times to the last five presentations than to the initial five, $t(13) = 3.72$, $p < .003$, two-tailed. No similar trend was found in the other groups.

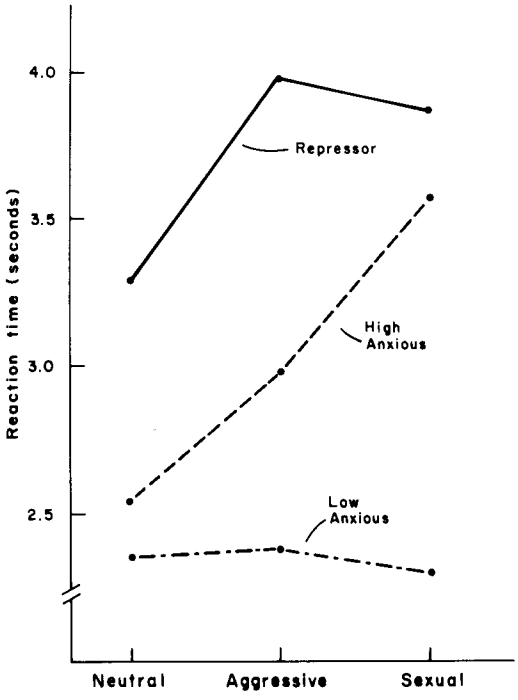

Figure 1. Mean reaction time in seconds to counterbalanced neutral, aggressive and sexual phrase association presentations separately for low-anxious subjects (n = 15), high-anxious subjects (n = 11), and repressors (n = 14).

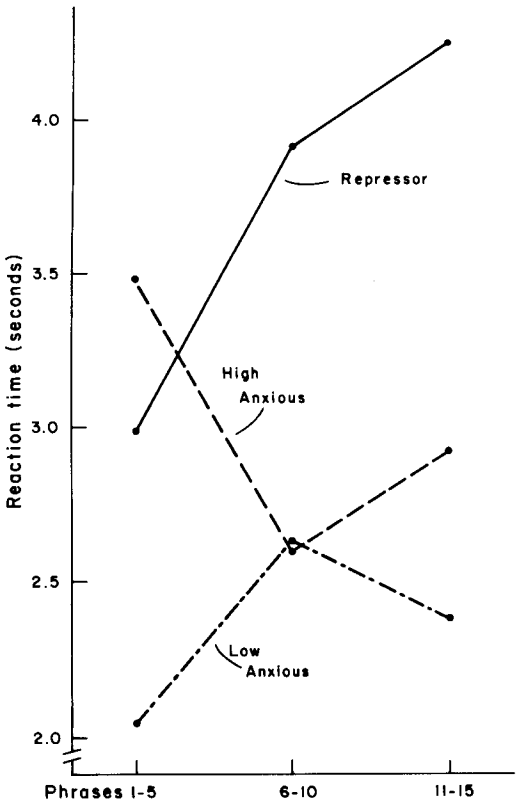

Figure 2. Mean reaction time in seconds to Phrases 1–5, 6–10, and 11–15 in order of presentation separately for low-anxious, high-anxious, and repressive subjects.

Verbal disturbance scores. In the two analyses of total verbal disturbance scores, a main effect for group, $F(2, 37) = 4.73$, $p = .015$, indicated that the repressors had a higher level of disturbance than the other two groups (M = 6.78, REP; 2.80, LA; and 2.55, HA). In addition, a phrase type effect, $F(2, 74) = 8.04$, $p < .001$, confirmed that sexual (1.60)

and aggressive (1.72) relative to neutral (.80) content contributed more heavily to total disturbance scores within groups. There were no Group × Phrase Type, Group × Trial, or trial effects.

