

## FEAR OF FAILURE AND ACHIEVEMENT GOALS IN SPORT: ADDRESSING THE ISSUE OF THE CHICKEN AND THE EGG

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The hierarchical model of achievement motivation proposes that, in addition to need achievement, fear of failure (FF) energizes achievement behaviour and predisposes individuals to adopt particular types of achievement goals. An impressive volume of cross-sectional support for this model has emerged, however, the causal assumptions of the model have never been tested. College students ( $N = 356$ ) enrolled in physical activity classes completed multidimensional measures of FF and achievement goals on four occasions in a 3-week interval. FF was positively related to mastery-avoidance (MAv), performance-approach (PAP), and performance-avoidance (PAv) achievement goals. FF scores predicted residualized change in MAv and PAV (but not MAP or PAp) goal scores across occasions. Goal scores did not reliably predict residualized change in FF scores across occasions. Results were consistent with the hierarchical model of achievement motivation and suggest that FF may indeed have a causal influence on achievement goals.

*Keywords:* Fear of failure; Achievement goals; Hierarchical model

Early motivation research identified the motive to avoid failure, or fear of failure (FF), as an energizing agent for human behaviour (Murray, 1938). Subsequent achievement motivation researchers have emphasized FF and achievement goals as determinants of achievement processes and outcomes.<sup>1</sup> Elliot (1997) proposed a *hierarchical model of achievement motivation* that integrated motive-based and goal-based perspectives. Briefly, this model asserts that FF and goals energize and direct (respectively) achievement-related processes and outcomes. An impressive amount of empirical support for this hierarchical model has accumulated (primarily in the academic performance domain); however, the evidence is largely cross-sectional, thereby leaving the proposed causal sequence an assumption. Much like the proverbial chicken and egg, it is not clear whether FF antecedes goals or vice-versa. The present research aimed

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<sup>1</sup> The need for achievement is also a key component in classic achievement motivation models; however, it will not be discussed because the focus of this manuscript is avoidance motivation at the motive level.

(a) to establish the cross-sectional validity of the hierarchical model of achievement motivation in the context of sport, and (b) to test the causal sequence of the FF-goals relationship in a quasi-experimental context.

### **Fear of Failure**

Fear of failure has long been viewed as an important influence on achievement behaviour. Murray (1938) noted that infavoidance, the need to avoid failure, was a salient need among college-aged men. Classic achievement motivation theorists posited the motive to avoid failure construct to describe dispositional tendencies to behave in ways that reduce the likelihood of experiencing failure (McClelland, Atkinson, Clark, and Lowell, 1953). Although some classic achievement motivation researchers measured the motive to avoid failure projectively with TAT procedures, other researchers employed more convenient self-report measures of trait test anxiety (see Atkinson and Litwin, 1960; Feather, 1965). The FF and test anxiety constructs share an affective-motivational structure oriented toward avoiding the existential threat posed by evaluations or demonstrations of incompetence (Bedell and Marlowe, 1995; Birney, Burdick, and Teevan, 1969; Elliot, 1997; Hagtvet and Benson, 1997; Heckhausen, 1975; Herman, 1990; Spielberger, 1972). Elliot and McGregor (1999) found that more than half of the common variance in trait test anxiety, self-reported FF, and projectively-measured FF scores can be captured by a single factor. These three scores also exhibited similar predictive patterns in relation to goals and performance. Based on these similarities, Elliot and McGregor concluded that FF and trait test anxiety are conceptually equivalent constructs that “serve[d] the same function in the hierarchical model” (p. 629). Regardless of how this construct was labelled or what measures were employed, it should be noted that most conceptual models of FF have been unidimensional (Atkinson and Litwin, 1960; McClelland *et al.*, 1953; Murray, 1938) despite more recent calls to conceptualize FF multidimensionally (Birney *et al.*, 1969; Schmalt, 1982).

In the context of sport, a multidimensional and hierarchical model of FF has been developed that integrates previous conceptualizations of FF. This model was based on the cognitive-motivational-relational theory of emotion (Lazarus, 1991). It holds that FF results when beliefs or cognitive schemas about aversive consequences of failing are activated by situations in which failure is possible. These belief systems predispose the individual to make appraisals of threat and experience the state anxiety that is associated with FF in evaluative situations.

Conroy, Poczwadowski, and Henschen (2001) used inductive content analysis to define a non-exclusive universe of aversive consequences of failure that would provide the basis for FF. The five aversive consequences of failing that have been replicated across samples and over time include (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 (Conroy, 2001; Conroy, Metzler, and Hofer, 2003; Conroy, Willow, and Metzler, 2002). By measuring the strength of an individual's beliefs in each of these aversive consequences of failing, one can infer the individual's tendency to associate failure with existential threats, and to subsequently experience FF.

