The Performance Failure Appraisal Inventory

User’s Manual
Second Edition © 2002

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Introduction

Thank you for your interest in the Performance Failure Appraisal Inventory (PFAI), a self-report tool for measuring fear of failure (FF). This user’s manual summarizes the primary sources of evidence for score validity and provides copies of the PFAI, profile sheets, and norms to facilitate use of the PFAI. Before providing additional information about the conceptual basis of the PFAI or the composition of this manual, several acknowledgements must be made.

My interest in fear of failure as a research topic began in the course of my work under the supervision of Dr. Bruce Ogilvie in Los Gatos, CA in the summer of 1995. Conversations with Brent Walker during our days as graduate students working with Dr. John Silva at the University of North Carolina at Chapel Hill deepened my interest in the topic. After leaving Chapel Hill to pursue doctoral study at the University of Utah in Salt Lake City, many mentors and colleagues supported my interest in FF. Dr. Ted Packard introduced me to the cognitive-motivational-relational theory of emotion that provided the theoretical platform for developing the PFAI. Dr. Keith Henschen (my doctoral advisor), Dr. Barry Shultz, and Dr. Artur Poczwardowski were all instrumental in early attempts to define the domain of FF and measure aspects of that domain. Data collection and entry for the studies described in this manual would not have been possible without the assistance of a number of friends, research assistants, and students including Dawn Anderson-Butcher, Jordi Ciambrone, Jon Metzler, Steve Portenga, Sumiyo Shiina, Traci Sommer, and Jason Willow. To each of these individuals (as well as others who I may have carelessly neglected to identify), I owe a debt of gratitude.

Conceptual Background on the PFAI

The PFAI was designed to be a clinically useful device for assessing why an individual fears failure. Lazarus (1991) asserted that an individual’s appraisal of a (real or imagined) perceived change in their relationship to the environment results in an emotion. In the case of fear and anxiety, appraisals center emphasize threatening or aversive consequences associated with failure. The PFAI assesses respondents’ beliefs in five threatening or aversive consequences of failure, including experiencing shame and embarrassment, devaluing their self-estimate, having an uncertain future, having important others lose interest, and upsetting important others. These five appraisals are moderately to strongly intercorrelated and the relationships between them can be summarized effectively with a single higher-order score representing a general FF (the belief that failure is associated with threatening or aversive consequences).

The Manual

This user’s manual is divided into four sections, not including this introduction. Three empirical articles are presented. The first article summarizes a qualitative study conducted to identify the aversive consequences of failing that provide the basis for appraisals associated with FF. The second article describes how the PFAI was developed and the initial study of the psychometric properties of scores. The third article reviews a study that led to a modification of the PFAI as well as a development. In the appendix, copies of the PFAI from various stages of development are presented (note: the 25-item version should be used as a long form and the five-item version should be used as a short form). The appendix also contains norms and a profile sheet that can be used to provide feedback to clients.

Best wishes in your applications of the PFAI. The PFAI is copyrighted but there are no royalty fees associated with using the PFAI. I would appreciate learning about forthcoming publications of your research using the PFAI. Updates on research using the PFAI in my laboratory are regularly posted on my website – http://www.personal.psu.edu/dec9.
Evaluative Criteria and Consequences Associated with Failure and Success for Elite Athletes and Performing Artists

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Fears of failure and success are widely regarded as salient threats to performance in a variety of domains yet scientific understanding of these constructs is still in its infancy. Sixteen elite athletes and performing artists participated in in-depth interviews to shed light on the nature of the cognitive-motivational-relational appraisals associated with these fears. Results revealed distinct criteria for evaluations of failure and success, as well as the perceived consequences of failure and success. It was concluded that the criteria used to evaluate failure and success are sufficiently distinct to suggest that perceptions of failure and success should not be thought of as a bipolar phenomenon. The consequences of failure and success were used to form multidimensional models of fear of failure and fear of success.

Fear can be a fascinating and powerful emotional response to failure or success. Fear of failure (FF) and fear of success (FS) have somewhat controversial histories in the social and behavioral sciences, perhaps due in part to the lack of a unified theory to frame these constructs. A meta-theory of emotion would provide
a useful framework to guide research into these kinds of emotional responses to failure and success.

A Theory of Emotion

The cognitive-motivational-relational theory of emotion (Lazarus, 1991, 1999) is a very comprehensive theory of emotion that has gained acceptance and popularity in recent years. According to this theory, emotions are associated with cognitive-motivational-relational appraisals that summarize how perceived changes in one’s relationship to the environment affect one’s ability to accomplish one’s goal(s). For the constructs of interest in this paper (i.e., FF and FS), the relevant perceived relational change is a perception of failure or success in a performance.

Perceptions of Relational Changes

According to Duda (1993), “the ways in which sport participants define personal success and judge their level of competence coincide with their overall motives for being there” (p. 429). A number of systems exist to classify the needs that motivate human behavior. For example, Murray (1938) studied 50 males and proposed a list of 30 needs that motivate human behavior (e.g., achievement, affiliation, infavoritism [to name but a few]). Later, Maslow (1970) presented a smaller list of needs organized into a hierarchy of importance beginning with those required for survival (e.g., physiological and safety needs) and progressing through belongingness, esteem, aesthetic and cognitive needs before peaking with the need for self-actualization. More recently, Ryan and Deci (2000a, 2000b) argued that needs for autonomy, competence, and relatedness are “essential for facilitating optimal functioning” (Ryan & Deci, 2000b, p. 68). Although the generalizability of these needs to specific achievement contexts remains to be determined, perceptions of failure or success may be determined by how well performers’ needs are met more than by either the level of performance alone or the orientation performers take in evaluating their competence.

It would be extremely difficult to determine what needs performers are attempting to fulfill in a performance but a close proxy for this information might be accessed by determining specific examples of criteria performers use to evaluate whether they failed or succeeded. Furthermore, it seems unlikely that these evaluative criteria are invariant between individuals or even between seemingly similar performance domains. For example, performing artists could use different criteria for evaluating their failure/success than athletes. Such knowledge would be valuable because it could shed light on the importance of context in understanding emotional responses to failure and success. Thus, research is needed to clarify if and how the factors that influence perceptions of failure/success vary between performance domains such as the arts and sport.

Cognitive-Motivational-Relational Appraisals

Once individuals perceive relational changes indicating failure or success, they must appraise how those changes affect their ability to accomplish their goals
before experiencing an emotion. In this appraisal, individuals determine (a) whether their goals are impacted by the perceived relational change, (b) which of their goals are impacted, and (c) how important achieving those goals is to them. Collectively, the cognitive-motivational-relational appraisals for each emotion can be represented by a core relational theme (CRT). For example, the CRT for fear is that one is “facing an immediate, concrete, physical danger”; the CRT for anxiety is that one is “facing an uncertain, existential threat” (Lazarus, 1991, p. 122). These CRTs appear to be consistent with the worry that Liebert and Morris (1967) distinguished as characteristic of anxiety. Wigfield and Eccles (1990) identified a need to understand the specific content of worries associated with anxiety. Similarly, the FF and FS domains may be clarified by distinguishing the threatening or aversive consequences associated with failure and success, respectively.

**Fear of failure.** Birney, Burdick, and Teevan (1969) were the first behavioral scientists to note that it is “the possibility of nonattainment of an achievement standard [which] can produce fear. If we are to understand why nonattainment is aversive, we must know what results from nonattainment” (p. 201). Based on a review of the literature and their own research, Birney et al. (1969) proposed that three general consequences of failure were associated with FF: (a) devaluation of one’s self-estimate, (b) non-ego punishment, and (c) reduction in one’s social value.

**Fear of devaluing one’s self-estimate** involves the threat of having to change (typically, but not necessarily, in a downward direction) one’s beliefs about oneself. Fear of non-ego punishment has similarly threatening consequences, but the punishments do not involve the performer’s self-estimate. Finally, **fear of having a reduced social value** involves the threat that others will not perceive a performer as valuable. According to Birney et al. (1969), a performer’s perceptions of the likelihood of these consequences will be directly related to her or his fear of failure. Although it is easy to understand how failure might be threatening, the threat(s) presented by success may be subtle because success is so widely viewed as desirable.

**Fear of success.** Based on their early experiences consulting with athletes, Ogilvie and Tutko (1966) introduced a complementary notion of “success phobia” as a problem confronting some performers. Ogilvie (1968) outlined five FS

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1. Lazarus (1991) described a process of primary and secondary appraisals used to answer this question but stated that the secondary appraisal was only relevant for certain emotions. For the emotions most closely related to FF and FS (viz., fear and anxiety), only the primary appraisal process is necessary. Thus, consideration of the appraisal process in the present paper will be limited to the primary appraisal.

2. As used by Birney et al. (1969), the phrase “non-ego punishment” is not meant to imply that the individual does not have an ego involvement in the transaction; it simply means that the punishment is not to one’s self-estimate.

3. Shortly after this publication, Matina Horner (1968) completed her landmark dissertation on fear of success. Discussion of Horner’s work is excluded from the present review because a sport performance-specific discussion of FS is available (whereas a comparable, sport-specific discussion of FF was not available).
syndromes. In the first syndrome, athletes fear the social and emotional isolation that accompanies success. The second syndrome involves athletes who experience guilt over asserting themselves in competition. The third syndrome was the subtlest in Ogilvie’s opinion but it may also be the most complex. In this syndrome, athletes protect themselves from competition because they fear discovering their true potential. These athletes are fearful of failing and generalize that fear to success because failure and success are seen as opposite sides of the same coin. Withdrawing from competition or rationalizing one’s ability are defenses against this fear. Athletes who fear success also may develop anxiety about the possibility of surpassing a previous record established by an admired performer. The final fear of success syndrome relates to the pressure of constantly having to match or exceed one’s previous best performance to satisfy fans and the media.

Both the Birney et al. (1969) and Ogilvie (1968; Ogilvie & Tutko, 1966) models implicitly acknowledge the importance of performers’ perceptions of the consequences of their performance. Thus, these existing models of FF and FS are consistent with the contemporary cognitive-motivational-relational theory of emotion. Neither of these models has been subject to empirical validation within the context of specific performance domains. Additionally, it is not known whether the FF and FS universes vary between performance domains (i.e., are the feared consequences of failing in sport similar to the feared consequences of failing in the performing arts?). Such information about the function of context in appraisals is critical for individuals who wish to research or consult across performance domains. Systematic research into the consequences of failure and success in specific performance domains with defined populations may extend this knowledge.

Purpose

The cognitive-motivational-relational theory of emotion provides a framework for organizing existing research and informs our understanding of FF and FS. Based on the literature reviewed above, several research questions are apparent, answers to which would enhance our understanding of FF and FS. First, what evaluative criteria are relevant for performers’ perceptions of failure or success? Second, what aversive consequences have performers learned to be associated with failure and success? An exploratory qualitative method was used to answer these questions. Results will be presented in two phases corresponding to each of these research questions.

A third question concerned the transferability of these results across different socially-evaluative performance domains. Despite the similar physical and mental demands of athletic and artistic performance, differences in the longevity of performing careers and the subcultures (e.g., values, roles, norms) of sport and the arts could influence the criteria used to evaluate failure/success and the consequences associated with failure/success. Performance feedback in sport is much more overt and objective (e.g., scores, times, distances) than is feedback on artistic performance (e.g., feedback from an audience, directors, critics, colleagues). It is important to understand the role and contribution of performance context in-
stead of assuming that the context does not influence emotional responses to performance. Findings related to contextual differences will be included with the Phase I and II results.

METHOD

Participants

Eight elite athletes (four male, four female) and eight elite performing artists (four male, four female) older than 18 years of age voluntarily participated in semi-structured interviews that lasted an average of approximately two hours. Athletes in the sample competed in team (basketball, American football, volleyball) and individual (archery, golf, gymnastics, skeet shooting, track and field [multi-event]) sports. Participants were judged to be elite because the sample included a world record holder, an Olympic medalist (and multiple Olympian), two All-American collegiate athletes, an All-Conference collegiate athlete, a World Championship level competitor, and two professional athletes. Pairs of performing artists (one male, one female) were sampled from the domains of dance (ballet), singing (opera), music (percussion and string bass), and acting. Again, the sample of performing artists was judged to be elite because six of the performing artists were professionals with either national or international reputations and two were regionally-recognized professionals in training.

Elite performers were selected for this study because they have invested significant time in the domain and the results of their participation can have powerful consequences on the rest of their lives. In sum, elite performers are likely to have heightened ego-involvement in their performances compared to non-elite performers, and ego-involvement is a prerequisite for emotion according to the cognitive-motivational-relational theory of emotion. The domains of sport and the performing arts were sampled because (a) both athletic and artistic performances integrate physical and mental performance in socially-evaluative settings, and (b) many sport psychology consultants are beginning to cross boundaries between these domains in their practices (Hays, 2000; Partington & Orlick, 1998). Six of the athletes and two of the performing artists had previously worked with a performance enhancement consultant.

Materials

Interviews were videotaped using a tripod-mounted, Sony Hi-8 camcorder (CCD-TRV65) with a Soundgrabber II external microphone (Crown Audio, Elkhart, IN). QSR NUD*IST 4 (1997) and Microsoft Excel 97 software were used to facilitate data management.

Procedures

Pilot study. After the Institutional Review Board approved study procedures for use with human participants, a pilot study was conducted. Two female athletes
participated in pilot interviews that were used to focus the interview guide and improve interviewing procedures. Specifically, investigators determined that (a) the interview guide could be shortened by reducing the number of questions about participants’ pre-, during-, and post-performance routines, (b) probes should be used to clarify the developmental roots of participants’ emotional responses; (c) resistance should be handled by addressing participants’ feelings about responding to the question before pursuing an answer to a question; (d) participants’ specific words should be used when reflecting, paraphrasing, and summarizing responses to stimulate further disclosure; and (e) participants should be debriefed completely about the purposes of the study at the end of each interview to provide closure on the experience.

Sampling procedures. Purposive sampling procedures (Patton, 1990) were used to recruit the athletes in the sample. Because of the investigators’ limited contacts in the performing arts community, snowball sampling procedures (Patton, 1990) were used to recruit performing artists. Existing relationships with insiders in the performing arts community also were used to gain access to some of the performing artists (cf. Gamson, 1995). These procedures allow for “information-rich cases” (Patton, 1990, p. 169). All participants were telephoned by one of the investigators to request their participation in the study. Everybody approached agreed to participate in the study. Participants were given the choice of being interviewed at the investigators’ laboratory (n = 9), or a location of their choosing (the participant’s home, n = 4; the participant’s studio/office/practice area, n = 3).

Interviews. The interviewers described the study to participants prior to each interview and reminded participants of the voluntary and confidential nature of their participation. Participants then provided informed consent to participate in the study. The general interview guide approach (Patton, 1990; Spradley, 1979) was used to structure the interviews and two investigators were present for every interview.4 When appropriate, questions were followed by probes specific to the information shared by the participant. No participants refused to answer any questions in the interviews.

Transcription. Videotaped interviews were transcribed by two professional transcribers; transcripts were an average of 30.4 single-spaced pages (SD = 6.8) in 12-point font. Each interviewer watched eight of the videotaped interviews to check the accuracy of the transcripts. Videotapes also were reviewed for non-verbal cues that would suggest additional meaning to the verbal data. Any transcription errors were corrected in this process and each member of the research team was then given a copy of the corrected transcript. Researchers also gave participants a copy of the corrected transcript for partial member-checking purposes (Lincoln & Guba, 1985). Seven participants indicated that their transcripts were accurate representations of their experience and three returned feedback to clarify or expand on aspects of their interview (six participants did not return any feedback on their transcript). All comments received were integrated into the data set for reduction and analysis.

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4 A copy of this interview guide is available upon request from the first author.
Analytic Procedures

Content analysis. All three investigators read the 16 transcripts and marked meaning units independently. Although videotaping interviews permitted recording of non-verbal behaviors, these behaviors did not appear to be especially informative in the present study; thus, analyses were limited to the verbal content of interviews. The first two authors used Miles and Huberman’s (1994) linked subprocesses of data analysis involving (a) data reduction, (b) data display, and (c) conclusion drawing and verification. In this process, the two analysts coded the raw data from their independently-marked transcripts using the QSR NUD*IST 4 (1997) computer program. Spradley’s (1979) recommendations were followed for assessing the contextual meaning of data. Disagreements between investigators about the meaning of raw data units were discussed and agreements were negotiated. Next, the interviewers grouped similar raw data codes into meaning units and assigned meaning units names that were as close to the words used by the participants as possible. The next stages in the analysis involved grouping meaning units into lower-order themes, and then grouping lower-order themes into higher-order themes. To increase the transferability of results and lessen the possibility that results would simply reflect idiosyncrasies of single informants, at least two participants had to provide different meaning units for each lower-order theme (i.e., one participant’s narrative could not generate a lower-order theme by itself). When naming lower-order themes, efforts were taken to keep the theme names close to the participants’ language. Two or more lower-order themes were required to assemble a higher-order theme. The investigators permitted themselves to use the language of social science when needed to name higher-order themes. The third author served as a quasi-auditor throughout this data analysis process. A second auditor who was not directly involved in the project but has experience reviewing qualitative research also reviewed the analyses.\footnote{The first author can, upon request, provide extensive appendices containing hierarchically-organized lists of meaning units, lower-order themes, and higher-order themes for the criteria associated with perceptions of failure, criteria associated with perceptions of success, consequences of failure, consequences of success, respectively, including the identification numbers of participants reporting each meaning unit.}

Writing and representation. The process of writing and representation (Coffey & Atkinson, 1996) deepened the analysis. Following the collaborative effort of all three researchers in the process of reconstructing participants’ meanings, the findings were clarified, and contextualized. Thus, the referential adequacy of participants’ reports was considered to enhance the credibility (Lincoln & Guba, 1985) of this exploratory study.

Trustworthiness

All of the outlined procedures were carried out using a team approach which, in and of itself, served as a major trustworthiness check. In addition, several techniques described by Patton (1990) were purposefully selected and contextually...
grounded to further enhance the trustworthiness of this study. The following techniques constituted the characterizing traits for readers to use in evaluating the trustworthiness of this study (Sparkes, 1998): (a) conducting and incorporating findings from a pilot study, (b) using two forms of study auditing (horizontally via peer debriefing between the interviewers, vertically via a quasi-auditor who participated in research design but not data collection or analysis, and vertically via an external auditor who was not involved in designing or conducting the research), (c) using partial member checking, (d) employing investigator triangulation, (e) assuring appropriate education and training in the content area as well as in qualitative research methodology, and (f) providing thick description of the procedures and results.

**PHASE I: EVALUATIVE CRITERIA ASSOCIATED WITH FAILURE AND SUCCESS**

**RESULTS**

*Perceptions of Failure*

Categories of control and affiliation were used to organize the higher-order themes that directly emerged from the data. This model of evaluative criteria for failure comprised 5 higher-order themes, 12 lower-order themes, and 70 meaning units. Table 1 presents a list of the higher- and lower-order themes describing criteria used to evaluate failure in participants’ performance domains.

*Control.* The control category represented participants’ assessments and attributions of their responsibility for the failure. The performers described failure as their inability to influence themselves, their performance, and their career to the extent that would allow for desirable outcomes.

*Commitment unfulfilled* emerged as a higher-order theme from participants’ reports. For instance, Athlete 3 said, “Failure, at certain times, is not achieving the goal I set for myself.” Some participants added that not taking advantage of an opportunity is a failure in itself: “Failure is just not making the most of opportunities you’re given. Number one, not being given opportunity is hard, but then if you are [given an opportunity], don’t waste it” (Performing Artist 9).

Participants’ narratives also referred to the higher-order theme of having *insufficient realistic control*. Only performing artists (n = 4) reported the lower-order theme of poor artistic communication. The meaning of not having control over things that can be controlled as a criterion for failure was eloquently captured by Performing Artist 15 who said:

I was really mad at myself this last show because I kept forgetting my lines during the run. It was a split second but it started to aggravate me because I felt like I was failing. I felt that I would trip over words, mistakes that I thought were so unprofessional for me at this point to be doing.

Performers also believed that they should control their effort or how they cope with stressors. Therefore, “Failure, would probably be not giving the best effort
you could, not being satisfied with your effort” (Athlete 6); or making “a mockery of something that you’ve been handed. At least give it your best shot, because if you don’t then, on any level, that’s really a failure” (Performing Artist 9).

Lastly, according to the performers, control-related failure occurred when they experienced a blocked wish for unrealistic control. Athlete 4 reported:

I’m a control freak. I like to put myself in a position that I think I have control over the outcome. . . . I guess I haven’t taken into account the other stuff, the stuff I can’t control. I think being sick, or being late to a game, or somebody is not doing their part. I have always thought that I’ve had control over that, or at least I’ve had a part responsibility in it.

In some cases, these experiences had a profound impact on a performer’s life because “never being given a chance is like the worst thing in the world for a performer—an artist or an athlete. Because how can you ever know [your potential] if you weren’t ever given the chance to try” (Performing Artist 9).

**Affiliation.** The affiliation category for evaluating failure comprised two higher-order themes that reflected participants’ perceptions that they were devalued in their eyes or in others’ eyes. In other words, this category referred to the hostile shift in performers’ perceptions of their relationships with self and others in and out of the performance domain (with respect to their identities as performers as

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### Table 1
**Categories and Themes in Subjective Criteria for Evaluating Failure in Performance**

<table>
<thead>
<tr>
<th>Higher-Order Theme</th>
<th>Lower-Order Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Control Category (8/8)</strong></td>
<td></td>
</tr>
<tr>
<td>Commitment unfulfilled (6/7)</td>
<td>(a) Not accomplishing my goals, (b) Squandering an opportunity</td>
</tr>
<tr>
<td>Insufficient realistic control (6/7)</td>
<td>(a) Not controlling things I should control, (b) Poor adaptation, (c) Poor artistic communication, (d) Losing perspective on my role in performance</td>
</tr>
<tr>
<td>Blocked wish for unrealistic control (7/7)</td>
<td>(a) Thinking I should control more than I can, (b) No more opportunity</td>
</tr>
<tr>
<td><strong>Affiliation Category (6/6)</strong></td>
<td></td>
</tr>
<tr>
<td>Generate negative feelings in others (6/5)</td>
<td>(a) Giving others reason to doubt me, (b) Disappointing others</td>
</tr>
<tr>
<td>Generate negative feelings in self (1/4)</td>
<td>(a) I’m nothing, (b) Becoming skeptical of self</td>
</tr>
</tbody>
</table>

**Note.** The numbers in parentheses after each label refer to the number of athletes and performing artists, respectively, who reported data associated with that category or higher-order theme. The sequence of themes is arbitrary.
well as people). Affiliation was selected as the category name instead of hostility (or a similar name) because it suggests the bipolar and dynamic nature of relationships to others and perceptions of self (i.e., friendly to hostile, loving to attacking). Performing Artist 14 captured these two higher-order themes in one short response to the question of what failure meant to her: “No self-worth, that people wouldn’t like you.”

Narratives referred to a higher-order theme of generating negative feelings in others. More performing artists ($n = 5$) than athletes ($n = 2$) reported the lower-order theme of giving others reason to doubt the performer. For example, Performing Artist 16 disclosed:

> When you say failure the first thing I can think of is like letting my family down, like everybody hates me. It’s just like the biggest, biggest pit. It’s just down, down in the gutter. Like nobody thinks I’m even interesting, or attractive, or remotely anything, maybe a sense of disappearing. Of people walking by and you’re just invisible practically. That’s failure to me.

The final higher-order theme associated with perceptions of failure involved performers’ generating negative feelings in themselves. One of the most powerful statements supporting the notion of failure as not fulfilling this affiliative motive was again provided by Performing Artist 16 for whom failure was:

> Not mattering. Being nothing. Being a cipher in this world, like just becoming a nothing. Something that can’t affect anything in any way, just can’t move anything, can’t change anything. Just something that is so almost like a little pebble that can’t.