Interestingly, the total verbal disturbance scores of the 40 subjects correlated .33 ($p < .05$) with the Marlowe-Crowne as a measure of trait defensiveness. In addition, the disturbance scores, which were validated as a measure of anxiety thresholds (Heath, 1960), correlated −.31 ($p < .05$) with R–S scores and −.28 with the MAS. Thus, defensiveness, in contrast, to self-reported trait anxiety, seems particularly related to difficulty with this task.

Because avoidance of the content and interference in the production of a response are distinct measures of disturbance, two one-way analyses of variance were used to investigate group differences further. As predicted, mean avoidance scores indicated that repressors avoided responding directly to the phrase content most and high-anxious subjects (also referred to as sensitizers) least (M = 5.14, REP; 2.53, LA; and 1.64, HA). Both low-anxious and high-anxious subjects displayed less avoidance than the repressors, $F(2, 37) = 4.44$, $p = .019$; HA vs. REP, $t(23) = 2.45$, $p < .02$; LA vs. REP, $t(27) = 1.98$, $p < .03$. In a somewhat different pattern, only the low-anxious subjects had lower interference scores than the repressors, and the high-anxious subjects fell in between (M = 1.64, REP; .27, LA; and .91, HA), $F(2, 37) = 2.85$, $p = .071$; LA vs. REP, $t(27) = 2.33$, $p < .02$.

Heart rate. For heart rate, the main effect for group approached significance, $F(2, 37) = 3.06$, $p = .059$, indicating that the low-anxious group tended to have smaller increases than the other two groups (see Figure 3). Unlike reaction time and verbal disturbance scores, heart rate was not differentially responsive to phrase type. However, subjects' increases in heart rate became significantly less pronounced over time, as indicated by a main effect for trial, $F(2, 74) = 11.73$, $p < .001$.

There was also a marginal Group × Trial interaction, $F(4, 74) = 2.20$, $p = .078$. The low-anxious group's heart rate changes were fairly constant across trials relative to the other groups' (see Figure 3). During the first five trials, the low-anxious subjects responded less than either the high-anxious subjects or the repressors, $F(2, 37) = 4.13$, $p < .025$; LA vs. HA, $t(24) = 3.01$, $p < .005$; LA vs. REP, $t(27) = 2.25$, $p < .02$. This effect diminished as the high-anxious subjects and the repressors habituated.

Spontaneous skin resistance responses. For changes in the number of SSRRs, the main effect for group was marginally significant, $F(2, 37) = 2.42$, $p = .10$. The group effect resulted from low-anxious subjects (3.3) responding less overall than the repressors (5.1), $t(27) = 2.52$, $p < .01$. The high-anxious subjects (3.7) fell in between but more closely resembled the low-anxious group (see Figure 4).

As in heart rate, all groups' SSRRs habituated to phrase presentations. The main effect for trial was highly significant, $F(2, 74) = 14.24$, $p < .001$. There also was a marginal main effect, $F(2, 74) = 2.63$, $p = .080$, for

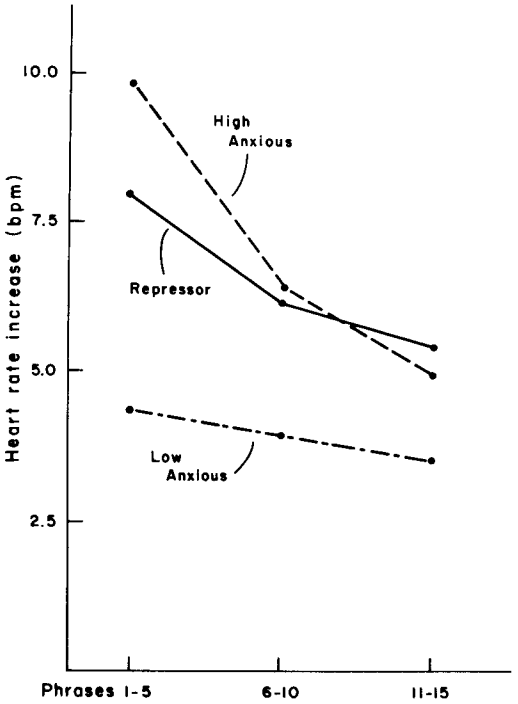

Figure 3. Mean heart rate increase (in beats per minute) during the minute following the tone preceding each phrase presentation separately for group (low anxious, high anxious, repressor) and for trial (Phrases 1–5, 6–10, 11–15, in order of presentation).

phrase type, because of a tendency for jects (particularly high-anxious and anxious ones) to respond less to aggr phrases (see Figure 4).

