Measuring Goal Orientation in a Work Domain: Construct Validity Evidence for the 2 x 2 Framework

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Measuring Goal Orientation in a Work Domain
Construct Validity Evidence for the 2×2 Framework

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The current research extended the three-factor (mastery, performance-approach, and performance-avoidance) measure of achievement goals in a work domain to the four-factor conceptualization (in a 2×2 framework) by adding items to represent mastery-avoidance goals. Confirmatory factor analysis was conducted on two independent samples to evaluate the dimensionality of scores. Results from both samples indicated that after dropping 5 problematic mastery-avoidance items, responses to a reduced 18-item version of the instrument fit a four-factor model well. In addition, initial support for each of the four goal orientations having a unique relationship to theoretically related external criteria was found.

Keywords: achievement goals; mastery-avoidance; construct validity; work motivation

Most everyone who has held a job recognizes that employees are motivated by a number of different factors. Understanding employees’ underlying motives may help explain the different patterns of affect, cognition, and behaviors that are displayed at work. Currently, one of the predominant approaches to understanding achievement motivation is achievement goal theory. Achievement goal theory proposes that individuals have different purposes, or goals, for engaging in achievement behavior (Dweck, 1986; Pintrich & Schunk, 2002). These different goals provide a framework for how individuals approach and react when in an achievement setting. Interestingly, much of the initial research using an achievement goal theory framework originated from research in educational domains, and advances in achievement goal theory and scale development continue to emerge from...
research conducted in educational domains. Therefore, the purposes of the present research were to (a) review research on the measurement of goals in educational domains, (b) review research on the measurement of goals in work domains, and (c) conduct a series of studies to evaluate how recent advances in education domains can be applied to develop a new measure of achievement goals for a work domain.

**History of Achievement Goal Measurement in the Education Domain**

Initially, achievement goal theorists (Dweck & Leggett, 1988; Nicholls, 1984) proposed a two-factor model of achievement goals consisting of two goal orientations, which researchers (Ames, 1992; Elliot, 2005) have recommended calling mastery goals and performance goals. A mastery goal represents a mind-set in which an individual is concerned with developing his or her competence or mastering a task. In contrast, a performance goal represents a mind-set in which an individual is concerned with demonstrating his or her competence relative to others.

Researchers initially found that students endorsing mastery goals were likely to experience adaptive outcomes (Ames & Archer, 1988; Butler, 1987; Meece, Blumenfeld, & Hoyle, 1988) and students endorsing performance goals were likely to experience maladaptive outcomes (Elliott & Dweck, 1988; Meece et al., 1988). However, other researchers found that performance goals were not always linked to negative outcomes, with some research showing null effects and other research showing positive effects on adaptive outcomes (Harackiewicz, Barron, Carter, Lehto, & Elliot, 1997).

To better explain the mixed pattern of findings for performance goals, Elliot and his colleagues (Elliot & Church, 1997; Elliot & Harackiewicz, 1996) noted an important distinction in Dweck’s original definition of a performance goal (Dweck & Bempechat, 1983). Dweck defined performance goals in terms of either trying to approach favorable judgments and demonstrating competence compared with others or trying to avoid unfavorable judgments and demonstrating incompetence compared with others. Appreciating this distinction and the long-standing history of approach and avoidance themes in other theories of motivation, Elliot and his colleagues separated performance goals into separate constructs of performance-approach goals and performance-avoidance goals (Elliot & Harackiewicz, 1996). A performance-approach goal was defined as striving to demonstrate competence relative to others, whereas a performance-avoidance goal was defined as striving to avoid incompetence relative to others. Empirically, distinguishing performance-approach goals from performance-avoidance goals helped better account for the pattern of conflicting relationships between performance goals and various adaptive and maladaptive outcomes (Elliot & Church, 1997; Elliot & McGregor, 2001; Elliot, McGregor, & Gable, 1999).
In 2001, Elliot and McGregor argued that a fourth goal should be added to the achievement goal framework: mastery-avoidance (see also Elliot, 1999; Pintrich, 2000). Mastery-avoidance was defined as “a focus on avoiding self-referential or task-referential incompetence” (Elliot, 2005, p. 61). This addition to the achievement goal literature was justified (for reviews, see Elliot, 2005; Elliot, McGregor, & Thrash, 2002) by viewing achievement goals as a function of an individual’s definition of competence and valence toward competence.

First, Elliot et al. (2002) suggested that competence be defined in one of three ways. Absolute competence refers to defining competence on the basis of the ability to complete a particular task. Intrapersonal competence refers to defining competence on the basis of improving one’s past performance. Interpersonal competence refers to defining competence relative to others. Mastery goals reflect holding an absolute or intrapersonal definition of competence. In contrast, performance goals reflect holding an interpersonal definition of competence. Second, Elliot et al. noted different valences toward competence (i.e., focusing on approaching vs. avoiding). For example, one could approach wanting to improve on one’s past performance on a task (i.e., a mastery-approach goal), or one could focus on trying to avoid performing worse on a task than in the past (i.e., a mastery-avoidance goal). Fully crossing different definitions of competence (mastery vs. performance) with valence (approach vs. avoidance) results in a $2 \times 2$ framework, or four-factor model, of goal orientation consisting of mastery-approach, mastery-avoidance, performance-approach, and performance-avoidance goals.

The $2 \times 2$ framework has been supported empirically via confirmatory factor analysis (CFA) in both specific and general academic contexts (Elliot & McGregor, 2001; Finney, Pieper, & Barron, 2004). Furthermore, Elliot and McGregor (2001) found that mastery-avoidance goals related to external criteria and other achievement goals in the $2 \times 2$ framework in predicted ways. In general, mastery-avoidance goals appear to be associated with more adaptive outcomes than performance-avoidance goals, but with fewer adaptive outcomes than mastery-approach goals (e.g., Conroy, Elliot, & Hofer, 2003; Elliot & Reis, 2003; Malka & Covington, 2004).