**Perceptions of Success**

As seen in Table 2, control and affiliation again emerged as categories for grouping 4 higher-order themes, 11 lower-order themes, and 62 meaning units related to the criteria participants used to evaluate their success.

**Control.** The category of control in the performers’ definitions of success contained their perceptions of their ability to influence and assumed responsibility for influencing themselves, their performance, and their career in a desired manner.

Participants’ narratives supported the higher-order theme of achieving a desired outcome; earning/deserving the opportunity was reported by all performing artists and only three athletes. The essence of what participants meant by achieving a desired outcome was presented as follows: “For myself, [success] would be accomplishing the goals that I’ve set for myself” (Athlete 1).

Participants also defined success as their ability to implement a desired process within their performance and career. The following illustrates how participants viewed success as being able to initiate and control the process of performance: “You can’t do everything right all the time so [success is] knowing that you went out and gave a good effort” (Athlete 6). Similarly, performers perceived good adaptation to performance outcomes as a success in itself:
Beyond a finish or beyond a score, [success] is dealing with certain situations. Dealing maybe with the wind conditions better, dealing with the Olympic rounds. If I came away losing but I felt like I went up and that I was aggressive in my shots . . . then I feel good about coming away, even if I maybe lost. (Athlete 2)

**Affiliation.** The affiliation category in the participants’ definitions of success concerned the friendliness of participants’ perceptions of self and perceptions of other people’s beliefs about them as performers and persons.

One higher-order theme involved *pleasing others*. None of the athletes’ narratives informed the lower-order theme of effective artistic communication (compared to six performing artists). Two athletes and five performing artists reported the lower-order theme of satisfying others. For example:

[A] singer’s job is to find something that seems to work and inspires your colleagues, and inspires the audience in some way, and the conductor. That’s success, that’s what we’re doing, we’re trying to find something that’s very human, and sharing that. (Performing Artist 10)

Performing Artist 13 said that success “is in the fact that they call you back again and invite you to come back and do it again. It generally reflects at least some satisfaction with your previous performance.”

Performers also defined success using the higher-order theme of *enhanced perceptions of self*; this theme was briefly summarized by Athlete 7 who said, “when you’re winning or playing good you feel good about yourself and you carry yourself with confidence.”

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**Table 2**

Categories and Themes in Subjective Criteria for Evaluating Success in Performance

<table>
<thead>
<tr>
<th>Higher-Order Theme</th>
<th>Lower-Order Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Control Category (8/8)</strong></td>
<td></td>
</tr>
<tr>
<td>Achieved desired outcome (7/8)</td>
<td>(a) Accomplished goals, (b) Earned/deserved the opportunity, (c) Showed others I can still do it</td>
</tr>
<tr>
<td>Implementing desired process (7/7)</td>
<td>(a) Controlling what I can control, (b) Maximizing my potential, (c) Adapting effectively</td>
</tr>
<tr>
<td><strong>Affiliation Category (5/8)</strong></td>
<td></td>
</tr>
<tr>
<td>Desire to please others (2/6)</td>
<td>(a) Effective artistic communication, (b) Satisfying others</td>
</tr>
<tr>
<td>Enhanced perceptions of self (5/4)</td>
<td>(a) Appreciate self, (b) Positive feelings about self, (c) I received positive attention</td>
</tr>
</tbody>
</table>

*Note.* The numbers in parentheses after each label refer to the number of athletes and performing artists, respectively, who reported data associated with that category or higher-order theme. The sequence of themes is arbitrary.
DISCUSSION

Using in-depth interviews, the present study identified criteria used by performers to evaluate their performance and generate perceptions of failure or success. These findings represent one of the first efforts designed to document the specific criteria associated with elite performers’ perceptions of success and failure. The transferability of these results may be somewhat limited because the sample was delimited to include only performers who had a great deal of experience (of both success and failure) in their performance domains. Given the apparently dynamic nature of these evaluative criteria over time, individuals who perform at lower-levels or have less experience in the domain may use different (or at least a greater variety of) criteria to evaluate their successes and failures. Although this delimitation should be kept in mind, it also is considered to be an asset in the present study because few studies have examined the criteria by which elite performers evaluate their performances.

Results from the present study were organized in categories of affiliation and control to accommodate the limited number of higher-order themes. It was clear that these evaluative criteria sampled a broader domain than simple levels of performance or orientations for evaluating ability. Taken collectively, the criteria for evaluating failure and success resembled Ryan and Deci’s (2000b) model of human needs for optimal functioning. The need for relatedness was well represented in participants’ reports (e.g., generating negative feelings in others, having a desire to please others). Participants also appeared to use an internalized form of relatedness as criteria for evaluating success and failure (e.g., generating negative feelings in themselves, enhancing perceptions of themselves). The need for competence was readily apparent as well in criteria such as having a commitment unfulfilled, achieving a desired outcome, and implementing a desired process. The criteria based around realistic and unrealistic control could be related to the need for autonomy but this link is slightly more speculative than the links for the preceding needs.

Differences emerged in how athletes and performing artists evaluated their performances. With respect to criteria used to evaluate failure, performing artists evaluated their performances based on (a) poor artistic communication, (b) losing perspective on their role in the performance, (c) giving others reason to doubt them, and (d) both lower-order themes associated with generating negative feelings about themselves more than did athletes. These results suggested that affiliative failure was more salient for performing artists than athletes. Additionally, there appear to be unique aspects of the artistic performance (e.g., effective communication and keeping one’s role in perspective) that are not as relevant for failure in sports.

Concerning the criteria used to evaluate success, more performing artists emphasized earning/deserving the opportunity and both lower-order themes associated with a desire to please others than did athletes. Interestingly, athletes seemed to emphasize appreciating themselves and receiving positive attention when evaluating whether they were successful more than did performing artists. In absolute terms, these differences were relatively small and there did not appear to be a
difference between the performance domains with respect to the associated higher-order theme of having enhanced perceptions of oneself. Thus, it may be premature to draw conclusions about how these evaluative components may be unique to a performance domain.

**Integrating Perceptions of Failure and Success**

Distinct criteria for evaluating success and failure in performance emerged. As expected, a perception of success in one aspect of performance precluded a perception of failure in that same aspect just as a perception of failure precluded a perception of success. Because the evaluative criteria were distinct, however, a performance that was not evaluated as a success was not necessarily evaluated as a failure. This “gray area” in performance evaluations has not received attention in the literature. The language of one participant (Performing Artist 16) illustrated this complexity when she unconventionally chose to describe herself as being “not not successful” instead of phrasing her statement simply as “being successful” (as one might expect).

The question of whether certain phenomenological experiences (e.g., perceptions of failure and success) are bipolar or independent is important and has been examined in other contexts. For example, in the study of affect, the distinction between pleasant and unpleasant affect has sparked much research and spirited discussion about whether these affects are bipolar or independent dimensions (e.g., Diener, 1999; Feldman, Barrett, & Russell, 1998; Green, Goldman, & Salovey, 1993; Russell & Carroll, 1999; Watson, Wiese, Viadya, & Tellegen, 1999).

Although evaluative criteria were grouped in terms of the same categories (control and affiliation), the higher-order themes appeared to be somewhat different for success and failure. At first glance, the affiliation category may appear to lend itself to a single bipolar continuum because success was based on pleasing others or enhancing perceptions of self, whereas failure represented the opposite (i.e., generating negative feelings in others or in the self). Closer examination of the lower-order themes comprising the higher-order, affiliative themes, however, reveals that, when situated within the narrative context, meanings of affiliation within failure and success were quite different. For example, there was no affiliative success that could be paired with an affiliative failure such as giving others a reason to doubt me. Similarly, the affiliative success of effective artistic communication was not represented in the domain of affiliative failure.

The distinct evaluative criteria were more apparent for the control categories in failure and success. The higher-order control themes for failure involved not having enough control (realistic or not) or not being able to fulfill a commitment. In contrast, the higher-order control themes associated with success simply involved controlling the process or outcome of the performance. Thus, although common motives (i.e., control and affiliation) may underlie performance evaluations, perceptions of failure and success demonstrated more independence than bipolarity in the present data.

Participants reported that they either failed or succeeded but did not report that they both failed and succeeded. It appears that these perceptions may develop
from one of two processes. First, the performer could pass a positive test for failure or success. This positive test entails determining that the performance met one or more necessary criteria for either failure or success (summarized in Tables 1 and 2). Alternately, the performer could pass an antipositive test for the opposite evaluation. These antipositive tests for success and failure involve determining that the performance did not meet the criteria for failure or success, respectively. For example, a perception of failure could result from not meeting the criteria for success. The apparent independence of these systems (i.e., positive and antipositive tests for failure/success) creates the possibility for uncertain perceptions in performers’ evaluations and suggests that researchers and practitioners need to consider each of these dimensions separately in future work.

**Implications for Framing Achievement Conflicts**

The finding that perceptions of failure and success are not bipolar is significant because it provides another way to frame FF and FS. Previous definitions of FF include (a) the need “to quit embarrassing situations or to avoid conditions which may lead to belittlement” (Murray, 1938, p. 192), (b) “a disposition to avoid failure and/or a capacity for experiencing shame and humiliation as a consequence of failure” (Atkinson, 1966, p. 13), and (c) the “disposition to become anxious about failure under achievement stress” (Atkinson & Litwin, 1973, p. 146). These definitions share the idea that failure presents a threat to the individual but the notion of anticipating a threat from not succeeding is not explicit in any of the definitions. Explicitly stating that not meeting evaluative criteria for succeeding can stimulate perceptions of failure (and FF) may facilitate a more complete sampling of the domain of FF perceptions. A similar argument could be made for FS. Thus, a more complete conceptualization of FF should include: (a) the anticipated presence of negative consequences of failure, as well as (b) the absence of anticipated positive consequences of success. Similarly, FS can be expanded to include: (a) the anticipated presence of negative consequences of success, as well as (b) the absence of anticipated positive consequences of failure. This clarification will result in (a) greater theoretical specificity, (b) more appropriate response sets for assessing FF and FS, and (c) broader frames of reference for interviewing clients.

**PHASE II: CONSEQUENCES OF FAILURE AND SUCCESS**

**RESULTS**

**Consequences of Failure**

Seven higher-order themes, 22 lower-order themes, and 173 meaning units were associated with the perceived consequences of failure. Table 3 presents the lower-order themes associated with the seven higher-order themes.

Narratives referred to tangible losses as a higher-order theme; the lower-order theme of repeated failure was only mentioned by athletes \((n = 4)\). Athlete 2 captured the change that accompanies these losses when she described that, “if I’m
winning, I’ve got contract money, and I’m in this magazine, or I’m in that magazine . . . then all of a sudden I’m not winning and I have a regular job.”

With respect to the higher-order theme of attempted adaptation, athletes reported the lower-order themes of increased motivation to improve and succeed and decreased motivation to perform more frequently than performing artists. As an example of how performers came to terms with the need to adapt, Athlete 7 said that he had reached “the point then where I’d almost look at myself and say ‘What am I doing out here?’ I just knew that something had to change. I either had to play better or quit playing in tournaments, because it just wasn’t that much fun.”

Feelings of losing control also appeared as a higher-order theme. Athlete 2 described a situation in which she failed that was difficult for her:

I was in the position [I wanted to be in]. Everything was working right for me. I was shooting good. My opponents didn’t come out and shoot anything spectacular. It was mine to take and I couldn’t take it . . . that part is devastating because I lost an opportunity, and maybe the opportunity of a lifetime, to win an individual medal, possibly the gold medal.

### Table 3

<table>
<thead>
<tr>
<th>Higher-Order Theme</th>
<th>Lower-Order Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tangible losses (7/7)</td>
<td>(a) Material loss, (b) Repeated failure, (c) Not accomplishing a goal, (d) Blocked aspirations</td>
</tr>
<tr>
<td>Attempted adaptation (8/7)</td>
<td>(a) Learned and improved performance, (b) Interpreted poor effort as the cause of failure, (c) Increased motivation to improve and succeed, (d) Decreased motivation to perform, (e) Attempted to cope</td>
</tr>
<tr>
<td>Feeling of losing control (4/3)</td>
<td>(a) Realization that “my opportunity is no longer guaranteed,” (b) Perceptions of an uncertain future, (c) Affected performer’s personal life</td>
</tr>
<tr>
<td>Shifts in interpersonal exchanges (5/7)</td>
<td>(a) Damaged relationship to important objects/others, (b) Upsetting important others, (c) Others offer support</td>
</tr>
<tr>
<td>Emotional cost (8/7)</td>
<td>(a) Cycle of negative emotions, (b) Lose confidence, (c) A feeling of personal diminishment,</td>
</tr>
<tr>
<td>Punitive action directed against self (6/6)</td>
<td>(a) Belief that “I’m no good,” (b) Self-criticism</td>
</tr>
<tr>
<td>Embarrassing self-presentational failure (4/5)</td>
<td>(a) Public shame, (b) Thought that “I may not match the image that I want”</td>
</tr>
</tbody>
</table>

**Note.** The numbers in parentheses after each label refer to the number of athletes and performing artists, respectively, who reported data associated with that category or higher-order theme. The sequence of themes is arbitrary.
A higher-order theme of *shifting interpersonal exchanges* emerged from participants’ narratives. Athlete 4 gave a striking example of how failing caused her to feel that she let others down (and her father in particular) when she commented that:

I think I lose a little bit of trust from other people, and it takes a while to get that back. It hurts me to lose trust, because there’s some sort of trust that you just can’t ever, ever get back, and that’s hard to deal with, because you knew you had that . . . like with my dad . . . knowing that he sees me differently in his eyes, that’s hard, and I know I can’t get that back, because he’ll always remember that.

Sometimes, however, participants felt like they let down an internal representation of an object instead of a person. For example, Performing Artist 10 said that “it’s hard to explain but you let down the art and that’s who you’re letting down. It’s like an entity in itself.” The cast of important others or objects implicated in these statements included parents, spouses, co-workers/teammates, directors/coaches, audiences, and even an internal representation of “the art” itself.

*Emotional cost* was reported as a higher-order theme. Athlete 3 captured the emotions that followed failure for so many performers when she stated that:

During the season, . . . it wasn’t just emotions of sadness, it was just everything...I was just up and down a lot this year. Things were more extreme on more of the negative side. More frustrated, more negative. . . . I wasn’t as happy because I hardly had any good experiences, because I wasn’t competing to where I wanted to be, so there was no good ones.

Under the higher-order theme of *punitive beliefs about self*, twice as many performing artists (*n* = 4) as athletes (*n* = 2) reported the belief that “I’m no good.” Examples of these beliefs were vividly expressed by Performing Artist 11, “I think the things that go through your mind are, ‘I’m not a good person,’ and ‘I’m not talented,’ ‘I wonder if I really can do this,’ ‘I wonder if I really am doing the right thing,’ ‘Is this really the profession I should be pursuing?’ I think all those things naturally go through your mind.” Interestingly, this self-blame was perceived as being worse than any criticism that anyone else could offer (cf. personal diminishement as an emotional cost): “I’m the hardest person on myself. . . . I don’t think anybody could really say anything to hurt me as much as I could kick myself. And I have kicked myself” (Performing Artist 14).

Participants provided data contributing to the final higher-order theme, *embarrassing self-presentational failure*. Athlete 6 may have said it best when he observed that “When you fail everybody knows.”

*Consequences of Success*

Five higher-order themes, 15 lower-order themes, and 88 meaning units were associated with performers’ perceived consequences of success. Table 4 presents these lower- and higher-order themes.
Related to the higher-order theme of pressure to meet higher expectations, twice as many performing artists ($n = 6$) as athletes ($n = 3$) reported pressuring themselves not to fail. Participants commented that others’ performance expectations were raised; people “expect you to play good all the time” (Athlete 7). Performing Artist 16 described how her success led her to expect the same in the future and to wonder “What happens if this time I fail? What happens if this time I can’t pull it off? . . . It’s very scary because once you’re successful it means you’re not not successful, and I think that’s terrifying.”

Performance benefits also emerged as consequences of success. Accounts of twice as many performing artists ($n = 4$) than athletes ($n = 2$) supported the lower-order theme of rewards in future performance opportunities. Performing Artist 11 remarked that, after succeeding, she feels like she “had control over my talents, that my hard work has paid off. I feel that I can do anything. It definitely spurs my interest to continue, to do more, and to do better the next time.”

Narratives also revealed the higher-order theme of surprising costs of succeeding. Some participants lost their enjoyment of success as success became less positively reinforcing and more of a relief: “There was no second place or third place – either you won and that was what you were supposed to do, or you lost and that was really bad” (Athlete 2).

Another higher-order theme involved increased psychological interaction with others. More performing artists ($n = 4$) reported a belief that “I owe others for my success” than athletes ($n = 2$). As Performing Artist 15 stated, “You don’t have a life anymore because everybody’s so involved with what you are doing. . . . People

<table>
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<tr>
<td>Pressure to meet higher expectations (6/8)</td>
<td>(a) Others’ expectations raised, (b) Own expectations raised, (c) Pressured self not to fail</td>
</tr>
<tr>
<td>Performance benefits (6/7)</td>
<td>(a) Enhanced retrospective feelings of control, (b) Belief that “I have enhanced performance capabilities,” (c) Rewards in future performance opportunities</td>
</tr>
<tr>
<td>Surprising costs of succeeding (3/4)</td>
<td>(a) Success became a bad thing, (b) Tangible costs</td>
</tr>
<tr>
<td>Increased psychological interaction with others (7/6)</td>
<td>(a) Interpersonal rivalry, (b) Belief that “I owe others for my success,” (c) Others becoming more invested in my performance, (d) Increased recognition and appreciation</td>
</tr>
<tr>
<td>Enhanced perceptions of self (8/6)</td>
<td>(a) Feeling good about myself as a performer, (b) Feeling good about myself, (c) Humility</td>
</tr>
</tbody>
</table>

Note. The numbers in parentheses after each label refer to the number of athletes and performing artists, respectively, who reported data associated with that category or higher-order theme. The sequence of themes is arbitrary.
kind of get annoying because they want to be around you more because they find you fascinating as an actor.”

The final higher-order theme pertained to having enhanced perceptions of self after succeeding. Athlete 5 captured the essence of this theme in stating, “It’s a feeling of worth, of self-worth when I’m successful.”

**DISCUSSION**

In the second phase of data analysis, participants’ perceptions of the consequences of failure and success were identified and organized. Similar to the results of the first phase of this project, some striking differences emerged between the perceptions of athletes and performing artists. With respect to the consequences of failure, athletes reported repeated failure, increased motivation to improve and succeed, and a decreased motivation to perform more than did performing artists. In contrast, performing artists reported believing that “I’m no good” more than did athletes. Overall, motivation seemed to be more directly affected by failure for athletes than performing artists. Performing artists, on the other hand, seemed more attuned to changes in their self-concepts than did athletes.

Concerning the consequences of success, performing artists reported pressuring themselves not to fail, receiving rewards in future performance opportunities, and believing that they owed others for their success more than did athletes. These differences suggested that performing artists believed that some of the important consequences of their success are out of their control.

The primary purpose of this investigation was to generate cognitive-motivational-relational models of fears of failure and success by elaborating on the consequences of failure and success perceived by elite performers. According to Lazarus (1991), the appraisals for fear and anxiety both involve the anticipation of a threatening outcome. As revealed in the Phase I results, failure and success appeared to be perceptual states associated with different evaluative criteria and linked by positive and antipositive tests. By logical extension, the anticipated threatening outcomes following failure may derive either (a) from consequences of failing that are threatening, or (b) from certain consequences of succeeding that would be aversive if absent. It may seem odd to suggest that not experiencing certain consequences of success would stimulate a fearful or anxious response. If performers anticipated and made a psychological investment in receiving a particular consequence of success (e.g., gaining self-esteem), then not attaining such a consequence could be sufficiently threatening to stimulate a fearful or anxious response. Thus, fear of failure may derive from appraisal of threatening consequences of (a) failing, or (b) not succeeding.

On the other hand, if performers perceived that the consequences of failure would be desirable (e.g., if failure would lead to a decrease in others’ involvement in their performance), the absence of those consequences may be sufficiently threatening to stimulate an emotional response. Thus, fear of success may derive from appraising threatening consequences to (a) succeeding, or (b) not failing (through the absence of desirable consequences of failing). Constructing “double-edged”
models in this way may represent the domains of fear of failure and fear of success more fully than models that focus only on the direct consequences of failing or succeeding, respectively.

*Extrapolating Composite Appraisals for Fear of Failure and Fear of Success*

Reviewing the consequences of failure and success identified in the present study provided a basis for defining the domains of fears of failure and success. To identify the aversive consequences of failing or not succeeding that define the fear of failure domain, the higher- and lower-order themes for each set of consequences were reviewed. Some of these consequences were nearly redundant (e.g., experiencing feelings of personal diminishment as a consequence of failure seemed similar to not realizing the consequence of feeling good about oneself as a consequence of succeeding). To handle this redundancy efficiently, composite appraisals were formed to represent consequences of failing and not succeeding that were conceptually similar. Three lower-order themes describing consequences of failing seemed to be associated with more than one composite appraisal (i.e., interpreted poor effort as the cause of failure, realization that “my opportunity is no longer guaranteed,” and perceptions of an uncertain future) so a conservative approach was adopted and each theme was listed with each possible composite appraisal. Ten composite appraisals that mapped (at least partially) the fear of failure domain could be identified from these data: (a) experiencing personal diminishment, (b) demonstrating that I have low ability, (c) demonstrating that I lack control, (d) experiencing tangible losses, (e) wasting my effort, (f) making my future uncertain, (g) losing a special opportunity, (h) causing others to lose interest in me, (i) disappointing or upsetting important others, and (j) experiencing an embarrassing self-presentational failure.6

A similar procedure was utilized in reviewing the consequences of succeeding and not failing. One consequence of succeeding (i.e., increased recognition and appreciation) seemed to influence two related but sufficiently unique appraisals (i.e., experiencing jealousy and interpersonal rivalry, experiencing increased recognition and appreciation) so a conservative approach was adopted and the consequence was used to inform both appraisals. Ten composite appraisals associated with the fear of success domain included: (a) not learning and improving, (b) facing an overly rigid future, (c) accomplishing all of my goals, (d) facing higher expectations (own and others), (e) losing enjoyment of success (desensitization), (f) experiencing tangible costs (e.g., slumps, injuries, loneliness), (g) experiencing jealousy and interpersonal rivalry, (h) experiencing increased recognition and appreciation, (i) not receiving support from others, (j) losing or not increasing motivation, and (k) becoming over-confident.6

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6 Tables detailing the specific consequences (i.e., lower-order themes) comprising each composite appraisal for fears of failure and success are available from the first author upon request.
Comparing Composite Appraisals to Existing Literature

The fear of failure appraisals identified above were largely consistent with Birney et al.’s (1969) early model of the construct. For example, Birney et al.’s fear of devaluing one’s self-estimate was similar to the composite appraisals of “experiencing personal diminishishment,” “demonstrating that I have low ability,” and “demonstrating that I lack control.” Appraisals related to “experiencing tangible losses,” “wasting my effort,” “making my future uncertain,” or “losing a special opportunity” were similar to Birney et al.’s fear of non-ego punishment. Finally, the fear of reductions in one’s social value appeared to be represented in appraisals that one is “causing important others to lose interest in me,” “disappointing or upsetting important others,” or “experiencing an embarrassing self-presentation failure.”