Frontalis region EMG. For EMG main effect for group was significant, $F($ = 4.68, $p = .016$.[6] Both the low-anxious and high-anxious (3.1) subjects tensed foreheads less than the repressors (8.6) vs. REP, $t(26) = 1.87$, $p < .04$; REP vs $t(23) = 2.97$, $p < .01$, two-tailed; LA HA, *ns*.

Unlike heart rate and electroderma tivity, there were no trial effects for E However, a main effect for phrase type found, $F(2, 72) = 4.76$, $p = .012$, becau smaller increases in response to sexual ph (M = 5.9, neutral; 5.9, aggressive; and sexual).

Awareness of somatic reactions. Alth there were clear group differences on behavioral and physiological measures, a way analysis of variance of total score vealed no significant differences in sub awareness of bodily reactions during the p association task. In addition, separate ana of the most relevant items indicated tha groups reported similar degrees of (a) lessness, (b) increased heart rate, (c) swe hands, and (d) forehead tension.

Further Psychometric Distinctions

Cognitive–somatic anxiety. The Cogn Somatic Anxiety Questionnaire (Schwa al., 1978) requires subjects to estimate they typically respond when they be anxious. As predicted, the repressors rep that they usually do not experience as cognitive (12.1) as somatic (15.0) an $t(13) = 3.17$, $p < .005$. No similar dis tion occurred in the respective self-repo the high-anxious or low-anxious subjects

Differences in cognitive anxiety dis nated the groups more clearly than differ in somatic anxiety. Relative to the anxious subjects (15.0), the repressors reported experiencing significantly less tive anxiety, $t(27) = 2.13$, $p < .025$, wh the high-anxious subjects (18.2) reporte periencing significantly more, $t(24) =$ $p < .025$. In contrast, only the repr (15.0) and the high-anxious subjects

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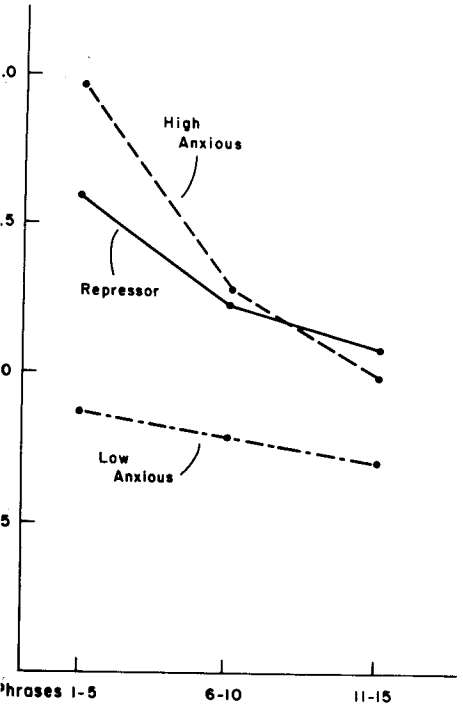
Spontaneous skin resistance responses. For anges in the number of SSRRs, the main ect for group was marginally significant, 2, 37) = 2.42, $p = .10$. The group effect ulted from low-anxious subjects (3.3) re- nding less overall than the repressors (5.1), 7) = 2.52, $p < .01$. The high-anxious sub- ts (3.7) fell in between but more closely embled the low-anxious group (see Figure 4). As in heart rate, all groups' SSRRs ha- uated to phrase presentations. The main ct for trial was highly significant, $F(2, 74)$ 14.24, $p < .001$. There also was a marginal in effect, $F(2, 74) = 2.63$, $p = .080$, for



e 3. Mean heart rate increase (in beats per te) during the minute following the tone pre- g each phrase presentation separately for group anxious, high anxious, repressor) and for trial ses 1–5, 6–10, 11–15, in order of presentation).

phrase type, because of a tendency for subjects (particularly high-anxious and low-anxious ones) to respond less to aggressive phrases (see Figure 4).