The strength of beliefs in the five consequences of failing noted above are strongly related to scores on trait anxiety and trait performance anxiety measures (Conroy, 2001; Conroy *et al.*, 2002). Furthermore, these beliefs are sufficiently intercorrelated

that a higher-order factor representing general FF can be modeled (Conroy *et al.*, 2002, 2003). To summarize, FF represents a dispositional tendency to experience apprehension and anxiety in evaluative situations because individuals have learned that failure is associated with aversive consequences.

### **Beyond Fear of Failure: Contemporary and Hierarchical Models of Achievement Motivation**

As noted by Elliot (1997), motive and goal approaches to achievement motivation have complementary strengths and limitations. For example, the motive approach addresses the energization of achievement behaviour, whereas the goal approach addresses the direction of achievement behaviour. The motive approach distinguishes between approach and avoidance-oriented achievement behaviour, whereas the standard goal approach has focused exclusively on approach motivation (Nicholls, Patashnick, Cheung, Thorikildson, and Lauer, 1989). Goal theorists distinguish two type of approach motivation (i.e. mastery and performance goals) in contrast to classic theories of achievement motivation which include only one type of approach motivation (cf. Spence and Helmreich, 1983). Finally, due to their situational-specificity, goals may be better predictors of behaviour in concrete achievement settings than are broad motive dispositions.

As noted previously, the classic motive disposition theorists emphasized FF as a proximal predictor of achievement behaviour. More contemporary achievement goal theorists have de-emphasized dispositional predictors of achievement behaviour in favor of situational (or sometimes interactional) predictors of achievement behaviour (Ames, 1984; Dweck, 1986; Maehr, 1983; Nicholls, 1984). This more contemporary, goal-based approach continues to dominate achievement motivation research in the context of sport (see Roberts, 2001).

To integrate the complementary assets of these two approaches, Elliot (1997; Elliot and Church, 1997) proposed a hierarchical model of achievement motivation. Two unique features of this model may be highlighted. First, the model employs an expanded conceptualization of achievement goals based on both the definition of competence and the valence of the goals. Second, the hierarchical model proposes that the effects of motives (e.g. FF) on achievement behaviour are mediated by achievement goals; that is, FF antecedes goals.

#### *Structure of achievement goals*

The hierarchical model of achievement motivation proposes that both the valence of goals (i.e. approach-avoidance) and the definition of competence (i.e. mastery-performance) are fundamental characteristics of achievement goals (Elliot, 1999; Elliot and McGregor, 2001). Using this 2 × 2 framework, four achievement goals can be identified: mastery-approach (MAp), mastery-avoidance (MAv), performance-approach (PAp) and performance-avoidance (PAv) goals (see also Pintrich, 2000). Experimental research has documented the importance of differentiating between approach and avoidance forms of performance goals for predicting competence valuation, task absorption, state evaluation anxiety, and intrinsic motivation (Cury, Elliot, Sarrazin, Da Fonseca, and Rufo, 2002; Elliot and Harackiewicz, 1996; Rawsthorne and Elliot, 1999). Field studies have shown that MAp goals are positive predictors of deep processing and intrinsic motivation, and negative predictors of health center visits; MAv goals are positive predictors of

disorganized studying and state test anxiety; PAp goals are positive predictors of surface processing, grade aspirations and exam performance; and PAv goals are positive predictors of state test anxiety and procrastination and negative predictors of intrinsic motivation and exam performance (see Elliot, 1999; Elliot and McGregor, 2001; McGregor and Elliot, 2002). Thus, in both experimental and field contexts, the utility of the  $2 \times 2$  achievement goal framework has been clearly documented.

#### *Causal assumptions*

A second unique feature of the hierarchical model is the proposition that motive dispositions (e.g., FF) affect achievement-related processes and outcomes indirectly, through their influence on achievement goal adoption (Elliot and Church, 1997). Cross-sectional evidence demonstrated that FF is positively related to MAV, PAp, and PAV goals (Elliot and Church, 1997; Elliot and McGregor, 1999, 2001). Although the causal nature of the link between achievement goals and achievement-relevant processes/outcomes has been put to empirical test (Cury *et al.*, 2002; Elliot and Harackiewicz, 1996), the same cannot be said for the link between FF and achievement goals. Given that motive manipulations are likely to be extremely time-consuming and expensive (see McClelland and Winter, 1969), testing residualized change in goals over time as a function of early FF (and vice-versa) may represent an appropriate quasi-experimental model for investigating the causal propositions of the hierarchical model.

#### **Aims of the Study**

The present study had three aims. The first aim of the study was to establish the hierarchical model of achievement motivation in the context of sport using cross-sectional data. It was hypothesized that FF would be a positively associated with MAV, PAp, and PAV goals, and would be unrelated to MAp goals. These four hypotheses were tested separately for each of the five FF appraisals and general FF. The second aim of the study was related to the proposition from the hierarchical model of achievement motivation that FF antecedes achievement goals. It was hypothesized that initial FF would predict residualized change in MAV, PAp, and PAV goals, but not MAp goals. The third aim of the study was to test the alternative possibility that achievement goals actually antecede FF. Although this causal sequence is inconsistent with, and even contrary to, the hierarchical model of achievement motivation, testing such hypotheses affords an opportunity to falsify and reject a plausible alternative explanation of correlations between FF and MAV, PAp, and PAV goals observed in previous cross-sectional designs (Conroy, Elliot, and Hofer, 2003; Elliot and Church, 1997; Elliot and McGregor, 1999, 2001).