The fear of success appraisals identified above generally resembled Ogilvie’s (1968) model although some appraisals conceivably involved more than one of Ogilvie’s syndromes. The fear of social and emotional isolation was similar to appraisals such as “others not offering support,” “experiencing jealousy and interpersonal rivalry,” “experiencing increased recognition and appreciation,” and “experiencing tangible costs” to succeeding (e.g., loneliness). Fear of surpassing a previous record held by an admired performer was associated with appraisals of “accomplishing one’s goals,” and “experiencing jealousy and interpersonal rivalry.” The pressure of constantly having to match or exceed one’s previous best performance was conceptually similar to appraisals involving “not improving,” “accomplishing one’s goals,” and “having expectations raised for one’s performance.” Guilt over assertion and fear of discovering one’s true potential only seemed to be related to one type of appraisal each: “becoming over-confident” and “accomplishing one’s goals,” respectively. Three consequences of succeeding (composite appraisals) were unlike previously documented fear of success syndromes, including “having an overly-rigid future,” “losing or not increasing motivation,” and “losing enjoyment of success (desensitization).”

Overall, the composite appraisals for FF and FS identified in the present study were quite consistent with existing models of FF and FS. The present results extend these previous models by providing a more detailed (and empirically-derived) definition of the domains in question. Although these results suggest that fears of failure and success may be multidimensional constructs, it would be premature to draw conclusions about dimensionality without further research to test the present findings in a confirmatory mode.

Future Research

Several types of research may prove useful in developing understanding of FF and FS. Qualitative methods were appropriate in the present study for examining the domain of appraisals made by elite performers. Similar designs could be used with other populations of interest including youth performers in athletic, artistic, and academic performance domains. Additionally, coaches and teachers’ perspectives on these phenomena could provide valuable insights for social scientists. It
also will be important to assess the degree to which the use of particular evaluative criteria is associated with the belief in particular consequences of failing/succeeding.  

Several of the composite appraisals identified in the present research were similar. This similarity was not unexpected because a relatively conservative approach was used to form the composite appraisals. Measurement-oriented research that can shed light on the dimensionality of FF and FS will be very useful in the future. Both multidimensional scaling of threat-provoking consequences and factor analytic approaches will be helpful in answering this question.

Assuming that future research supports the multidimensionality of FF and FS, the correlates and consequences of these different dimensions will need to be clarified. Of particular interest will be outcomes such as performers’ and judges’ subjective and objective ratings of performances. Subjective performance outcomes represent performers’ satisfaction with their performances whereas objective performance outcomes represent changes in actual performance levels. Both of these outcomes are important and will influence popular and scientific perceptions of the utility of these achievement-related constructs. Research also will be needed to compare the predictive power of these multidimensional models of performance worries with less specific (typically unidimensional) measures of cognitive performance anxiety relative to objective and subjective performance outcomes.

**SUMMARY, CONCLUSIONS, AND IMPLICATIONS**

Using in-depth interviews with elite athletes and performing artists and inductive content analyses, researchers identified a variety of (a) evaluative criteria that influence perceptions of failure and success, and (b) perceived consequences of failing and succeeding. We hope that these findings provide a point of departure for future research and practice related to motivation and emotion in performance environments. We do not presume that the models of evaluative criteria and consequences of failure and success are necessarily complete and we recognize that larger or more diverse samples in future research may yield additional information.

Results from this study did reveal that the criteria used to evaluate failure are not simply the opposite of the criteria used to evaluate success (i.e., failure and success are not bipolar perceptions). Additionally, the criteria used to evaluate performance appeared to share more with human needs than with either performance goals or goal orientations. Incorporating this broader frame of reference may provide both consultants and researchers with greater precision in their assessments and a heightened understanding of performers’ realities. Also, the minimal overlap between the criteria used to evaluate performance failure/success and objective standards of performance suggested that consultants and researchers should take care to distinguish between objective and subjective failure (or suc-

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7 We thank the section editor for pointing out this important question for future research.
cess) when considering the effects of performance failure (or success) on emotion and motivation. Finally, analysis of the evaluative criteria that influence perceptions of failure or success revealed that context matters. Many similar criteria were described by both groups of performers but several striking differences emerged as well. Consultants and researchers are advised to consider the role of context in their assessments related to perceived failure or success.

Multidimensional models of worries associated with FF and FS were developed from participants’ reports of the perceived consequences of failing or succeeding. Perhaps the greatest contribution of this research lies in the insight it has added to the phenomenology of performers who fear failure or success. Both consultants and researchers may use this information to make their assessments of FF and FS more specific. The value of this added specificity is an empirical question but it has the potential to uncover important nuances about FF and FS that we hope leads to more effective case formulations and treatment planning for performance enhancement consultants.

REFERENCES


Supplementary Materials
Interview Guide

I. Introduction and Relationship Building
   1. Describe the nature and demands of your performance domain.

II. Success
   1. How do you define success (i.e., what is success to you)?
   2. What do you see as the consequences of success?
   3. Beyond your definition of success, what does success mean to or about you?
   4. How do you feel when you know you are being successful?

III. Transition
   1. Can you describe a situation in which you have had similar thoughts and feelings and you behaved in a similar manner, but you failed?
   2. Can you tell us about a situation in which someone has slighted or demeaned your performance?
   3. In a moment, I will read out a list of emotions, one at a time. After I read out each emotion, I would like you to describe how you experience that emotion in your performance domain: pride, happiness, sadness, hope, shame, anger, anxiety, fear (read one emotion at a time).

IV. Failure
   1. How do you define failure (i.e., what is failure to you)?
   2. What do you see as the consequences of failure?
   3. Beyond your definition of failure, what does failure mean to or about you?
   4. Would you be willing to describe your most traumatic failure?
   5. Can you describe what you were thinking and feeling when you realized you would fail?
   6. What was it that you felt was irrevocably lost in your excellence domain?
   7. Can you describe a situation in which you have had similar thoughts and feelings and you behaved in a similar manner, but you succeeded?
   8. If you were to try to summarize what you have told us about failure and what it means in a few words, what words would you choose?

V. Conclusion and Debriefing
   1. Finally, would you tell us about the event that established you as an elite performer in your domain?
   2. Debrief participants and answer any questions.
Evaluative Criteria for Failure

Lower-Order Themes, & Meaning Units with Codes for Participants Reporting Each Meaning Unit (1-8 are Athletes, 9-16 are Performing Artists)

Lower-order Failure Themes, Meaning Units, and Participant Codes

Not accomplishing my goals – 1, 2, 3, 5, 7, 8, 10, 11, 12, 14, 15, 16
Not accomplishing goals – 1, 3, 8, 11, 14, 15
Not winning – 8
Not improving – 15, 16
Not meeting my expectations – 1, 2, 5, 7, 12, 15
Not succeeding with all advantages – 5
Not getting scholarship – 15
Didn’t do what I prepared myself to do – 1
When established levels are not met – 10, 12
Squandering an opportunity – 5, 8, 9, 16
Knowing I could have done more – 8
Making mistakes and getting held back – 9
Wasting opportunity – 9
Not open to learn from others – 16
Not translating practice into competition – 5
Being stubborn w boss – 9
Not controlling things I should control – 1, 3, 5, 6, 7, 9, 10, 11, 13, 14, 15, 16
Not practicing – 7, 15
Not preparing well – 9
Having a mental lapse – 3, 5
Giving poor effort – 1, 3, 6, 7, 9, 11, 14, 15
Not being consistent – 3, 7, 11, 15
Choking – 7
Making mistakes – 9
Letting others affect my performance – 9, 15
Not enjoying – 11
Not knowing self – 16
Making the same mistake twice – 15
I lost control – 10, 13
I wasn’t all there – 16
Letting other dancers create insecurity – 9
Letting others under my skin – 9
Poor adaptation – 3, 7, 9, 16
Being weak, unable to cope with world – 16
Not coping well – 3
Giving up – 9
Quitting – 7
Poor artistic communication – 9, 11, 15, 16
Not affecting audience – 11, 15
Not sensitive to others – 16
If bring joy to others, no fail – 9
Losing perspective on my role in performance – 4, 9, 11
   Not connecting to part - 9
   Not knowing/accepting role on team - 4
Make mockery of show - 9
   Technical worries break unity - 11
   Losing the big picture - 9
Thinking I should control more than I can – 3, 4, 5, 6, 8, 10, 11, 12, 14, 15
   Not having control – 4, 12
   Getting sick my fault – 4, 10
   Not being perfect - 8
   Getting injured – 3, 12
   Getting fired before ready to leave - 12
Imprint that I should never fail - 14
   Effort not leading to success – 5, 6, 15
   Others think I don’t have enough ability to do it – 11
No results after hours of practice – 5
No more opportunity – 1, 7, 8, 9, 11, 16
   No opportunity – 8, 11
   Not getting right opportunity & help– 7, 8
   Not getting a job - 16
   Lost opportunity to continue something - 9
   Lost opportunity to do something special – 8
   Nothing I can do to prevent failure – 1
Giving others reason to doubt me – 4, 8, 10, 12, 14, 15, 16
   Not meeting others expectations – 4, 8, 12, 14, 15, 16
   Piece had to be cancelled - 10
Disappointing others – 1, 4, 5, 6, 7, 10, 12, 15, 16
   Letting important others down – 1, 4, 6, 7, 10, 12, 15, 16
   Being irresponsible – 4, 5
   Being criticized by others - 15
   Embarrassing others - 10
I’m nothing – 4, 14, 16
   I’m invisible - 16
   No self-worth - 14
   Part of me dying - 14
   Feel unwanted – 4, 14, 16
Becoming skeptical of self – 4, 11, 12, 14
   Doubting self - 4
   Letting down self -12
   Own worst critic – 11
   What was I doing? – 14
Evaluative Criteria for Success

Lower-Order Themes, & Meaning Units with Codes for Participants Reporting Each Meaning Unit (1-8 are Athletes, 9-16 are Performing Artists)

Lower-order Success Themes, Meaning Units, and Participant Codes

Accomplished goals – 1, 2, 3, 5, 7, 8, 11, 12, 13, 14, 16
Meeting or exceeding goals – 1, 2, 3, 5, 7, 8, 13, 14, 16
Winning – 1, 2, 5, 7, 8
Getting mood roles/music - 11
Maintaining a level – 5, 8, 13, 14
Top consistent – 3, 8, 12
Maintain, no more pressure to achieve - 14
Still possessing a desire to perform – 7
Earned/deserved this opportunity – 2, 5, 7, 9, 10, 11, 12, 13, 14, 15, 16
Deserving and ready for role - 9
Being in contention – 5, 7
Hard work reinforced – 14, 16
Getting more opportunities – 9, 10, 12, 13, 15, 16
Others pay me to do it – 2, 11, 13, 15, 16
Showed others I can still do it – 6, 14
Not being forced out because of my age - 14
Proving I can do it to others - 6
Controlling what I can control – 1, 2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15, 16
Effort – 4, 6, 8, 13, 15
Preparation – 4, 5, 8, 9, 11, 16
Do what I can – 4, 8, 12, 13
Shooting without target panic – 2
No mistakes – 1, 5, 9, 12, 13, 15
Meeting responsibility – 4, 9
Gain freedom by giving up control – 16
Must be able to control self and stay in comfort zone - 13
Performance tests your control not your music - 13
Avoid looking bad - 15
Game of fewest mistakes - 7
Transforming notes into something incredible - 10
Focused and concentrating – 16
Maximizing my potential – 1, 4, 5, 8, 9, 12, 13
Making the most of what I have - 9
Doing best that I can – 1, 4, 5, 8, 12, 13
Get on with it or get out of it – 9
Doing best is good enough – 9
Adapting effectively– 2, 6, 9, 16
Moving on after mistake - 9
Coping well – 2, 9
Not afraid to fail – 6
Keep ego away – 16
Effective artistic communication – 9, 10, 11, 12, 14, 15, 16
Creating an authentic/genuine character – 11, 15, 16
Connecting with the audience – 10, 12, 14, 15, 16
Serving the art - 10
Reaching a different audience - 9
Relating to other performers to share with audience - 10

Satisfying others – 4, 8, 9, 10, 12, 13, 15
Please others – 8, 9, 12, 13
Avoid criticism – 9, 13
Giving honest effort to please others – 8
Represented others well – 4
Played well, crowd loved us – 4
Must please audience for them to pay – 15
Try to please parents - 15
Want to be successful in parents’ eyes - 9
Want to please authority figures - 15
Getting attention from important others - 10
When people like me, I know I pleased them - 15

Appreciate self – 2, 4, 8, 16
Giving honest effort to please self - 8
My perceptions more important than others’ perceptions – 2, 16
Represented ourselves well – 4

Positive feelings about self – 4, 5, 7, 8, 9, 15, 16
Feel good about self – 7, 9, 16
Knowing I have talent - 15
Confidence – 4, 7, 8, 9
Can compete with the best in the world – 5
Pleasing self by doing my best – 9

Knowing I received positive attention – 4, 8, 10
Dad demanded perfection but was supportive – 8
Cared about by teammates – 4
Drumming got me attention – 10
Consequences of Failure

Lower-Order Themes, & Meaning Units with Codes for Participants Reporting Each Meaning Unit (1-8 are Athletes, 9-16 are Performing Artists)

Lower-order Consequences of Failure Themes, Meaning Units, and Participant Codes

Material Loss
- Losing job – 9, 12
- Losing sponsors – 2, 3
- Lose insurance – 2
- Paychecks stop – 8
- Not maintaining standard of living – 12
- Hurts career by decreasing opportunities – 13
- Lost money – 10

Repeated Failure
- Failure leads to failure – 3, 6
- Expect more failure – 5
- Tighten up and get more careful – 5
- Play bad and get more tentative – 4

Not Accomplishing a Goal
- Not making team/crew – 2, 5, 7, 8, 12
- Not winning – 3
- Not able to pull things off – 11
- Not shooting scores I should – 5
- I didn’t complete something I knew I could – 11
- Angry at self for not living up to the situation – 15

Blocked Aspirations
- Becoming a person I don’t want to be – 2
- Must consider a life change – 11, 16
- Need to get a regular job – 2, 16
- Lower expectations – 2, 3

Learned and Improve Performance
- Lesson as a catalyst for success – 9
- Learn from mistakes – 4, 13
- Learn new coping strategies – 3, 13, 14
- Learn about self as performer – 2
- Learn to trust performance instincts – 16
- Analyzing what happened – 2, 4, 5, 8, 9
- Learn to trust coach – 2
- Broader learning about performance – 3, 16
- Why didn’t we win? – 4
- Why am I not better? – 3

Interpreted Poor Effort as the Cause of Failure
- Better effort would have prevented failure – 6
- Can accept failing if effort was good – 6
- Taking partial responsibility – 5
Unprepared – 10, 11, 14

Increased Motivation to Improve & Succeed

- Hunger for success – 3
- Want to work harder – 6, 7, 8
- Draw more on little successes – 5
- Need to make self better person and player – 6
- I must be better than before – 15
- Accept failure and work to improve - 6

Decreased Motivation to Perform

- Don’t care – 7
- Not practicing – 5
- Hard to keep shooting – 5
- Won’t try - 1

Attempted to Cope

- Drinking – 16
- Take a walk – 6
- Reacting to criticism by getting defensive – 2
- Keep negative thoughts out – 5
- Remind self that one mistake is not the whole performance – 11
- Remind self that audience did not see mistake – 11
- Learn or quit – 7
- Sought consulting – 5, 9, 13
- Remind that goal is most important – 4
- Now first one to laugh at self – 13
- Unable to leave mistakes behind – 9
- Wouldn’t show emotion – 4
- Dealing with pressure – 2
- Built walls around self for protection – 4
- Keep self fit to prevent more failure – 10
- Cry – 14
- Reassure and reaffirm self – 11
- Talk and be understood – 3
- Self-instruction – 3
- Laugh – 3
- No talk or apologize – 4
- Practice – 7
- Must calm down – 7
- Must serve art – 10
- Learn and it will never happen again – 9
- Learn or sob – 9
- Letting things beat me down is not productive – 9
- After mistake, rehearse - 11

Realization that “My Opportunity is No Longer Guaranteed”

- Lost opportunity – 2, 9
- Losing shots – 7
- Dream of leaving town blocked – 13
Hope for another opportunity – 8
Lost opportunity to continue doing something – 9
Lost opportunity to do something special – 8

Perceptions of an Uncertain Future
What do I do now? – 2
Unknown consequences – 14
Hope for next year - 1

Affects Personal Life
Affects life beyond sport – 2
Learned to separate person from performer – 9
Affects me as a dancer and person – 9

Damage Relationship to Important Objects/Others
Lost trust from others – 4, 12
Others do not respect me – 7
No one will like me – 14
Punishment from mom – 6
Art let down – 10
Afraid of holding the piece back – 10
Others don’t like me – 11

Upsetting Important Others
Letting others down – 8, 12
Others angry – 1
Criticism from others – 6, 9, 12, 13, 15
Wife beats me down – 7
Don’t want to let others down – 13
Want to avoid director growling – 13
Confronted by coach – 1
Coach angry – 4
Publicly criticized when vulnerable – 12
Controversial performance offends others – 15
Being unprepared lets others down – 8
Thinking I should not have disrespected her class – 1
Lying to teacher – 16

Others Offer Support
Receive encouragement from others – 16
Family would accept mistake regardless – 13
Criticism to get better (well-intended) – 15
Bonded with parents and coaches - 4

Cycle of Negative Emotions
Disappointment – 2, 6, 15
Sadness – 2, 5, 9, 11, 16
Embarrassment – 13, 14
Emotional roller-coaster – 3
Anger – 15, 16
Frustrated with not being competitive – 5
Doubt created anxiety – 9
Worried and stressed – 11
Tense up, frustrated – 15
Nervous – 16
Regret – I should have done this (another option) – 8
Guilty for not practicing – 2
Angry that I took myself out of the competition – 5
Angry at self for poor results – 3, 7

Lose Confidence
Takes away confidence – 2, 6, 7, 9, 14
Hope for instead of expect success – 2
Accumulation of failure destroys your confidence – 2
Doubt it will get better – 11
Repeated failure leads to doubt – 1
Doubt my preparation and belonging to art – 10
When results are poor, I can only think about my mistakes – 7

A Feeling of Personal Diminishment
Negative self-esteem – 1, 2, 4, 6, 7
Self feels bad – 1, 2, 3
Conductors make me feel worthless – 11
Feeling like no voice – 16
Lose respect for self – 4, 6
Reduced to nothing – Had to start over – 9
Demise of human being – 16
Letting self down – 10
I’m only as good as my performance – 14
Took responsibility for poor performance – 4
Criticism taken personally – 11
I couldn’t meet the demands of my performance – 16

Belief that I’m No Good
Not a good person – 11
Not smart enough to correct mistake – 5
Not good, not talented – 5, 6, 10, 11, 14, 15
If I wasn’t inadequate, I wouldn’t have been criticized – 11

Self-Criticism
Negative self-talk – 1, 5
What’s wrong with me? – 5
Punish self – 2
I’m my own worst critic – 11, 14
Doubt introduced – 2, 5, 9, 15
Blame self – 1, 4, 10
I didn’t do enough – 4, 8
Kick self in head – 15
Criticize self – 12

Public Shame
Everybody knows – 6
Looking stupid – 15
No excuse for going out like that – 5
Proving doubters right – 16
Humbles – 6, 10
Others’ explanations wrong – 2
Dealing with negative stories in press – 2
Reminded you’re a human being – 10
Others thought I wasn’t trying – 6
Audiences sees you stop to fix a mistake - 11

Thought that “I May Not Match the Image I Want”

Want to avoid embarrassment – 13
Fear that someone would see through image – 13
Trying to uphold image of a good player – 13
Losing position in field – 7
Association with bad players – 7
Worried what others think – 11
Consequences of Success

Lower-Order Themes, & Meaning Units with Codes for Participants Reporting Each Meaning Unit (1-8 are Athletes, 9-16 are Performing Artists)

Lower-order Consequences of Success Themes, Meaning Units, and Participant Codes

**Others’ Expectations Increased**
- More responsibility – 2, 4, 8
- Others expect more – 5, 7, 12, 15, 16

**Own Expectations Increased**
- My expectations increased – 2, 3, 5, 9, 10
- Expect perfect – 3, 5, 8, 11
- Responsibility to give your best to the piece – 10
- Keeps me from slopping through performance – 9
- Expect success - 2

**Pressured Self Not to Fail**
- Didn’t want to fail – 2, 16
- What if I don’t succeed? – 16
- Higher own expectations harm performance – 13
- No longer not not successful – 16
- Worry I’ll have to leave before done or stay too long – 9, 12
- Must reinvent self – 15
- Full-time involvement required – 7, 16
- Don’t want to be involved less than I can – 14
- With more success, it is harder to be inconsistent - 3

**Enhanced Retrospective Feelings of Control**
- Know I had control – 5, 11
- I should be able to control any failure – 5
- Discipline of performance career makes new career seem easy – 9
- Gaining more control of career – 10
- Feeling of control over my talents – 11
- Know I worked hard – 1, 2, 6, 8, 11
- Know that I’ll be used for strengths, not pushed to fail – 12
- Knowing when to push and when not to push – 9
- Eager for next opportunity – 11
- Excitement of making audience listen – 15
- Play well and become more aggressive - 4

**Belief that “I Have Enhanced Performance Capabilities”**
- Better able to cope with mistakes – 10
- Better concentration – 2
- Learn to let go of control – 10
- Stronger - 2

**Rewards in Future Performance Opportunities**
- Get new music – 10
- More opportunities – 9, 10
- More success – 2, 8
Getting jobs - 16
See and work in new places – 8, 10, 13

Success Became a Bad Thing
Lost enjoyment of success – 2
Fear of success – 5, 14, 16
Everything else seemed duller – 2
Ego out of control, performance goes downhill – 3
Get lazy – 12
Fewer post-performance options because of sacrifices – 12
Stayed here, less known elsewhere – 12
You don’t know what you are going to be successful at – 2

Tangible Costs
Worked harder, got worse – 2
Injuries – 12
Being on the road is difficult – 10

Interpersonal Rivalry
Others jealous – 12
Others want to see you crack – 3, 8, 9
Doubt intentions with friends – 16
Compete with others – 5, 10, 12
Other performers rarely appreciate your success – 10
Others resent you for getting good roles – 16
Not liked by teammates – 4
Think you’re better than others – 3
Make efforts to find friends who are not actors (cope) - 16

Belief that “I Owe Others for My Success”
Must give back to sport – 2
Want to give back to those who helped – 8, 12
Must do it for the music – 13
Don’t want to disappoint others – 12, 16
Memory of grandfather goes wherever I go – 10
Music set a positive direction for my life - 13

Others Become More Invested in My Performance
Encouraged by important others – 12
Others become more involved – 7, 13, 15
Easier to approach others for help – 6, 8
Coach and parents’ support – 4

Increased Recognition and Appreciation
Fame – 2, 3, 5, 6, 8, 10, 12, 13, 15
People want to see me perform – 10, 15
Others believe in/respect me – 5, 6, 7, 10, 12, 15
Like feeling of respect from others – 5
People recognize me for music – 13
Reinforcement from an important person gives pride - 13
Friendships – 12, 13
Make friends, don’t want to move – 12
Felt Good About Myself as Performer
  Increased confidence – 2, 4, 5, 6, 7, 8, 9, 11
  More excited to try it again – 11
  Peak affective experience – 4, 10, 11, 13
  Feel stronger – 2
  Knowing I had an impact on the performance domain – 9, 13
  Tuck successful performance away but never forget it – 9
  More excited to try it again - 11
Felt Good About Myself
  Knowing that I have talent and abilities – 2
  Feel good about self – 1, 5, 6, 8, 9, 11
  Avoid feeling like a failure – 3, 12, 16
  Built self-esteem - 3
Humility
  Don’t take talent for granted – 9
  Must stay humble – 2, 5, 6, 9, 13
Extrapolating Composite Fear of Failure Appraisals

