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Irrational Beliefs and Anxiety

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Samples of 451 (205 male and 246 female) and 189 (78 male and 111 female) introductory psychology students completed measures of irrational beliefs, trait anxiety, test anxiety, speech anxiety, fear of negative social evaluation, and social avoidance and distress. Simultaneous regressions on full and extreme group distributions showed no sex and sex × belief interaction effects in the prediction of anxieties, suggesting that results were applicable to both sexes. Stepwise regressions of irrational beliefs on both full and extreme group distributions showed that (a) regression equations in the two samples were substantially replicated, (b) beliefs predictive of the full distribution were generally the same as those for the extreme groups, (c) the amount of variance accounted for in the extreme groups was greater than in the full distributions, (d) the amount of variance accounted for by irrational beliefs varied from one type of anxiety to another type of anxiety, and (e) different beliefs tended to be predictive of the different anxieties. Implications for the understanding and treatment of anxities were discussed.

KEY WORDS: irrational beliefs; trait anxiety; test anxiety; speech anxiety; fear of negative evaluation; social avoidance and distress.

A number of cognitive interventions, e.g., stress inoculation training (Meichenbaum, 1977) and systematic rational restructuring (Goldfried, Decenteceo, & Weinberg, 1974), have been applied to various anxieties. Most of these interventions assist clients to identify and change distorted cognitive

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processing and, directly or indirectly, incorporate Ellis's (1962) irrational beliefs. These cognitive interventions, however, appear to be based on hypothesized relationships between irrational beliefs and the presenting anxiety, rather than on empirically established relationships between beliefs and a given anxiety. Thus, studies that explore the relationship of irrational beliefs to specific anxieties not only would add to the understanding of the anxieties but also would be of practical value in intervention design. They would point to which irrational beliefs might most profitably be targeted for a specific anxiety. Such information would be particularly helpful in the development of group programs in which individual assessment is not often readily available. Programs could be tailored to those beliefs that had the strongest empirical link to the presenting anxiety.

Correlational studies have shown significant relationships between irrational beliefs (see Method section for description of beliefs) and various anxieties. For example, trait anxiety, test anxiety, fear of negative social evaluation, and social avoidance and distress correlate significantly with a number of irrational beliefs (e.g., Goldfried & Sobocinski, 1975; Himle, Thyer, & Papsdorf, 1982; Zwemer & Deffenbacher, 1984). Relationships with speech anxiety varied, with one study (Goldfried & Sobocinski, 1975) showing significant correlation with seven beliefs but another (Lohr & Rea, 1981) showing correlation only with demand for approval. Additionally, studies employing composite indices of irrational beliefs (e.g., Goldfried & Sobocinski, 1975; Lohr & Bonge, 1981a; Sutton-Simon & Goldfried, 1979) have shown that the overall tendency to endorse irrational beliefs was related to these and other anxieties. However, the single regression analysis in these studies (Zwemer & Deffenbacher, 1984) suggested that many fewer beliefs may account for unique variance in an anxiety.

While these studies suggest that irrational beliefs are associated with some anxieties, they are marked by several methodological shortcomings. First, some (e.g., Smith, 1982) have expressed concern about correlating self-report indices of irrational beliefs with self-report indices of distress. If significant item overlap existed, then the correlation might reflect measurement of a single concept or assessment of general emotional distress. Careful inspection of items in belief and anxiety scales is needed to minimize problems of item overlap, and evidence of discriminant validity is needed (Smith, 1982) to evaluate whether only underlying general distress is being assessed. That is, if the anxieties themselves are not highly correlated, and if belief patterns vary by anxiety, then validity of the correlational approach is strengthened. Second, only a few studies (e.g., Goldfried & Sobocinski, 1975; Himle et al., 1982) include more than one anxiety with the same study such that possible discriminant validity could be established through inspection of correlations among anxieties and belief patterns by type of anxiety. Third, all but one

study (Zwemer & Deffenbacher, 1984) presented only simple correlation matrices that do not isolate the unique contributions of beliefs to an anxiety, which would suggest which beliefs might most profitably be targeted. Additionally, studies that report only composite indices force reasonably independent beliefs into a general index, which does prevent targeting specific cognition content in treatment. Fourth, only two studies (Sutton-Simon & Goldfried, 1979; Zwemer & Deffenbacher, 1984) attempted to isolate beliefs that discriminated more extreme, clientlike groups. Yet information on extreme groups would be most useful in designing interventions since beliefs most characteristic of clients with the anxiety might be targeted. Fifth, few studies report separate analyses by sex to see if different beliefs cluster to a given anxiety by sex of subject, which would provide information for the sex composition of treatment groups. Finally, no study has provided replication that would assess the stability of findings and minimize overgeneralization.