Despite the initial empirical support of the $2 \times 2$ framework, some recent problems have been identified. Cronbach’s $\alpha$ values and standardized pattern coefficients (i.e., factor loadings) have been lower for the mastery-avoidance and performance-avoidance subscales than for the mastery-approach and performance-approach subscales (Hargis, Senter, & LeBrenton, 2004; Miller, 2004). Moreover, Miller (2004) found that a number of the current items used to assess avoidance goals might better represent a measure of fear (see also Midgley et al., 1998).

History of Achievement Goal Measurement in a Work Domain

Researchers in achievement domains other than education have also recognized the potential benefit of using achievement goal theory to understand individuals’
behavior (Farr, Hofmann, & Ringenbach, 1993; Kanfer, 1990). Button, Mathieu, and Zajac (1996) were among the first to develop a two-factor measure of mastery and performance goal orientation appropriate for use with non-school-age populations. Similar to work in the education domain, Button et al.’s measure of mastery goals has been associated with adaptive outcomes, such as higher worker self-efficacy, motivation to learn, and test performance in training (Colquitt & Simmering, 1998; Fisher & Ford, 1998; Phillips & Gully, 1997), and Button et al.’s measure of performance goals has been associated with both adaptive and maladaptive outcomes (VandeWalle, Cron, & Slocum, 2001; Yeo & Neal, 2004). In some studies, performance goals were negatively correlated to effort at work and worker self-efficacy (Fisher & Ford, 1998; Ford, Smith, Weissbein, Gully & Salas, 1998) but in other studies were positively correlated to effort and worker self-efficacy (Kozlowski et al., 2001; Sujan, Weitz, & Kumar, 1994). Although Button et al.’s measure provided an initial instrument to advance understanding of achievement goals in nonacademic situations, a number of issues limited its value for use in work domains. Specifically, CFAs testing the proposed two-factor model uncovered inadequate fit (Button et al., 1996), performance goals were assessed unidimensionally, and goals were assessed at a broad, general level rather than a level specific to work.

To address these concerns, VandeWalle (1997) developed a measure to represent the three-factor model of goal orientation specific to a work domain. VandeWalle (1997) integrated the work of Dweck (1986) and Elliot (Elliot & Harackiewicz, 1996) by defining mastery goals as “the desire to develop the self by acquiring new skills, mastering new situations, and improving one’s competence”; performance-approach goals as “the desire to prove one’s competence and to gain favorable judgments about it”; and performance-avoidance goals as “the desire to avoid the disproving of one’s competence and to avoid negative judgments about it” (p. 1000). A three-factor model fit the data and the subscales correlated in expected ways with other theoretically related constructs (VandeWalle, 1997). Mastery goals were linked to adaptive outcomes, and performance-approach goals were found to be less deleterious than performance-avoidance goals (Brett & VandeWalle, 1999; Heimbeck, Frese, Sonnentag, & Keith, 2003; VandeWalle, 2001; VandeWalle & Cummings, 1997). However, VandeWalle’s measure did not incorporate a mastery-avoidance goal subscale.

Purpose of the Current Study

The purpose of the current study was to extend VandeWalle’s (2001) three-factor model of goal orientation in a work domain to the more current four-factor conceptualization proposed by Elliot and McGregor (2001). Evaluating mastery-avoidance goals in a work domain may be particularly important because of its potential pervasiveness in organizations. Mastery-avoidance may be a common
goal orientation among newly hired employees, who are just focusing on mastering the basics of their jobs, or among older employees, who are focusing on not losing work-related knowledge, skills, and abilities. In addition, including mastery-avoidance may enhance the predictive utility of goal orientation and provide a richer understanding of individuals’ goal orientation profiles as found in other research (Pastor, Barron, Miller, & Davis, in press).

To help evaluate the effectiveness of adding mastery-avoidance items to create a four-factor model of goal orientation, Benson’s (1998) recommendations for establishing construct validity were followed, entailing a substantive phase, which stresses theoretical background of the construct; a structural phase, which involves investigating internal consistency of the scores; and an external phase, which involves investigating the nomological net. Two studies were conducted to accomplish three research objectives:

1. to develop items to represent mastery-avoidance in a work domain (the substantive phase; Study 1),
2. to assess the fit of the four-factor model and competing theoretically based models to the data (the structural phase; Studies 1 and 2), and
3. to evaluate if hypothesized relations between the goals and other theoretically related constructs are supported (the external phase; Study 2).

**Study 1**

**Method**

*The Substantive Phase: Instrument Development and Measures*

Because VandeWalle’s existing items align with Elliot’s (2005) review of the $2 \times 2$ framework and have been empirically supported, 12 items from VandeWalle’s (2001) prior research were used to represent mastery-approach (MAP), performance-approach (PAP), and performance-avoidance (PAV). However, to represent mastery-avoidance (MAV), we wrote a new pool of items following the operational definition suggested by Elliot and colleagues (Conroy et al., 2003; Elliot & McGregor, 2001): striving to avoid absolute and intrapersonal incompetence. A large pool of items (45) was initially generated. A team of four faculty members and five graduate students with experience in measurement and motivation theory selected 11 items on the basis of face validity and readability that they believed best represented the definition of mastery-avoidance. Items were written to avoid the use of *fear* and *afraid*, which has been a criticism of other avoidance goal measures (Miller, 2004). The 11 mastery-avoidance items were interspersed with VandeWalle’s (2001) 12 items to create a new 23-item measure (see appendix) to assess the four goal orientations. Participants responded to each item using a 7-point scale ranging from 1 (*not at all true of me*) to 7 (*very true of me*).
Participants and Procedures

Data were collected from 341 introductory psychology students at a midsized southeastern university. Of the collected responses, 88% of participants were White, and 76% were female. The mean age was 19.1 years. Students were recruited to participate in a session in which multiple surveys were being collected for different research projects in the psychology department, and they were compensated with course credit. Only students who had held jobs or currently held jobs completed the new $2 \times 2$ measure of goal orientation for work. All surveys were administered to groups of approximately 20 participants in a computer lab using WebSurveyor software. A Latin-square design was used to counterbalance the surveys.