<table>
<thead>
<tr>
<th>Appraisal Domain (&quot;I am…&quot;)</th>
<th>Aversive Consequences of Failure</th>
<th>Consequences of Success Whose Absence Could Be Aversive</th>
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<td>Experiencing personal diminishment</td>
<td>Emotional cost/Feeling of personal diminishment, Lose confidence; Punitive action directed against self/Self-criticism</td>
<td>Enhanced perceptions of self/Feeling good about oneself</td>
</tr>
<tr>
<td>Demonstrating that I have low ability</td>
<td>Punitive action directed against self/Belief that “I’m no good”</td>
<td>Enhanced perceptions of self/Feeling good about myself as a performer; Performance benefits/Belief that I have enhanced performance capabilities</td>
</tr>
<tr>
<td>Demonstrating that I lack control</td>
<td>Attempted adaptation/Interpreted poor effort as the cause of failure; Feelings of losing control/Realization that “my opportunity is no longer guaranteed”, Perceptions of an uncertain future, Affected the performer’s personal life</td>
<td>Performance benefits/Enhanced retrospective feelings of control</td>
</tr>
<tr>
<td>Experiencing tangible losses</td>
<td>Tangible losses/Material loss, Repeated failure, Not accomplishing a goal, Blocked aspirations</td>
<td></td>
</tr>
<tr>
<td>Wasting my effort</td>
<td>Attempted adaptation/Interpreted poor effort as the cause of failure</td>
<td></td>
</tr>
<tr>
<td>Making my future uncertain</td>
<td>Feeling of losing control/Perceptions of an uncertain future, Realization that “my opportunity is no longer guaranteed”; Attempted adaptation/Decreased motivation to perform</td>
<td></td>
</tr>
<tr>
<td>Losing a special opportunity</td>
<td>Feeling of losing control/Realization that my opportunity is no longer guaranteed</td>
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<td>Causing others to lose interest in me</td>
<td>Increased psychological interaction with others/Others becoming more invested in my performance, Increased recognition and appreciation</td>
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<td>Disappointing or upsetting important others</td>
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## Extrapolating Composite Fear of Success Appraisals

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<tr>
<td>Not learning and improving</td>
<td>Attempted adaptation/Learned and improved performance, Attempted to cope</td>
<td></td>
</tr>
<tr>
<td>Facing an overly-rigid future</td>
<td>Feelings of losing control/Perceptions of an uncertain future</td>
<td></td>
</tr>
<tr>
<td>Accomplishing all of my goals</td>
<td>Tangible losses/Not accomplishing a goal, Blocked aspirations</td>
<td></td>
</tr>
<tr>
<td>Facing higher expectations (own and others)</td>
<td></td>
<td>Pressure to meet higher expectations/Others’ expectations raised, Own expectations raised, Pressured self not to fail</td>
</tr>
<tr>
<td>Losing enjoyment of success (desensitization)</td>
<td></td>
<td>Surprising costs of succeeding/Success became a bad thing</td>
</tr>
<tr>
<td>Experiencing tangible costs (slumps, injuries, loneliness, etc.)</td>
<td></td>
<td>Surprising costs of success/Tangible costs</td>
</tr>
<tr>
<td>Experiencing jealousy and interpersonal rivalry</td>
<td></td>
<td>Increased psychological interaction with others/Interpersonal rivalry, Increased recognition and appreciation</td>
</tr>
<tr>
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<td>Not receiving support from others</td>
<td>Shifts in interpersonal exchanges/Others offering support</td>
<td>Increased psychological interaction with others/Others becoming more invested in my performance</td>
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<tr>
<td>Losing or not increasing motivation</td>
<td>Attempted adaptation/Increased motivation to improve and succeed</td>
<td>Enhanced perceptions of self/Feeling good about myself as a performer</td>
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<td>Becoming over-confident</td>
<td>Emotional cost/Lost confidence, Cycle of negative emotions, Feelings of personal diminishment; Punitive action directed against self/Belief that “I’m no good,” Self-criticism; Attempted adaptation/Attempted to cope</td>
<td>Performance benefits/Enhanced retrospective feelings of control, Belief that “I have enhanced performance capabilities”; Enhanced perceptions of self/Feeling good about myself as a performer, Feeling good about myself</td>
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PROGRESS IN THE DEVELOPMENT OF A MULTIDIMENSIONAL MEASURE OF FEAR OF FAILURE: THE PERFORMANCE FAILURE APPRAISAL INVENTORY (PFAI)

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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 measures 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

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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 multidimensional measure of FF.

Initially, Atkinson (1960) 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, hetero-method 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 performera's 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 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 (Wamses 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; a 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

\(^2\)A 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., $\chi^2$, GFI) and incremental (i.e., NNFI, CFI) fit indices were calculated 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 considered. 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 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>
<thead>
<tr>
<th>Factor</th>
<th>$\chi^2$ ($df$)</th>
<th>GFI</th>
<th>NNFI</th>
<th>CFI</th>
<th>AIC</th>
<th>RMSEA [90% CI]</th>
<th>SRMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fear of Shame and Embarrassment (11)</td>
<td>54.92 (44)</td>
<td>.95</td>
<td>.98</td>
<td>.98</td>
<td>99.29</td>
<td>.04 [.00 - .06]</td>
<td>.04</td>
</tr>
<tr>
<td>Fear of Devaluing One’s Self-Estimate (8)</td>
<td>27.88 (20)</td>
<td>.97</td>
<td>.96</td>
<td>.97</td>
<td>57.92</td>
<td>.04 [.00 - .08]</td>
<td>.04</td>
</tr>
<tr>
<td>Fear of Having an Uncertain Future (5)</td>
<td>7.75 (5)</td>
<td>.98</td>
<td>.98</td>
<td>.98</td>
<td>27.70</td>
<td>.04 [.00 - .12]</td>
<td>.04</td>
</tr>
<tr>
<td>Fear of Losing Social Influence (9)</td>
<td>35.01 (27)</td>
<td>.96</td>
<td>.97</td>
<td>.96</td>
<td>70.06</td>
<td>.05 [.00 - .07]</td>
<td>.04</td>
</tr>
<tr>
<td>Fear of Upsetting Important Others (8)</td>
<td>32.38 (20)</td>
<td>.96</td>
<td>.97</td>
<td>.98</td>
<td>64.10</td>
<td>.06 [.01 - .09]</td>
<td>.04</td>
</tr>
</tbody>
</table>

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; Mott 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.

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.

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, NFI = .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

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**TABLE II** Fit indices for CFAs on the complete PFAI model

<table>
<thead>
<tr>
<th>Model</th>
<th>( \chi^2 ) (df)</th>
<th>GFI</th>
<th>NNFI</th>
<th>CFI</th>
<th>AIC</th>
<th>RMSEA</th>
<th>[90% CI]</th>
<th>SRMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>One factor</td>
<td>1803.85 (779)</td>
<td>.66</td>
<td>.65</td>
<td>.66</td>
<td>2288.50</td>
<td>.09</td>
<td>[0.09-0.10]</td>
<td>.08</td>
</tr>
<tr>
<td>Five factors (uncorrelated)</td>
<td>1719.24 (779)</td>
<td>.69</td>
<td>.68</td>
<td>.69</td>
<td>1947.83</td>
<td>.08</td>
<td>[0.08-0.09]</td>
<td>.23</td>
</tr>
<tr>
<td>Five factors (correlated)</td>
<td>1327.94 (769)</td>
<td>.75</td>
<td>.80</td>
<td>.82</td>
<td>1511.52</td>
<td>.06</td>
<td>[0.06-0.07]</td>
<td>.08</td>
</tr>
<tr>
<td>Five factors (correlated) with two method factors (correlated)</td>
<td>1130.80 (727)</td>
<td>.79</td>
<td>.85</td>
<td>.87</td>
<td>1340.30</td>
<td>.05</td>
<td>[0.04-0.06]</td>
<td>.07</td>
</tr>
<tr>
<td>High-order factor and five first-order factors</td>
<td>1342.33 (774)</td>
<td>.75</td>
<td>.80</td>
<td>.81</td>
<td>1512.36</td>
<td>.06</td>
<td>[0.06-0.07]</td>
<td>.08</td>
</tr>
</tbody>
</table>

---

1When 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.

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.

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*These 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 (Continued)

<table>
<thead>
<tr>
<th>Item</th>
<th>Parameter Estimate</th>
<th>SE</th>
<th>Uniqueness</th>
<th>SE</th>
<th>SMC</th>
<th>A priori item content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fear of Upsetting Important Others</td>
<td>5</td>
<td>1.00</td>
<td>n/a</td>
<td>.94</td>
<td>.10</td>
<td>.44</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>1.14</td>
<td>.16</td>
<td>1.14</td>
<td>.12</td>
<td>.41</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>1.19</td>
<td>.16</td>
<td>.78</td>
<td>.09</td>
<td>.50</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>1.16</td>
<td>.14</td>
<td>.78</td>
<td>.09</td>
<td>.58</td>
</tr>
<tr>
<td></td>
<td>25</td>
<td>1.31</td>
<td>.15</td>
<td>.72</td>
<td>.09</td>
<td>.62</td>
</tr>
<tr>
<td></td>
<td>29</td>
<td>– .94</td>
<td>.16</td>
<td>.74</td>
<td>.09</td>
<td>.50</td>
</tr>
<tr>
<td></td>
<td>33</td>
<td>1.36</td>
<td>.16</td>
<td>.64</td>
<td>.08</td>
<td>.68</td>
</tr>
<tr>
<td></td>
<td>37</td>
<td>1.49</td>
<td>.18</td>
<td>.44</td>
<td>.07</td>
<td>.74</td>
</tr>
</tbody>
</table>

Factor Covariates

<table>
<thead>
<tr>
<th>Factor</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Fear of Shame and Embarrassment</td>
<td>61</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Fear of Devaluing One’s Self-Estimate</td>
<td>39</td>
<td>.40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Fear of Having an Uncertain Future</td>
<td>51</td>
<td>.31</td>
<td>.83</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Fear of Losing Social Influence</td>
<td>49</td>
<td>.27</td>
<td>.49</td>
<td>.44</td>
<td></td>
</tr>
<tr>
<td>5. Fear of Upsetting Important Others</td>
<td>45</td>
<td>.20</td>
<td>.39</td>
<td>.46</td>
<td>.55</td>
</tr>
</tbody>
</table>

TABLE IV Descriptive statistics for the PFAI scales

<table>
<thead>
<tr>
<th>PFAI Scale</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>Skewness (SE = 0.12)</th>
<th>Kurtosis (SE = 0.25)</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Coefficient Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fear of Experiencing Shame and Embarrassment</td>
<td>391</td>
<td>.95</td>
<td>.87</td>
<td>.08</td>
<td>– .63</td>
<td>–2.00</td>
<td>1.91</td>
<td>.87</td>
</tr>
<tr>
<td>Fear of Devaluing One’s Self-Estimate</td>
<td>393</td>
<td>– .32</td>
<td>.76</td>
<td>.09</td>
<td>– .39</td>
<td>–2.00</td>
<td>1.88</td>
<td>.75</td>
</tr>
<tr>
<td>Fear of Having an Uncertain Future</td>
<td>395</td>
<td>– .13</td>
<td>.87</td>
<td>– .02</td>
<td>– .44</td>
<td>–2.00</td>
<td>2.00</td>
<td>.73</td>
</tr>
<tr>
<td>Fear of Losing Social Influence</td>
<td>393</td>
<td>– .49</td>
<td>.77</td>
<td>.44</td>
<td>.11</td>
<td>–2.00</td>
<td>2.00</td>
<td>.82</td>
</tr>
<tr>
<td>Fear of Upsetting Important Others</td>
<td>392</td>
<td>– .34</td>
<td>.97</td>
<td>.20</td>
<td>– .53</td>
<td>–2.00</td>
<td>2.00</td>
<td>.87</td>
</tr>
</tbody>
</table>

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 Corvergent and discriminant validity coefficients for the PFAI

<table>
<thead>
<tr>
<th>External scale</th>
<th>Lower-order factors</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance Appraisal</td>
<td>Perceived Competence</td>
<td>.30</td>
<td>.34</td>
<td>.39</td>
<td>.51</td>
<td>.44</td>
</tr>
<tr>
<td>Perceived Competence</td>
<td>Performance Appraisal</td>
<td>.09</td>
<td>– .02</td>
<td>.13</td>
<td>.02</td>
<td>.04</td>
</tr>
<tr>
<td>Social Desirability</td>
<td>School Goal Orientation</td>
<td>.17</td>
<td>.16</td>
<td>.20</td>
<td>.23</td>
<td>.08</td>
</tr>
<tr>
<td>Self-Esteem</td>
<td>Mastery (n = 82)</td>
<td>.04</td>
<td>.08</td>
<td>.02</td>
<td>– .10</td>
<td>– .07</td>
</tr>
<tr>
<td>Self-Esteem</td>
<td>Performance (n = 80)</td>
<td>.14</td>
<td>.14</td>
<td>.06</td>
<td>.15</td>
<td>.22</td>
</tr>
<tr>
<td>Self-Esteem</td>
<td>Performance Avoidance (n = 80)</td>
<td>.12</td>
<td>.07</td>
<td>.37</td>
<td>.31</td>
<td>.33</td>
</tr>
</tbody>
</table>

Note: All significance tests were one-tailed; *p < .01, **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-evaluate, (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-esteem (–.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, the analyses were performed using PFA scores grouped together in the same way as PFA scores. In addition, the one-way ANOVA was performed on the same factor in the analyses. The items were designed to measure the belief that failure indicated an individual’s propensity to experience personal shame. Public shame over failure, similar to the two-factor theory of personal shame and public shame, was measured in the FF and PFA constructs. When items were measured, the belief that failure indicated an individual’s propensity to experience personal shame was measured on a four-point scale, from 1 (not at all) to 4 (very strongly). The two-factor theory of personal shame was measured on a four-point scale, from 1 (not at all) to 4 (very strongly). The two-factor theory of personal shame was measured on a four-point scale, from 1 (not at all) to 4 (very strongly).

The factor loadings of the items on the scale were assessed using a principal component analysis. The combination of the two-factor theory of personal shame and scale dimensions indicates that the belief in failure decreases the belief in the social influence of others and increases the belief that personal shame over failure is greater. This finding is consistent with previous research (Elliot, 1997; Elliot, 1994; Elliot & Harackiewicz, 1990). It also suggests that the belief in personal shame over failure may be related to performance avoidance goals. This finding is consistent with the previous research that showed that individuals who were high in anxiety and achievement goals orientations, both PFA and FF, had a stronger belief in personal shame over failure. This finding is consistent with the previous research that showed that individuals who were high in anxiety and achievement goals orientations, both PFA and FF, had a stronger belief in personal shame over failure.
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.

Acknowledgments
This paper was based on the author’s doctoral dissertation at the University of Utah. This research was supported by a University of Utah Research Dissertation Fellowship.
I thank the members of my dissertation committee, Keith Henschen (Chair), Lorna Smith Benjamin, Hal Lawson, Ted Packard, and Barry Shultz for the feedback throughout this research.

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.

<table>
<thead>
<tr>
<th>RATING SCALE</th>
<th>-2</th>
<th>-1</th>
<th>0</th>
<th>+1</th>
<th>+2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do not believe at all</td>
<td>Believe 50% of the time</td>
<td>Completely believe</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

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.

References

Sage, Newbury Park, CA.


Supplementary Materials
The Original PFAI Item Pool

Devaluation of the Self-Estimate

Personal Diminishment
1. When I am failing, I lose respect for myself.
2. When I am failing, I feel like I let myself down.
3. When I am failing, I doubt that I am as good a person as I thought I was.
4. When I am failing, I am nearly worthless.
5. When I am failing, I feel just as good about myself as when I succeed. (Reverse)
6. When I am not succeeding, my personal worth is less than when I succeed.
7. When I am not succeeding, it bothers me that I was too confident before performing.
8. When I am not succeeding, I am less valuable than when I succeed.
9. When I am not succeeding, I still feel good about myself. (Reverse)
10. When I am not succeeding, I get down on myself easily.
11. When I am failing, I take criticism personally.

Poor Ability
1. When I am failing, it is usually because I do not have enough ability.
2. When I am failing, it is often because I am not smart enough to perform successfully.
3. When I am failing, I blame my lack of talent.
4. When I am failing, I wish that I were more able.
5. When I am failing, I believe that I have less ability than others.
6. When I am failing, I am afraid that I might not have enough talent.
7. When I am failing, I hope that I have more ability than I am showing.
8. When I am failing, it is rarely because I am not good enough. (Reverse)

Lack of Control
1. When I am failing, I wish I could control more of my performance.
2. When I am failing, I still feel in control of the outcome. (Reverse)
3. When I am failing, I hate the fact that I am not in control of the outcome. (Reverse)
4. When I am failing, it does not bother me that so many things are outside of my control. (Reverse)
5. When I am not succeeding, I wish I had more control over my performance.
6. When I am not succeeding, it is because too many factors are out of my control.
7. When I am not succeeding, I still feel completely in control of my performance. (Reverse)
8. When I am not succeeding, I am comfortable with not having control over the outcome. (Reverse)

Nonego Punishment

Wasted Effort
1. When I am failing, I try to save my energy so it is not wasted.
2. When I am failing, it is a waste of energy to do too much.
3. When I am failing, I try my hardest with no concerns about conserving energy. (Reverse)
4. When I am failing, I am upset if I become tired and still fail.
5. When I am failing, I like to know that I gave my best effort even though it wasn’t enough. (Reverse)
6. When I am failing, I believe that my effort is wasted.
7. When I am failing, it is even more important to go “all out” with no concerns about wasting my effort. (Reverse)
8. When I am failing, I feel okay about getting tired even if I still fail. (Reverse)
9. When I am failing, I try to save my effort for when it could make a difference.

Tangible Loss
1. When I am failing, I miss out on some rewards that I wanted.
2. When I am failing, I still get some rewards that I would have received for succeeding. (Reverse)
3. When I am failing, I lose awards that I would have liked to have.
4. When I am not succeeding, I do not get the awards that I want.
5. When I am not succeeding, there are certain advantages I miss out on.
6. When I am not succeeding, I still get all the advantages of succeeding. (Reverse)

Crushed Hope/Lost Opportunity
1. When I am failing, I doubt I will have another chance to show that I can do it.
2. When I am failing, I am afraid that I won’t be allowed to try again.
3. When I am failing, I can stay hopeful because I know I will have another opportunity later. (Reverse)
4. When I am failing, I am hopeful because I know that I can still accomplish what I want to accomplish in this area. (Reverse)
5. When I am failing, I worry that it is my last (or only) chance to do well.
6. When I am failing, I know that I will have another chance soon. (Reverse)
7. When I am failing, I feel like I am losing a great opportunity to accomplish something.
8. When I am failing, I lose hope for my future performances.

Uncertain Future
1. When I am failing, I usually do not know how to change my plans to be more successful.
2. When I am failing, I am not sure how I will handle the failure.
3. When I am failing, I am unsure of what I will do next.
4. When I am failing, my future seems uncertain.
5. When I am failing, I believe that my future plans will change.
6. When I am failing, it upsets my “plan” for the future.
7. When I am failing, important plans for the future change.
8. When I am failing, I have a plan for recovering. (Reverse)
9. When I am failing, I am not worried about it affecting my future plans. (Reverse)

Reduced Social Value

Others Lose Interest in Me
1. When I am not succeeding, people are less interested in me.
2. When I am not succeeding, people seem to want to help me less.
3. When I am not succeeding, people tend to leave me alone.
4. When I am not succeeding, I can tell that some people avoid me.
5. When I am not succeeding, some people do not want to associate with me.
6. When I am not succeeding, I do not blame others for not wanting to be around me. (Reverse)
7. When I am not succeeding, I understand why others would not want to be around me. (Reverse)
8. When I am not succeeding, some people are not interested in me anymore.
9. When I am not succeeding, my value decreases for some people.
10. When I am not succeeding, I am less useful to others.
11. When I am not succeeding, other people try to get involved in my life. (Reverse)

Others Let Down
1. When I am failing, I am disappointing people who are important to me.
2. When I am failing, it upsets important others.
3. When I am failing, I expect to be criticized by important others.
4. When I am failing, I am surprised if others criticize me. (Reverse)
5. When I am failing, I lose the trust of people who are important to me.
6. When I am failing, I let down people who depend on me.
7. When I am failing, important others do not like me.
8. When I am failing, important others are not happy.
9. When I am failing, important others still appreciate me. (Reverse)
10. When I am failing, important others are disappointed.
11. When I am failing, important people think less of me.

Self-Presentational Failure
1. When I am failing, it is embarrassing if others are there to see it.
2. When I am failing, I believe that everybody knows I am failing.
3. When I am failing, I believe that my doubters feel that they were right about me.
4. When I am failing, my doubters seem to gloat.
5. When I am failing, I believe that others think I look stupid.
6. When I am failing, I worry about what others think about me.
7. When I am failing, I worry that others may think I am not trying.
8. When I am failing, I believe that most people will not understand the real reasons why I failed.
Multidimensional Fear of Failure Measurement: The Performance Failure Appraisal Inventory

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The Pennsylvania State University

The Performance Failure Appraisal Inventory (PFAI) is a multidimensional measure of cognitive-motivational-relational appraisals associated with fear of failure (FF). College students (N = 544) completed the PFAI and a variety of other measures. Calibration sample analyses reduced the PFAI to 25 items measuring five appraisals in a higher-order factor structure that demonstrated tight cross-validity in the second half of the sample. The five aversive consequences of failure assessed by the PFAI included (a) experiencing shame and embarrassment, (b) devaluing one’s self-estimate, (c) having an uncertain future, (d) important others losing interest, and (e) upsetting important others. A five-item short form also demonstrated tight cross-validity. FF was associated with (a) high levels of worry, somatic anxiety, cognitive disruption, and sport anxiety, and (b) low levels of optimism. General FF was unrelated to either perceived competence or fear of success.

Successful performers often describe fear of failure (FF) as a factor that can motivate them to reach a high level of performance or prevent them from actualizing their potential. The FF construct possesses rare intuitive appeal and meaning, to social and behavioral scientists and lay persons alike, which is paralleled by few psychological constructs. Recent progress on a multidimensional model based on the cognitive-motivational-relational theory of emotion has reduced conceptual and methodological problems associated with FF (Conroy, 2001b; Conroy, Poczwardowski, & Henschen, 2001). We hope to add to this progress by refining a multidimensional measure of cognitive-motivational-relational appraisals associated with FF.

The consequences of FF can be severe, as this construct has been associated with problems in achievement, mental health, moral development, and physical health (for a review, see Conroy, 2001a). Although often assumed to be unidimensional, several multidimensional models of FF have been proposed (Birney, Burdick, & Teevan, 1969; Conroy et al., 2001; Schmalt, 1982). From an applied standpoint, these multidimensional models are useful because they attempt to reveal what individuals fear about failure. From a cognitive-motivational-relational perspective (Lazarus, 1991), FF will be associated with appraisals of threats to an individual’s ability to accomplish one or more personally meaningful goals when one fails in a performance. Thus, Conroy et al. extrapolated the consequences of failure and success identified by
elite performers to infer the content of cognitive-motivational-relational appraisals associated with FF (i.e., the aversive consequences of failing or not succeeding).

