

PROGRESS IN THE DEVELOPMENT OF A MULTIDIMENSIONAL MEASURE OF FEAR OF FAILURE: THE PERFORMANCE FAILURE APPRAISAL INVENTORY (PFAI)

DAVID E. CONROY*

The Pennsylvania State University, PA, USA

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Measuring fear of failure (FF) is a tremendous challenge for researchers and practitioners because (a) existing measures have demonstrated limited support for the validity of their score interpretations, and (b) existing measures are unidimensional while accumulating evidence suggests that FF is multidimensional. The Performance Failure Appraisal Inventory (PFAI) was developed to measure a set of empirically-derived cognitive-motivational-relational appraisals associated with FF. Results indicated that PFAI scores represented fears of (a) experiencing shame and embarrassment, (b) devaluing one's self-estimate, (c) losing social influence, (d) having an uncertain future, and (e) upsetting important others. Correlations with external measures of achievement goal orientations, trait anxiety, and social desirability were consistent with theoretical predictions. PFAI scores correctly classified 76.5% of participants' perceptions of underachievement.

Keywords: Fear of failure; Appraisal measurement

Fear of failure (FF) is an intrinsically interesting phenomenon to many people. In popular advertisements, celebrity athletes have described how their fears of failing helped them to achieve at the high level that they did. Conversely, there are many lesser-known stories of individuals who have been paralyzed by their fears of failure and

*267 Rec Hall, Department of Kinesiology, The Pennsylvania State University, University Park, PA 16802, USA. E-mail: David-Conroy@psu.edu

were never able to attain their full potential in an area. Popular fascination has helped fear of failure become a buzzword in psychology but such notoriety has come at the expense of theoretical clarity. This theoretical ambiguity stimulated the present effort to develop a multi-dimensional measure of FF.

Initially, Atkinson (1966) defined FF, or the motive to avoid failure, as a "disposition to avoid failure and/or a capacity for experiencing shame or humiliation as a consequence of failure" (p. 13). Although shame is mentioned explicitly in the definition of the motive to avoid failure, it has been common practice to operationalize fear of failure as a form of performance anxiety (cf. Atkinson and Litwin, 1973; Smith and Smoll, 1990). Central to both the shame and anxiety definitions of FF is emotion. According to Lazarus (1991), emotions are experienced when individuals perceive changes in their relationship to the environment that they believe will impact their ability to accomplish one or more of their goals. The perceived changes can be real or imagined but individuals must consciously or unconsciously appraise how those changes will affect their goals. Appraisals related to fear and anxiety involve (a) assessing whether the change is relevant for their goals, (b) determining whether the perceived change helps or hurts the chances of goal achievement, and (c) identifying the content of the specific goal. The many potential appraisals for a specific emotion can be summarized in terms of a core relational theme (CRT). For example, the CRT for anxiety is that the individual is facing an "uncertain, existential threat" (p. 122).

SUBSTANTIVE AND EMPIRICAL LIMITATIONS OF EXISTING FEAR OF FAILURE MODELS AND MEASURES

Existing measures of FF are unidimensional yet unidimensional measures may be inadequate for multidimensional constructs. Anxiety researchers adapted to this criticism by developing multidimensional models based on worry and emotionality (Liebert and Morris, 1967). Forms of emotionality have been elaborated (e.g., Fahrenberg, 1986; Lacey, 1967) but little is known about the components of worry. Wigfield and Eccles (1990) argued that it will be necessary to elaborate on the qualitative differences between worries.

Birney, Burdick and Teevan (1969) may have anticipated this need as it applied to FF. Based on the premise that failure only provokes fear to the extent that its consequences are perceived as aversive, they proposed a tripartite model of FF, including (a) fear of devaluing one's self-estimate, (b) fear of nonego punishment, and (c) fear of reduced social value. This rich theoretical model has tremendous potential for enhancing understanding of FF, however, it has not yet stimulated the empirical research that one might expect.

Empirical evidence also suggests that existing unidimensional models of FF can be improved. Unidimensional and self-report FF measures have consistently demonstrated relatively low monotrait, heteromethod correlations (Birney *et al.*, 1969; Gelbort and Winer, 1985; MacDonald and Hyde, 1980), indicating that the method of measurement may be contributing more variance to scores than the true FF score variance. When compared to measures of theoretically distinct constructs, such as the fear of success, correlations have often been higher than the convergent validity coefficients (Jackaway and Teevan, 1976; Mulig, Haggerty, Carballosa, Cinnick & Madden 1985). These findings offer the impression that it may be possible to improve our measures of FF. One approach to measurement that may address some of these substantive and empirical concerns incorporates a multidimensional conceptualization of FF based on the cognitive-motivational-relation theory of emotion.