## **METHODS**

### **Participants**

Three hundred fifty-six (250 male and 106 female) undergraduates at a large university participated in the study. Participants were enrolled in various physical activity courses (strength training, golf, jogging and walking), and received extra course credit for their participation. The age of participants ranged from 18 to 34 years old ( $M = 21.57$ ,  $SD = 1.92$ ) and were predominantly Caucasian.

## Procedures

After being introduced to the purpose of the study, the risks of participating, and their rights, participants signed a consent form and completed FF and achievement goal measures (in that order). Three additional waves of data collection were completed 2 days, 1 week and 3 weeks after the initial data collection. At each wave, participants completed the same FF and achievement goal measures.

## Instruments

The Performance Failure Appraisal Inventory (PFAI; Conroy, 2001; Conroy *et al.*, 2002) was used to assess fear of failure. This 25-item measure yields scores for five first-order beliefs about aversive consequences of failing and one higher-order factor representing general FF. The lower-order scales (and sample items) include (a) Fears of Experiencing Shame and Embarrassment (“When I am failing, I worry about what others think about me”), (b) Fears of Devaluing One’s Self-Estimate (“When I am failing, I am afraid that I might not have enough talent.”), (c) Fears of Having an Uncertain Future (“When I am failing, it upsets my ‘plan’ for the future”), (d) Fears of Important Others Losing Interest (“When I am not succeeding, people are less interested in me”), and (e) Fears of Upsetting Important Others (“When I am failing, important others are disappointed”). Participants were asked to think of how often they believed each statement was true in their significant motor performances. Responses were made on a scale ranging from *do not believe at all* (−2) to *believe 100% of the time* (+2). PFAI scores have demonstrated sound psychometric properties, including factorial invariance across groups and over time, internal consistency, external validity, and predictive validity. Scores have also exhibited evidence of differential stability (i.e., test-retest reliability > 0.80), and latent mean stability (Conroy *et al.*, 2003).

The 2 × 2 Achievement Goals Questionnaire for Sport (AGQ-S; Conroy *et al.*, 2003) was used to measure participants’ achievement goals for their courses. This 12-item measure provided scores for MAP, MAV, PAp, and PAV achievement goals. Sample items included “It is important to me to perform as well as I possibly can” (MAP), “I worry that I may not perform as well as I possibly can” (MAV), “It is important to me to do well compared to others” (PAp), and “My goal is to avoid performing worse than everyone else” (PAV). Participants were asked to focus on their thoughts and feelings about the present season/class when responding to the questions. Responses were made on a scale ranging from *not at all true of me* (−3) to *very true of me* (+3). This measure was adapted from the short form of the original Achievement Goals Questionnaire (Elliot and McGregor, 2001) to be directly applicable to sport. AGQ-S scores have demonstrated evidence of longitudinal factorial invariance, differential stability, external validity, and latent mean stability.

## RESULTS

Table I presents descriptive statistics for the measures used in each wave of the study. The first purpose of this research was to establish the relationship between FF and

TABLE I Descriptive statistics

	<i>Wave 1 (N = 328)</i>			<i>Wave 2 (N = 255)</i>			<i>Wave 3 (N = 274)</i>			<i>Wave 4 (N = 276)</i>		
	<i>M</i>	<i>SD</i>	$\alpha$									
General Fear of Failure	-0.48	0.62	0.80	-0.54	0.71	0.85	-0.58	0.74	0.86	-0.62	0.75	0.87
Fear of...												
Experiencing Shame and Embarrassment	-0.12	0.85	0.81	-0.27	0.90	0.86	-0.34	0.97	0.90	-0.39	0.96	0.89
Devaluing One's Self-Estimate	-0.49	0.85	0.69	-0.57	0.92	0.81	-0.69	0.89	0.79	-0.74	0.88	0.80
Having an Uncertain Future	-0.36	0.91	0.78	-0.39	0.93	0.79	-0.47	0.90	0.77	-0.48	0.96	0.80
Important Others Losing Interest	-0.94	0.76	0.79	-0.88	0.86	0.88	-0.80	0.89	0.89	-0.85	0.88	0.88
Upsetting Important Others	-0.48	0.81	0.77	-0.59	0.90	0.87	-0.59	0.95	0.90	-0.66	0.92	0.89
Mastery-Approach Goals	6.14	0.84	0.69	6.06	0.81	0.60	6.00	0.94	0.72	5.90	1.08	0.79
Mastery-Avoidance Goals	5.27	1.25	0.80	5.09	1.21	0.81	4.99	1.31	0.86	4.93	1.31	0.82
Performance-Approach Goals	5.24	1.41	0.87	4.92	1.39	0.87	4.97	1.37	0.89	4.79	1.42	0.89
Performance-Avoidance Goals	4.51	1.58	0.86	4.33	1.54	0.86	4.28	1.56	0.87	4.19	1.56	0.87