Frontalis region EMG. For EMG, the main effect for group was significant, $F(2, 36) = 4.68$, $p = .016$.[6] Both the low-anxious (5.2) and high-anxious (3.1) subjects tensed their foreheads less than the repressors (8.6); LA vs. REP, $t(26) = 1.87$, $p < .04$; REP vs. HA, $t(23) = 2.97$, $p < .01$, two-tailed; LA vs. HA, *ns*.

Unlike heart rate and electrodermal activity, there were no trial effects for EMG. However, a main effect for phrase type was found, $F(2, 72) = 4.76$, $p = .012$, because of smaller increases in response to sexual phrases ($M = 5.9$, neutral; 5.9, aggressive; and 5.1, sexual).

Awareness of somatic reactions. Although there were clear group differences on the behavioral and physiological measures, a one-way analysis of variance of total scores revealed no significant differences in subjects' awareness of bodily reactions during the phrase association task. In addition, separate analyses of the most relevant items indicated that the groups reported similar degrees of (a) restlessness, (b) increased heart rate, (c) sweating hands, and (d) forehead tension.

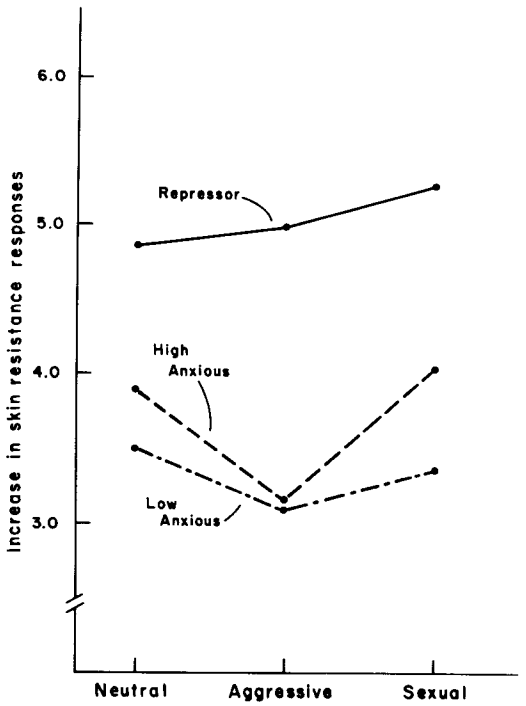


Figure 4. Mean increase in spontaneous skin resistance responses (of at least 100 ohms) during the minute following the tone preceding each phrase presentation separately for group (low anxious, high anxious, and repressor) and for phrase type (neutral, aggressive, and sexual).

Further Psychometric Distinctions

Cognitive–somatic anxiety. The Cognitive–Somatic Anxiety Questionnaire (Schwartz et al., 1978) requires subjects to estimate how they typically respond when they become anxious. As predicted, the repressors reported that they usually do not experience as much cognitive (12.1) as somatic (15.0) anxiety, $t(13) = 3.17$, $p < .005$. No similar dissociation occurred in the respective self-reports of the high-anxious or low-anxious subjects.