A NEW MEASURE OF FEAR OF FAILURE

An adequate FF measure should assess how strongly individuals believe or anticipate that certain aversive consequences will occur when they perceive that they are failing. The 89-item Performance Failure Appraisal Inventory (PFAI) was developed to measure 10 appraisals associated with FF from a content analysis of in-depth interviews of performers' perceptions of the consequences of failing and not succeeding (Conroy *et al.*, in press). Three of the appraisals were related to the Birney *et al.* (1969) fear of devaluing of one's self-estimate: (a) personal diminishment (11 items), (b) poor ability (8 items), and (c) lack of control (8 items). Four appraisals were associated with the Birney *et al.* fear of nonego punishment: (a)

tangible losses (6 items), (b) wasted effort (9 items), (c) crushed hope/lost opportunity (8 items), and (d) uncertain future (9 items). The last three appraisals related to a fear of a reduction in one's social value: (a) important others lose interest in me (11 items), (b) upsetting important others (11 items), and (c) embarrassing self-presentational failure (8 items). Nine of the 10 scales possessed at least one reverse-scored item and no scale contained more than four reverse-scored items.

In light of the contextual-dependence of human judgments (Schwarz, 1999), items on the PFAI began with a stem to stimulate recall of a perceptual set of failure. The two stems were drawn from the findings of Conroy *et al.* (in press) that individuals' perceptions of failure appeared to be grounded in beliefs that they either (a) met their evaluative criteria for failure, or (b) did not meet their evaluative criteria for success. A 5-point response scale anchored by *Do Not Believe At All* (-2) and *Completely Believe* (+2) was utilized to produce a more normal response distribution (Schwarz, 1999). The zero point of the scale was labeled *Believe 50% of the Time*.

PURPOSE AND HYPOTHESES

Borrowing Messick's (1995) terminology, this study examined structural (i.e., factorial), external (i.e., convergent and discriminant), and predictive aspects of score validity. Structural validity was tested using a series of exploratory and confirmatory factor analyses (EFA and CFA, respectively). Convergent and discriminant validity were assessed in relation to anxiety models and the hierarchical theory of achievement motivation (Elliot, 1997; Elliot and Church, 1997). Scores for each FF appraisal were predicted to be positively related to trait anxiety scores and scores for performance-approach, performance-avoidance, and ego goal orientations. In contrast, FF scores were predicted not to be related to scores on mastery (or task) goal orientations, impression management, or self-deceptive enhancement scores. Achievement-related outcomes (e.g., decreased satisfaction with academic progress; Elliot and Sheldon, 1997) have been associated with avoidance orientations so PFAI scores were hypothesized to discriminate effectively between (a) participants who describe

themselves as underachieving in their performance domain, and (b) participants who feel they are either achieving at the level they expect of themselves or are over-achieving.

METHODS

Participants

Four-hundred eight high-school and college-aged athletes and students participated in this study, however, only 396 participants (167 females, 229 males) submitted usable data. This sample was randomly split into equal-sized model generation and cross-validation samples. The mean age for all participants was 19.3 years ($SD = 4.3$). No statistically significant demographic differences (e.g., age, birth order, maternal education level, paternal education level, socio-economic status) existed between numbers of the generation and cross-validation samples.

Instruments

In addition to the PFAI, which was described earlier, additional measures were used to collect data on achievement perceptions, trait anxiety, achievement goal orientations, and socially desirable response biases. To assess achievement perceptions, participants responded to the question "In this performance domain, I am achieving..." Response alternatives included (a) above my expectations, (b) right at the level I expected of myself, and (c) below my expectations.¹ Trait anxiety was assessed using the trait portion of the State-Trait Anxiety Inventory (STAI, Spielberger *et al.*, 1983). Athletes' achievement goal orientations were assessed using the Task and Ego Orientation in Sport Questionnaire (TEOSQ, Duda and Nicholls [as cited in Duda, 1989]; Duda and Whitehead, 1998). Students

¹Single items are generally avoided for measuring latent constructs because of perceived unreliability, however, recent research has demonstrated that single items *may* demonstrate acceptable reliability for certain research uses (Wanous *et al.*, 1997). It was decided that the added reliability of a more complex measure was not worth the additional time required to administer such a measure.

completed the Achievement Goals Questionnaire (AGQ; Elliot and Church, 1997) to assess the achievement goals that they adopted for their academic performance. The Balanced Inventory of Desirable Responding (BIDR; Paulhus, 1984) was used to measure impression management (IM) and self-deceptive enhancement (SDE), the two main dimensions tapped by the most popular measures of socially desirable responding.