Overview of Data Analysis

We used CFA to evaluate the four-factor model’s fit to the data. If the four-factor model were supported, a series of alternative models would be tested to ensure that the four goals were distinct and not explained more parsimoniously by merging goal constructs. Specifically, a number of alternative models, which Elliot and McGregor (2001) and Finney et al. (2004) tested, would be evaluated: (a) three-factor Model A, evaluating a combined factor of mastery-approach and mastery-avoidance, a performance-approach factor, and a performance-avoidance factor; (b) three-factor Model B, evaluating a combined factor of mastery-avoidance and performance-avoidance, a mastery-approach factor, and a performance-approach factor; (c) two-factor Model A, evaluating a combined factor of mastery-approach and mastery-avoidance and a combined factor of performance-approach and performance-avoidance; and (d) two-factor Model B, evaluating a combined factor of mastery-approach and performance-approach and a combined factor of mastery-avoidance and performance-avoidance. However, if the four-factor model were not supported, Study 1 would focus on diagnosing the misfit associated with this model.

Results and Discussion

Descriptive Statistics and Data Screening

There was no evidence of univariate or multivariate outliers or of bivariate or multivariate multicollinearity. Univariate kurtosis values were also within suggested ranges (see Finney & DiStefano, 2006, for a review of this research), but the normalized Mardia’s multivariate kurtosis coefficient was large (17.35), indicating potential problems with multivariate kurtosis (Bentler & Wu, 2003). To correct for problems with nonnormality, the Satorra-Bentler (S-B) correction was applied in conjunction with maximum likelihood estimation to produce a corrected $\chi^2$ (S-B $\chi^2$) and corrected standard errors (Satorra & Bentler, 1994).
Confirmatory Factor Analysis

LISREL 8.7 was used to conduct the CFAs using the covariances among the item responses (the covariance matrix is available from the first author). We evaluated model fit using the S-B $\chi^2$ statistic in conjunction with fit indices recommended by Hu and Bentler (1998, 1999), including the standardized root mean square residual (SRMR), the S-B-corrected comparative fit index (S-B CFI), and the S-B-corrected root mean square error of approximation (S-B RMSEA). When modeling nonnormal data, SRMR values below .07, S-B CFI values .95 or above, and S-B RMSEA values .05 or below suggest adequate model-data fit (Yu & Muthén, 2002).

Fit results and diagnosing misfit. The four-factor model did not fit the data adequately (see Table 1), so the focus of Study 1 quickly switched to diagnosing areas of misfit by examining both standardized covariance residuals and modification indices in conjunction with theory. The majority of misfit was associated with mastery-avoidance, with Items MAV1, MAV3, MAV7, MAV8, MAV9, and MAV10 all having standardized covariance residuals greater than 5. Standardized covariance residuals greater than 3 indicate that a model is not reproducing the relationship between two items well (Byrne, 1998). Modification indices suggested that adding factor loadings from performance-avoidance to Item MAV1, from mastery-approach to Item MAV7, and from performance-avoidance to Item MAV7 would result in large $\chi^2$ decreases, indicating that the items are multidimensional. In addition, modification indices suggested that adding error covariances between Items MAV8 and MAV10, Items MAV7 and MAV10, Items MAV3 and MAV9, and Items MAV7 and MAV8 would result in large $\chi^2$ decreases, indicating that the pairs of items represent a construct beyond mastery-avoidance.

Ancillary analyses evaluating VandeWalle’s three-factor model and a one-factor mastery-avoidance model. Given the poor fit of the four-factor model, the results of the standardized covariance residuals and modification indices, and past research supporting the three-factor structure of VandeWalle’s instrument, we suspected that the model misfit was due to the new mastery-avoidance items. Therefore, we conducted two ancillary analyses to confirm potential problems with the newly written mastery-avoidance items. We broke the four-factor model down into a three-factor VandeWalle (2001) model and a one-factor mastery-avoidance model. Not surprisingly, the three-factor model fit the data well. On the other hand, the unidimensional model fit to just the new mastery-avoidance items resulted in poor fit (see Table 1).

Similar to results from the four-factor model, Items MAV7, MAV8, and MAV10 had the highest standardized covariance residuals (> 6) and were associated with large increases in model-data fit when their error terms were allowed to
covary. Close inspection of these items suggests that they share variance related to self-efficacy (e.g., “I avoid taking on new tasks at work when I’m not sure I’ll be able to learn or master them”), whereas other items used to assess mastery-avoidance do not (e.g., “At work, I am just trying to avoid performing the tasks required for my job poorly”).

In addition, Items MAV1, MAV3, and MAV9 had standardized covariance residuals that were greater than 3. Allowing the error terms associated with Items MAV3 and MAV9 to covary would result in a substantial increase in model-data fit, suggesting that the two items share variance independent of mastery-avoidance. Closer inspection of item wording revealed that the two items were redundant. Both are not needed, and in turn one could be removed. Finally, Item MAV1 appeared to share variance with items written to assess performance-avoidance.