Differences in cognitive anxiety discriminated the groups more clearly than differences in somatic anxiety. Relative to the low-anxious subjects (15.0), the repressors (12.1) reported experiencing significantly less cognitive anxiety, $t(27) = 2.13$, $p < .025$, whereas the high-anxious subjects (18.2) reported experiencing significantly more, $t(24) = 2.12$, $p < .025$. In contrast, only the repressors (15.0) and the high-anxious subjects (17.7) differed significantly in somatic anxiety, $t(23) = 1.96$, $p < .04$. The low-anxious subjects' reports (15.3) were similar to the repressors' and were only marginally lower than the high-anxious groups, $t(24) = 1.55$, $p < .07$.

Change in self-perception after stress. The Bendig Short Form of the MAS was administered in the pretest under relaxed conditions and was readministered immediately after subjects had observed their behavior in a stressful experiment. As predicted, an analysis of variance of Group × Test Condition (in residences, after experiment) revealed a significant interaction, $F(2, 37) = 6.44$, $p < .005$. Only the low-anxious subjects maintained a stable self-perception across conditions, with an original mean of 2.93 and a retest mean of 3.27. After the stressful ex-

[6] One subject's data were excluded from this analysis because of a malfunctioning electrode.

perience, the sensitizing high-anxious subjects concluded that they must generally be more anxious (8.55 vs. 6.45) than they had previously supposed, $t(10) = 2.38$, $p < .02$. In contrast, the stress heightened the repressors' defensiveness about their tendencies to become anxious. Not a single repressor was more willing to admit trait anxiety following the experiment than he was during the initial relaxed conditions. The repressors' mean Bendig score decreased from 2.50 to 1.64 (out of 20), $t(13) = 3.71$, $p < .002$.[7]

Discussion

This study provides construct validity for distinctions among low-anxious, high-anxious, and repressive styles as three general patterns of coping with threatening situations.[8] A number of theoretically consistent self-report, behavioral, and physiological differences emerged.

Among subjects claiming low trait anxiety, elevated scores on the Marlowe-Crowne Social Desirability Scale predicted a repressive style involving an avoidance of disturbing cognitions. This conclusion was supported by the repressors' particular denial of cognitive (relative to somatic) anxiety and their reports of decreased trait anxiety following a stressful experiment.

The repressors' defensiveness was illustrated in the phrase association task by high content avoidance scores and increasingly poor reaction times. Although these data indicate that the repressors responded slowly and evasively to minimize their sense of threat, the relative ineffectiveness of their coping style was further documented by four additional measures: heart rate, sweat gland activity, forehead muscle tension, and verbal interference. Thus, the repressors' claim of having less trait anxiety than the low-anxious group was uniformly contradicted by three measures of their behavior and three of their physiology.

In contrast, the self-perceptions of the low-anxious subjects (who scored low in anxiety and defensiveness) were relatively accurate. Their estimates of their trait anxiety were not influenced by situational factors, and their experiences of the cognitive and somatic components of anxiety were congruent. Generally, they did not find the phrase association task very stressful. In particular, they tended to respond rapidly and appropriately (low verbal disturbance scores and fast reaction times) to sexual and aggressive as well as to neutral content and had relatively small but consistent changes in heart rate across trials (see Figures 1 and 3).

Showing a third pattern, the high-anxious subjects exhibited an intermediate level of stressful responding but generally lacked the repressors' defensiveness. For example, they displayed little tendency to avoid the content of the phrase presentations. Particularly the reaction time data (see Figure 2), in conjunction with the other measures, suggest that the high-anxious subjects initially found the task quite threatening but adaptively reevaluated this perception as the experiment proceeded. Interestingly, this process (of recognizing overreaction) seemed to amplify their views of themselves as high anxious.

When we asked subjects to describe their most important characteristics, they provided self-descriptions that were very consistent with their behavior in the laboratory. The repressors' preoccupation with mastering negative emotion and rigorously controlling their behavior was particularly striking. They clearly value a rational, nonemotional approach to life.