Procedures

For participants under the age of 18, a letter was sent to parents describing the nature of the study and requesting their permission for their child to participate. Parents provided permission for participants under the age of 18 to participate and participants provided either informed assent or informed consent as appropriate. Next, participants completed the demographic data sheet, the PFAI, and the single-item achievement perception index. Selected participants also completed measures of achievement goal orientation (TEOSQ for athletes [$n=55$], AGQ for students [$n=81$]), the trait component of the STAI ($n=130$), and the BIDR ($n=130$).

RESULTS

Model Generation: Preliminary Item Screening

Items were written to sample very specific content domains. Coefficient alpha provided an empirical index of the amount of error associated with item sampling in each content domain (i.e., item cluster). Removing items that are not reliable members of the *a priori* item clusters should provide a more appropriate test of the *a priori* model by reducing error, therefore increasing the likelihood of an accurate factor solution. The mean coefficient alpha for all *a priori* clusters was .77 ($SD=.10$); only three *a priori* scales failed to meet the conventional .70 criterion (DeVellis, 1991; Nunnally, 1978; α for those three scales ranged from .62-.69). Items were removed if either (a) they did not correlate significantly with trait anxiety (13 items), (b) they correlated with trait anxiety in the

wrong direction (2 items), or (c) after removing the items above, coefficient alpha for the reduced scale was less than .70 (8 items). Sixty-six of the original 89 items remained for further analysis.²

Model Generation: Determining the Appropriate Number of Factors

To determine the number of factors underlying PFAI responses, an exploratory factor analysis was conducted using a maximum likelihood algorithm and data from a randomly-selected half of the data (generation sample, $n=198$). Sixteen eigenvalues were greater than 1.0 (i.e., Kaiser's [1970] "Little Jiffy" criterion for factor extraction) and the first value was more than four times larger than next largest value. Considering the theory used to create the instrument, it seemed plausible that a higher-order factor representing a general FF could be responsible for the large first eigenvalue; the other substantial eigenvalues might then represent specific types of FF such as those identified by the different appraisal styles hypothesized. Consequently, a series of EFAs extracting between one and eight factors were conducted with oblique rotations (i.e., promax, $k=4$).

Fourteen items failed to demonstrate a salient loading (operationally defined as a loading greater than or equal to .40) in one or more of these models. Ideal simple structure was not achieved although cross loading was less prevalent in models with more factors. The percentage of absolute residuals greater than .05 in the reproduced correlation matrix decreased from 46% in the one-factor model to 19% in the eight-factor model. The five-factor model was most interpretable. Three pairs of *a priori* domains clustered together in this solution: (a) personal diminishment and embarrassing self-presentational failure, (b) perceptions of having low ability and lacking control, and (c) important others losing interest and having lost an opportunity. The *a priori* personal diminishment and embarrassing self-presentational failure items reflected beliefs that *experiencing shame and embarrassment* was a consequence of failure. Items tapping perceptions that

²A complete report of which original items were removed is available from the author upon request.

one had poor ability and lacked control were originally hypothesized to be a part of the same higher-order factor and can be interpreted as an appraisal related to *devaluing one's self-estimate*. Finally, both the important others lose interest and lost opportunity items tapped the belief that *one loses social influence* in the performance domain following failure. These descriptions will be used hereafter to refer to these empirical clusters of items. Items tapping the *a priori* appraisals of having an *uncertain future* or *upsetting important others* tended to load on their own individual factors (as predicted) so their interpretations did not change. Interfactor correlations in this five-factor solution ranged from .40 to .57.

Model Generation: Reducing Scale Size

Using the same generation sample data as above, a series of CFAs were conducted to test the factorial integrity of the five individual first-order factors and guide model modifications. A variety of absolute (i.e., χ^2 , GFI) and incremental (i.e., NNFI, CFI) fit indices were consulted to evaluate the fit of different confirmatory models of PFAI responses; incremental fit indices were not used to compare models (Hoyle and Panter, 1995). AIC, RMSEA (with a 90% confidence interval), and SRMR also were consulted. For comparisons of competing models, lower AIC values indicated the preferred model. Browne and Cudeck (1993) suggested that RMSEA values of .08, .05, and .00 were criteria for reasonable, close, and exact model fit, respectively. Hu and Bentler (1999) reported that Type I and II errors can be minimized if models are rejected when both (a) NNFI or CFI are less than .95, and (b) SRMR is greater than .09. A note of caution is warranted about the cutoff criteria described above. Generally speaking, fit indices tend to reward small models and penalize large, complex models even when a complex model is necessary to fit the data (Marsh *et al.*, 1996). Readers are encouraged to consider the size of the matrix being reproduced as well as the number of degrees of freedom used to reproduce that matrix when evaluating the fit of a model.