The Performance Failure Appraisal Inventory (PFAI) is grounded in the cognitive-motivational-relational theory of emotion (Lazarus, 1991) and is generally consistent with other multidimensional models of FF (e.g., Birney et al., 1969). This instrument measures beliefs that failure is associated with five aversive consequences (Conroy, 2001b). An initial attempt to develop a measure of FF appraisals narrowed the domain to five aversive consequences of failing: (a) experiencing shame and embarrassment, (b) devaluing one’s self-estimate, (c) having an uncertain future, (d) losing social influence, and (e) upsetting important others. A series of exploratory and confirmatory factor analyses were performed on two samples to establish the factorial validity of PFAI scores in a model with five correlated factors. Although a model with five first-order factors (representing appraisals) and one higher-order factor (representing general FF) could be estimated, Conroy reported that a model with five correlated appraisal factors and two correlated method factors (based on item stems) fit the data better.¹ In a preliminary test of cross-validity in that study, the fit of the latter model replicated successfully in a second sample. PFAI scores in that study were positively related to trait anxiety and performance-avoidance goal orientations and were generally unrelated to task (or mastery) and performance-approach goal orientations. Additionally, PFAI scores successfully classified 76.5% of participants based on their perceptions of underachievement.

The PFAI is a promising, theoretically-grounded measure of FF, but empirical, conceptual, and practical concerns remain. Empirically, individual appraisal scales demonstrated excellent fit when analyzed separately, but the fit of the assembled model was suboptimal by conventional standards (Conroy, 2001b). Additionally, the accepted model with five correlated factors was neither the most parsimonious model nor was it entirely consistent with a priori theory behind the PFAI, which held that the five appraisals should be associated with a higher-order factor representing a fear of (or motive to avoid) failure.

Conceptual flaws with the content of several items on the PFAI may have contributed to the empirical problems. For example, the published PFAI contained several items whose content was not entirely consistent with the appraisal of a specific aversive consequence of failure (e.g., items 1, 4, 6, 9, 11, 14, 20, 22, 31, 32, 35, 37). Other items failed to tap active cognitions and instead related to fantasies (e.g., item 22) or affect (e.g., items 4, 9). Finally, there are a number of negatively-worded (e.g., items 2, 4, 12, 17, 23, 25, 27, 36) or reverse-scored items (e.g., items 9, 17, 18, 21, 23, 29, 35) on the PFAI. Negative wording (often associated with reverse-scored items) may introduce systematic error variance into factor solutions (Marsh, 1996; Motl, Conroy, & Horan, 2000; Tomàs & Oliver, 1999); however, such negative wording should be central to an avoidance motivational orientation. Thus, we expect that reverse-scored items on the PFAI will introduce more systematic error into the factor solution than negatively worded items with substantive meaning.

On a practical level, the PFAI is a long instrument (i.e., 41 items) and it does not yield a single score for general FF. Practitioners and researchers alike may be more inclined to use this measure if a shorter version could be developed without sacrificing the psychometric quality of scores. These objectives can be accomplished by (a) identifying and removing problematic items from the full version of the instrument, (b) combining the most representative items from each factor to create a short-form measure of higher-order FF that samples the five appraisal domains, or (c) both of the above.

¹ A model with two first-order method factors, five first-order substantive factors, and a single higher-order factor to explain relationships between the substantive factors failed to converge.
These goals may be accomplished using the jigsaw piecewise technique to refine the PFAI model (Bollen, 2000). Under this method, “we fit pieces of the model individually and then together until we find a coherent whole” (p. 79). That is, separate confirmatory factor analyses are performed for individual first-order factors; conceptually and empirically informed modifications can be made to each scale at this stage. Once satisfactory models of individual appraisal factors are identified, the pieces of the model are assembled to test relationships between the factors. Theoretically plausible assembled PFAI models include (a) one factor representing FF, (b) five uncorrelated factors representing specific FF appraisals, (c) five correlated factors representing specific FF appraisals, and (d) a higher-order factor (general FF) that influences the five first-order appraisal factors. Bollen added that parameter estimates from models fitted in pieces should be compared to estimates from the assembled model as a test of model misspecification.

Model misspecification also may be the product of data-driven model modifications that capitalize on chance features of the samples on which they are based, even if the modifications are theoretically informed (MacCallum, Rosnowski, & Necowitz, 1992). Cross-validation of modified models is essential to rule out this plausible explanation for results. Bentler (1980) identified three degrees of cross-validation. “Loose cross-validation” involves a simple replication of a factor solution in an independent sample but it is insufficient in most cases because it does not test the generalizability, or invariance, of specific parameter estimates across samples (MacCallum, Rosnowski, Mar, & Reith, 1994). “Moderate (or partial) cross-validation” involves testing the invariance of specific parameters in a model between samples. MacCallum et al. (1994) proposed a hierarchy of cross-validation strategies with fixed loadings, fixed weights, and fixed structure in the model. “Tight cross-validation” occurs when all of the parameters in a model can be fixed from one sample and successfully reproduce the observed covariances in another sample.

Model modifications require caution when generalizing previous findings about score interpretations. New scores must be located in a nomological network to support interpretations of score meaning. For example, FF should be related to more negative outcome expectancies (i.e., beliefs that goals cannot be accomplished) and greater anxiety specific to a performance domain. Individuals with high or low competence may experience FF so we predicted that it would be unrelated to perceived competence. Finally, FF scores should not be confounded by fear of success (FS), a similar achievement-anxiety construct. For this study, we hypothesized that FF scores would be (a) positively related to sport anxiety, (b) negatively related to optimism and hope, and (c) unrelated to perceived competence and fear of success.

In summary, the present research had five purposes: (a) to evaluate the fit of the existing PFAI model in an independent sample, (b) to evaluate fit improvements from conceptually and empirically derived model modifications, (c) to assess the cross-validity of model modifications, (d) to develop a short form of the PFAI to measure general FF, and (e) to provide additional information about PFAI score meanings.

METHODS

Participants

Two different samples were used in these analyses. Sample A comprised female \( n = 234 \) and male \( n = 204 \) college students (2 participants did not report their sex). The sample included freshmen \( n = 72 \), sophomores \( n = 74 \), juniors \( n = 103 \), seniors \( n = 187 \), and graduate students \( n = 3 \); one participant did not report her year and 35 participants were varsity athletes. Participants’ ages ranged from 18 to 35 years \( (M = 20.5, SD = 1.9) \). This
sample was split so the first 252 participants formed a calibration sample (listwise deletion removed one participant due to missing data) and the remaining participants formed part of a cross-validation sample. This cross-validation sample was supplemented with data from Sample B from a separate experiment in our laboratory. Participants included female (n = 68) and male (n = 42) college students with a mean age of 21.1 years (SD = 1.1). The complete cross-validation sample contained usable data from 293 participants (listwise deletion resulted in the removal of five participants with missing data).

**Instruments**

The PFAI, a 41-item measure of beliefs that aversive consequences follow failure (Conroy, 2001b), was administered to measure FF appraisals. Responses were made on a five-point scale ranging from do not believe at all (−2) to believe 100% of the time (+2).

Participants also completed the 27-item Fear of Success Scale (FOSS; Zuckerman & Allison, 1976), an inventory that measures “a disposition to be anxious about . . . achievement because achievement has negative consequences” (p. 422). Responses were made on a rating scale ranging from strongly disagree (1) to strongly agree (7). The psychometric properties of scores on this measure have not been well-documented, but it is among the most popular FS measures and the only FS measure used in previous sport research.

The 21-item Sport Anxiety Scale (SAS; Smith, Smoll, & Schutz, 1990) provided scores for cognitive disruption, worry, somatic anxiety, and overall sport anxiety. Responses are made on a four-point response scale ranging from not at all (1) to very much so (4). SAS total scores have been strongly related to trait anxiety (large effect size [ES]), sport competition anxiety (large ES), precompetitive tension (large ES), confusion (large ES), anger (moderate-large ES), and depression (moderate ES). The internal consistency and test-retest reliability of the SAS have been adequate in previous research.

Perceived sport competence was assessed with the Carolina Sport Confidence Inventory (CSCI; Manzo, Silva, & Mink, 2001). Each item on the CSCI presented two statements; participants were forced to choose one of those statements and rate it as being either very true for me or somewhat true for me. Scores have demonstrated preliminary evidence of factorial validity and convergent validity in relation to scores on the Trait Sport Confidence Inventory, the Competitive State Anxiety Inventory-2, and teammate ratings of self-confidence.

The 6-item State Hope Scale (SHS; Snyder et al., 1996) and 12-item Life Orientation Test (LOT; Scheier & Carver, 1985) measured state and trait forms of optimism, respectively. The SHS provides scores for agency (i.e., “perceived capacity for initiating and maintaining the actions necessary to reach a goal,” p. 321) and pathways (i.e., “perceived ability to generate routes to one’s goals,” p. 321) as well as general state hope. The SHS is an internally consistent measure whose scores have demonstrated convergent and discriminant validity in relation to theoretically meaningful measures. Responses to the SHS were made on an eight-point scale ranging from definitely false (1) to definitely true (8). The 12 LOT items were rated on a five-point scale ranging from strongly disagree (0) to strongly agree (4) but only eight items were used to compute scores (the other four items were filler items). Scores on the LOT have demonstrated internal consistency as well as factorial, convergent, discriminant, and predictive validity.

Finally, the 8-item Defensive Pessimism Questionnaire (DPQ; Norem & Cantor, 1986) assessed optimistic and pessimistic expectations in a specific performance context. Items were modified to reflect an impending motor task for participants in Sample B (as opposed to the academic task in the original instrument). Responses were made on an 11-point scale ranging from not at all true of me (1) to very true of me (11). Responses to the four pessimism items
were subtracted from responses to the four optimism items to provide a single score describing preferred strategies for viewing the future.\(^2\) Scores have demonstrated predictive validity for identifying optimists and pessimists.

**Procedures**

All procedures were approved by the local Institutional Review Board to ensure participant’s safety and compliance with ethical guidelines for conducting research with human participants. Participants in Sample A were recruited from undergraduate Kinesiology and activities courses at a large northeastern university. They completed the PFAI, SAS, and FOSS at the start of a larger battery of measures that were used in another study. Participants in Sample B were recruited from Kinesiology undergraduate classes at the same university for an experiment that involved performing a motor task in an evaluative context. At the beginning of that experiment, they completed the PFAI, CSCI, DPQ, SHS, LOT, and FOSS in a random order on a laboratory computer.

**Data Analysis**

Maximum likelihood estimation with LISREL 8.3 (Scientific Software International, Inc., Chicago, IL) was used in the confirmatory factor analyses presented in this study. In all models, items were specified to load on one factor each; the loading for a lead indicator on each factor was fixed to 1.0 to establish a metric for the factor. Uniquenesses and disturbances were estimated for each item, but neither correlated uniquenesses nor correlated disturbances were permitted. As recommended by Hoyle and Panter (1995), a variety of absolute and incremental fit indices were used to assess model fit. Absolute fit indices included the \(c^2\) statistic, the goodness of fit index (GFI), root mean square error of approximation (RMSEA), and standar-dized root mean residual (SRMR). Incremental fit indices included the non-normed fit index (NNFI) and the comparative fit index (CFI). For GFI, NNFI, and CFI, we adopted values of .90 and .95 as indicative of acceptable and good fit, respectively. Browne and Cudeck (1993) indicated that RMSEA values of .08, .05, and .00 indicate reasonable, close, and exact fit, respectively. Hu and Bentler (1999) indicated that misspecified models are least likely to be accepted if models are rejected when SRMR > .09 and CFI < .95. The \(c^2\) statistic is known to be biased in large samples so it was not interpreted by itself. To evaluate cross-validation hypotheses, a series of progressively more restrictive invariance analyses, similar to those demonstrated by Jöreskog and Sörbom (1996), were performed. Chi-square difference tests were used to evaluate the effects of added restrictions on model fit (Bollen, 1989).

**RESULTS**

Based on calibration sample data, PRELIS 2.2 (Scientific Software International, Inc., Chicago, IL) provided Mardia’s (1970) coefficient values (normalized estimates) for multivariate skewness and kurtosis of 18.80 and 10.79, respectively. Corresponding estimates for the cross-validation sample were 23.38 and 13.82, respectively. These indices suggested that the data may not be multivariate normal; however, large samples inflate values for Mardia’s coefficient (Bollen, 1989; Mardia, 1970). Thus, the statistic was reported for descriptive purposes only (Boomsma, 2000).

\(^2\) We did not control for participants’ ability so pessimism scores could reflect justified or realistic pessimism as well as defensive pessimism. Our interpretations are made accordingly.
Based on the model presented by Conroy (2001b) and the guidelines for the jigsaw piecewise process (Bollen, 2000), separate CFAs were performed for each of the five appraisal scales. The fit indices for calibration sample a priori models were largely satisfactory according to conventional criteria. In light of previously described conceptual concerns, the worst item on each scale was identified using empirical indices (e.g., squared multiple correlations [SMCs], standardized residuals), the a priori conceptual criteria outlined earlier were considered, and a decision regarding item removal was made. The model was then re-estimated and the process was repeated until no conceptually or empirically problematic items remained. On the “fear of having an uncertain future” scale, a decision was made to retain a problematic item (item 23) because of local identification problems that emerged when testing the substantively meaningful a priori higher-order model if the fear of having an uncertain future factor was reduced to three items. This decision does not appear to have affected other results because, when the fear of having an uncertain future factor was modeled with each of the other factors, changes in model fit were negligible regardless of whether item 23 was included in the model or not. Additionally, the inter-factor correlations in the model with five correlated factors did not change appreciably when the item was removed compared to when the item was present (suggesting that the location of the factor centroid in multivariate space was not unduly affected by the item’s inclusion).

The content of the scales remained consistent with a priori scale names for four of the five scales; however, the domain sampled by the “fear of losing social influence” scale appeared to change. To reflect this alteration, this scale will henceforth be labeled “fear of important others losing interest.” Parameters estimated from the first sample accurately reproduced covariances in the second sample without significant decreases in model fit (i.e., each scale demonstrated tight cross-validity).

The next step in this jigsaw piecewise CFA involved combining all 25 items from the modified appraisal scales into a single model to compare various models of scores for the whole instrument. Table 1 summarizes the fit indices for several plausible models. As expected, a multidimensional factor structure best reproduced the covariances between items. The mean inter-factor correlation in the five correlated factors model was .60 (range = .29–.83). The fit of the higher-order factor model compared favorably with the five correlated factors model. The higher-order factor model was more parsimonious and theoretically meaningful than the correlated five-factor model, so we concluded that a higher-order factor should be modeled from PFAI scores.

A series of invariance analyses were performed to assess which parameters in the assembled higher-order model were invariant across samples. The replication of previous results in the cross-validation sample provided evidence for loose cross-validity of the solution. The covariance matrices for the calibration and cross-validation samples appeared to be equal and a series of \( \chi^2 \) difference tests between models with sequentially more restrictive constraints on parameters indicated that the constraints did not significantly decrease model fit. Thus, the model demonstrated tight cross-validity.

Table 2 presents item-level descriptive statistics for the modified PFAI scales as well as estimates for item loadings and SMCs from the common metric completely standardized solution in the tight-cross-validation analysis (i.e., combining data from both samples). Estimates did not appear to vary between the piecewise models and the assembled model. Table 2 also

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3 A table summarizing modifications made at each iteration of the analysis is available upon request from the first author.

4 These findings were consistent in both the calibration and cross-validation samples. A table of interfactor correlations is available upon request from the first author.
presents factor-level descriptive statistics, internal consistency estimates, and estimates of structural parameters from the same solution. Coefficient alpha for the higher-order factor (calculated using the five factor scores) was .82; alpha for all 25 items was .91. Long-form (i.e., 25 item) general FF scores ranged from –2.00 to +1.61 with a mean value of –0.17 (SD = 0.68). Lower-order factor scores were calculated by averaging responses to each item associated with the respective factor; long-form total scores were calculated by averaging scores for the five lower-order factors. Scales had unequal numbers of items and this scoring procedure ensures that each factor has equal influence on the general FF score.)

To develop a short-form measure of the higher-order FF factor, items with the largest SMCs on each factor in the calibration sample analyses were identified (items 12, 13, 19, 33, 40). As seen in Table 3, this model demonstrated acceptable fit in a calibration sample analysis as well as in a test of loose cross-validation. A series of progressively more restrictive invariance analyses demonstrated that the five-item short form satisfied the criteria for tight cross-validation because parameters estimated in the calibration sample (i.e., item loadings, factor covariances, and uniquenesses) did not significantly reduce the model’s ability to reproduce the covariance matrix for the cross-validation sample. The common metric completely standardized item loadings and uniquenesses, respectively, for this scale were: item 12 (0.56, 0.68), item 13 (0.58, 0.67), item 19 (0.64, 0.59), item 33 (0.48, 0.77), and item 40 (0.66, 0.56). Coefficient alpha for
### Table 2
Descriptive Statistics and Parameter Estimates from Calibration and Cross-Validation Samples

<table>
<thead>
<tr>
<th>Fear of experiencing shame and embarrassment</th>
<th>Piecewise Models Assembled Model</th>
<th>Piecewise Models Assembled Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor Score</td>
<td>Parameter</td>
<td>SMC</td>
</tr>
<tr>
<td>Item 16</td>
<td>0.48</td>
<td>0.23</td>
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<td>Item 26</td>
<td>0.60</td>
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<td>Item 30</td>
<td>0.60</td>
<td>0.36</td>
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<tr>
<td>Item 34</td>
<td>0.69</td>
<td>0.48</td>
</tr>
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<td>Item 38</td>
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<td>Item 40</td>
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<table>
<thead>
<tr>
<th>Fear of devaluing one's self-estimate</th>
<th>Piecewise Models Assembled Model</th>
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</thead>
<tbody>
<tr>
<td>Factor Score</td>
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</tr>
<tr>
<td>Item 2</td>
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</tr>
<tr>
<td>Item 12</td>
<td>0.87</td>
</tr>
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<td>Item 27</td>
<td>0.46</td>
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<table>
<thead>
<tr>
<th>Fear of having an uncertain future</th>
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</thead>
<tbody>
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<td>Factor Score</td>
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<td>Item 3</td>
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</tr>
<tr>
<td>Item 8</td>
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</tr>
<tr>
<td>Item 13</td>
<td>0.83</td>
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<tr>
<td>Item 23</td>
<td>−0.27</td>
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</table>

<table>
<thead>
<tr>
<th>Fear of important others losing interest</th>
<th>Piecewise Models Assembled Model</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Parameter</td>
</tr>
<tr>
<td>Item 19</td>
<td>0.76</td>
</tr>
<tr>
<td>Item 24</td>
<td>0.62</td>
</tr>
<tr>
<td>Item 28</td>
<td>0.61</td>
</tr>
<tr>
<td>Item 36</td>
<td>0.77</td>
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<tr>
<td>Item 39</td>
<td>0.67</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fear of upsetting important others</th>
<th>Piecewise Models Assembled Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor Score</td>
<td>Parameter</td>
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<tr>
<td>Item 5</td>
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<tr>
<td>Item 10</td>
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</tr>
<tr>
<td>Item 15</td>
<td>0.48</td>
</tr>
<tr>
<td>Item 25</td>
<td>0.83</td>
</tr>
<tr>
<td>Item 33</td>
<td>0.82</td>
</tr>
</tbody>
</table>

Note: Parameter estimates represent the common metric completely standardized solution for the higher-order model. All parameter estimates were statistically significant ($p < .01$). Item uniquenesses and factor disturbances can be calculated by subtracting SMC values from 1.0. Factor scores (i.e., average item responses for the scale) and standard deviations for each factor were computed using unit weights to facilitate comparison with future samples.
the five short-form items was .72. Short-form scores ranged from –2.00 to +2.00 with a mean value of 0.00 (SD = 0.84).\(^5\)

Pearson correlations of appraisal scores and general FF scores (long and short form) with a variety of external measures are presented in Table 4. As hypothesized, appraisal and FF scores were unrelated to fear of success in both samples, and largely unrelated to perceived sport competence. State and trait optimism scores were each negatively related to three FF appraisals, as well as both general FF scores. All PFAI appraisal and FF scores were positively related to cognitive disruption, somatic anxiety, worry, and total sport anxiety scores.

Similar to Norem and Cantor (1986), optimism-pessimism scores on the DPQ were used to identify optimists (i.e., scores in the top third of the distribution) and pessimists (i.e., scores in the bottom third of the distribution). Pessimists scored higher than optimists on general FF (long form: \(t[70] = 2.61, p < .05, ES = 0.62\); short form: \(t[71] = 2.13, p < .05, ES = 0.50\), fear of experiencing shame and embarrassment (\(t[72] = 3.67, p < .05, ES = 0.86\)), fear of devaluing one’s self-estimate (\(t[72] = 3.18, p < .05, ES = 0.86\)), and fear of having an uncertain future (\(t[72] = 2.27, p < .05, ES = 0.53\)). Pessimists and optimists did not differ with respect to fear of important others losing interest or fear of upsetting important others (\(p > .05\)).

### DISCUSSION

The present investigation improved the factorial validity of the PFAI by identifying and removing items that were poor on both conceptual and empirical grounds. As expected, reverse-scored items introduced a large proportion of error into the model. Six reverse-scored items were removed (items 9, 17, 18, 21, 29, 35); however, one reverse-scored item (23) was retained because of local identification problems that arose when testing the higher-order model if the fear of having an uncertain future scale was reduced below four items. The higher-order

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\(^5\) Short- and long-form scores were significantly correlated, \(r (438) = .92, p < .001\); however, this estimate was likely inflated because the short form was not administered separately.
model was of great substantive interest in the present study so a decision was made to retain this item for the present analyses with the caveat that future research should attempt to replace this item with a more appropriate, positively worded item.

Three items were removed from the fear of experiencing shame and embarrassment scale because their content seemed to represent a fear of devaluing one’s self-estimate (items 1, 6, 11). Items 4, 9, and 22 were removed because they did not assess cognitions directly. Finally, four items were removed because their content appeared to be inconsistent with the remaining items on their factors (items 14, 20, 31, 37). The 25 remaining items are presented in the Appendix. The relationships between the five factors used to summarize these items could be modeled with a single higher-order factor representing general FF.