The present study addressed these issues by having two large groups of undergraduates complete measures of irrational beliefs, trait anxiety, test anxiety, speech anxiety, fear of negative social evaluation, and social avoidance. Regression analyses isolated unique contributions of specific beliefs to full distributions of each anxiety and to more extreme, clientlike groups. Using two large samples and differing anxieties allowed for an exploration of convergent or divergent patterns of irrational beliefs by type of anxiety and sex of subject and a replication of findings.

METHOD

Subjects

Samples I and II consisted of 451 (205 male and 246 female) and 189 (78 male and 111 female) undergraduates enrolled in introductory psychology courses. Subjects earned 1 hour of required research credit for participation.

Instruments

Irrational Beliefs. The Irrational Beliefs Test (IBT; Jones, 1969) is a 100-item self-report inventory in which each of Ellis's (1962) 10 irrational beliefs is represented by 10 items. Irrational belief themes are briefly: (a) *demand for approval*—it is essential to be loved and approved of by all significant others; (b) *personal perfection*—one must be perfect to be worthwhile;

(c) *blame-proneness*—when people do something that one considers wrong, they are bad and should be punished; (d) *catastrophizing*—it is terrible when things are not as one wants; (e) *emotional irresponsibility*—happiness is caused by external events over which one has no control; (f) *anxious overconcern*—threatening events are cause for great concern and their possibility must be continuously dwelt upon; (g) *problem avoidance*—it is easier to avoid than face difficulties; (h) *dependency*—one must have someone stronger upon whom to rely; (i) *helplessness*—past experiences determine present feelings and behaviors, and the influence of the past cannot be changed; and (j) *perfect solutions*—there is always a right solution that must be found. Subjects rate agreement or disagreement with each item on a 5-point scale, providing scores from 10 to 50 for each irrational belief, with higher scores indicating greater endorsement of the irrational belief. The initial study (Jones, 1969) established the 10 irrational belief scales through factor analysis, and a subsequent factor analysis (Lohr & Bonge, 1982) substantially replicated the factor structure. Other studies (e.g., Hazaleus & Deffenbacher, 1985; Zwemer & Deffenbacher, 1984) have found low interscale correlations supporting the relative independence of the scales. Alpha reliabilities for the IBT scales ranged from .52 to .73 (Lohr & Bonge, 1982) and 8-week retest reliabilities from .58 to .80 (Lohr & Bonge, 1981b). Validity relative to anxiety was outlined in the introduction.

Anxieties. General or trait anxiety was assessed by the Trait Anxiety Inventory (TAI; Spielberger, Gorsuch, & Lushene, 1970), test anxiety by the Test Anxiety Scale (TAS; Sarason, 1972), speech anxiety by the Personal Report of Confidence as a Speaker (PRCS; Paul, 1966), apprehension about others' evaluations and possible criticisms by the Fear of Negative Evaluation scale (FNE; Watson & Friend, 1969), and the tendency to avoid or escape social interactions by the Social Avoidance and Distress Scale (SAD; Watson & Friend, 1969). Higher scores on all scales indicate greater anxiety.

Procedure

Subjects indicated intent to participate by signing a folder containing times and locations of testing sessions. Upon their arrival at a large university classroom in groups from 75 to 125, the experiment was described, and informed consent forms were signed. Subjects then completed the questionnaires. The IBT was completed first in order to prevent any subject hypotheses about anxiety and IBT content from influencing IBT ratings. Anxiety scales were completed in randomized order. After completing the instruments, subjects were given research credit forms, a written debriefing, and the opportunity to discuss the experiment with either of two experimenters. Samples I and II were recruited and assessed in the same manner, but 2 years apart.

RESULTS

Due to the number of analyses and repeated use of some data, $\alpha = .01$ was employed to minimize Type I errors and overinterpretation of marginal findings. Simultaneous regressions were run in order to evaluate the possible contribution of sex or sex × belief interactions in explaining variance in the five anxieties. Tests on the semipartial correlations (Cohen & Cohen, 1975) revealed no significant main effect for sex, or for sex × belief interactions, on any anxiety in either sample. Since sex of subject, either alone or in interaction with irrational beliefs, did not significantly improve the prediction of any anxiety, data were collapsed across sex of subject.