All parameters (i.e., item loadings, uniquenesses, and variances of latent variables) for the five-factor model were estimated using the

maximum likelihood algorithm in Lisrel 8.3 (Scientific Software International, Chicago, IL). Items loaded on one and only one factor and all uniquenesses (errors) for indicators were estimated in a diagonal matrix. The loading for one indicator on each factor was fixed to 1.0 and factor variances were freely estimated. These simple CFA models met Bollen's (1989) necessary and sufficient criteria for identification.

The largest standardized residual between a pair of items was identified in each model and the content of those items was examined. The item with more absolute standardized residuals greater than 2.0 was removed and the model was re-estimated. When two items had the same number of absolute standardized residuals greater than 2.0, item content guided modifications. This process was repeated until either (a) the fit was acceptable, or (b) item removal caused a model to be over-fitted. Table I present a summary of the fit indices for these five modified scales and reveals that each scale by itself was factorially sound.

Model Generation: Testing the Fit of Five Scales Combined

Having eliminated the poorest items and identified a set of well-fitting individual scales, it was necessary to test how well the combined scales could reproduce the complete covariance matrix for PFAI responses. This multiple-scale model is a much more stringent test of the

TABLE I Fit indices for separate CFAs on first-order factors

<i>Factor (No. of Items)</i>	χ^2 (<i>df</i>)	<i>GFI</i>	<i>NNFI</i>	<i>CFI</i>	<i>AIC</i>	<i>RMSEA [90% CI]</i>	<i>SRMR</i>
Fear of Shame and Embarrassment (11)	54.92 (44)	.95	.98	.98	99.29	.04 [.00-.06]	.04
Fear of Devaluing One's Self-Estimate (8)	27.88 (20)	.97	.96	.97	57.92	.04 [.00-.08]	.04
Fear of Having an Uncertain Future (5)	7.75 (5)	.98	.98	.99	27.70	.04 [.00-.12]	.04
Fear of Losing Social Influence (9)	35.01 (27)	.96	.97	.98	70.06	.05 [.00-.07]	.04
Fear of Upsetting Important Others (8)	32.38 (20)	.96	.97	.98	64.10	.06 [.01-.09]	.04

Note: A summary of the sequence of item removal is available upon request from the author.

adequacy of the solution than the previous tests of separate scales because it permits modeling of covariances between factors. The number of item covariances to be modeled increased exponentially compared to the number of meaningful parameters used to model them; thus, it was expected that the fit indices for this combined model would not approach the level of fit for the single scale models. These analyses were conducted on the same data from the generation sample. The fit indices for a selection of measurement models with items from all five PFAI scales are summarized in Table II. Four first-order factor models were estimated: (a) a one factor model, (b) an uncorrelated five factor model, (c) a correlated five factor model, and (d) a correlated five factor model with two additional correlated factors representing method variance associated with the item stems. The last model was estimated because accumulating evidence indicates that item wording can introduce systematic variance into responses (cf. Marsh, 1996; Motl *et al.*, 2000; Tomás and Oliver, 1999). Model fit increased substantially when this pair of method factors was included in the model. Although the fit indices did not meet conventional cutoff criteria, the size of the covariance matrix being modeled should temper interpretations of these fit indices. Considering the order of the covariance matrix being modeled (861 unique elements) and the fact that all model parameters have a meaningful interpretation, these fit indices were judged to be quite satisfactory.

TABLE II Fit indices for CFAs on the complete PFAI model

<i>Model</i>	χ^2 (<i>df</i>)	<i>GFI</i>	<i>NNFI</i>	<i>CFI</i>	<i>AIC</i>	<i>RMSEA</i> [90% <i>CI</i>]	<i>SRMR</i>
One factor	1803.85 (779)	.66	.65	.66	2288.50	.09 [.09-.10]	.08
Five factors (uncorrelated)	1719.24 (779)	.69	.68	.69	1947.83	.08 [.08-.09]	.23
Five factors (correlated)	1327.94 (769)	.75	.80	.82	1511.52	.06 [.06-.07]	.08
Five factors (correlated) with two method factors (correlated)	1130.80 (727)	.79	.85	.87	1340.80	.05 [.04-.06]	.07
High-order factor and five first-order factors	1342.33 (774)	.75	.80	.81	1512.36	.06 [.06-.07]	.08

Furthermore, it is clear from the measurement models for individual scales that the individual scales are strong and the degradation of model fit developed when the matrix was expanded without an equivalent increase in the number of parameters being estimated.