For four of the five appraisals measured by the PFAI, the domain sampled by each item did not appear to change; however, the content of the fear of losing social influence domain was noticeably narrower after the model modifications. This factor may be more accurately labeled fear of important others losing interest to reflect these modifications. This “new” label actually corresponds to one of the appraisals originally identified by Conroy et al. (2001) and all of the items remaining on that scale were originally written to assess that appraisal. Thus, the revised PFAI sampled 7 of the 10 composite FF appraisals identified by Conroy et al.: (a) experiencing personal diminishment (part of fear of experiencing shame and embarrassment), (b) embarrassing self-presentation failure (part of fear of experiencing shame and embarrassment), (c) demonstrating poor ability (part of fear of devaluing one’s self-estimate), (d) lacking control (part of fear of devaluing one’s self-estimate), (e) having an uncertain future, (f) important others losing interest, and (g) upsetting important others. The PFAI does not necessarily assess all possible FF appraisals. For example, the PFAI does not sample beliefs that failure is associated with (a) wasting one’s effort, (b) losing a special opportunity, or (c)

### Table 4

<table>
<thead>
<tr>
<th>Sample and External Scale</th>
<th>S/E</th>
<th>DSE</th>
<th>UF</th>
<th>IOLI</th>
<th>UIO</th>
<th>FF (Long)</th>
<th>FF (Short)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sample A</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAS – Cognitive Disruption</td>
<td>.33&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.30&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.18&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.30&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.16&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.33&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.32&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>SAS – Worry</td>
<td>.61&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.52&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.37&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.35&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.29&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.56&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.55&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>SAS – Somatic Anxiety</td>
<td>.37&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.33&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.26&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.21&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.17&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.35&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.30&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>SAS – Total Score</td>
<td>.53&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.46&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.34&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.33&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.25&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.50&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.47&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Fear of Success</td>
<td>.09</td>
<td>.15&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.01</td>
<td>.13</td>
<td>.03</td>
<td>.11</td>
<td>.09</td>
</tr>
<tr>
<td><strong>Sample B</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Fear of Success</td>
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<td>-.08</td>
<td>.00</td>
<td>-.05</td>
<td>.01</td>
<td>.01</td>
<td>-.02</td>
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<td>Perceived Sport Competence</td>
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<td>.09</td>
<td>.24</td>
<td>.16</td>
<td>.06</td>
<td>.05</td>
</tr>
<tr>
<td>State Hope – Total</td>
<td>-.37&lt;sup&gt;b&lt;/sup&gt;</td>
<td>-.39&lt;sup&gt;b&lt;/sup&gt;</td>
<td>-.16</td>
<td>-.30&lt;sup&gt;+&lt;/sup&gt;</td>
<td>-.05</td>
<td>-.31&lt;sup&gt;b&lt;/sup&gt;</td>
<td>-.26&lt;sup&gt;+&lt;/sup&gt;</td>
</tr>
<tr>
<td>State Hope – Agency</td>
<td>-.34&lt;sup&gt;b&lt;/sup&gt;</td>
<td>-.34&lt;sup&gt;b&lt;/sup&gt;</td>
<td>-.13</td>
<td>-.34&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.01</td>
<td>-.28&lt;sup&gt;b&lt;/sup&gt;</td>
<td>-.27&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>State Hope – Pathways</td>
<td>-.29&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-.31&lt;sup&gt;b&lt;/sup&gt;</td>
<td>-.14</td>
<td>-.14</td>
<td>-.11</td>
<td>-.25</td>
<td>-.16</td>
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<tr>
<td>Life Orientation</td>
<td>-.41&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-.42&lt;sup&gt;b&lt;/sup&gt;</td>
<td>-.28&lt;sup&gt;b&lt;/sup&gt;</td>
<td>-.25</td>
<td>-.16</td>
<td>-.40&lt;sup&gt;b&lt;/sup&gt;</td>
<td>-.30&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

**Note:** Abbreviations in the table represent: fear of experiencing shame and embarrassment (S/E), fear of devaluing one’s self-estimate (DSE), fear of having an uncertain future (UF), fear of important others losing interest (IOLI), and fear of upsetting important others (UIO). To guard against an inflated Type-I error rate from testing each external score with seven PFAI scores, Bonferroni adjustments were made.

<sup>a</sup> p < .05,  <sup>b</sup> p < .01
experiencing tangible losses. Additionally, there may be other beliefs concerning aversive consequences of failure not identified by Conroy et al. Nevertheless, the PFAI appears to sample several major appraisals associated with FF.

Changes to the PFAI appear to have enhanced the content relevance of items as well as the empirical properties of scale scores. Although it is possible that the appraisal scales were over-fitted in the piecewise calibration sample analyses, we do not believe this possibility presents a large threat to the validity of our findings. None of the confidence intervals around the RMSEA included negative numbers (out-of-range values would suggest that models may have been over-fit) and the fit indices for the assembled model did not suggest an exact fit. It also seemed unlikely these modifications led to a misspecified model being accepted because (a) standardized parameter estimates for items (loadings and uniquenesses) were almost identical between the piecewise and assembled models, and (b) cross-validation analyses indicated that these results generalized across two samples of young adults.

General FF was associated with high levels of cognitive disruption, somatic anxiety, worry, and overall sport anxiety and low levels of optimism. FF is a subclass of performance anxiety constructs in sport so it was not surprising that FF was strongly related to sport anxiety. Consistent with the present findings, pessimists have previously demonstrated higher levels of both trait and sport anxiety (both of which have demonstrated strong relationships with FF) than optimists (Spencer & Norem, 1996). PFAI scores, at the appraisal and general levels, were not significantly related to fear of success. This finding distinguishes the PFAI from other FF measures whose scores have failed to demonstrate discriminant validity from fear of success (Jackaway & Teevan, 1976; Mulig, Haggerty, Carballosa, Cinnick, & Madden, 1985).

As expected, individual appraisal scores were very strongly related to worry on the SAS. Participants who feared failure because it meant that important others would lose interest in them had high levels of perceived sport competence. On the other hand, fears that failure would lead to devaluing one’s self-estimate were associated with lower levels of perceived sport competence. Scholars have concluded that anxiety and confidence are not opposite poles of a single dimension (Hardy, Jones, & Gould, 1996, pp. 55–56) although findings have been somewhat equivocal in this area. Although perceived competence and general FF were independent in this study (consistent with the conclusions of Hardy et al.), it is plausible that perceived competence may influence the specific appraisals that performers make about the consequences of failure. For example, it may be that only performers who believe they are competent believe that their future may become uncertain because of failure (i.e., performers with less perceived competence may believe that they have nothing to lose in the future if they fail). Similarly, less-competent performers may be more vulnerable than highly competent performers to fears of devaluing their self-estimate because their self-estimates are more easily influenced by individual episodes of failure or success. Both interpretations are consistent with a goal of self-protection in threatening situations (Tesser, Martin, & Cornell, 1996).

Low trait optimism scores have previously been associated with greater levels of anxiety and more irrational beliefs in general (Chang & Bridewell, 1998). A similar finding emerged in the present research although we prefer not to label FF appraisals as irrational beliefs.6 Trait optimism was associated with only three of five FF appraisals, indicating that FF was not always associated with pessimism. Nevertheless, results clearly indicated that fears of experi-

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6 Although similarities between irrational beliefs and FF appraisals (which we view as maladaptive thoughts) are evident, the difference is more than semantic. Individuals often have very logical reasons for adopting beliefs associated with FF appraisals (i.e., they are rational when understood from the perspective of the performer). Honoring this assumption may help consultants to understand why performers fear failure.
encing shame and embarrassment, devaluing one’s self-estimate, and having an uncertain future were consistently associated with a less optimistic orientation toward the future. Participants who feared experiencing shame and embarrassment, devaluing their self-estimate, or important others losing interest also were less hopeful about their performance in an upcoming evaluative motor task. Interestingly, the two former appraisals were associated with low levels of agentic and pathways thinking whereas the latter appraisal was only associated with low levels of agentic thinking. Performers who feared experiencing shame and embarrassment or devaluing their self-estimate appeared to be less hopeful about their ability to develop plans to meet their goals. This relationship may be weaker compared to trait optimism because FF appraisals are similar to dispositional constructs (e.g., situational expectancies) whereas hope is a state.

The short form of the PFAI contained the most representative item from each factor in the calibration sample analyses. The short form demonstrated a good fit to the data; however, it is not unusual for reasonably specified, small models to exhibit good fit (MacCallum, 1995, p. 30). The short form exhibited a similar pattern of correlations with external measures compared to the long form. These results should be interpreted with some caution because the short form was not administered as a true alternate form of the long form (such research is necessary in future; Smith, McCarthy, & Anderson, 2000). Nevertheless, the PFAI short form shows promise and merits consideration as a measure of general FF although further research is needed on this alternate form.

Researchers may be most interested in the general FF score provided by the PFAI short form because it requires less time to complete and has strong factorial validity and similar correlations with external measures. Internal consistency for the short form was slightly lower than that estimated for the long form; however, this difference was not surprising because reliability coefficients are known to be sensitive to the number of items used in their calculation (Crocker & Algina, 1986). The internal consistency estimate for the short form still exceeded conventional criteria (DeVellis, 1991).

Measurement-oriented priorities for future research with the PFAI include (a) developing an appropriate item to replace item 23, (b) evaluating the temporal stability of PFAI scores over various time periods, (c) linking PFAI scores to established nomological networks (e.g., hierarchical theory of achievement motivation, self-determination theory), and (d) creating a normative database with relevant populations (e.g., children, elites). On a more substantive level, the PFAI may be useful in identifying the features of early environments that are associated with the development of FF and uncovering the psychological dynamics (e.g., self-talk, fantasies, representational models of others) associated with FF. Conroy (2001) identified other research priorities related to the prevention and treatment of FF.

In future applications, performance enhancement consultants may find the PFAI useful as an assessment device and as a tool for monitoring the efficacy of their interventions. In assessments, long-form appraisal scores may be of greatest interest because those scores can facilitate the identification of specific maladaptive cognitions associated with failure. Consultants may then work on restructuring FF-related appraisal styles used by clients. Given that the instrument does not necessarily sample the entire domain of FF appraisals, consultants are encouraged to utilize interviews to supplement PFAI feedback. General FF scores may be useful for consultants seeking to identify clients who will be most threatened by failure. Provided that lower-order and higher-order factor scores are stable over time (an empirical question for future research), this instrument also may be useful for monitoring the efficacy of cognitive or cognitive-behavioral interventions aimed at reducing maladaptive cognitions associated with failure. Establishing cut-off criteria would be premature until evidence of predictive validity relative to relevant behavioral and mental health outcomes is available. Until
then, consultants are encouraged to judge the extremity of their clients’ FF scores in relation to the normal distribution of scores described in this sample (e.g., as a z-score computed using the reported $M$ and $SD$). As a final caution, we urge consultants not to employ PFAI scores for talent identification or selection purposes.

Based on these results, we conclude that it is appropriate to extend applications of the PFAI to performance enhancement consultations and more substantively oriented research. Elaborating on the cognitive, affective, and behavioral antecedents and consequences of FF appraisal styles should be a priority. We anticipate that effects will be larger for indices of cumulative behavior than for individual episodes of behavior and encourage researchers to include potential mediators of FF effects in their research (e.g., achievement goal orientations).

REFERENCES


Appendix

THE PERFORMANCE FAILURE APPRAISAL INVENTORY—REVISED

<table>
<thead>
<tr>
<th></th>
<th>-2</th>
<th>-1</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Do Not Believe</td>
<td>At All</td>
<td>Believe 50%</td>
<td>of the Time</td>
<td>Believe 100%</td>
</tr>
</tbody>
</table>

**Fear of Experiencing Shame and Embarrassment**
16. When I am not succeeding, I am less valuable than when I succeed.
26. When I am not succeeding, I get down on myself easily.
30. When I am failing, it is embarrassing if others are there to see it.
34. When I am failing, I believe that everybody knows I am failing.
38. When I am failing, I believe that my doubters feel that they were right about me.
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.

**Fear of Devaluing One’s Self-Estimate**
2. When I am failing, it is often because I am not smart enough to perform successfully.
7. When I am failing, I blame my lack of talent.
12. When I am failing, I am afraid that I might not have enough talent.
27. When I am failing, I hate the fact that I am not in control of the outcome.

**Fear of Having an Uncertain Future**
3. When I am failing, my future seems uncertain.
8. When I am failing, I believe that my future plans will change.
13. When I am failing, it upsets my “plan” for the future.
23. When I am failing, I am not worried about it affecting my future plans. (Reverse)

**Fear of Important Others Losing Interest**
19. When I am not succeeding, people are less interested in me.
24. When I am not succeeding, people seem to want to help me less.
28. When I am not succeeding, people tend to leave me alone.
36. When I am not succeeding, some people are not interested in me anymore.
39. When I am not succeeding, my value decreases for some people.

**Fear of Upsetting Important Others**
5. When I am failing, it upsets important others.
10. When I am failing, I expect to be criticized by important others.
15. When I am failing, I lose the trust of people who are important to me.
25. When I am failing, important others are not happy.
33. When I am failing, important others are disappointed.

*Note:* Item numbers are provided to identify the sequence of administration in previous research—missing numbers in the sequence were removed. Items 12, 13, 19, 33, and 40 can be used to create a short-form measure of general fear of failure.
Supplementary Materials
## Supplementary Table 1. Specification Search: Step-wise Fit Indices for CFA of Individual FF Appraisal Scales

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**Losing Social Influence/Important Others Losing Interest**

| A priori (9 items)                      | 27 | 58.38   | .07 (.05 - .09) | .05  | .95   | .93  | .95  |
| Remove item 9                          | 20 | 48.46   | .08 (.05 - .10) | .05  | .95   | .93  | .95  |
| Remove item 4                          | 14 | 22.68   | .05 (.00 - .08) | .03  | .98   | .98  | .98  |
| Remove item 14                         | 9  | 17.87   | .06 (.01 - .10) | .03  | .98   | .97  | .98  |
| Remove item 32                         | 5  | 1.57    | .00 (.01 - .04) | .01  | 1.00  | 1.02 | 1.00 |

**Upsetting Important Others**

| A priori (8 items)                      | 20 | 55.24   | .09 (.07 - .12) | .05  | .94   | .92  | .94  |
| Remove item 37                         | 14 | 25.98   | .06 (.02 - .10) | .04  | .97   | .96  | .98  |
| Remove item 29                         | 9  | 10.19   | .02 (.00 - .08) | .03  | .99   | 1.00 | 1.00 |
| Remove item 20                         | 5  | 2.60    | .00 (.00 - .06) | .02  | 1.00  | 1.01 | 1.00 |
## Supplementary Table 2. Fit Indices for CFA of Individual FF Appraisal Scales

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<td>12.10</td>
<td>.00 (.00 - .05)</td>
<td>.03</td>
<td>.99</td>
<td>1.00</td>
<td>1.00</td>
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<tr>
<td>Above + equal factor covariance</td>
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<td>12.87</td>
<td>.00 (.00 - .05)</td>
<td>.05</td>
<td>.99</td>
<td>1.00</td>
<td>1.00</td>
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<tr>
<td>Tight cross-validation</td>
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<td>20.03</td>
<td>.01 (.00 - .05)</td>
<td>.05</td>
<td>.99</td>
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<td>1.00</td>
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Model Comparisons

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<th>$\chi^2$</th>
<th>df</th>
<th>p</th>
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<tr>
<td>Item Loadings – Structure</td>
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<td>6</td>
<td>&gt; .01</td>
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<tr>
<td>Factor Variance - Item Loadings</td>
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<td>1</td>
<td>&gt; .01</td>
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<tr>
<td>Uniquenesses – Factor Loadings</td>
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<td>7</td>
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<th>Devaluing One’s Self-Estimate</th>
<th>$\chi^2$</th>
<th>df</th>
<th>p</th>
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<tr>
<td>Item Loadings – Structure</td>
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<tr>
<td>Factor Variance - Item Loadings</td>
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<th>p</th>
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</table>

Note. The name of the “fear of losing social influence” scale was changed to “fear of important others losing interest” to better reflect the new composition of the scale after modifications; this scale directly reflects the original factor proposed by Conroy et al. (in press).
Running head: PFAI TEMPORAL STABILITY

Factorial Invariance and Latent Mean Stability of Performance Failure Appraisals

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Abstract

Accumulating evidence points to the validity of fear of failure score interpretations for the Performance Failure Appraisal Inventory (PFAI); however, the temporal stability of scores has not been established previously. Female and male college students participating in exercise activity classes (N = 356) completed long and short form versions of the PFAI on four occasions over a three-week period. An evaluation of the factor structure, latent mean stability, and individual differences in change of PFAI scores was performed using longitudinal factorial invariance and latent growth curve analyses. Evidence was obtained for longitudinal factorial invariance of all first-order factors on the long form and the general fear of failure factor (long and short forms). Differential stability estimates for six time intervals ranging from 2 to 21 days exceeded conventional minimum values for all factors. A small decrease in latent mean scores due to a skills test and a possible habituation effect was observed after the first occasion for several factors.
Factorial Invariance and Latent Mean Stability of Performance Failure Appraisals

Fear of failure (FF) emerged as a very popular psychological construct in the 20th century. From the early personality research at Harvard University (Murray, 1938) to the achievement motivation research boom in the middle to later parts of the century (McClelland, Atkinson, Clark, & Lowell, 1953; Atkinson & Feather, 1966), the FF construct has stimulated a great deal of thought among psychologists. Although scientific interest waned for a period in the late century, recent work on a hierarchical theory of achievement motivation (Elliot, 1997) has revitalized interest in the FF construct among social scientists. In the world of sport, FF occupies a rare place of significance as an intuitive psychological construct. Most athletes and coaches would claim familiarity with FF and few would completely discount its significance in predicting performance-relevant affect, behavior, and cognition.

The cognitive-motivational-relational theory of emotion (Lazarus, 1991) has been applied in the conceptualization of FF as a multidimensional construct (Conroy, Poczwardowski, & Henschen, 2001). Essentially, this model asserts that two processes must occur for individuals to fear failure. First, individuals must anticipate that failure is possible (or even likely) or perceive that they are presently failing. Second, individuals must appraise that failure in that situation will bring about one or more aversive consequences. Conroy et al. (2001) interviewed elite performers whose experience and investment in their performance domain made them rich sources of information about the universe of perceived consequences of failing. Subsequently, Conroy (2001; Conroy, Willow, & Metzler, 2002) developed the Performance Failure Appraisal Inventory (PFAI) to measure individuals’ beliefs in specific aversive consequences of failing, including fears of (a) experiencing shame and embarrassment, (b) devaluing one’s self-estimate, (c) having an uncertain future, (d) having important others lose interest, and (e) upsetting
important others. The construct validity of PFAI scores have been evaluated in a series of studies on high school and college-aged recreational athletes. The purpose of the present research was to extend understanding of PFAI score meaning by evaluating the comparability of the PFAI factor structure over repeated assessments and the stability of the subscales over relatively brief intervals that are characteristic of interventions often used to alter achievement motives (cf. McClelland, 1965).

_Evaluating the Validity of Performance Failure Appraisals_

Evidence supporting the construct validity of PFAI scores is available from two studies published by Conroy (2001; Conroy et al., 2002).² One of the greatest advantages of the PFAI over alternative FF measures (e.g., Alpert & Haber, 1960; Passer, 1983; Sadd, Lenauer, Shaver, & Dunivant, 1978; Willis, 1982) may be its superior substantive foundation. The PFAI draws from the cognitive-motivational-relational theory of emotion, a mechanistic meta-theory of emotion with strong empirical support (Lazarus, 1991). The nature of the PFAI appraisals was consistent with and integrated earlier theoretical propositions about multidimensional aspects of FF (e.g., Birney, Burdick, & Teevan, 1969; Schmalt, 1982). Scores appear to be relevant for performers invested in socially-evaluative performance domains. The hierarchical model of PFAI scores has demonstrated a high degree of cross-validity based on simultaneous factorial invariance analyses in separate samples. Additionally, scores have demonstrated strong external validity with theoretically-similar and distinct constructs (Conroy, 2001; Conroy et al., 2002). The available evidence suggests that the PFAI may serve a useful purpose as a research instrument or as a diagnostic aid in consulting practices (especially for cognitive therapists seeking to identify the specific nature of maladaptive thoughts related to failure). Conroy et al. (2002) indicated that there is presently no justifiable basis for using PFAI scores in talent
detection or personnel selection applications. Pending support for the temporal stability of PFAI scores, it would also be premature to employ this instrument as a measure of intervention efficacy. Thus, one purpose of the present research was to investigate the temporal stability of PFAI scores.

*Elaborating on the Meaning of Stability*

Researchers traditionally evaluate the longitudinal generalizability of scores by assessing test-retest reliability (correlation coefficients), internal consistency (Cronbach’s alpha), intraclass correlations (Hoyt’s $r$), or G-coefficients. In each of these methods, systematic and measurement error variance of observed scores are collapsed resulting in a single coefficient which may be imprecise and difficult to interpret (Schutz, 1998). Additionally, these methods only account for variance in observed scores and do not distinguish true score variance in a latent variable from random error score variance that will attenuate reliability estimates. To overcome this lack of precision, structural equation modeling (SEM) techniques can be used to evaluate score stability. Three important categories of temporal score stability can be assessed using SEM: (a) structural stability, (b) differential stability, and (c) latent mean stability (cf. Marsh, 1993; Schutz, 1998).

Longitudinal comparison of individuals’ scores on measures with multiple indicators requires that similar latent variable structures underlie responses over time. *Structural* stability (i.e., longitudinal factorial invariance, LFI) refers to longitudinal consistency in multidimensional measurement properties and provides a basis for comparison of factor means and relations over time. LFI is achieved when models fit well using parameter estimates obtained at an initial occasion as estimates of the same parameters at subsequent time points. Meredith’s (1993; see also Hofer, Horn, & Eber, 1997) hierarchy of increasingly stringent tests of factorial invariance provides a structure for evaluating model fit and determining the level of LFI.
Evidence for increasingly stringent levels of LFI is supported when advancement through these hierarchical tests does not result in significant changes in model fit. If invariant factor loadings are not achieved, it is impossible to differentiate between time-related differences of latent means or latent variances due to substantive individual differences or to inconsistencies of measurement (Hofer, 1999).

*Differential* stability represents the correlation of individual latent scores assessed at two separate occasions separated by a significant time interval. It is analogous to traditional test-retest reliability if the interval is nearly instantaneous and retest effects are minimal. Differential stability summarizes consistencies in the rank ordering of individuals in a group over a specific time interval and provides information regarding individual differences in change as well as the reliability of retest scores. Although high differential stability suggests that individuals maintain their relative standing compared to others in the group, this technique does not capture changes in absolute scores of individuals over time. For example, individuals may maintain their relative standing amongst group members, yet their individual scores may decrease or increase as a function of a time constant (without affecting differential stability estimates).

A third category of temporal stability, *mean* stability, describes changes in the latent construct scores over time. Traditional tests of score changes over time (e.g., t-test, ANOVA) collapse individual scores into mean scores for groups at each time point, effectively discarding information about individual score trajectories over time. In SEM, techniques for modeling latent growth curves (LGC; McArdle, 1988) allow researchers to analyze growth, decline, or stability in individuals’ latent trajectories over a number of time points (i.e., waves). In LGC analyses, the *intercept* term provides the initial level of scores and the *slope* describes how much scores changed from that initial value over time. Furthermore, once an appropriate LGC is established
for a construct, covariates can be added to test hypotheses about plausible influences on individual variation in longitudinal change. This method permits the evaluation of mean change at both the group or population level and at the level of the individual, in terms of variance in rate of change over time.

**Purpose**

The present research was designed to investigate the (a) structural stability (i.e., longitudinal factorial invariance), (b) differential stability (i.e., latent variable test-retest reliability), and (c) latent mean stability (i.e., individual growth curve trajectories emphasizing fixed and random effects of stability) of PFAI scores over a three-week interval. Each aspect of stability was addressed separately for the five appraisal scores and two general FF scores (from the long and short forms of the PFAI).

**Methods**

**Participants**

Recreational athletes ($N = 356$) at a large university participated in this study on four occasions over a three-week interval for extra credit in physical activity classes. Participants included 106 women (30%), 250 men (70%) and 2 individuals who did not report their sex. Participants ranged in age from 18 to 34 years ($M = 21.57, SD = 1.92$). Participants were recruited from strength training ($n = 175$), golf ($n = 110$), jogging ($n = 61$), and walking ($n = 10$) classes. Three participants reported receiving treatment for FF or test anxiety and were removed from analyses.

**Instruments**

Both the 25-item long-form and 5-item short form versions of the PFAI (PFAI-S for the short form) were administered in this study. Each item began with one of two stems, “When I am
failing…” or “When I am not succeeding…,” followed by an aversive consequence of failing.
The items can be found in Conroy et al. (2002). Participants rated how often they believed each
statement was true for them on a five point scale ranging from –2 (do not believe at all) to +2
(believe 100% of the time); the midpoint of the response scale was anchored by 0 (believe 50% of
the time). Evidence supporting the factorial validity, external validity, and predictive stability of
PFAI scores was summarized by Conroy (2001; Conroy et al., 2002).

Procedures

After being introduced to the purpose of the study, the risks of participating, and their
rights, participants signed an informed consent document and completed the PFAI and PFAI-S.
A third instrument unrelated to the present research was administered between the long and short
forms of the PFAI. On average, participants needed 10 minutes to complete the questionnaires.
Three additional waves of data collection were completed two days, one week, and three weeks
after initial data collection.