In sum, the results of Study 1 suggested that model misfit was associated with Items MAV1, MAV3, MAV7, MAV8, MAV9, and MAV10. This model misfit seemed to be associated with construct irrelevant variance and redundancy. However, it is important to note that the standardized covariance residuals and modification indices used to inform this conclusion were based on one sample. MacCallum, Roznowski, and Necowitz (1992) warned that modification indices might reflect idiosyncrasies in a data set and may not replicate across independent samples. Thus, to evaluate the stability of misfit associated with the four-factor structure, it was imperative to reevaluate areas of misfit using an independent sample.

Table 1
Fit Statistics for the 23-Item Model of Goal Orientation for a Work Domain

<table>
<thead>
<tr>
<th>Model</th>
<th>ML $\chi^2$</th>
<th>S-B–Scaled $\chi^2$</th>
<th>S-B $p$ Value</th>
<th>$df$</th>
<th>S-B CFI</th>
<th>S-B RMSEA</th>
<th>SRMR</th>
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<tbody>
<tr>
<td><strong>Sample 1</strong></td>
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<tr>
<td>a. Four-factor:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 × 2 framework</td>
<td>702.05</td>
<td>766.31</td>
<td>&lt;.01</td>
<td>224</td>
<td>.90</td>
<td>.084</td>
<td>.08</td>
</tr>
<tr>
<td>b. Three-factor:</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>VandeWalle</td>
<td>87.84</td>
<td>79.48</td>
<td>.03</td>
<td>51</td>
<td>.98</td>
<td>.041</td>
<td>.04</td>
</tr>
<tr>
<td>c. One-factor:</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>mastery-avoidance</td>
<td>284.85</td>
<td>304.93</td>
<td>&lt;.01</td>
<td>44</td>
<td>.88</td>
<td>.130</td>
<td>.09</td>
</tr>
<tr>
<td><strong>Sample 2</strong></td>
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<td>a. Four-factor:</td>
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<tr>
<td>2 × 2 framework</td>
<td>691.74</td>
<td>697.2</td>
<td>&lt;.01</td>
<td>224</td>
<td>.80</td>
<td>.083</td>
<td>.10</td>
</tr>
<tr>
<td>b. Three-factor:</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VandeWalle</td>
<td>71.07</td>
<td>67.6</td>
<td>.06</td>
<td>51</td>
<td>.98</td>
<td>.033</td>
<td>.04</td>
</tr>
<tr>
<td>c. One-factor:</td>
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<td></td>
</tr>
<tr>
<td>mastery-avoidance</td>
<td>250.26</td>
<td>240.26</td>
<td>&lt;.01</td>
<td>44</td>
<td>.81</td>
<td>.120</td>
<td>.09</td>
</tr>
</tbody>
</table>

Note: The four-factor model used all 23 items, the three-factor model used just VandeWalle’s (2001) 12 items, and the one-factor model used the 11 newly written mastery-avoidance items. ML = maximum likelihood; S-B = Satorra-Bentler; CFI = comparative fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual.
Study 2

The goal of Study 2 was to retest the fit of the four-factor model using an independent sample. If the misfit found in Study 1 was replicated, problematic items would be removed, and a model consisting of a reduced set of items would be tested for dimensionality and against theoretically based alternative models. In addition, goal orientations would be correlated with three other measures of motivation to gather convergent and discriminant validity evidence.

The first measure, the Work and Family Orientation Scale (WOFO; Spence & Helmreich, 1983), provides an approach motivation measure that assesses three distinct ways of approaching the need for achievement: work (the desire to work hard), mastery (the desire to seek out challenges), and competitiveness (the desire to outperform others). Because WOFO’s Work and Mastery subscales represent approaching absolute and intrapersonal competence, they should be strongly correlated with the mastery-approach subscale of the $2 \times 2$ framework for a work domain (Harackiewicz et al., 1997). The Competitiveness subscale represents approaching interpersonal competence and should be strongly correlated with the performance-approach subscale of the $2 \times 2$ framework for a work domain.

The second measure, the Motive to Avoid Failure Scale (MAF; Hagtvet & Benson, 1997), provides an avoidance measure of motivation that assesses individuals’ tendencies to avoid and to have increased negative reactions to situations in which they may fail. Because MAF assesses avoiding absolute incompetence, it should correlate positively with mastery-avoidance goals and negatively with mastery-approach goals. Although MAF does not specifically reference interpersonal competence, we hypothesized that individuals high on the motive to avoid failure may be motivated to avoid failure because of the presence of others, and we predicted that the MAF and performance-avoidance goals would also be positively correlated.

The third measure, the Achievement Goal Questionnaire (AGQ; Elliot & McGregor, 2001; Finney et al., 2004), assesses individuals’ goal orientations in an academic achievement domain. We expected each of the four goals of the AGQ to be more positively correlated with its associated goal in a work domain (e.g., mastery-approach goals in an academic domain and mastery-approach goals in a work domain) than with other goals (e.g., mastery-approach goals with performance-approach goals). In addition, we expected goals from different domains to still be distinct (VandeWalle, 1997). To investigate the differences between achievement goals in a work domain and achievement goals in an academic domain, two additional models warranted testing. The first model was an eight-factor structure consisting of the four achievement goals in a work domain and the four achievement goals in an academic domain. The second model was a four-factor structure combining the corresponding goals from an academic and work...
domain. For example, mastery-approach goals in a work domain and mastery-approach goals in an academic domain would represent one factor of mastery-approach orientation. We hypothesized that the eight-factor model would fit the data better than the four-factor model, suggesting that goal orientations are more domain specific than they are global traits.