TABLE II Fear of failure and 2 × 2 achievement goals at each occasion

	<i>General FF</i>	<i>FSE</i>	<i>FDSE</i>	<i>FUF</i>	<i>FIOLI</i>	<i>FUIO</i>
Wave 1						
MAp	-0.02	0.09	0.00	-0.07	-0.07	-0.02
MAv	0.41*	0.41*	0.31*	0.31*	0.25*	0.25*
PAP	0.16*	0.22*	0.05	0.11**	0.14**	0.10
PAv	0.27*	0.31**	0.14*	0.20**	0.17**	0.17**
Wave 2						
MAp	-0.06	0.03	-0.04	-0.01	-0.13*	-0.08
MAv	0.37**	0.36**	0.29**	0.27**	0.27**	0.28**
PAP	0.06	0.15*	-0.03	0.03	0.10	0.03
PAv	0.25**	0.27**	0.17**	0.17**	0.23**	0.18**
Wave 3						
MAp	0.03	0.06	-0.02	0.04	-0.04	0.04
MAv	0.37**	0.40**	0.28**	0.34**	0.23**	0.23**
PAP	0.11	0.16**	0.01	0.08	0.10	0.09
PAv	0.27**	0.29**	0.15*	0.23**	0.16**	0.23**
Wave 4						
MAp	0.01	0.06	0.01	-0.03	-0.06	-0.02
MAv	0.37**	0.43**	0.30**	0.33**	0.25**	0.21**
PAP	0.16**	0.22**	0.09	0.14*	0.15*	0.07
PAv	0.28**	0.31**	0.22**	0.23**	0.21**	0.18**
Average Correlation Coefficients Across Waves						
MAp	-0.01	0.06	-0.01	-0.02	-0.06	-0.02
MAv	0.38**	0.40**	0.30**	0.31**	0.25**	0.24**
PAP	0.12*	0.19**	0.03	0.09	0.12*	0.07
PAv	0.27**	0.30**	0.17**	0.21**	0.19**	0.19**

*Note.* FF = Fear of Failure, FSE = Fear of Experiencing Shame and Embarrassment, FDSE = Fear of Devaluing One's Self-Estimate, FUF = Fear of Having an Uncertain Future, FIOI = Fear of Important Others Losing Interest, FUIO = Fear of Upsetting Important Others, MAp = Mastery-Approach Goal, MAv = Mastery-Avoidance Goal, PAP = Performance-Approach Goal, PAv = Performance-Avoidance Goal. \* $p < 0.05$ , \*\* $p < 0.01$ .

the 2 × 2 achievement goal framework in the context of sport. As seen in Table II, MAv and PAv achievement goals were positively associated with each FF appraisal score and with general FF scores at all four occasions of measurement. Additionally, PAP goals were positively associated with fears of experiencing shame and embarrassment at all four occasions of measurement; PAP goals were also positively associated with general FF, fears of having an uncertain future, and fears of important others losing interest at waves 1 and 4, but not at waves 2 or 3. MAp goals were associated with only one FF appraisal score on one occasion; these goals appear to be largely, if not wholly, independent of FF appraisals and general FF. Given that scores for various first-order FF appraisals exhibited very similar relationships with achievement goals during each occasion of measurement and that hierarchical achievement motivation theory focuses on the general FF motive rather than specific cognitive expressions of the motive, the remaining analyses focused on the higher-order FF construct (rather than lower-order FF constructs).

Structural equation modeling was used to investigate the direction of causal influence between the FF motive and achievement goals for the second and third aims. The number of missed measurement occasions was not significantly correlated with any initial FF or achievement goal scores ( $p > 0.05$ ). Accordingly, data were assumed to be missing at random (Graham, Hofer, Donaldson, MacKinnon, and Schafer, 1997;

Schafer and Graham, 2002) and full information maximum likelihood estimates were used to overcome missing data. This method is the current state-of-the-art for handling missing data in structural equation analyses (Enders and Bandalos, 2001; Schafer and Graham, 2002). AMOS 4.1 (Arbuckle, 1999) was used for these analyses and the appropriate independence model was estimated for the purpose of calculating relative fit indices. Full measurement models were specified to provide more accurate tests of hypotheses about the structural model (i.e., relationships between constructs). In these models, all but one item-factor regression coefficient for each latent construct was freely estimated (the first such coefficient on each factor was fixed at 1.0 for identification purposes). Uniquenesses were estimated for each item and, because the same individuals were assessed at each occasion, uniquenesses were permitted to covary for corresponding items across measurement occasions. In the initial wave of measurement, the latent FF and goal variables were permitted to covary. Paths also were specified between each latent variable and the corresponding latent variable at the next measurement occasion (e.g., initial FF predicted time 2 FF, time 2 FF predicted time 3 FF, and time 3 FF predicted time 4 FF). The parameterization described above was common to all of the models and, by itself, represented the *no cross prediction model*. This model assumes no influence of FF on goals or vice-versa.