Data Analysis

Missing data accounted for 8%, 28%, 23%, and 22% of the total sample at waves 1-4 of
data collection, respectively. The large proportion of missing data at wave 2 was likely due to the
following day being a national holiday during which classes were cancelled. Missingness (i.e.,
number of missing waves of data) was not correlated with general FF scores from the PFAI or
PFAI-S (ps > .05) so attrition did not appear to be a function of prior scores on FF. Data were
assumed to be missing at random (Graham, Hofer, Donaldson, MacKinnon, & Schafer, 1997;
Little & Rubin, 1987) for purposes of analysis and full information maximum likelihood
(AMOS; Arbuckle & Wothke, 1999) estimation was used to obtain parameter estimates under
conditions of incomplete data (Enders & Bandalos, 2001).
For each analysis, seven separate models were fitted: one for each of the five first-order appraisal factors on the PFAI, one for a second-order, general FF factor measured by the PFAI (unit weights were used to calculate the appraisal scores used as observed variables in this model), and one for a general FF factor measured by the PFAI-S. Separate models were fitted for simplicity in reporting results, because the scales can be used independently in practice, and because the multi-wave hierarchical model had problems converging when the five factors were modeled simultaneously. In each of the seven models, separate latent variables represented each of the four waves of scores for the relevant appraisal or general FF construct. Factors were permitted to covary across waves and corresponding uniquenesses (i.e., item residual variances) were permitted to covary across waves because these were not assumed to be independent across time within individuals.

Analyzing longitudinal factorial invariance. We assessed LFI for each of the seven models using Meredith’s (1993) hierarchy of increasingly stringent constraints of configural, weak, strong, and strict factorial invariance. Configural invariance required only that the number and pattern of factor loadings be equivalent across waves with factor identification constraints as needed. Weak factorial invariance (i.e., metric invariance; see also Hofer, Horn, & Eber, 1997; Widaman & Reise, 1997) involved equality constraints on the factor loadings across waves and evaluates the degree to which factor-variable regressions are identical. Strong factorial invariance models added equality constraints to the intercepts in the regression models relating manifest variables to latent constructs (i.e., mean intercepts) across waves. This model permits the evaluation of mean differences at the factor level, relative to a reference group (i.e., wave 1). To establish a metric for comparing latent variables across waves, the factor mean and variance at wave 1 were fixed to 0 and 1, respectively. Achievement of strong factorial invariance is a
minimum requirement for fitting second-order LGC models (Hofer, 1999). \textit{Strict} factorial invariance models involved the additional constraint of invariant uniquenesses across waves; this constraint forces specific and random error for each item to be equivalent over time. Although establishing strict factorial invariance assures the validity of comparisons across waves (Hofer, 1999), failure of such a constrained model is likely when change is modeled (Sayer & Cumsille, 2001).

To assess model fit we compared each of the sequential factorial invariance models described above to an appropriate independence model (estimated variances and means for observed variables only). Data analyses included a variety of absolute and incremental fit indices, as recommended by Hoyle and Panter (1995). The $\chi^2$ statistic served as the absolute index of fit while the non-normed fit index (NNFI; Tucker & Lewis, 1973), normed fit index (NFI; Bentler & Bonett, 1980), comparative fit index (CFI; Bentler & Bonett), and root mean square approximation (RMSEA; Browne & Cudeck, 1993) were used as incremental indices of fit. Values of .90 and .95 were operationally defined as acceptable and good fit, respectively, to assess fit of NNFI, NFI, and CFI (cf. Hu & Bentler, 1999). Model fit was evaluated using both $\chi^2$ difference tests and change in relative fit indices; however, the latter was emphasized more than the former because those indices are less sensitive to sample size and are more appropriate for evaluating badness-of-fit in regards to misspecification of factor loadings.

\textit{Analyzing differential stability.} Upon establishing the best-fitting and most appropriate factorial invariance model for each of the seven models, we assessed differential stability by estimating the standardized covariances (i.e., stability coefficients) between latent factors across waves. Four waves of data collection allowed for evaluation of six separate stability coefficients representing differential stability of latent scores over intervals of 2, 5, 7, 14, 19, and 21 days. By
convention, an arbitrary minimum standard for the reliability of research instrument scores has been suggested as .70 (Nunnally & Bernstein, 1994, p. 265); however, these coefficients will ideally approach 1.00, indicating that the rank ordering of participants was perfectly consistent over time in latent variable measurement models.

Analyzing latent mean stability. To evaluate intraindividual change in scores across waves, we specified two LGC models for each of the seven models which achieved at least strong factorial invariance. Both LGC models retained the constraints of the strong invariance model and provided information regarding the population average (i.e., fixed effects) and individual deviations from this average (i.e., random effects). The intercept factor represents the initial status of individuals on the latent construct. The slope factor represents the amount of intraindividual change over time (e.g., positive mean slopes indicate increasing scores over time whereas negative slopes indicate decreasing scores over time). First-order factor loadings on the higher-order intercept factor were fixed to one in both models. A no growth (intercept only) model was specified by fixing the four slope factor loadings to zero. A second plausible model, labeled linear trajectory, was specified by fixing the slope factor loadings to the corresponding time interval in days between occasions of measurement (i.e., wave 1 = 0, wave 2 = 2, wave 3 = 7, and wave 4 = 21). Latent growth curve models can be fit to unequal intervals between occasions (e.g., McArdle, 1988; Willett & Sayer, 1994) which retains the interpretation of the slope factor as the rate of change per interval of time (i.e., per day). Model fit was assessed and comparisons were made using the same approach used in LFI assessment.

Results

Table 1 shows descriptive statistics and internal consistency estimates at each wave of data collection for five FF appraisals and general FF scale scores (calculated with unit weights).
Following a Bonferroni correction to reduce the probability of familywise error, significant differences appeared between waves for group averages on all appraisal scale scores and the general FF score. The general trend in these differences was a decline following the initial data collection. This pattern was most pronounced for fears of experiencing shame and embarrassment and fears of devaluing one’s self-estimate, and least pronounced for fears of important others losing interest. No differences were evident in short form general FF scores across waves (ps > .05).

**Structural Stability**

Seven models were evaluated to assess their respective structural stability using LFI analyses. Table 2 presents the fit indices for sequential factorial invariance tests for each model. Each model achieved at least acceptable fit (i.e., relative fit indices > .90) for strong factorial invariance. Evaluation of weak factorial invariance revealed a statistically significant decline in absolute fit (i.e., $\Delta \chi^2/\Delta df$) for two appraisals (viz., fears of having an uncertain future and upsetting important others); however, relative fit indices did not decrease more than 0.01 for any of the seven models. Inspection of parameter estimates in the configural compared to the weak invariance models suggested that the constraint on the parameter between item 12 and the latent variable was responsible for the decrease of fit in the model of scores for fear of having an uncertain future. In a partial weak invariance model, the item 12 loading was not constrained (in any wave) and fit did not decline significantly compared to the configural invariance model ($\Delta \chi^2(6) = 6.69, p > .05$). Inspection of parameters in the fear of upsetting important others model revealed that the parameter estimates for items 9 and 14 differed substantially in the first (and only the first) wave of the configural compared to the weak invariance model. When these two parameters at wave 1 were not constrained to be equal, fit did not decrease substantially from the
configural invariance model ($\Delta \chi^2(10) = 17.57, p > .05$). Although items 9, 12, and 14 contributed to declining fit of these two models, the overall fit indices were quite acceptable so we concluded that the models demonstrated a substantial degree of weak invariance.

Although the addition of strong invariance constraints resulted in a statistically significant decrement in absolute fit for all models except the fear of having an uncertain future and the general FF-short form, relative fit indices did not decrease more than 0.02 for any of the models. To identify the sources of decreasing fit, parameter estimates were examined with and without the strong invariance constraints. For scores on fear of experiencing shame and embarrassment, item intercept parameters were overestimated in waves 3 and 4 in the strong compared to the weak invariance model; removing the equality constraint on those wave 3 and 4 parameters resulted in a non-significant decrease in fit, $\Delta \chi^2(2) = 9.02, p > .05$. In the model of scores for fear of devaluing one’s self-estimate, misfit could be attributed to constraints that over-estimated intercepts for items 4 and 7 in the third and fourth waves, and the intercept constraint for item 16 across all waves (the constrained parameter was underestimated at wave 1 and overestimated in the remaining waves). When these constraints were removed, fit did not decrease significantly compared to the weak invariance model ($\Delta \chi^2(2) = 0.55, p > .05$). With respect to the fear of important others losing interest, fit did not decrease significantly compared to the weak invariance model when constraints were lifted from the intercepts for items 11, 13, 21, and 23 at wave 3 and items 13 and 21 at wave 4 (all of which were overestimated under the equality constraints), $\Delta \chi^2(6) = 7.50, p > .05$. No particular source of misfit could be identified for the models of fear of upsetting important others or general FF-L so we concluded that these models did not demonstrate strong invariance. Across all strong invariance tests, the greatest decrease in relative fit appeared for fears of upsetting important others ($?NFI = .02, ?NNFI = \ldots$).
Given the stringency of the test for strong invariance, this result was not surprising and did not stimulate concern on our part.

Overall, placing increasingly stringent invariance constraints on factor structures did not substantially reduce relative model fit in any of the models, although several cases of partial invariance were noted. Table 3 presents the unstandardized solutions for the seven strong invariance models.\(^4\)

**Differential Stability**

Table 4 presents standardized covariances between waves for each latent variable in the seven *strong invariance* models. These values represent differential stability coefficients for time intervals ranging from 2 to 21 days. Test-retest stabilities estimated using zero-order correlations of unit-weighted factor scores are presented in parentheses next to each differential stability coefficient obtained from the factor models. All latent variable differential stability estimates exceeded conventional criteria for modest stability (e.g., .70; Nunnally & Bernstein, 1994, p. 265) for all intervals. On average, the zero-order correlation coefficients based on unit-weighted composite scores were approximately 90% as large as the differential stability estimates based on factor scores, indicating that the former underestimated the differential stability of PFAI scores by approximately 10%.

**Latent Mean Stability**

Table 5 presents results for no growth and linear trajectory model specifications. Six of seven no growth models achieved at least acceptable fit. Only fears of experiencing shame and embarrassment demonstrated noticeably less than desirable fit (i.e., NFI = .88). Compared to the no growth model, specification of linear trajectory models resulted in statistically significant increases in absolute fit for all models although change in relative fit indices indicated only
slightly better fit. It is reasonable to accept no growth specifications for each model; however, given the acceptable fit of the alternative model, it was appropriate to examine the parameter estimates of the linear trajectory specification for each model. Table 6 presents factor scores for each of these LFI models. Fears of important others losing interest and general FF (short form) did not decrease over four waves (i.e., mean slope = 0). Fears of having an uncertain future exhibited a slight increase over time. Scores for general FF (long form), and fears of experiencing shame and embarrassment, devaluing one’s self-estimate, and upsetting important others all demonstrated minimal decreases over time.

Post Hoc Analyses

Results of paired t-tests across waves and LGC analyses prompted further examination of the data to explore sources of the small mean score changes. In five of seven models, means at wave 1 were significantly greater than means at each subsequent wave, a finding that stimulated curiosity about data collection at wave 1. Participants involved in golf classes completed the initial battery of questionnaires on the same day as a skills test, prompting the a posteriori hypothesis that the unique wave 1 test setting in the golf classes contributed to the elevated wave 1 mean values. In post hoc analyses, we added a skills test covariate specified as a predictor of mean intercept and mean slope for each LGC model (i.e., a Level 2 predictor variable, Sayer & Cumsille, 2001). The covariate was dummy coded 1 or 0 corresponding to participants in golf classes (n = 85) or all other activity classes (n = 268), respectively. Linear and unspecified trajectory models were tested to evaluate whether the skills test affected initial FF or changes in FF over time. In six of seven models, skills test status was not significantly related to mean intercept or slope parameters, regardless of the specified trajectory (ps > .05). For the linear trajectory model of fears of upsetting important others, the skills test variable positively
predicted mean intercept parameters (parameter estimate = 0.48, \( p < .01 \)) but did not significantly predict mean slope (parameter estimate = -0.01, \( p > .05 \)). In the unspecified trajectory model of fears of upsetting important others, skills test related positively to mean intercept (parameter estimate = 0.48, \( p < .01 \)) and negatively to mean slope (parameter estimate = -0.20, \( p < .01 \)).

Discussion

The present study investigated the structural, differential, and mean stability of PFAI scores. In general, results indicated a high level of stability for PFAI appraisal scores and general FF (long and short form) scores. As expected from previous investigations of the PFAI factor structure (Conroy, 2001; Conroy et al., 2002), all parameter estimates were statistically significant and in the expected directions. Indeed the common metric factor loadings were similar to those obtained by Conroy et al. in previous work with this 25-item version of the PFAI. Thus, the a priori factor structure for all seven models successfully replicated previous findings in a sample of college students engaged in physical activity classes. The invariance of this factor structure among other relevant populations such as college student-athletes or elite athletes remains to be determined in future research.

These results provided the best evaluation yet of the factor structure for the PFAI short form by administering the short form as a true alternate form (Smith, McCarthy, & Anderson, 2000). Conroy et al. (2002) developed and evaluated the PFAI-S utilizing responses to items from the PFAI long form and it was not clear whether those results would generalize to circumstances when the short form was administered independently. The present results suggested that earlier results concerning the PFAI-S factor structure were indeed accurate.

The factor structure of responses to the PFAI and PFAI-S demonstrated relatively impressive consistency over a three-week interval. Specifically, relative fit indices did not
decrease greatly in any model although additional constraints revealed statistically significant
decrements in $\chi^2$ relative to degrees of freedom in some models. We concluded that the structure
of first-order factors and the higher-order factor were equivalent across different times of
measurement. This evidence permitted further examination of the differential and mean stability
of scores at the factor level.

The overall pattern of differential stability coefficients indicated that the relative position
of participants in the sample remained highly consistent over time. That is, over a period of three
weeks and with repeated assessment, the rank ordering of participants at each wave was highly
similar. Long form PFAI scores were slightly more stable over time than short form PFAI scores.
As expected, a slight degradation in differential stability was evident as the time interval
increased. This change was generally quite small and even the smallest differential stability

Scores for fears of having an uncertain future were associated with slightly more error
due to time than other appraisal scores. This difference was not altogether unexpected as
problems were previously noted with one item on this scale. The problematic item (#12) was the
only reverse-scored item on the PFAI and we recommend that this item be altered to be forward
scored in future research. For example, an item such as, “When I am failing, I am worried that
failing will affect my future plans,” should sample similar content as the offending item in the
present study but is forward scored and may increase scale stability over time.

One item on the fear of devaluing one’s self-estimate scale also had relatively small
squared multiple correlations across waves although its parameter estimates were statistically
significant and may encourage modification or replacement of this item as well. The PFAI
demonstrated superior differential stability compared to the PFAI-S. This difference was not
unexpected given that long form scores were based on more items and would be expected to incorporate less measurement error than short form scores (Nunnally & Bernstein, 1994). In any case, scores on both the PFAI and PFAI-S exhibited substantial differential stability over a three-week interval.

When standardized differential stability coefficients were compared to between-wave zero-order correlations of composite (unit-weighted) scores, the former were consistently larger than the latter (by approximately 10%). This difference illustrates one of the primary benefits of SEM analyses in psychological research; that is, SEM permits researchers to distinguish variance associated with unique variance and true score (common) variance in a construct. With respect to the differential stability estimates, all values exceeded .80 and “measurement error attenuates correlations very little at that [.80] level” (Nunnally & Bernstein, 1994, p. 265).

Interestingly, differential stability coefficients tended to be lower when wave 1 data was involved than when wave 1 was not involved, even when the interval was relatively short. For example, five-day differential stability coefficients (waves 2-3) tended to be larger than two-day stability coefficients (waves 1-2) and 14-day differential stability coefficients (waves 3-4) tended to be larger than 7-day differential stability coefficients (waves 1-3).

Differential stability coefficients do not necessarily indicate that mean scores were constant over time; they simply indicate whether the rank ordering of scores was consistent over time. Atkinson and Nevill (1998) referred to this point as a distinction between absolute agreement and relative reliability. Questions about changes in score values over time (i.e., absolute agreement) must be addressed in addition to questions about rank orderings of scores (i.e., relative reliability) before scores can be interpreted accurately in studies of change (e.g., developmental research, treatment research).
A series of paired t-tests revealed wave 1 score elevations for four appraisals and the long form general FF scores. The latent growth curve models offered a slightly more conservative picture because the no growth models demonstrated acceptable fit for all models. Linear growth models, a more liberal test than no growth models, indicated (a) no change in scores over time for two models, (b) a significant increase in scores over time for one model, and (c) small (but significant) decreases in scores for four models.

The decreased differential stability for intervals associated with wave 1 data suggested that the skills test administered to some participants at wave 1 may be a plausible explanation for the change in means. This a posteriori hypothesis was supported for fears of upsetting important others. Under the circumstances, this finding was quite reasonable because failing the skills test may disappoint the teacher. It was impressive that this PFAI subscale was so sensitive to the social context under which the measure was administered; however, this sensitivity also was somewhat disappointing because the appraisals were theorized to be highly stable over time (i.e., emotional traits; Vallerand & Blanchard, 2000). The acceptable fit of no growth models suggests that PFAI appraisal scores were quite stable in practical terms and we continue to view them as emotional traits. Nevertheless, we recommend that users not administer the PFAI on occasions when performance evaluations occur (i.e., when the possibility of failing is especially salient).

The skills test hypothesis was not supported for any of the other appraisal scores that changed or for the general FF score. Habituation may be a more relevant concern for these other appraisals and for the general FF scores. Fortunately, the magnitude of this effect rendered the change practically inconsequential (e.g., fears of experiencing shame and embarrassment exhibited the greatest change over the three weeks \[d = -.30\], an effect that represented approximately a 5% weakening of beliefs based on the metric of the response scale). Our
recommendations for users are to incorporate multiple PFAI assessments and include appropriate
predictors of slope and intercept parameters. These strategies will help to establish accurate
estimates of developmental trajectories and eliminate concerns about habituation or other
potential confounding influences of score changes.

Summary and Conclusions

All models of PFAI responses exhibited strong longitudinal factorial invariance, high
levels of differential stability, and a relatively high degree (in practical terms) of latent mean
stability. These results contribute to the accumulating body of knowledge related to the meaning
of PFAI scores by providing support for structural and generalizability aspects of score validity.
These findings illustrate the clarity provided by distinguishing different forms of latent variable
stability and the utility of structural equation modeling approaches to evaluating stability. We
hope that these techniques will be used increasingly when evaluating psychological measures.

Based on these results, new PFAI applications are possible. The strong stability of scores
suggests that this tool may be used effectively as a measure of change in treatment or prevention
research, provided that multiple assessments are made to establish accurate developmental
trajectories that account for habituation effects. This new possibility complements existing
assessment and diagnostic applications for the PFAI. With that in mind, further research on PFAI
factorial invariance and score stability using longer time intervals with participants from
different populations defined by gender, age (e.g., youth) and skill categories (e.g., elites) is still
necessary. Establishing the domain specificity/generality of FF also remains an important issue
for future research (e.g., do individuals who fear failing in sport also fear failing in other
evaluative activities such as academics?). Additionally, further research extending understanding
of psychological and behavioral consequences of FF would be valuable.
Footnotes

1 FF is sometimes referred to as infavoidance or a motive to avoid failure in these literatures.

2 Most of the research on this instrument to date has involved the long-form version; research involving the short-form version of the PFAI that comprises one item from each long-form scale is needed.

3 Item level descriptive statistics are available from the first author upon request.

4 Although it is not the focus of this paper, it seems appropriate to report that observed scores from the PFAI and PFAI-S exhibited large positive correlations at all waves ($r_1 = .86, r_2 = .85, r_3 = .88, r_4 = .87, ps < .01$). This finding supports the convergent validity of these alternate forms.
References


### Table 1

**Descriptive Statistics for Appraisal and Adjusted Mean Scores for Factors**

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*Note.* SE = Fears of experiencing shame and embarrassment, DSE = Fears of devaluing one’s self-estimate, UF = Fears of having an uncertain future, IOLI = Fears of important others losing interest, UIO = Fears of upsetting important others, FF-L = General fear of failure (long form), FF-S = General fear of failure (short form). Means were calculated using unit weights. Mean values sharing a common subscript in a row were significantly different (Bonferroni corrected $p < .05$).
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Model Parameters for Strong Invariance Models

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General Fear of Failure (Long Form)

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<td>.42</td>
<td>.53</td>
<td>.54</td>
<td>.58</td>
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<td>0.04</td>
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<td>.38</td>
<td>.39</td>
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<tr>
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<td>.54</td>
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General Fear of Failure (Short Form)

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<th>Wave 3</th>
<th>Wave 4</th>
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<td>.33</td>
<td>.38</td>
<td>.46</td>
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<tr>
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<td>0.05</td>
<td>.36</td>
<td>.36</td>
<td>.42</td>
<td>.46</td>
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<td>0.76</td>
<td>0.05</td>
<td>.47</td>
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<tr>
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*Note.* Item 12 should be reversed prior to scoring.
Table 4

*Differential Stability (and Test-Retest Reliability) Coefficients - Strong Invariance Models*

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<th>Waves 1-3</th>
<th>Waves 3-4</th>
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<td>5 days</td>
<td>7 days</td>
<td>14 days</td>
<td>19 days</td>
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<tr>
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<td>.90 (.82)</td>
<td>.95 (.89)</td>
<td>.83 (.76)</td>
<td>.91 (.85)</td>
<td>.89 (.81)</td>
<td>.83 (.76)</td>
</tr>
<tr>
<td>DSE</td>
<td>.96 (.82)</td>
<td>.94 (.85)</td>
<td>.87 (.76)</td>
<td>.95 (.85)</td>
<td>.91 (.83)</td>
<td>.83 (.76)</td>
</tr>
<tr>
<td>UF</td>
<td>.87 (.75)</td>
<td>.96 (.84)</td>
<td>.85 (.69)</td>
<td>.96 (.84)</td>
<td>.92 (.81)</td>
<td>.80 (.65)</td>
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<td>IOLI</td>
<td>.88 (.78)</td>
<td>.96 (.86)</td>
<td>.91 (.78)</td>
<td>.95 (.84)</td>
<td>.93 (.81)</td>
<td>.84 (.71)</td>
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<td>UIO</td>
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<td>.96 (.88)</td>
<td>.87 (.74)</td>
<td>.90 (.83)</td>
<td>.92 (.82)</td>
<td>.85 (.70)</td>
</tr>
<tr>
<td>FF-L</td>
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<td>.95 (.92)</td>
<td>.89 (.83)</td>
<td>.93 (.90)</td>
<td>.92 (.88)</td>
<td>.87 (.81)</td>
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<td>.87 (.81)</td>
<td>.90 (.82)</td>
<td>.87 (.82)</td>
<td>.82 (.78)</td>
<td>.84 (.76)</td>
</tr>
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</table>

*Note.* SE = Fears of experiencing shame and embarrassment, DSE = Fears of devaluing self-estimate, UF = Fears of having an uncertain future, IOLI = Fears of important others losing interest, UIO = Fears of upsetting important others, FF-S = General fear of failure (short form), FF-L = General fear of failure (long form). Pearson product-moment correlation estimates of test-retest reliabilities using observed scores are in parentheses. All correlations were statistically significant ($p < .01$).
Table 5