**Method**

*Participants and Procedures*

Data were collected from 307 introductory psychology students at a midsized southeastern university, who were compensated with course credit. Of the final sample, 88% of participants were White, and 52.2% were female. The mean age was 18.9 years. As in Study 1, only students who had held jobs or currently held jobs were asked to participate. The procedure used for Study 2 was similar to that used for Study 1. WebSurveyor was used to present the surveys to approximately 20 participants at a time in a computer lab. However, to assess external criteria, additional measures were included in Study 2.

*Measures*

**WOFO.** Spence and Helmreich’s (1983) WOFO was used to assess an individual’s need for achievement multidimensionally using three subscales: Work, Mastery, and Competitiveness. Work uses six items to assess the desire to work hard and complete tasks. Mastery uses eight items to assess the desire to seek out and master challenges. Competitiveness uses five items to assess the desire to surpass and outperform others. All of the subscales use a 5-point scale that ranges from 1 (strongly disagree) to 5 (strongly agree). Cronbach’s $\alpha$ values in the current study were .79 for Work, .67 for Mastery, and .81 for Competitiveness, indicating that the Work and Competitiveness subscales have adequate internal consistency, but the Mastery subscale has lower internal consistency (Henson, 2001; Lance, Butts, & Michels, 2006).

**MAF.** Hagtvet and Benson’s (1997) unidimensional MAF was used to assess an individual’s tendencies to avoid or to have increased negative reactions in situations in which he or she may fail. Six items are rated on a 4-point scale that ranges from 1 (almost never) to 4 (almost always). Cronbach’s $\alpha$ in the current study was .86.

**AGQ.** A version of the AGQ (Elliot & McGregor, 2001) that investigates a four-factor model of achievement goals across a general education domain was used (Finney et al., 2004). Mastery-approach, performance-approach, mastery-avoidance, and performance-avoidance are each assessed with three items that are rated on a
7-point scale ranging from 1 (not at all true of me) to 7 (very true of me). Cronbach’s \( \alpha \) values in the current study were .89 for mastery-approach, .74 for mastery-avoidance, .88 for performance-approach, and .77 for performance-avoidance. The internal consistency for mastery-approach and performance-approach is adequate, but internal consistency is lower for mastery-avoidance and performance-avoidance (Henson, 2001).

Results and Discussion

Descriptive Statistics and Data Screening

Similar to Study 1, there was no evidence of univariate outliers or of bivariate or multivariate multicollinearity. Mahalanobis’s distances identified one multivariate outlier, which was removed, leaving a final sample size of 306. Similar to Study 1, univariate kurtosis values were at recommended levels, but multivariate kurtosis was large (22.26). Thus, the S-B correction was used.

CFA: Reexamining the Structural Phase

To investigate if the misfit identified in Study 1 was replicated in the independent sample used in Study 2, a four-factor model was fit to all 23 item responses.

Fit results and diagnosing misfit. Similar to Study 1, the four-factor model did not fit the data (see Table 1). Standardized covariance residuals and modification indices were again examined to identify misfit. The pattern of standardized covariance residuals from Study 1 was closely replicated in Study 2. Specifically, Items MAV1, MAV3, MAV7, MAV8, MAV9, and MAV10 had numerous standardized covariance residuals higher than 5. Different from Study 1, Item MAV6 had a high standardized covariance residual with Item MAP3 (5.87). Modification indices also appeared to be consistent across Study 1 and Study 2, aligning with the problems identified by the standardized covariance residuals, providing more evidence that the misfit associated with the four-factor model was due to poorly functioning items from the mastery-avoidance subscale.

Analyses evaluating VandeWalle’s three-factor model and the one-factor mastery-avoidance model. As was done in Study 1 to ensure that the misfit was attributed to the mastery-avoidance items of the 2 × 2 model, a three-factor model using the 12 items representing VandeWalle’s instrument and a one-factor model of mastery-avoidance using just the 11 newly written mastery-avoidance items were evaluated. Once again, the three-factor model met recommended fit indices’ cutoff values, whereas the one-factor mastery-avoidance model did not (see Table 1). The standardized covariance residuals and modification indices were examined and compared to those found in Study 1. Again, Items MAV7, MAV8, and MAV10 all
had numerous standardized covariance residuals greater than 6, and modification indices indicated problems with Items MAV7, MAV8 and MAV10, as well as with Items MAV1, MAV3 and MAV9.

Replication Conclusions and Revising Items Assessing the 2 \( \times \) 2 Framework

Across both Study 1 and Study 2, the 12 items used to assess VandeWalle’s three-factor model of goal orientation functioned well and were all retained. In contrast, a number of the newly written mastery-avoidance goal items functioned poorly and theoretically appeared to be measuring another construct in addition to mastery-avoidance, to have problematic wording, or to be too similar in language. Therefore, on the basis of the results and replication of misfit across Study 1 and Study 2, Items MAV1, MAV3, MAV7, MAV8, and MAV10 were dropped from the model, resulting in a revised four-factor model consisting of 18 items. The remaining mastery-avoidance items (MAV2, MAV4, MAV5, MAV6, MAV9, and MAV11) still covered the breadth of mastery-avoidance.

CFA: Testing the Four-Factor Model With the Reduced Number of Items

To test the dimensionality of the reduced 18-item instrument, another CFA was conducted using the data from Study 2. The four-factor model was found to fit the responses to the reduced number of items (see Table 2). Therefore, we tested four alternative models that were more parsimonious than the four-factor model (previously described under Study 1’s overview of data analyses). As evident in Table 2, none of the alternative models fit the data as well as the four-factor model, providing evidence for viewing each of the constructs in the four-factor model as distinct.