In lieu of testing the Birney *et al.* (1969) higher order model (which no longer seemed appropriate with the five factors found in this study), the procedures demonstrated by Marsh and Hocevar (1985) were followed to model the covariances between the first-order substantive factors with a single higher-order factor representing general FF. This final model did not include method factors and should be evaluated in relation to the model with five correlated factors.³ As seen in the bottom half of Table II, and as is typically the case, imposing a more parsimonious structure on the factor covariances reduced overall fit. In this case, the reduction in fit was quite insubstantial and it appeared that a single higher-order factor may be appropriate for the present model. Based on empirical fit alone, however, it was concluded that the model with five correlated substantive factors and two correlated method factors was most appropriate for summarizing PFAI responses.

Model Cross-Validation: Traditional Confirmatory Factor Analysis

Data-driven model modifications run the risk of capitalizing on chance (MacCallum *et al.*, 1992) so an attempt was made to cross-validate these findings in the half of the sample that was not used to generate this model. A comparable fit was found for the seven-factor (5 substantive, 2 method) model using data from the cross-validation sample, $\chi^2(727) = 1173.66$, RMSEA = .06 [90% CI = .05-.06], SRMR = .06, AIC = 1461.01, GFI = .77, NNFI = .86, CFI = .87. This replication alleviated concern that the empirically-generated model was based on chance fluctuations in the sample and provided further evidence for the factorial validity of PFAI responses in the five construct and two method factor model. Table III presents a

³When the same higher-order factor was modeled with the two method factors based on item stems, the model could not converge, indicating that it was not possible to model the higher-order and method factors.

summary of item loadings, standard errors, and squared multiple correlations (SMC), and factor covariances for this model. With the exception of one item on the fear of devaluing one's self-estimate scale, all loadings were statistically significant and in the expected direction. The final set of PFAI items is presented in the Appendix.

Based on this model, lower-order factor scores were calculated by summing items that loaded on each factor with unit weights and dividing that total by the number items used in the calculation. Table IV presents a summary of descriptive statistics for each of these scale scores. Scores were normally distributed and capitalized on the full range of the distribution.

External Validity

Data from the entire sample was used to test the convergent, discriminant, and predictive validity of PFAI score interpretations. As seen in the top of Table V, scores on each of the PFAI scales demonstrated a moderate relationship with both impression management and self-deceptive enhancement scores. To minimize the confounding influence of a socially-desirable response bias on the interpretation of other relationships, partial correlations controlling for impression management and self-deceptive enhancement were reported for the remaining relationships in Table V.⁴

As predicted, all PFAI scales were significantly positively correlated with trait anxiety. Before partialling out the effects of social desirability, all PFAI scales were significantly associated with performance-approach and performance-avoidance achievement goals. After controlling the influence of social desirability, one and three PFAI scale scores were significantly associated with performance-approach and performance-avoidance achievement goal scores, respectively.

⁴These analyses were repeated with Pearson product-moment coefficients that did not adjust for the socially-desirable response bias. When impression management and self-deceptive enhancement were not controlled, eight additional correlations appeared to be statistically significant ($p < .05$). These correlations involved task orientation in sport (2 correlations), performance-approach goals in school (4 correlations), and performance-avoidance goals in school (2 correlations).

TABLE III Pattern coefficients and factor covariances for the five-factor model of PFAI scores

<i>Item</i>	<i>Parameter Estimate</i>	<i>SE</i>	<i>Uniqueness</i>	<i>SE</i>	<i>SMC</i>	<i>A priori item content</i>
<i>Fear of Shame and Embarrassment</i>						
1	1.00	n/a	1.02	.11	.39	Personal Diminishment (PD)
6	1.20	.15	.95	.10	.48	PD
11	.93	.14	1.33	.14	.30	PD
16	1.28	.16	1.02	.11	.50	PD
21	-.78	.13	1.17	.13	.32	PD
26	.98	.14	1.13	.13	.41	PD
30	.98	.13	.88	.10	.46	Embarassing self-presentational failure (ESPF)
34	1.01	.14	.90	.10	.44	ESPF
38	1.15	.14	.86	.10	.49	ESPF
40	1.16	.14	.84	.09	.54	ESPF
41	1.18	.15	.91	.10	.54	ESPF
<i>Fear of Devaluing One's Self-Estimate</i>						
2	1.00	n/a	.88	.10	.31	Poor ability (PA)
7	1.36	.19	.75	.09	.49	PA
12	1.64	.22	.58	.08	.65	PA
17	-.30	.16	1.47	.15	.11	PA
22	1.25	.19	.98	.11	.42	Lack of control (LC)
27	1.33	.21	1.38	.15	.35	LC
31	.76	.15	1.07	.11	.18	LC
35	-.98	.18	1.34	.14	.25	LC
<i>Fear of having an Uncertain Future</i>						
3	1.00	n/a	.77	.10	.52	Uncertain future (UF)
8	1.09	.11	.60	.09	.63	UF
13	.99	.11	.59	.08	.63	UF
18	-.40	.10	1.10	.12	.15	UF
23	-.56	.11	1.47	.15	.19	UF
<i>Fear of Losing Social Influence</i>						
4	1.00	n/a	1.07	.11	.31	Crushed hope/lost opportunity (LO)
9	-.91	.16	1.10	.11	.25	LO
14	.69	.14	.90	.10	.36	LO
19	1.21	.18	.79	.09	.53	Important others lose interest (IOLI)
24	1.08	.17	.87	.10	.45	IOLI
28	.96	.15	.68	.08	.47	IOLI
32	1.25	.18	.48	.07	.71	IOLI
36	1.18	.18	.61	.07	.60	IOLI
39	1.29	.19	.87	.09	.50	IOLI