By adding cross-lagged paths between constructs (e.g., initial FF predicting time 2 goals, time 2 FF predicting time 3 goals, and time 3 FF predicting time 4 goals), sequential patterns of change between FF and goals could be modelled (i.e., aims 2 and 3). Three alternative cross-lagged models were considered. Based on the second aim of this research, the cross-lagged paths in one model originated in early FF and predicted subsequent goals (hereafter referred to as the *FF → Goals model*). Based on the third aim of this study, the cross-lagged paths in an alternative model originated in early goals and predicted subsequent FF (hereafter referred to as the *Goals → FF model*). The final model included paths from both FF and goals to subsequent goals and FF, respectively (hereafter referred to as the *full cross prediction model*).

Given that the *full cross prediction model* was the least constrained (i.e., it estimated the most non-zero paths), it served as the baseline model. The other models (i.e., *FF → Goals*, *Goals → FF*, and *no cross prediction*) were nested within the *full cross prediction model* so chi-square difference tests were employed to determine whether the constraints in the three alternate models substantially reduced model fit relative to the *full cross prediction model*. For example, if the *Goals → FF model* failed to reduce model fit significantly relative to the baseline model, that would indicate that the paths from early FF to subsequent goals were reasonably estimated with the constrained value of 0 (aim 3). Likewise, if the *FF → Goals model* failed to reduce model fit significantly compared to the baseline model, that finding would indicate that the paths from early goals to subsequent FF were reasonably estimated with the constrained value of 0 (aim 2). If either of these alternative models (i.e., *FF → Goals*, or *Goals → FF*) were viable, they were compared to the *no cross prediction model* to ensure that further constraints were not necessary.

As seen in Table III, all models involving FF and MAP goals exhibited a good fit to the data. Nested model comparisons indicated that fit decreased significantly when paths from early MAP goals to subsequent FF were removed but not when paths from early FF to subsequent MAP goals were removed. Thus, the best model involved one or

TABLE III Fear of failure and mastery-approach goals

	<i>df</i>	$\chi^2$	<i>NFI</i>	<i>NNFI</i>	<i>CFI</i>	<i>RMSEA (90% CI)</i>
Independence	496	8172.86				
Full cross-prediction	403	670.77	0.93	0.96	0.97	0.04 (0.04–0.05)
Goals → FF	406	674.18	0.93	0.96	0.97	0.04 (0.04–0.05)
FF → Goals	406	680.76	0.93	0.96	0.97	0.04 (0.04–0.05)
No cross-prediction	409	684.22	0.93	0.96	0.97	0.04 (0.04–0.05)
<i>Model Comparisons</i>	$\Delta df$	$\Delta \chi^2$				
Full cross prediction vs. Goals → FF	3	3.41				
Full cross prediction vs. FF → Goals	3	9.99*				
Goals → FF vs. No cross prediction	3	10.04*				

\**p* < 0.05, \*\**p* < 0.01.

more non-zero paths between early MAp goals and subsequent FF (i.e., Goals → FF model). Fig. 1 presents the standardized parameter estimates for this model.<sup>2</sup> This model revealed that individuals with higher MAp scores at time 3 decreased their FF at time 4.

As seen in Table IV, all models involving FF and MAv goals exhibited a good fit to the data. Nested model comparisons indicated that fit decreased significantly when paths from early FF to subsequent MAv goals were removed but not when paths from early MAv goals to subsequent FF were removed. Accordingly, the best model involved one or more non-zero paths between early FF and subsequent MAv goals (i.e., FF → Goals model). Fig. 2 presents the standardized parameter estimates for this model. These parameters revealed that individuals with high FF at an early time point consistently had higher subsequent MAv goals (after controlling for prior MAv goals).