Correlations among irrational beliefs were modest. Though many correlations in both samples were significant, these significant correlations ranged from .11 to .40 for Sampe I and from .19 to .40 for Sample II, and the average *r* between irrational beliefs was .16 for both samples, supporting the relatively low intercorrelation among irrational beliefs. Other correlations for Samples I and II are presented in Tables I and II, respectively. Inspection of these tables shows that anxieties were moderately intercorrelated and that they all tended to correlate with need for approval, personal perfection, catastrophizing, anxious overconcern, problem avoidance, and helplessness, but minimally or to a much lesser extent with blame-proneness, emotional irresponsibility, dependency, and perfect solutions.

Forward stepwise regressions in which irrational beliefs were regressed on each anxiety were run in order to isolate the unique variance accounted

Table I. Correlations Among Anxieties and Beliefs for Sample I

	Measures[a]				
	TAI	TAS	PRCS	FNE	SAD
TAI	—	.46	.31	.43	.35
TAS		—	.25	.40	.12
PRCS			—	.37	.44
FNE				—	.40
SAD					—
Demand for approval	.36	.32	.19	.65	.15
Personal perfection	.47	.30	.23	.41	.27
Blame-proneness	.07	.03	.04	.06	.03
Catastrophizing	.47	.21	.17	.22	.12
Emotional irresponsibility	.05	.02	.06	.07	.09
Anxious overconcern	.48	.40	.22	.41	.18
Problem avoidance	.36	.23	.23	.21	.14
Dependency	−.03	.06	−.06	.14	−.16
Helplessness	.38	.30	.23	.23	.25
Perfect solutions	−.13	−.10	−.14	−.10	−.06

$r > .11, p < .01$

[a]TAI = Trait Anxiety Inventory, TAS = Test Anxiety Scale, PRCS = Personal Report of Confidence as a Speaker, FNE = Fear of Negative Evaluation, SAD = Social Avoidance and Distress.

Table II. Correlations Among Anxieties and Beliefs for Sample II

	Measures[a]				
	TAI	TAS	PRCS	FNE	SAD
TAI	–	.48	.30	.45	.38
TAS		–	.29	.28	.15
PRCS			–	.37	.45
FNE				–	.45
SAD					–
Demand for approval	.36	.12	.19	.67	.18
Personal perfection	.38	.13	.13	.44	.34
Blame-proneness	.11	.17	.11	.02	.11
Catastrophizing	.42	.18	.27	.25	.19
Emotional irresponsibility	.11	.09	.09	.14	.06
Anxious overconcern	.54	.36	.36	.51	.25
Problem avoidance	.38	.12	.42	.15	.28
Dependency	.02	−.01	−.01	.18	−.21
Helplessness	.31	.34	.21	.33	.36
Perfect solutions	−.10	−.11	−.19	.03	−.01
$r > .18$, $p < .01$					

[a]TAI = Trait Anxiety Inventory, TAS = Test Anxiety Scale, PRCS = Personal Report of Confidence as a Speaker, FNE = Fear of Negative Evaluation, SAD = Social Avoidance and Distress.

for by each belief. Inclusion in the regression equation was dependent upon the belief's contribution being significant at $p < .01$ and explaining at least 1% of the variance. Results of these analyses are summarized in Table III.

These regression analyses showed which beliefs were most predictive of the anxieties when the full distributions were considered, but not the beliefs most characteristic of the extremes of anxiety. However, knowing the cognitive characteristic of individuals high on a given anxiety would have the greatest utility for understanding clients and designing interventions. To pursue this issue, regression analyses were run on high- and low-anxiety groups. Extremes on anxiety were defined by the approximate upper and lower quartiles on each anxiety distribution.

In order to assess the meaningfulness and external validity of the high-anxiety groupings, the means of the high-anxiety groups were compared to pretreatment anxiety levels in the treatment literature. For example, the high general anxiety groups (Ms = 50.33 and 48.53) were not significantly different from the generally anxious college students (M = 50.06) of Daley, Bloom, Deffenbacher, and Stewart (1983), $t(175) = .32$ and $t(137) = 1.81$. Speech anxiety levels (Ms = 23.47 and 25.08) were significantly higher than the pretreatment level in Paul's (1966) study (M = 20.6), $t(212) = 6.62$ and $t(140) = 9.34$, p's $< .001$. The high test anxiety group of Sample I (M = 27.54) was not significantly different from self-referred test-anxious clients (M = 29.72) coming to a counseling center (Deffenbacher & Shelton, 1978), $t(140)$