(Continued on next page)

TABLE III (Continued)

<i>Item</i>	<i>Parameter Estimate</i>	<i>SE</i>	<i>Uniqueness</i>	<i>SE</i>	<i>SMC</i>	<i>A priori item content</i>		
<i>Fear of Upsetting Important Others</i>								
5	1.00	n/a	.94	.10	.44	Upsetting important others (UIO)		
10	1.14	.16	1.14	.12	.41	UIO		
15	1.19	.16	.78	.09	.50	UIO		
20	1.16	.14	.78	.09	.58	UIO		
25	1.31	.15	.72	.09	.62	UIO		
29	-.94	.16	.74	.09	.50	UIO		
33	1.36	.16	.64	.08	.68	UIO		
37	1.49	.18	.44	.07	.74	UIO		
<i>Factor Covariances</i>				<i>Factor</i>				
				1	2	3	4	5
1. Fear of Shame and Embarrassment				.61				
2. Fear of Devaluing One's Self-Estimate				.39	.40			
3. Fear of Having an Uncertain Future				.51	.31	.83		
4. Fear of Losing Social Influence				.49	.27	.49	.44	
5. Fear of Upsetting Important Others				.45	.20	.39	.46	.55

TABLE IV Descriptive statistics for the PFAI scales

<i>PFAI Scale</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>Skewness</i> (<i>SE</i> =0.12)	<i>Kurtosis</i> (<i>SE</i> =0.25)	<i>Min</i>	<i>Max</i>	<i>Coefficient Alpha</i>
Fear of Experiencing Shame and Embarrassment	391	.05	.87	-.08	-.63	-2.00	1.91	.87
Fear of Devaluing One's Self-Estimate	393	-.32	.76	.09	-.39	-2.00	1.88	.75
Fear of Having an Uncertain Future	395	-.13	.87	-.02	-.44	-2.00	2.00	.73
Fear of Losing Social Influence	393	-.49	.77	.44	.11	-2.00	2.00	.82
Fear of Upsetting Important Others	392	-.34	.97	.20	-.53	-2.00	2.00	.87

Contrary to the original hypotheses, none of the PFAI scales were significantly correlated with an ego goal orientation in sport. As expected, neither mastery nor task goal orientations in school and sport, respectively, were significantly correlated with PFAI scores.

TABLE V Convergent and discriminant validity coefficients for the PFAI

External scale	Lower-order factors				
	1	2	3	4	5
<i>Pearson Correlations</i>					
Impression Management ($n = 122$)	-.33 ^a	-.31 ^a	-.33 ^a	-.27 ^a	-.24 ^a
Self-Deceptive Enhancement ($n = 138$)	-.29 ^a	-.34 ^a	-.46 ^a	-.38 ^a	-.28 ^a
<i>Partial Correlations Controlling for Social Desirability (IM and SDE)</i>					
Trait Anxiety ($n = 133$)	.50 ^a	.34 ^a	.39 ^a	.51 ^a	.44 ^a
Sport Goal Orientations					
Ego ($n = 53$)	.09	-.02	.13	.02	.04
Task ($n = 53$)	.17	.16	.20	.23	.08
School Goal Orientations					
Mastery ($n = 82$)	.04	.08	.02	-.10	-.07
Performance Approach ($n = 80$)	.14	.14	.06	.15	.22 ^b
Performance Avoidance ($n = 80$)	.12	.07	.37 ^a	.31 ^a	.33 ^a

Note: All significance tests were one-tailed; ^a $p < .01$, ^b $p < .05$. As interpreted based on the EFA, factors 1-5 represented (1) fear of losing social influence, (2) fear of upsetting important others, (3) fear of devaluing one's self-estimate, (4) fear of shame and embarrassment, and (5) fear of having an uncertain future.