As seen in Table V, all models involving FF and PAp goals exhibited a good fit to the data. Nested model comparisons indicated that fit did not decrease significantly when constraints were placed either on paths from early FF to subsequent PAp goals or from early PAp goals to subsequent FF. Additionally, fit of the *no cross prediction* model was

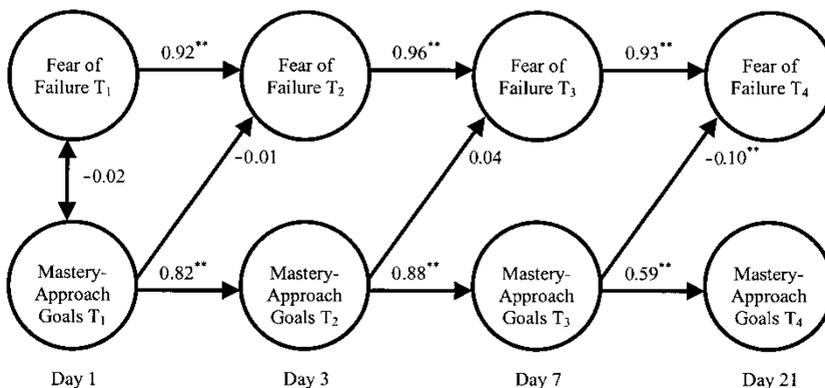


FIGURE 1 Structural model (*Goals* → *FF*) parameters for fear of failure and mastery-approach goals. Note. \*\* *p* < 0.01.

<sup>2</sup> Structural model parameters were of greatest theoretical interest in this study so measurement model results are not reported here. Those results may be obtained from the first author.

TABLE IV Fear of failure and mastery-avoidance goals

	<i>df</i>	$\chi^2$	<i>NFI</i>	<i>NNFI</i>	<i>CFI</i>	<i>RMSEA (90% CI)</i>
Independence	496	8467.31				
Full cross-prediction	403	639.52	0.93	0.97	0.97	0.04 (0.04–0.05)
Goals → FF	406	659.42	0.93	0.97	0.97	0.04 (0.04–0.05)
FF → Goals	406	641.80	0.93	0.97	0.97	0.04 (0.03–0.05)
No cross-prediction	409	662.40	0.93	0.97	0.97	0.04 (0.04–0.05)
<i>Model Comparisons</i>	$\Delta df$	$\Delta \chi^2$				
Full cross prediction vs. Goals → FF	3	19.90**				
Full cross prediction vs. FF → Goals	3	2.28				
Goals → FF vs. No cross prediction	3	20.60**				

\**p* < 0.05, \*\**p* < 0.01.

not significantly worse than any of the more complex models. The *no cross prediction* model was concluded to be most appropriate because of its equivalent fit and added parsimony relative to the other models. Fig. 3 presents the standardized parameter estimates for this model. These results indicated that early FF and PAp goal scores did not influence subsequent PAp goal and FF scores, respectively (after controlling for the influence of prior PAp goals and FF).

As seen in Table VI, all models involving FF and PAv goals exhibited a good fit to the data. Nested model comparisons indicated that fit decreased significantly when constraints were placed on paths from early FF to subsequent PAv goals but not when similar constraints were placed on paths from early PAv goals to subsequent FF. The *no cross prediction* model exhibited a significant reduction in model fit compared to the more optimal FF → Goals model. Fig. 4 presents the standardized parameter estimates for this model. The latter model revealed that individuals with higher FF scores at time 2 increased their use of PAv goals at time 3.

DISCUSSION

This study makes two important contributions to the achievement motivation and test anxiety literatures. First, it extends empirical evaluations of the hierarchical model of

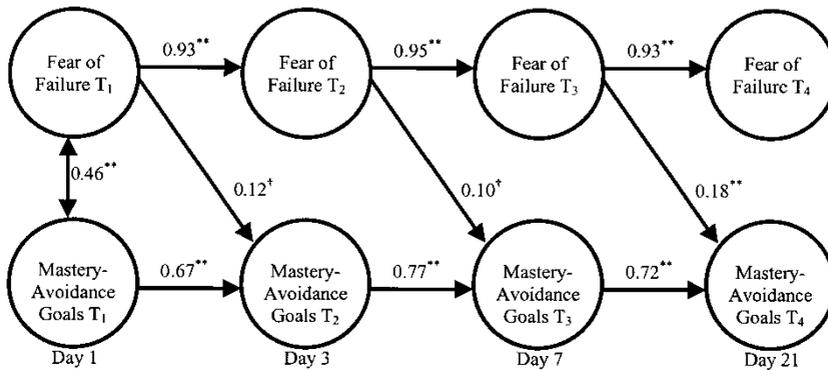


FIGURE 2 Structural model (*FF* → *Goals*) parameters for fear of failure and mastery-avoidance goals. Note. <sup>†</sup> *p* < 0.10, \*\**p* < 0.01.

TABLE V Fear of failure and performance-approach goals

	<i>df</i>	$\chi^2$	<i>NFI</i>	<i>NNFI</i>	<i>CFI</i>	<i>RMSEA (90% CI)</i>
Independence	496	9255.40				
Full cross-prediction	403	655.19	0.93	0.97	0.97	0.04 (0.04–0.05)
Goals → FF	406	658.52	0.93	0.97	0.97	0.04 (0.04–0.05)
FF → Goals	406	656.51	0.93	0.97	0.97	0.04 (0.04–0.05)
No cross-prediction	409	659.94	0.93	0.97	0.97	0.04 (0.04–0.05)
<i>Model Comparisons</i>	$\Delta df$	$\Delta \chi^2$				
Full cross prediction vs. Goals → FF	3	3.33				
Full cross prediction vs. FF → Goals	3	1.32				
Goals → FF vs. No cross prediction	3	1.42				
FF → Goals vs. No cross prediction	3	3.43				

achievement motivation to another achievement context, namely sport. Second, it provides the strongest test to date of the causal sequence postulated in the model. Results also helped to rule out a plausible rival hypothesis concerning the causal sequencing in the model.