Table 2

<table>
<thead>
<tr>
<th>Model</th>
<th>ML ( \chi^2 )</th>
<th>S-B ( \chi^2 )</th>
<th>S-B ( p ) Value</th>
<th>( df )</th>
<th>S-B CFI</th>
<th>S-B RMSEA</th>
<th>SRMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Four-factor model</td>
<td>253.68</td>
<td>220.35</td>
<td>&lt; .01</td>
<td>129</td>
<td>.96</td>
<td>.05</td>
<td>.06</td>
</tr>
<tr>
<td>Three-factor Model A</td>
<td>861.61</td>
<td>1,273.63</td>
<td>&lt; .01</td>
<td>132</td>
<td>.77</td>
<td>.17</td>
<td>.17</td>
</tr>
<tr>
<td>Three-factor Model B</td>
<td>448.70</td>
<td>482.76</td>
<td>&lt; .01</td>
<td>132</td>
<td>.90</td>
<td>.09</td>
<td>.10</td>
</tr>
<tr>
<td>Two-factor Model A</td>
<td>1,242.92</td>
<td>1,988.75</td>
<td>&lt; .01</td>
<td>134</td>
<td>.65</td>
<td>.21</td>
<td>.22</td>
</tr>
<tr>
<td>Two-factor Model B</td>
<td>634.35</td>
<td>690.55</td>
<td>&lt; .01</td>
<td>134</td>
<td>.84</td>
<td>.12</td>
<td>.13</td>
</tr>
</tbody>
</table>

Note: ML = maximum likelihood; S-B = Satorra-Bentler; CFI = comparative fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual.

Table 3 contains the standardized and structure coefficients associated with the 18 items. All unstandardized path coefficients were statistically significant at the \( p < .05 \) level. The lowest standardized path coefficient (.45) was associated with
performance-approach (Item PAP4), and the highest (.80) was associated with mastery-approach (Item MAP4). Although most of the items had standardized path coefficients above .5, the majority of items had standardized path coefficients ranging between only .6 and .7.

$R^2$ values, which represent the amount of variance in items that can be explained by the latent construct, indicated that there still was a substantial amount of unexplained variance (e.g., variance associated with another construct, wording, method, or unreliability) associated with the items.

Table 4 lists the reliability values and variance extracted for each of the four goal orientations. The standardized path coefficients and error variances were used to calculate reliability because Cronbach’s $\alpha$ is biased downward when items do not have equal path coefficients (Reuterberg & Gustafsson, 1992). The reliabilities of the scores for the mastery-avoidance items, performance-avoidance items, and mastery-approach items were all above .78. Surprisingly, the reliability of the scores for the items representing performance-approach was only .69, which is low

<table>
<thead>
<tr>
<th>Goal Orientation Items</th>
<th>Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAV2</td>
<td>.64 (.64)</td>
</tr>
<tr>
<td>MAV4</td>
<td>.67 (.67)</td>
</tr>
<tr>
<td>MAV5</td>
<td>.54 (.54)</td>
</tr>
<tr>
<td>MAV6</td>
<td>.64 (.64)</td>
</tr>
<tr>
<td>MAV9</td>
<td>.72 (.72)</td>
</tr>
<tr>
<td>MAV11</td>
<td>.70 (.70)</td>
</tr>
<tr>
<td>MAP1</td>
<td>.00 (-.03)</td>
</tr>
<tr>
<td>MAP2</td>
<td>.00 (-.03)</td>
</tr>
<tr>
<td>MAP3</td>
<td>.00 (-.03)</td>
</tr>
<tr>
<td>MAP4</td>
<td>.00 (-.03)</td>
</tr>
<tr>
<td>PAV1</td>
<td>.00 (.39)</td>
</tr>
<tr>
<td>PAV2</td>
<td>.00 (.43)</td>
</tr>
<tr>
<td>PAV3</td>
<td>.00 (.41)</td>
</tr>
<tr>
<td>PAV4</td>
<td>.00 (.44)</td>
</tr>
<tr>
<td>PAP1</td>
<td>.00 (.21)</td>
</tr>
<tr>
<td>PAP2</td>
<td>.00 (.22)</td>
</tr>
<tr>
<td>PAP3</td>
<td>.00 (.23)</td>
</tr>
<tr>
<td>PAP4</td>
<td>.00 (.15)</td>
</tr>
</tbody>
</table>

Note: The standardized factor pattern coefficients are presented first, followed by structure coefficients in parenthesis. The pattern coefficients in bold type were freely estimated, whereas the pattern coefficients equal to .00 were fixed at zero. The structure coefficients represent the direct and indirect relationship between the factor and the item (Thompson & Daniel, 1996). MAV = mastery-avoidance; MAP = mastery-approach; PAP = performance-approach; PAV = performance-avoidance.
for a scale that is beyond the initial stages of development (Henson, 2001; Lance et al., 2006). Although some studies have found performance-approach items to have lower reliability (VandeWalle & Cummings, 1997), most studies have found Cronbach’s $\alpha$ values of .80 or above (VandeWalle, 1997; VandeWalle et al., 2001). One possible explanation for the poor functioning of the performance-approach items was the current study’s use of VandeWalle’s 2001 instrument rather than his 1997 instrument. The 2001 instrument has one performance-approach item slightly reworded. However, this is unlikely to be the cause of the low reliability value, because all the standardized coefficients associated with the performance-approach items were low, suggesting that the low reliability is not a function of just one item. A second explanation may be the sample used in the current study, which was composed of mainly 1st-year college students. Research showing higher reliabilities and standardized path coefficients associated with performance-approach items were found in samples of upper-class college students and graduate students (VandeWalle, 1997; VandeWalle et al., 2001). Older students may have a higher likelihood of holding jobs that present challenging work and that are valued, making achievement goals more salient. Younger students, however, may have a harder time thinking of situations at work in which they felt challenged. Therefore, younger students’ conceptualization of achievement goals may vary more from question to question for each subscale than older students, causing the internal consistency to be lowered.