Predictive Validity

A discriminant function analysis was performed to classify self-described underachievers ($n = 92$) as apart from individuals who were overachieving ($n = 55$) or performing at the level they expected of themselves ($n = 231$). All five PFAI scales were used in the model and a single discriminant function emerged that correctly classified 76.5% of the cases. This function was statistically significant (Wilks' $\lambda = .86$, $\chi^2(5, N = 378) = 58.4$, $p < .001$). The rank order of PFAI scales for standardized canonical discriminant function coefficients and structure coefficients, respectively, corresponded perfectly with the exception of the last two scales (whose influence and rank order were relatively weak or inconsistent): uncertain future (.56, .86), shame and embarrassment (.44, .83), loss of social influence (.31, .77), devalued self-estimate (-.21, .39), upsetting important others (.01, .66). Self-described underachievers scored higher than overachievers or individuals achieving at the level they expected of themselves on three PFAI scales (the last two scales were not included in that interpretation because their influence was relatively weak and their rank order was inconsistent).

DISCUSSION

Issues related to score interpretations are very important in the present study because it is the first evaluation of this new instrument. Although items written to tap *a priori* domains grouped together in the factor analyses, several of these *a priori* domains also grouped together so their names were re-evaluated to match their content domain. For example, items initially written to tap the beliefs that failure was an embarrassing self-presentational failure and led to feelings of personal diminishment loaded on the same factor. These items seemed to measure an individual's propensity to experience personal shame and public embarrassment after failure, similar to the early definition of FF as an anticipatory shame over failure (Atkinson, 1966).

Items initially designed to measure the belief that failure indicated a lack of ability and control over one's performance clustered on the same factor in the analyses. These items featured a self-esteem component and related closely to the Birney *et al.* (1969) fear of devaluing one's self-estimate and Schmalz's (1982) self-concept of low ability FF. These items also possessed an attributional component because failure provided feedback on the individual's ability. Weiner (1986) theorized and reviewed data that individuals high in anxiety (a construct similar to FF) make more internal attributions (i.e., low ability) for failure.

The third factor comprised items tapping the *a priori* appraisals that failure leads important others to lose interest in the performer and the performance and that failure signals a lost opportunity. The combination of the items on this scale seemed to represent the belief that individuals lose their social influence when they fail. This lost social influence manifests itself through increased (and involuntary) social distance from others as well as through a loss of influence over whether another opportunity will arise. This scale partly relates to the Birney *et al.* (1969) fear of reduction in one's social value. Birney *et al.* argued that individuals could fear failure because they were less useful as social objects when failing and the present scale includes the notion that individuals who fail become isolated socially. The present scale also adds the idea that failing decreases one's opportunity to achieve a desired level of performance during a key or rare performance opportunity.

The last two factors involved appraisals that one was letting others down when one failed and that failure introduced a significant degree of uncertainty into one's future. These factors were consistent with the *a priori* appraisals extrapolated by Conroy *et al.* (in press). The belief that failure disappoints important others also was associated with the Birney *et al.* (1969) fear of reduced social value.

The fear of having an uncertain future also seemed reasonable although it has not been addressed a great deal in the FF literature. As an example of how this fear can manifest itself, consider the high school athlete who scored high on another measure of FF because failing would have cost him the scholarship that provided his only chance at going to college. With a chance to be the first person in his family to go to college on the line and no equally appealing alternate plans for his future, the threat perceived from failure was understandable.

PFAI score interpretations may be somewhat confounded by social desirability. "False low" PFAI scores may be more frequent than expected. An internal index of profile validity that does not place additional demands on participants but can identify false lows would be a useful product of future research. For the present study, statistical adjustments were made by partialling variance associated with social desirability out of correlations between the PFAI scores and measures of trait anxiety and achievement goal orientations.

A great deal of previous research operationalized FF as a form of anxiety (e.g., Atkinson and Litwin, 1973) and scores on each of the PFAI scales demonstrated a statistically significant correlation with trait anxiety. Enthusiasm about this result should be tempered somewhat because items that did not correlate with trait anxiety in the preliminary item screening were removed from further analyses; replication of this finding in an independent sample is needed.

As hypothesized, PFAI scores were unrelated to mastery or task orientations but were related to performance-avoidance goal orientations. Interestingly, when approach and avoidance components of achievement goals were not distinguished, PFAI scores were not related to ego goal orientations. This finding was consistent with recent work on a hierarchical theory of achievement motivation (Elliot, 1997; Elliot and Church, 1997; Elliot and Harackiewicz, 1996). Future research is needed to clarify questions about whether dichotomous or trichotomous conceptualizations of goal orientations

are more appropriate in sport as well as the extent to which the relationship between FF and performance-approach goals is a by-product of social desirability. Self-described underachievers were characterized by stronger beliefs that failure (a) creates an uncertain future, (b) brings shame and embarrassment, and (c) leads to a loss of social influence. This finding was consistent with previous research documenting relationships between avoidance goal orientations (which are associated with FF) and lower levels of satisfaction with academic progress (Elliot and Sheldon, 1997). The PFAI may be useful as an assessment device for consultants and as an outcome measure for researchers.