Consistent with the hierarchical model of achievement motivation, general FF positively predicted both avoidance goals (mastery-avoidance and performance-avoidance) with a moderate effect size; general FF was a weaker and less stable correlate of performance-approach goals. The lack of significant relationships between general FF and mastery-approach goals also was consistent with previous findings. The observed relationships between FF and performance (-approach and -avoidance) goals were smaller than in previous research (Elliot and Church, 1997; Elliot and McGregor, 1999, 2001); the one exception being that the size of the general FF-performance-avoidance goal association in this study was equivalent to the Elliot and McGregor (2001) finding. Only one study has examined the relationship between mastery-avoidance goals and general FF (Elliot and McGregor, 2001); the present effect was slightly larger than previously estimated.

Despite some differences in the magnitude of the effects, the predictions of the hierarchical model of achievement motivation were largely accurate when describing the pattern of relationships between FF and goals. The slight effect size differences that emerged in these data may be attributable to the different FF scale used in this study, or

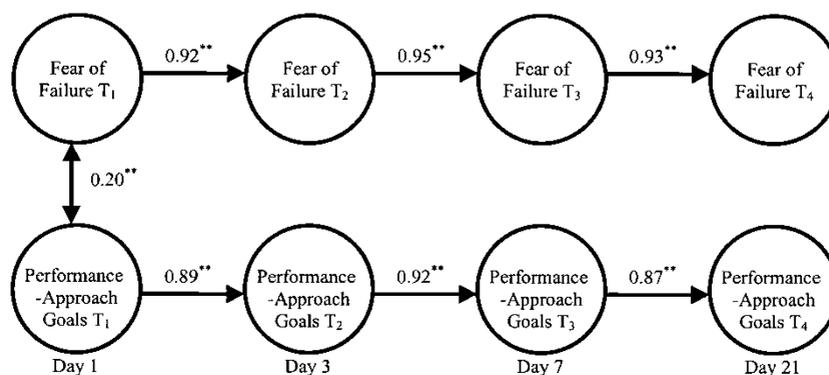


FIGURE 3 Structural model (*no cross prediction*) parameters for fear of failure and performance-approach goals. Note. \* $p < 0.01$ .

TABLE VI Fear of failure and performance-avoidance goals

	<i>df</i>	$\chi^2$	<i>NFI</i>	<i>NNFI</i>	<i>CFI</i>	<i>RMSEA (90% CI)</i>
Independence	496	9259.27				
Full cross-prediction	403	625.48	0.93	0.97	0.98	0.04 (0.03–0.05)
Goals → FF	406	645.57	0.93	0.97	0.97	0.04 (0.04–0.05)
FF → Goals	406	627.66	0.93	0.97	0.98	0.04 (0.03–0.05)
No cross-prediction	409	647.96	0.93	0.97	0.97	0.04 (0.04–0.05)
<i>Model Comparisons</i>	$\Delta df$	$\Delta \chi^2$				
Full cross prediction vs. Goals → FF	3	20.09**				
Full cross prediction vs. FF → Goals	3	2.18				
FF → Goals vs. No cross prediction	3	20.30**				

\**p* < 0.05, \*\**p* < 0.01.

these departures may reflect contextual differences between academic and sport domains. Given that FF entails avoiding threats associated with failure or incompetence regardless of the specific evaluative domain, the former is a more compelling explanation than the latter.

At a more specific level, all of the FF appraisals were associated with avoidance goals (mastery-avoidance and performance-avoidance). Fears of experiencing shame and embarrassment were most strongly linked to these goals, and were the only appraisal scores that significantly correlated with performance-approach goals at each wave of measurement. In factor analytic research on PFAI responses, scores from this scale consistently exhibited the strongest relationship to the general FF factor of all of the first-order FF factors (Conroy *et al.*, 2002; Conroy, Metzler, and Hofer, 2003). As such, it is not surprising that these scores were linked most directly to the hypotheses made with regard to general FF. Additionally, classic motive disposition theorists view anticipatory shame as a central component of FF (Atkinson, 1958; McClelland *et al.*, 1953). Clearly, the predictions of the hierarchical model are more consistent with the shame-based motive disposition components of FF than with other, more exclusively anxiety-related aspects of FF.