The self-descriptions of nine of the repressors were (a) "rational (subjugate emotion)," (b) "I do not get upset very easily," (c) "I like to deal with people and objects on a nontrivial level," (d) "I usually plan whatever I do (setting priorities)," (e) "utilitarian," (f) "I don't get discouraged easily," (g) "tolerant as well as tolerable," (h) "not overly worried; I reason rationally," (i) "I can make an important contribution to humanity." Each statement reflects the central importance to the repressor of cognitive self-control.

In contrast to the repressors, the low-anxious subjects displayed a lack of defen-

[7] Further analysis using the original groupings showed a similar pattern of score changes.

[8] It should be recognized that some aspects of these patterns may not generalize to females. As Chabot (1973) has indicated, sex differences in coping style are sometimes reported in the literature, though presently there is no theoretical model that adequately encompasses them.

siveness and an openness to experience interpersonal relationships. Their descrip included (a) "enjoying life," (b) "versat flexibility," (c) "like being with peo (d) "interact with people easily and natura (e) "fairly outgoing," (f) "diversity, ad bility, friendliness," (g) "open, happy, act (h) "outgoing, friendly person," (i) "a di person who enjoys doing active things."

As a third personality style, high-an subjects described themselves as (a) ' worried about what others think," (b) "c slow in making friends," (c) "an inconsi self-image, slight cynicism," (d) "sli shy," (e) "independence . . . sometimes t point of alienation," (f) "sensitivity, patie (g) "quiet, uncomplaining," (h) "cong ity." The high-anxious subjects, as one r expect, reported being shy, unassertive, generally threatened by interpersonal cor These reports suggest that if the repre were removed from the comparison, anxious persons might be considerably introverted than low-anxious ones.

The clinical implications of distingui among high-anxious, low-anxious, and re sive styles are numerous. Clearly, diff interventions may be necessary to hel pressors versus high-anxious individuals with stress more effectively (e.g., see Sh Butt, Horwitz, & Farbry, 1978). It i portant to note that psychoanalytic, hu istic-existential, and emotive therapies all somewhat specifically designed to with repressive aspects of personality function. In contrast, behavioral (e.g., W 1973) and rationally oriented cognitiv havioral (e.g., Beck, 1976; Ellis, 1970) m have tended to focus on the pattern of di exhibited by high-anxious persons.

Repressors pose particularly difficult ment problems. As might be expected their behavior in this study, repressor the R–S scale) avoid seeking help for pe difficulties but have the most severe prese problems (Pellegrine, 1971). Similarly, scorers on the Marlowe-Crowne are gen defensive in therapy, often terminating and without improvement, according to pist ratings (Strickland & Crowne, As mentioned earlier, a repressive sty handling stress may lead to a pronen

tion task very stressful. In particular, they tended to respond rapidly and appropriately (low verbal disturbance scores and fast reaction times) to sexual and aggressive as well as to neutral content and had relatively small but consistent changes in heart rate across trials (see Figures 1 and 3).

Showing a third pattern, the high-anxious subjects exhibited an intermediate level of stressful responding but generally lacked the repressors' defensiveness. For example, they displayed little tendency to avoid the content of the phrase presentations. Particularly the reaction time data (see Figure 2), in conjunction with the other measures, suggest that the high-anxious subjects initially found the task quite threatening but adaptively reevaluated this perception as the experiment proceeded. Interestingly, this process (of recognizing overreaction) seemed to amplify their views of themselves as high anxious.

When we asked subjects to describe their most important characteristics, they provided self-descriptions that were very consistent with their behavior in the laboratory. The repressors' preoccupation with mastering negative emotion and rigorously controlling their behavior was particularly striking. They clearly value a rational, nonemotional approach to life.

The self-descriptions of nine of the repressors were (a) "rational (subjugate emotion)," (b) "I do not get upset very easily," (c) "I like to deal with people and objects on a nontrivial level," (d) "I usually plan whatever I do (setting priorities)," (e) "utilitarian," (f) "I don't get discouraged easily," (g) "tolerant as well as tolerable," (h) "not overly worried; I reason rationally," (i) "I can make an important contribution to humanity." Each statement reflects the central importance to the repressor of cognitive self-control.