In closing, several unique features of the PFAI should be noted. The PFAI is the first FF measure explicitly developed from a meta-theory of emotion. Rather than framing FF as a trait or state, it can be examined as a function of the person-by-environment interaction. The idiosyncratic nature of perceptions of failure is explicitly acknowledged in the measure instead of assuming that failure is perceived the same way by all performers. Finally, consistent with the most recent theoretical advances in achievement motivation, the PFAI does not make assumptions about the performance effects of FF.

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APPENDIX: THE PERFORMANCE FAILURE APPRAISAL INVENTORY

Read each statement below and think of *how often you believe each is true* in your performance domain (e.g., sports, academics). Use the rating scale below to indicate how much you believe each statement applies to you.

RATING SCALE

-2	-1	0	+1	+2
Do not believe at all		Believe 50% of the time		Completely believe

1. When I am failing, I lose respect for myself.
2. When I am failing, it is often because I am not smart enough to perform successfully.
3. When I am failing, my future seems uncertain.
4. When I am failing, I am afraid that I won't be allowed to try again.
5. When I am failing, it upsets important others.
6. When I am failing, I doubt that I am as good as I thought I was.
7. When I am failing, I blame my lack of talent.
8. When I am failing, I believe that my future plans will change.
9. When I am failing, I am hopeful because I know that I can still accomplish what I want to accomplish in this area. (Reverse-scored)
10. When I am failing, I expect to be criticized by important others.
11. When I am not succeeding, it bothers me that I was too confident before performing.
12. When I am failing, I am afraid that I might not have enough talent.
13. When I am failing, it upsets my "plan" for the future.
14. When I am failing, I feel like I am losing a great opportunity to accomplish something.
15. When I am failing, I lose the trust of people who are important to me.
16. When I am not succeeding, I am less valuable than when I succeed.
17. When I am failing, it is rarely because I am not good enough. (Reverse-scored)
18. When I am failing, I have a plan for recovering. (Reverse-scored)
19. When I am not succeeding, people are less interested in me.
20. When I am failing, I let down people who depend on me.
21. When I am not succeeding, I still feel good about myself. (Reverse-scored)
22. When I am failing, I wish I could control more of my performance.
23. When I am failing, I am not worried about it affecting my future plans. (Reverse-scored)
24. When I am not succeeding, people seem to want to help me less.
25. When I am failing, important others are not happy.

26. When I am not succeeding, I get down on myself easily.
27. When I am failing, I hate the fact that I am not in control of the outcome.
28. When I am not succeeding, people tend to leave me alone.
29. When I am failing, important others still appreciate me. (Reverse-scored)
30. When I am failing, it is embarrassing if others are there to see it.
31. When I am not succeeding, it is because too many factors are out of my control.
32. When I am not succeeding, I can tell that some people avoid me.
33. When I am failing, important others are disappointed.
34. When I am failing, I believe that everybody knows I am failing.
35. When I am not succeeding, I still feel completely in control of my performance. (Reverse-scored)
36. When I am not succeeding, some people are not interested in me anymore.
37. When I am failing, important people think less of me.
38. When I am failing, I believe that my doubters feel that they were right about me.
39. When I am not succeeding, my value decreases for some people.
40. When I am failing, I worry about what others think about me.
41. When I am failing, I worry that others may think I am not trying.

Scoring Key: The fear of shame and embarrassment scale includes items, 1, 6, 11, 16, 21, 26, 30, 34, 38, 40, and 41. The fear of devaluing one's self-estimate scale includes items 2, 7, 12, 17, 22, 27, 31, and 35. The fear of having an uncertain future scale includes items, 3, 8, 13, 18, and 23. The fear of losing social influence scale involves items 4, 9, 14, 19, 24, 28, 32, 36, and 39. The fear of upsetting important others scale includes items 5, 10, 15, 20, 25, 29, 33 and 37.

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MEETING CALENDAR

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04.05.2002–08.05.2002 in Stockholm, Sweden

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European Psychiatry, Science and Humanity in Health Care
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Mrs Amal Khoury

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DK-2900 Hellerup, Copenhagen, Denmark

Tel: +45 3946 0510, Fax: +45 3946 0515

E-Mail: amal@ics.dk

Congress of the Association of European Psychiatrists

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D-09107 Chemnitz
Tel: +49 371 5612483, Fax: +49 371 5614450
E-Mail: Klaus.Boehnke@phil.tu-chemnitz.de

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Humboldtstr. 26
D-07743 Jena
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E-Mail: ecpsmail@uni-jena.de

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