**Investigating Correlations: Testing the External Phase**

Correlations were examined to investigate the nomological net surrounding the four goal orientations. First, when considering just the subscales of the four-factor model, correlations between the four goal orientations suggested that each goal was distinct and that they generally related in expected ways to one another (see Table 5). Similar to VandeWalle’s (1997) findings, the current study found a positive correlation between mastery-approach and performance-approach goals ($r = .28$), a negative relationship between mastery-approach and performance-avoidance goals
and a positive correlation between performance-avoidance and performance-approach goals, albeit weak ($r = .09$). Also, as found in past research (Elliot & McGregor, 2001; Finney et al., 2004), mastery-avoidance was positively correlated with performance-avoidance ($r = .48$) and performance-approach ($r = .24$). However, in contrast to past research, the current research found a null relationship between mastery-avoidance and mastery-approach goals ($r = -.03$), which others have found to be positive (Elliot & McGregor, 2001; Finney et al., 2004).

Table 5 contains the correlation coefficients between the four goal orientations in a work domain and the three dimensions of the WOFO (work, mastery, and competitiveness), the MAF, and the four goal orientations in an academic domain. The correlation matrix shows that each goal has a unique pattern of relationships with other motivational variables. Similar to VandeWalle’s (1997) findings and as predicted, the Work subscale of the WOFO was most positively correlated with mastery-approach goals ($r = .54$), the Mastery subscale of the WOFO was most positively correlated with mastery-approach goals ($r = .39$), and the Competitiveness subscale
of the WOFO was most positively correlated with performance-approach goals ($r = .51$).

Results associated with the MAF also supported the hypotheses that because of the focus on avoiding situations in which one may fail, MAF would be positively related to both mastery-avoidance ($r = .33$) and performance-avoidance goals ($r = .55$).

When examining the relationships between goals in academic and work domains, mastery-approach goals in the academic domain were the most correlated with mastery-approach goals in the work domain ($r = .42$), performance-approach goals in the academic domain were the most correlated with performance-approach goals in the work domain ($r = .43$), and mastery-avoidance goals in the academic domain were the most correlated with the mastery-avoidance goals in the work domain ($r = .15$). However, performance-avoidance goals in the academic domain were correlated at .31 with performance-avoidance in the work domain but at .45 with mastery-avoidance in the work domain. Although it is not unusual for an achievement goal to be moderately correlated with another achievement goal, it was surprising that mastery-avoidance goals in a work domain were not more highly correlated with mastery-avoidance goals in an educational domain. One possible reason is that the measure of mastery-avoidance goals in an education domain may not accurately assess mastery-avoidance, which has been suggested by other researchers (Miller, 2004; Midgley et al., 1998).

To further investigate the relationship between achievement goals in a work domain and achievement goals in an education domain, an eight-factor CFA was conducted to assess the distinctiveness of the four achievement goals in an academic domain and the four achievement goals in a work domain. The eight-factor model fit the data well (S-B CFI = .95, SRMR = .06, S-B RMSEA = .05). A more parsimonious four-factor model combining each goal across domains (e.g., the mastery-approach factor consisted of mastery-approach in a work domain and mastery-approach goals in an academic domain) did not fit the data (S-B CFI = .80, SRMR = .12, S-B RMSEA = .12), suggesting that achievement goals are distinct constructs across work and educational domains and may best be viewed as domain-specific, rather than as general, overarching personality traits.

**General Discussion**

The goal of the current study was to develop a measure of goal orientation appropriate for a work domain that reflected the current conceptualization of goal orientation as a $2 \times 2$ framework (Elliot, 2005). We used VandeWalle’s (2001) instrument to measure mastery-approach, performance-approach, and performance-avoidance goals and wrote new items to measure mastery-avoidance. After identifying problems with a number of the newly written mastery-avoidance items
through the use of CFA on multiple samples, an 18-item reduced scale was found to support the four-factor structure hypothesized in the $2 \times 2$ framework. The mastery-approach, mastery-avoidance, and performance-avoidance subscales functioned adequately, but the performance-approach subscale functioned worse than anticipated (i.e., low reliability) on the basis of past research (e.g., Vande-Walle, 1997).

Correlations among the four goal orientations revealed that they were related, yet distinct. Evidence gathered from other measures of achievement motivation indicated that each achievement goal in the $2 \times 2$ framework had a unique relationship to other theoretically related variables. As expected, the Work and Mastery subscales of the WOFO were positively correlated with mastery-approach goals, and the Competitiveness subscale of the WOFO was positively correlated with performance-approach goals. MAF was positively correlated with mastery-avoidance and performance-avoidance goals and was negatively correlated with mastery-approach goals. Finally, three of the four goal orientations in an academic domain were most correlated with their associated goal orientation in a work domain. The exception was mastery-avoidance, which was more positively correlated with performance-avoidance in a work domain than mastery-avoidance in a work domain. In addition, an eight-factor model of the four achievement goals in the work domain and the four achievement goals in an academic domain was tested and compared with a competing four-factor model that combined each goal across domains. The eight-factor model fit the data, whereas the four-factor model did not, providing additional evidence for goal orientations being domain specific.