In contrast to the repressors, the low-anxious subjects displayed a lack of defensiveness and an openness to experience and interpersonal relationships. Their descriptions included (a) "enjoying life," (b) "versatility, flexibility," (c) "like being with people," (d) "interact with people easily and naturally," (e) "fairly outgoing," (f) "diversity, adaptability, friendliness," (g) "open, happy, active," (h) "outgoing, friendly person," (i) "a diverse person who enjoys doing active things."

As a third personality style, high-anxious subjects described themselves as (a) "shy, worried about what others think," (b) "quiet, slow in making friends," (c) "an inconsistent self-image, slight cynicism," (d) "slightly shy," (e) "independence . . . sometimes to the point of alienation," (f) "sensitivity, patience," (g) "quiet, uncomplaining," (h) "congeniality." The high-anxious subjects, as one might expect, reported being shy, unassertive, and generally threatened by interpersonal contact. These reports suggest that if the repressors were removed from the comparison, high-anxious persons might be considerably more introverted than low-anxious ones.

The clinical implications of distinguishing among high-anxious, low-anxious, and repressive styles are numerous. Clearly, different interventions may be necessary to help repressors versus high-anxious individuals deal with stress more effectively (e.g., see Shipley, Butt, Horwitz, & Farbry, 1978). It is important to note that psychoanalytic, humanistic–existential, and emotive therapies were all somewhat specifically designed to cope with repressive aspects of personality dysfunction. In contrast, behavioral (e.g., Wolpe, 1973) and rationally oriented cognitive–behavioral (e.g., Beck, 1976; Ellis, 1970) models have tended to focus on the pattern of distress exhibited by high-anxious persons.

Repressors pose particularly difficult treatment problems. As might be expected from their behavior in this study, repressors (on the R–S scale) avoid seeking help for personal difficulties but have the most severe presenting problems (Pellegrine, 1971). Similarly, high scorers on the Marlowe-Crowne are generally defensive in therapy, often terminating early and without improvement, according to therapist ratings (Strickland & Crowne, 1963). As mentioned earlier, a repressive style of handling stress may lead to a proneness to physical disease, though repressors may also avoid seeking medical care (e.g., Cochrane, 1969). This may have important implications for models of stress-related disorders (e.g., Schwartz, 1977).

In conclusion, the results of this study indicate that repressors as well as high-anxious persons tend to cope ineffectively with psychosocial stress relative to truly low-anxious persons. Thus, investigations of stress management that employ self-report measures of anxiety (or the R–S scale) should include a measure of defensiveness, such as the Marlowe-Crowne, to distinguish between the very different styles of low-anxious versus repressive personalities.

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Crowne, D. P., & Marlowe, D. *The approval motive:*

[7] Further analysis using the original groupings owed a similar pattern of score changes.

[8] It should be recognized that some aspects of these tterns may not generalize to females. As Chabot 973) has indicated, sex differences in coping style sometimes reported in the literature, though esently there is no theoretical model that adequately compasses them.

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Learned Helple Acknowledg

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Subjects designated as high-te controllable or uncontrollable n of them subsequently received duction task, and the other hal tered. Test anxiety theory succ performance: Only high-test-an ness induction. The effects o proved ambiguous, but this may edgment and the susceptibility sions of the task situation. E helplessness theory has failed t that has similarly employed e merous competing explanations tion. Test anxiety theory sugg formance are likely to be attent

Learned helplessness theory was ori formulated on the basis of laboratory ments with infrahuman species. After Sel (1975) proposed learned helplessness appropriate model of depression and h other investigators extended the paradi research with human subjects, consid controversy developed. This controvers mately led to major reformulations theory that incorporated a revision of a tion theory (Abramson, Seligman, & Te 1978). The added attributional framewo permitted learned helplessness theory count for a number of findings that are wise embarrassing to, or unexplained b theory.

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