Table III. Beliefs in Stepwise Regression for Samples I and II

Anxiety[a]		Regression on full distribution	Regression on extreme groups
TAI	I	Anxious overconcern (23%), personal perfection (11%) problem avoidance (5%) catastrophizing (3%), helplessness (2%), and emotional irresponsibility (1%), R = .68	Anxious overconcern (38%), personal perfection (12%), castrophizing (6%), helplessness (4%), and problem avoidance (2%), R = .79
	II	Anxious overconcern (29%), problem avoidance (10%) catastrophizing (5%), and personal perfection (4%), R = .69	Anxious overconcern (39%), problem avoidance (11%), catastrophizing (5%), and personal perfection (3%), R = .77
TAS	I	Anxious overconcern (16%), helplessness (4%), and demand for approval (3%), R = .47	Anxious overconcern (26%), helplessness (6%), and demand for approval (3%), R = .62
	II	Anxious overconcern (13%) and helplessness (5%), R = .42	Anxious overconcern (19%) and helplessness (5%), R = .49
PRCS	I	Helplessness (5%), problem avoidance (3%), anxious overconcern (2%), and perfect solutions (1%, negative beta weight), R = .35	Helplessness (11%), anxious overconcern (6%), problem avoidance (4%), and perfect solutions (3%, negative beta weight) R = .49
	II	Problem avoidance (18%) and anxious overconcern (6%) R = .49	Problem avoidance (26%) and anxious overconcern (11%), R = .61
FNE	I	Demand for approval (42%), anxious overconcern (3%), and personal perfection (2%), R = .68	Demand for approval (54%), anxious overconcern (4%), and personal perfection (2%), R = .80
	II	Demand for approval (45%), anxious overconcern (9%), and personal perfection (3%), R = .75	Demand for approval (56%), anxious overconcern (10%), and personal perfection (4%), R = .84
SAD	I	Personal perfection (7%), helplessness (3%), and dependency (2%, negative beta weight), R = .35	Personal perfection (12%), helplessness (5%), and dependency (2%, negative beta weight), R = .43
	II	Helplessness (13%), personal perfection (6%), and dependency (3%, negative beta weight), R = .46	Helplessness (19%) and personal perfection (9%), R = .53

[a]TAI = Trait Anxiety Inventory, TAS = Test Anxiety Scale, PRCS = Personal Report of Confidence as a Speaker, FNE = Fear of Negative Evaluation, SAD = Social Avoidance and Distress. The Percentage after each belief represents the percent of variance accounted for each belief in the stepwise regression.

= 1.29; however, the high test anxiety group of Sample II (M = 23.56) was significantly less anxious, $t(70) = 3.45$, $p < .01$. The high social avoidance and distress groups (Ms = 16.82 and 16.96) were not significantly different from the college students expressing severe dating and social anxiety (M = 16.05) of Curran, Gilbert, and Little (1976), $t(138) = .62$ and $t(71) = .58$. However, the high fear of negative evaluation groups (Ms = 23.96 and 24.99) were significantly higher than the highly dating and socially anxious (M = 20.69) of Curran et al. (1976), $t(140) = 2.25$, $p < .05$ and $t(69) = 3.25$, $p < .01$. In summary, these comparisons with the treatment literature suggest that the high-anxious groups were generally as anxious as, if not more anxious than, meaningful comparison groups, suggesting that the cognitive characteristics of these groups might be validly generalized to similar anxiety groups.

Given this evidence of comparability, extreme groups were subjected to simultaneous regression analyses to assess for possible sex effects. Tests of the semipartial correlations revealed no effect for sex or sex × belief interactions. Forward stepwise regressions of beliefs on the extremes of anxiety were then run (see Table III).

DISCUSSION

Simultaneous regression analyses revealed that sex of subject, alone or in interaction with irrational beliefs, did not contribute significantly to the prediction of specific anxieties. The lack of sex differences suggests that findings are applicable to both sexes and that cognitively oriented groups could be delivered to mixed sex groups.

Regression analyses tended to replicate themselves. The same beliefs in roughly the same order tended to be found for full distribution and extreme group analyses and across both samples. The amount of variance accounted for by regressions tended to be the same across parallel analyses in the two samples, but the variance for the extreme group analyses tended to be greater than for the full distributions, suggesting even greater confidence including these beliefs in treatment design. Some of the equations for Sample I included more beliefs than those of Sample II. This was likely due to the increased sample size of Sample I influencing the level of statistical significance. The added beliefs, however, entered the equations late and accounted for relatively little variance. Furthermore, the beliefs found for Sampe II were always found in the equations for Sample I and typically entered early in the equations. This replication suggests a relatively firm base from which to draw conclusions and speculate about treatment.