DeShon and Gillespie (2005) called attention to measurement problems in achievement goal theory, namely, the inconsistencies across various research camps regarding conceptual and operational definitions, dimensionality, and the stability of achievement goals. Creating an instrument to represent the $2 \times 2$ framework of achievement goals for a work domain provided an opportunity to evaluate a number of these measurement issues. Specifically, we were able to provide support for four goal dimensions (rather than two or three) in a domain beyond academics. Moreover, when conducting analyses that simultaneously combined work and academic goals items, domain specificity for achievement goal subscales was found rather than support for more global achievement goal orientations.

Although there were a number of strengths in the current study, including the use of multiple, independent samples (MacCallum et al., 1992) and following Benson’s (1998) three phases of a strong program of construct validity, there were limitations as well. One limitation was using undergraduate student participants who had held part-time jobs rather than using full-time employees. Future research should investigate if the results of the current study generalize to different populations. Specifically, the $2 \times 2$ framework should be investigated using a sample composed of full-time employees to evaluate if a working population responds to the items similarly or differently than an undergraduate student population. For
example, the performance-approach subscale functioned worse in the current study than it has functioned in past research using older, more experienced participants (VandeWalle, 1997).

Another important area for future research is comparing the achievement goal means across samples, because some goal orientations, such as mastery-avoidance, may be more salient among full-time workers or workers in particular stages of their careers or in particular positions. For example, particular achievement goals may be more salient for new employees, who are focused on just learning the basics of their jobs, or for older employees, who are focused on not losing skills. Particular goals also may be more salient for employees in positions that involve high levels of challenge or that require continual retraining to perform work-related tasks.

Moreover, it is important to have a thorough understanding of how combinations of goals explain and predict behavior at work. Although much of the research conducted (e.g., Sujan et al., 1994) in the work domain has recommended encouraging mastery goals at work, it may be that a combination of mastery-approach and performance-approach goals is more beneficial (see Barron & Harackiewicz, 2001; Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002; Pastor et al., in press). An essential step in promoting optimal achievement at work is learning more about how each goal relates to key outcome variables, which can best be accomplished by researchers’ use of an instrument that aligns with the most current theorizing on goal orientation. However, before employers can understand specific goal orientations and their relationships to key outcome variables, it is essential to first develop a sound, valid assessment tool.
Appendix

Items in the 2 × 2 Framework of Achievement Goals for a Work Domain

<table>
<thead>
<tr>
<th>Item</th>
<th>Wording</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAV1</td>
<td>My main goal at work is to avoid messing up the tasks required for my job.</td>
</tr>
<tr>
<td>MAV2</td>
<td>I just try to avoid being incompetent at performing the skills and tasks necessary for my job.</td>
</tr>
<tr>
<td>MAV3</td>
<td>I just hope I am able to master enough skills so I am competent at my job.</td>
</tr>
<tr>
<td>MAV4</td>
<td>When I am engaged in a task at work, I find myself thinking a lot about what I need to do to not mess up.</td>
</tr>
<tr>
<td>MAV5</td>
<td>At work, I focus on not doing worse than I have personally done in the past on my job.</td>
</tr>
<tr>
<td>MAV6</td>
<td>My goal is to avoid being incompetent at performing the skills and tasks necessary for my job.</td>
</tr>
<tr>
<td>MAV7</td>
<td>I avoid taking on new tasks at work when I’m not sure I’ll be able to learn or master them.</td>
</tr>
<tr>
<td>MAV8</td>
<td>I often think that I might not be able to master all the skills required for my job.</td>
</tr>
<tr>
<td>MAV9</td>
<td>I just hope I am able to maintain enough skills so I am competent at my job.</td>
</tr>
<tr>
<td>MAV10</td>
<td>At work, I often feel that I’m unable to master what is necessary to do my job.</td>
</tr>
<tr>
<td>MAV11</td>
<td>At work, I am just trying to avoid performing the tasks required for my job poorly.</td>
</tr>
<tr>
<td>MAP1</td>
<td>I am willing to select a challenging work assignment that I can learn a lot from.</td>
</tr>
<tr>
<td>MAP2</td>
<td>For me, development of my work ability is important enough to take risks.</td>
</tr>
<tr>
<td>MAP3</td>
<td>I often look for opportunities to develop new skills and knowledge.</td>
</tr>
<tr>
<td>MAP4</td>
<td>I enjoy challenging and difficult tasks at work where I’ll learn new skills.</td>
</tr>
<tr>
<td>PAP1</td>
<td>I like to show that I can perform better than my coworkers.</td>
</tr>
<tr>
<td>PAP2</td>
<td>I prefer to work on projects where I can prove my ability to others.</td>
</tr>
<tr>
<td>PAP3</td>
<td>I try to figure out what it takes to prove my ability to others at work.</td>
</tr>
<tr>
<td>PAP4</td>
<td>I enjoy it when others at work are aware of how well I am doing.</td>
</tr>
<tr>
<td>PAV1</td>
<td>I would avoid taking on a new task if there was a chance that I would appear rather incompetent to others.</td>
</tr>
<tr>
<td>PAV2</td>
<td>Avoiding a show of low ability is more important to me than learning a new skill.</td>
</tr>
<tr>
<td>PAV3</td>
<td>I prefer to avoid situations at work where I might perform poorly.</td>
</tr>
<tr>
<td>PAV4</td>
<td>I’m concerned about taking on a task at work if my performance would reveal that I had low ability.</td>
</tr>
</tbody>
</table>

Note: MAV = mastery-avoidance; MAP = mastery-approach; PAP = performance-approach; PAV = performance-avoidance.

References