Fit Indices and Parameter Estimates for LGC Models

<table>
<thead>
<tr>
<th></th>
<th>df</th>
<th>( \chi^2 )</th>
<th>( \Delta ) df</th>
<th>Intercept M</th>
<th>Var. M</th>
<th>Slope M</th>
<th>Var. M</th>
<th>Cov.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fears of Experiencing Shame and Embarrassment</strong></td>
<td></td>
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<td></td>
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<tr>
<td>No growth</td>
<td>349</td>
<td>723.77</td>
<td>--</td>
<td>8.73*</td>
<td>6.55*</td>
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<td>0.00</td>
<td>0.00</td>
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<tr>
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<td>346</td>
<td>668.28</td>
<td>33.49*</td>
<td>2.17*</td>
<td>0.35*</td>
<td>-0.01*</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>Fears of Devaluing One’s Self-Estimate</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No growth</td>
<td>103</td>
<td>267.45</td>
<td>--</td>
<td>22.37*</td>
<td>10.61*</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
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<tr>
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<td>233.73</td>
<td>33.72*</td>
<td>4.13*</td>
<td>0.40*</td>
<td>-0.01*</td>
<td>0.00</td>
<td>0.00</td>
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<tr>
<td><strong>Fears of Having an Uncertain Future</strong></td>
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<td></td>
<td></td>
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<tr>
<td>No growth</td>
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<td>211.19</td>
<td>--</td>
<td>21.68*</td>
<td>9.26*</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
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<tr>
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<td>11.82*</td>
<td>0.02*</td>
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<th>df</th>
<th>$\chi^2$</th>
<th>diff</th>
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<th>NNFI</th>
<th>CFI</th>
<th>RMSEA (90% C. I.)</th>
<th>Intercept</th>
<th>Var.</th>
<th>M</th>
<th>Var.</th>
<th>Cov.</th>
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<tr>
<td><strong>Fears of Important Others Losing Interest</strong></td>
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<td>--</td>
<td>169</td>
<td>345.10</td>
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<td>--</td>
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<td>.95</td>
<td>.95</td>
<td>.05</td>
<td>.05-.06</td>
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<td>9.21</td>
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<td>14.65</td>
<td>166</td>
<td>330.45</td>
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<td>14.65</td>
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<td>.95</td>
<td>.96</td>
<td>.05</td>
<td>.05-.06</td>
<td>2.38</td>
<td>0.68</td>
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<td>.92</td>
<td>.93</td>
<td>.07</td>
<td>.06-.08</td>
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<td>433.19</td>
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<td>.94</td>
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<td>.06-.08</td>
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<td>--</td>
<td>169</td>
<td>486.48</td>
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<td>.92</td>
<td>.94</td>
<td>.95</td>
<td>.07</td>
<td>.07-.08</td>
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<td>166</td>
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<th>M</th>
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<th>Cov.</th>
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<td>.95</td>
<td>.96</td>
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<td>5.99*</td>
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<td>.96</td>
<td>.97</td>
<td>.05 (.04 - .08)</td>
<td>2.05*</td>
<td>0.45*</td>
<td>0.00</td>
<td>0.00*</td>
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</table>

* \( p < .05 \)
Table 6

*Factor Means and Variances for LFI Models*

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<td>Variance</td>
<td>M</td>
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<td>0.00</td>
<td>1.12**</td>
<td>0.00</td>
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<tr>
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<td>1.12**</td>
<td>-0.30**</td>
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<tr>
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<td>-0.19**</td>
<td>1.08**</td>
<td>-0.30**</td>
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<td>Fears of Devaluing One’s Self-Estimate</td>
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<td></td>
<td></td>
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<tr>
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<td>0.00</td>
<td>1.17**</td>
<td>0.00</td>
</tr>
<tr>
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<td>-0.19**</td>
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<td>-0.18**</td>
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<tr>
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<td>0.00</td>
<td>1.23**</td>
<td>0.00</td>
</tr>
<tr>
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<td>1.23**</td>
<td>-0.20**</td>
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<tr>
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<td>-0.19**</td>
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<tr>
<td>Weak</td>
<td>0.00</td>
<td>1.30**</td>
<td>0.00</td>
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<tr>
<td>Strong</td>
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<tr>
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<td>0.06</td>
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<td>0.17**</td>
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(table continues)
### Fears of Upsetting Important Others

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<td>Variance</td>
<td></td>
<td>$M$</td>
<td>Variance</td>
<td></td>
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<td>Weak</td>
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<td>1.21**</td>
<td>0.00</td>
<td>1.31**</td>
<td>0.00</td>
<td>1.30**</td>
</tr>
<tr>
<td>Strong</td>
<td>-0.11*</td>
<td>1.21**</td>
<td>-0.14**</td>
<td>1.31**</td>
<td>-0.20**</td>
<td>1.29**</td>
</tr>
<tr>
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<td>1.15**</td>
<td>-0.13**</td>
<td>1.24**</td>
<td>-0.19**</td>
<td>1.22**</td>
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### General FF (Long form)

<table>
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<th></th>
<th>Wave 4</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>Variance</td>
<td></td>
<td>$M$</td>
<td>Variance</td>
<td></td>
</tr>
<tr>
<td>Weak</td>
<td>0.00</td>
<td>1.41**</td>
<td>0.00</td>
<td>1.51**</td>
<td>0.00</td>
<td>1.63**</td>
</tr>
<tr>
<td>Strong</td>
<td>-0.15**</td>
<td>1.41**</td>
<td>-0.20**</td>
<td>1.52**</td>
<td>-0.25**</td>
<td>1.64**</td>
</tr>
<tr>
<td>Strict</td>
<td>-0.15**</td>
<td>1.37**</td>
<td>-0.20**</td>
<td>1.49**</td>
<td>-0.26**</td>
<td>1.60**</td>
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</table>

### General FF (Short form)

<table>
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<tr>
<th></th>
<th>Wave 2</th>
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<th>Wave 3</th>
<th></th>
<th>Wave 4</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>Variance</td>
<td></td>
<td>$M$</td>
<td>Variance</td>
<td></td>
</tr>
<tr>
<td>Weak</td>
<td>0.00</td>
<td>1.02**</td>
<td>0.00</td>
<td>1.21**</td>
<td>0.00</td>
<td>1.37**</td>
</tr>
<tr>
<td>Strong</td>
<td>-0.04</td>
<td>1.02**</td>
<td>-0.01</td>
<td>1.21**</td>
<td>-0.10*</td>
<td>1.37**</td>
</tr>
<tr>
<td>Strict</td>
<td>-0.04</td>
<td>1.03**</td>
<td>-0.01</td>
<td>1.20**</td>
<td>-0.10*</td>
<td>1.34**</td>
</tr>
</tbody>
</table>

*Note.* All factor means and variances at wave one were fixed to zero and 1.0, respectively, in each of the models. All factor means in the weak invariance models were fixed to zero.

* $p < .05$, ** $p < .01$
APPENDICES
The Performance Failure Appraisal Inventory (Long-Form, 25 Items)

<table>
<thead>
<tr>
<th>Response Scale</th>
<th>-2</th>
<th>-1</th>
<th>0</th>
<th>+1</th>
<th>+2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do Not Believe</td>
<td>At All</td>
<td>Believe 50%</td>
<td>of the Time</td>
<td>Believe 100%</td>
<td>of the Time</td>
</tr>
</tbody>
</table>

___ 1. When I am failing, it is often because I am not smart enough to perform successfully.
___ 2. When I am failing, my future seems uncertain.
___ 3. When I am failing, it upsets important others.
___ 4. When I am failing, I blame my lack of talent.
___ 5. When I am failing, I believe that my future plans will change.
___ 6. When I am failing, I expect to be criticized by important others.
___ 7. When I am failing, I am afraid that I might not have enough talent.
___ 8. When I am failing, it upsets my “plan” for the future.
___ 9. When I am failing, I lose the trust of people who are important to me.
___ 10. When I am not succeeding, I am less valuable than when I succeed.
___ 11. When I am not succeeding, people are less interested in me.
___ 12. When I am failing, I am not worried about it affecting my future plans.
___ 13. When I am not succeeding, people seem to want to help me less.
___ 14. When I am failing, important others are not happy.
___ 15. When I am not succeeding, I get down on myself easily.
___ 16. When I am failing, I hate the fact that I am not in control of the outcome.
___ 17. When I am not succeeding, people tend to leave me alone.
___ 18. When I am failing, it is embarrassing if others are there to see it.
___ 19. When I am failing, important others are disappointed.
___ 20. When I am failing, I believe that everybody knows I am failing.
___ 21. When I am not succeeding, some people are not interested in me anymore.
___ 22. When I am failing, I believe that my doubters feel that they were right about me.
___ 23. When I am not succeeding, my value decreases for some people.
___ 24. When I am failing, I worry about what others think about me.
___ 25. When I am failing, I worry that others may think I am not trying.
Scoring Template:
Performance Failure Appraisal Inventory (25 Item Long Form)

**Fear of Experiencing Shame & Embarrassment (FSE)**

\[
\frac{(___ + ___ + ___ + ___ + ___ + ___ + ___)}{7} = \_
\]

<table>
<thead>
<tr>
<th>item #</th>
<th>10</th>
<th>15</th>
<th>18</th>
<th>20</th>
<th>22</th>
<th>24</th>
<th>25</th>
</tr>
</thead>
</table>

**Fear of Devaluing One’s Self-Estimate (FDSE)**

\[
\frac{(___ + ___ + ___ + ___)}{4} = \_
\]

<table>
<thead>
<tr>
<th>item #</th>
<th>1</th>
<th>4</th>
<th>7</th>
<th>16</th>
</tr>
</thead>
</table>

**Fear of Having an Uncertain Future (FUF)**

\[
\frac{(___ + ___ + ___ - ___)}{4} = \_
\]

<table>
<thead>
<tr>
<th>item #</th>
<th>2</th>
<th>5</th>
<th>8</th>
<th>12</th>
</tr>
</thead>
</table>

**Fear of Important Others Losing Interest (FIOLI)**

\[
\frac{(___ + ___ + ___ + ___ + ___)}{5} = \_
\]

<table>
<thead>
<tr>
<th>item #</th>
<th>11</th>
<th>13</th>
<th>17</th>
<th>21</th>
<th>23</th>
</tr>
</thead>
</table>

**Fear of Upsetting Important Others (FUIO)**

\[
\frac{(___ + ___ + ___ + ___ + ___)}{5} = \_
\]

<table>
<thead>
<tr>
<th>item #</th>
<th>3</th>
<th>6</th>
<th>9</th>
<th>14</th>
<th>19</th>
</tr>
</thead>
</table>

**General Fear of Failure**

\[
\frac{(___ + ___ + ___ + ___ + ___)}{5} = \_
\]

Scale: FSE  FDSE  FUF  FIOLI  FUIO
## Profile Sheet
Performance Failure Appraisal Inventory (Long Form)

Client Name: ________________________________  Date: ________________

<table>
<thead>
<tr>
<th></th>
<th>Fear of Experiencing Shame &amp; Embarrassment</th>
<th>Fear of Devaluing One’s Self-Estimate</th>
<th>Fear of Having an Uncertain Future</th>
<th>Fear of Important Others Losing Interest</th>
<th>Fear of Upsetting Important Others</th>
<th>General Fear of Failure</th>
</tr>
</thead>
<tbody>
<tr>
<td>90%</td>
<td>1.41</td>
<td>1.03</td>
<td>0.99</td>
<td>0.48</td>
<td>0.85</td>
<td>0.70</td>
</tr>
<tr>
<td>75%</td>
<td>0.89</td>
<td>0.49</td>
<td>0.42</td>
<td>-0.04</td>
<td>0.31</td>
<td>0.29</td>
</tr>
<tr>
<td>50%</td>
<td>-0.32</td>
<td>-0.11</td>
<td>-0.21</td>
<td>-0.61</td>
<td>-0.28</td>
<td>-0.17</td>
</tr>
<tr>
<td>25%</td>
<td>-0.25</td>
<td>-0.71</td>
<td>-0.84</td>
<td>-1.18</td>
<td>-0.87</td>
<td>-0.63</td>
</tr>
<tr>
<td>10%</td>
<td>-0.77</td>
<td>-1.25</td>
<td>-1.41</td>
<td>-1.70</td>
<td>-1.41</td>
<td>-1.04</td>
</tr>
</tbody>
</table>

Notes:
The Performance Failure Appraisal Inventory (Short-Form)

<table>
<thead>
<tr>
<th>Response Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>-2 Do Not Believe at All</td>
</tr>
<tr>
<td>-1 Believe 50% of the Time</td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td>+1 Believe 100% of the Time</td>
</tr>
<tr>
<td>+2</td>
</tr>
</tbody>
</table>

_____ 1. When I am failing, I am afraid that I might not have enough talent.
_____ 2. When I am failing, it upsets my “plan” for the future.
_____ 3. When I am not succeeding, people are less interested in me.
_____ 4. When I am failing, important others are disappointed.
_____ 5. When I am failing, I worry about what others think about me.

Scoring Template:
Performance Failure Appraisal Inventory (Short Form)

General Fear of Failure

( _____ + _____ + _____ + _____ + _____ ) = ___ / 5 = ____

Item 1 2 3 4 5
Normative Data

The norms presented below were drawn from a sample of 440 college-aged females and males. Details about this sample can be found in Conroy, Willow, & Metzler (2002).

<table>
<thead>
<tr>
<th>Scale</th>
<th>Median</th>
<th>Mode</th>
<th>M</th>
<th>SD</th>
<th>SE</th>
<th>Skewness (SE)</th>
<th>Kurtosis (SE)</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSE</td>
<td>0.29</td>
<td>0.71</td>
<td>0.32</td>
<td>0.85</td>
<td>0.04</td>
<td>-0.26 (0.12)</td>
<td>-0.37 (0.23)</td>
<td>-2.00</td>
<td>+2.00</td>
</tr>
<tr>
<td>FDSE</td>
<td>0.00</td>
<td>0.38</td>
<td>-0.11</td>
<td>0.89</td>
<td>0.12</td>
<td>-0.11 (0.12)</td>
<td>-0.57 (0.23)</td>
<td>-2.00</td>
<td>+2.00</td>
</tr>
<tr>
<td>FUF</td>
<td>-0.25</td>
<td>-0.50</td>
<td>-0.21</td>
<td>0.94</td>
<td>0.05</td>
<td>0.01 (0.12)</td>
<td>-0.64 (0.23)</td>
<td>-2.00</td>
<td>+2.00</td>
</tr>
<tr>
<td>FIOLI</td>
<td>-0.60</td>
<td>-0.80</td>
<td>-0.61</td>
<td>0.85</td>
<td>0.04</td>
<td>0.40 (0.12)</td>
<td>-0.30 (0.23)</td>
<td>-2.00</td>
<td>+2.00</td>
</tr>
<tr>
<td>FUIO</td>
<td>-0.20</td>
<td>-0.20</td>
<td>-0.28</td>
<td>0.88</td>
<td>0.04</td>
<td>0.01 (0.12)</td>
<td>-0.52 (0.23)</td>
<td>-2.00</td>
<td>+2.00</td>
</tr>
<tr>
<td>FF-Long</td>
<td>-0.14</td>
<td>0.13</td>
<td>-0.17</td>
<td>0.68</td>
<td>0.03</td>
<td>-0.02 (0.12)</td>
<td>-0.15 (0.23)</td>
<td>-2.00</td>
<td>+1.61</td>
</tr>
<tr>
<td>FF-Short</td>
<td>0.00</td>
<td>0.40</td>
<td>-0.04</td>
<td>0.84</td>
<td>0.04</td>
<td>-0.08 (0.12)</td>
<td>-0.50 (0.23)</td>
<td>-2.00</td>
<td>+2.00</td>
</tr>
</tbody>
</table>

\(^a\) Multiple modes existed for FDSE scores and the number in the table is an average of the modes. The actual values are 0.25 and 0.50.

### Norms for college-aged females and males (N = 440; Conroy, Willow, & Metzler, 2002)

<table>
<thead>
<tr>
<th>z</th>
<th>Percentile</th>
<th>FSE</th>
<th>FDSE</th>
<th>FUF</th>
<th>FIOLI</th>
<th>FUIO</th>
<th>FF-Long</th>
<th>FF-Short</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.645</td>
<td>95</td>
<td>1.718</td>
<td>1.354</td>
<td>1.336</td>
<td>0.788</td>
<td>1.168</td>
<td>0.949</td>
<td>1.342</td>
</tr>
<tr>
<td>1.280</td>
<td>90</td>
<td>1.408</td>
<td>1.029</td>
<td>0.993</td>
<td>0.478</td>
<td>0.846</td>
<td>0.700</td>
<td>1.035</td>
</tr>
<tr>
<td>1.037</td>
<td>85</td>
<td>1.201</td>
<td>0.812</td>
<td>0.764</td>
<td>0.271</td>
<td>0.632</td>
<td>0.535</td>
<td>0.831</td>
</tr>
<tr>
<td>0.842</td>
<td>80</td>
<td>1.036</td>
<td>0.639</td>
<td>0.581</td>
<td>0.106</td>
<td>0.461</td>
<td>0.402</td>
<td>0.667</td>
</tr>
<tr>
<td>0.675</td>
<td>75</td>
<td>0.894</td>
<td>0.491</td>
<td>0.425</td>
<td>-0.036</td>
<td>0.314</td>
<td>0.289</td>
<td>0.527</td>
</tr>
<tr>
<td>0.524</td>
<td>70</td>
<td>0.766</td>
<td>0.357</td>
<td>0.283</td>
<td>-0.164</td>
<td>0.181</td>
<td>0.187</td>
<td>0.400</td>
</tr>
<tr>
<td>0.385</td>
<td>65</td>
<td>0.645</td>
<td>0.233</td>
<td>0.152</td>
<td>-0.283</td>
<td>0.059</td>
<td>0.092</td>
<td>0.284</td>
</tr>
<tr>
<td>0.253</td>
<td>60</td>
<td>0.535</td>
<td>0.115</td>
<td>0.028</td>
<td>-0.395</td>
<td>-0.057</td>
<td>0.002</td>
<td>0.173</td>
</tr>
<tr>
<td>0.126</td>
<td>55</td>
<td>0.427</td>
<td>0.002</td>
<td>-0.092</td>
<td>-0.503</td>
<td>-0.169</td>
<td>-0.085</td>
<td>0.066</td>
</tr>
<tr>
<td>0</td>
<td>50</td>
<td>0.320</td>
<td>-0.110</td>
<td>-0.210</td>
<td>-0.610</td>
<td>-0.280</td>
<td>-0.170</td>
<td>-0.040</td>
</tr>
<tr>
<td>-0.126</td>
<td>45</td>
<td>0.213</td>
<td>-0.222</td>
<td>-0.328</td>
<td>-0.717</td>
<td>-0.391</td>
<td>-0.255</td>
<td>-0.146</td>
</tr>
<tr>
<td>-0.253</td>
<td>40</td>
<td>0.105</td>
<td>-0.335</td>
<td>-0.448</td>
<td>-0.825</td>
<td>-0.502</td>
<td>-0.342</td>
<td>-0.253</td>
</tr>
<tr>
<td>-0.385</td>
<td>35</td>
<td>-0.008</td>
<td>-0.453</td>
<td>-0.572</td>
<td>-0.938</td>
<td>-0.619</td>
<td>-0.432</td>
<td>-0.364</td>
</tr>
<tr>
<td>-0.524</td>
<td>30</td>
<td>-0.126</td>
<td>-0.577</td>
<td>-0.703</td>
<td>-1.055</td>
<td>-0.741</td>
<td>-0.527</td>
<td>-0.481</td>
</tr>
<tr>
<td>-0.742</td>
<td>20</td>
<td>-0.396</td>
<td>-0.859</td>
<td>-1.001</td>
<td>-1.326</td>
<td>-1.021</td>
<td>-0.742</td>
<td>-0.747</td>
</tr>
<tr>
<td>-1.037</td>
<td>15</td>
<td>-0.561</td>
<td>-1.032</td>
<td>-1.184</td>
<td>-1.491</td>
<td>-1.192</td>
<td>-0.875</td>
<td>-0.911</td>
</tr>
<tr>
<td>-1.280</td>
<td>10</td>
<td>-0.768</td>
<td>-1.249</td>
<td>-1.413</td>
<td>-1.698</td>
<td>-1.406</td>
<td>-1.040</td>
<td>-1.115</td>
</tr>
<tr>
<td>-1.645</td>
<td>5</td>
<td>-1.078</td>
<td>-1.574</td>
<td>-1.756</td>
<td>-2.000</td>
<td>-1.728</td>
<td>-1.289</td>
<td>-1.422</td>
</tr>
</tbody>
</table>

- This paper details a qualitative investigation that provided the basis for sampling various domains of aversive consequences of failure in the PFAI.


- This document develops the theory behind the original PFAI and includes the first study of the psychometric properties of PFAI scores. Exploratory and confirmatory factor analyses were used to examine the factorial validity of scores. Data supporting the convergent, discriminant, and predictive validity of score interpretations also is included.


- This article reviews the literature on the FF construct, advocates for a multidimensional model of FF, reviews the literature on interpersonal influences on FF development, and identifies prevention and treatment research priorities related to FF.


- This article develops the theory behind the original PFAI and reports results from the first study of the psychometric properties of 41-item PFAI scores. Exploratory and confirmatory factor analyses were used to examine the factorial validity of scores. Data supporting the convergent, discriminant, and predictive validity of score interpretations also is included. Convergent validity measures included trait anxiety, and ego/performance goal orientations. Discriminant validity measures involved task/mastery goal orientations.


- This manuscript details the second study of the psychometric properties of PFAI scores, reducing the item pool to 25 items in a structure that demonstrated tight cross-validity across samples. A five-item short form that demonstrated tight cross-validity across samples also was proposed. Data supporting the convergent and discriminant validity of score interpretations for both the long and short forms in relation to also was included. Convergent validity measures included state hope before an achievement task, dispositional optimism, sport anxiety, worry, and cognitive disruption. Discriminant validity measures included fear of success and perceived competence.


- This paper presents results on how general FF scores are strongly related to self-talk while failing. The relationship between FF and representational models of mothers, fathers, and significant instructors also are examined. Collectively, self-talk and representational models account for over 60% of the variance in general FF scores.

- This paper documents differences in self-talk (while failing and succeeding) for athletes as a function of FF, fear of success, and general sport anxiety.
Items Organized by Factors:
Performance Failure Appraisal Inventory (25 Item Long Form)

Fear of Experiencing Shame and Embarrassment
10. When I am not succeeding, I am less valuable than when I succeed.
15. When I am not succeeding, I get down on myself easily.
18. When I am failing, it is embarrassing if others are there to see it.
20. When I am failing, I believe that everybody knows I am failing.
22. When I am failing, I believe that my doubters feel that they were right about me.
24. When I am failing, I worry about what others think about me.
25. When I am failing, I worry that others may think I am not trying.

Fear of Devaluing One’s Self-Estimate
1. When I am failing, it is often because I am not smart enough to perform successfully.
4. When I am failing, I blame my lack of talent.
7. When I am failing, I am afraid that I might not have enough talent.
16. When I am failing, I hate the fact that I am not in control of the outcome.

Fear of Having an Uncertain Future
2. When I am failing, my future seems uncertain.
5. When I am failing, I believe that my future plans will change.
8. When I am failing, it upsets my “plan” for the future.
12. When I am failing, I am not worried about it affecting my future plans. (Reverse)

Fear of Important Others Losing Interest
11. When I am not succeeding, people are less interested in me.
13. When I am not succeeding, people seem to want to help me less.
17. When I am not succeeding, people tend to leave me alone.
21. When I am not succeeding, some people are not interested in me anymore.
23. When I am not succeeding, my value decreases for some people.

Fear of Upsetting Important Others
3. When I am failing, it upsets important others.
6. When I am failing, I expect to be criticized by important others.
9. When I am failing, I lose the trust of people who are important to me.
14. When I am failing, important others are not happy.
19. When I am failing, important others are disappointed.

Note. Items 7, 8, 11, 19, 24 can be used to create a short-form measure of general fear of failure.