The second major contribution of this manuscript involved testing the proposed causal sequence whereby fear of failure antecedes goals. This test was conducted by comparing the fit of a series of nested cross-lagged models of fear of failure and each

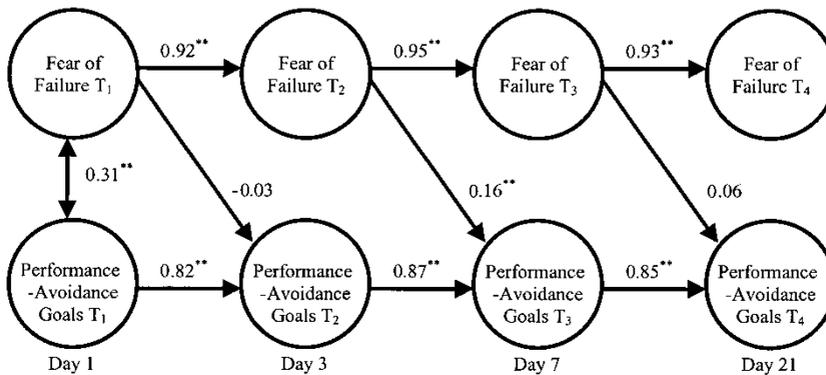


FIGURE 4 Structural model (*FF* → *Goals*) parameters for fear of failure and performance-avoidance goals. Note. \*\**p* < 0.01.

achievement goal. For mastery-avoidance and performance-avoidance goals, the best fitting model included paths from early FF to subsequent goals. These findings were precisely in line with expectations from the hierarchical model of achievement motivation (Elliot, 1997; Elliot and Church, 1997; Elliot and McGregor, 1999, 2001). It can reasonably be concluded that fear of failure antecedes and increases the likelihood that individuals will adopt avoidance achievement goals. Reducing FF may be a key to reducing sub-optimal or dysfunctional achievement motivation (i.e. avoidance motivation; Elliot and Church, 1997).

Results were less consistent with theoretical predictions for approach goals. Contrary to our expectations, mastery-approach goals anteceded fear of failure between the third and fourth measurement occasions. This relationship was negative and indicated that mastery-approach goals may have a slight protective effect against tendencies to develop fear of failure. Pursuing mastery-approach goals may even serve a developmentally-adaptive function by reducing unpleasant self-conscious affective states (e.g., shame) that are at the core of fear of failure. Nevertheless, the magnitude of this effect was quite small and it is not clear that it will be robust in future research.

Performance-approach goals were unrelated to fear of failure either as an antecedent or as a consequence. Several studies, including this one, have demonstrated that performance-approach goals tend to be positively associated with fear of failure (Conroy, 2001; Elliot and Church, 1997; Elliot and McGregor, 1999, 2001). At least three explanations may account for the lack of a causal link between fear of failure and performance-approach goals in this research. First, the performance-approach goals were the most stable of all the achievement goals studied. This high level of stability reduced the amount of variance that could be accounted for by fear of failure. Second, it is possible that widely-reported relationship between fear of failure and performance-approach goals is an artifact of social desirability or strategic self-presentation (Conroy, 2001). That is, although individuals who fear failing are more likely to indicate that they are employing performance-approach goals, their fear of failure may not actually heighten their likelihood of employing such goals in future. Third, the effect of fear of failure on performance-approach goals may not be as temporally immediate as the effect of fear of failure on avoidance achievement goals. Future research including measures of social desirability over longer time periods would help to clarify these possibilities.

Although the cross-construct path coefficients in all models were relatively small and somewhat inconsistent, this observation can be traced to the quasi-experimental design and the relatively stable scores in the brief time-frame of this research. Experimental designs that attempt to manipulate fear of failure or achievement goals (e.g., treatment or prevention research) over an extended period of time will reduce the stability of scores in the experimental group and should provide more precise estimates of the specific effect sizes in this causal relationship.

To summarize, this research provided support for the causal sequence between fear of failure and achievement goals proposed in the hierarchical model of achievement motivation. Specifically, fear of failure appears to energize behaviour and biases individuals toward the pursuit of avoidance achievement goals. Results from this study convincingly ruled out the plausible rival hypothesis that avoidance achievement goals antecede fear of failure. Although this study provided the first evidence of temporally-based change processes in FF and achievement goals, several limitations should be

noted. First, the data were quasi-experimental, not truly experimental. As noted previously, firm conclusions about the causal propositions of the hierarchical model will require experimental manipulation (Elliot and Sheldon, 1997)—FF treatment research represents one avenue for collecting such data. Additionally, the FF measure employed in this research was a self-report scale. Although there is a moderate amount of convergent validity between self-report and projective measures of FF (Elliot and McGregor, 1999; Thrash and Elliot, 2002), these two methods also capture unique variance associated with FF (Birney *et al.* 1969; Gelbort and Winer, 1985; MacDonald and Hyde, 1980). Finally, these data demonstrated that cross-sectional findings supporting the hierarchical model generalize from the academic to the sport context, but further research will be needed to determine whether these conclusions concerning the causal sequence (i.e., the question of whether the chicken or the egg came first) can be generalized from sport back to the academic context.

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