Anxious overconcern, personal perfection, catastrophizing, and helplessness were central irrational beliefs predictive of trait anxiety. The highly trait-anxious individual appeared to be characterized by kind of ruminative tendency or preoccupation with possible threat, which if it were to happen would be of more catastrophic proportions than for most. A particularly anxiety-arousing theme was that of personal perfection. At the same time, the individual believed that he/she was relatively incapable of changing the anxiety and was more likely to take avoidant approach in dealing with it. This picture was similar to that of Zwemer and Deffenbacher (1984), who found that anxious overconcern, problem avoidance, catastrophizing, and personal perfection entered the regression on trait anxiety.

Problem avoidance, anxious overconcern, and helplessenss were most predictive of speech anxiety. This was more like the pattern of correlations reported by Goldfried and Sobocinski (1975) than the relative lack of correlation reported by Lohr and Rea (1981). Regressions for test anxiety also included anxious overconcern and helplessness with demand for approval in Sample I. These were similar to the simple correlations reported by Goldfried and Sobocinski (1975) and Himle et al. (1982). Thus, the test- and speech-anxious individuals seemed characterized by the ruminative, helpless, and avoidant tendencies of the trait-anxious. Test-anxious individuals may be more sensitive to issues of personal approval than personal perfection, however.

Whereas fear of negative social evaluation and social avoidance and distress might be thought to be cognitively related, they were very different in terms of predictive irrational beliefs. Demand for approval, anxious overconcern, and personal perfection entered both regressions on fear of negative evaluation and accounted for relatively large portions of variance. Thus, cognitively, the individual who was highly fearful of negative evaluation tended to be marked by the general preoccupation with possible threat. However, he/she believed particularly strongly that he/she must have the social approval of significant others and secondarily that he/she must be perfect in order to be worthwhile. Social avoidance and distress, on the other hand, was predicted best by helplessness and personal perfection and dependency (negatively weighted), beliefs that accounted for far less variance. Thus, highly socially avoidant subjects appeared to believe in the importance of personal perfection, but that they were helpless to change things and they should not be dependent. Thus, fear of negative evaluation and social avoidance and distress were very different in terms of the variance predicted by irrational beliefs and in the overlap of beliefs, sharing only personal perfection.

Unlike the results Gotlib (1984) found for a variety of indices of psychopathology in college students, anxiety indices showed significant, but

only moderate, intercorrelation. Anxiety indices appeared to be assessing different sources of self-reported apprehension and tension, rather than tapping some type of general anxiety or source of psychological distress. Also, across anxieties there were significant differences in the amount of variance predicted, the beliefs involved, and the ways that irrational beliefs predicted anxiety. Taken together, these results provide the kind of discriminant validity for which Smith (1982) called. Though problems of item overlap were not investigated directly, finding different patterns of beliefs entering regressions with different predictive functions suggested that more was involved than simple item overlap and relationship to general psychological distress.

It is important to not overgeneralize these results or their implication, however. They were based upon, and are most relevant to, college populations. Nonetheless, this touches a large and relevant population. There are many college students who suffer significantly from these anxieties, and this study offers some suggestions for cognitively oriented programs for college counseling centers. For example, speech anxiety and social distress/avoidance were predicted least well by irrational beliefs, test anxiety more so, and trait anxiety and fear of negative evaluation far better. This suggests that interventions for the latter two anxieties can more confidently include attention to the changing or irrational beliefs. However, for the other anxieties the results suggest that, while alteration of relevant irrational beliefs may be one element of intervention, other cognitive and behavioral components, e.g., skill enhancement and applied relaxation coping skills, should be explored and perhaps included. Additionally, no pattern of irrational beliefs emerged that characterized most or all of the anxieties, suggesting that, to the extent irrational beliefs are involved, different beliefs are involved in different anxieties. Consequently, anxieties should not be lumped together in common cognitive groups that heavily emphasize irrational beliefs for efficiency. In fact, only two beliefs, anxious overconcern and helplessness, entered the regression equations of as many as four anxieties. To this extent they might profitably be included in cognitively oriented groups or workshops that are directed toward diverse sources of anxiety or audiences. Generally, however, cognitively oriented groups or treatment components should focus upon the specific beliefs that show the strongest empirical relationship to the specific anxiety being treated.

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