The Development and Validation of Scales Assessing Students’ Achievement Goal Orientations

Carol Midgley, Avi Kaplan, Michael Middleton, and Martin L. Maehr

University of Michigan

Tim Urdan

Santa Clara University

Lynley Hicks Anderman

University of Missouri, Kansas City

Eric Anderman

University of Kentucky

and

Robert Roeser

Stanford University

Achievement goal theory has emerged as a major new direction in motivational research. A distinction is made among conceptually different achievement goal orientations including the goal to develop ability (task goal orientation), the goal to demonstrate ability (ability-approach goal orientation), and the goal to avoid the demonstration of lack of ability (ability-avoid goal orientation). Scales assessing each of these goal orientations were developed over an eight year period by a group of researchers at the University of Michigan. The results of studies conducted with seven different samples of elementary and middle school students are used to describe the internal consistency, stability, and construct validity of the scales. Comparisons of these scales with those developed by Nicholls and his colleagues provide evidence of convergent validity. Confirmatory factor analysis attests to the discriminant validity of the scales.

The authors express their appreciation to Kwang Suk Yoon for consultation regarding the confirmatory factor analyses. The development of these scales and the preparation of this paper were funded by grants from the U.S. Department of Education and the William T. Grant Foundation.

Address correspondence and reprint requests to Carol Midgley, 1400D School of Education Building, 610 East University, Ann Arbor, MI 48109-1259. E-mail: <cmidgley@umich.edu>.
Since 1990 members of a research team at the University of Michigan, including faculty and graduate students, have collaborated to develop, refine, and validate scales to assess students’ achievement goal orientations. These scales have been used in studies conducted at a single point in time as well as in longitudinal studies with seven different samples of elementary and middle school students. These studies provide evidence of the internal consistency, as well as the convergent, construct, and discriminant validity of the scales. These scales are being used by researchers who approach the study of motivation using “achievement goal theory.”

Achievement goal theory has emerged as a major new direction in motivational research (Dweck & Leggett, 1988; Harackiewicz & Elliot, 1996; Maehr, 1989; Nicholls, 1989; Weiner, 1990). This theory has developed within a social-cognitive framework that focuses on the aims or purposes that are pursued or perceived in an achievement setting. Rather than conceiving of students as possessing or lacking motivation, the focus is on how students think about themselves, their tasks, and their performance (Ames, 1987). Goals provide a framework within which individuals interpret and react to events, and result in different patterns of cognition, affect, and behavior (Dweck & Leggett, 1988). Theorists have described two achievement goals in particular: the goal to develop ability (variously labeled a task goal, learning goal, or mastery goal), and the goal to demonstrate ability or to avoid the demonstration of lack of ability (variously labeled an ability goal, ego goal, or performance goal). Although there are some differences among achievement goal theorists regarding the exact nature and functioning of these two types of goals, for the most part there is considerable overlap among these different conceptions (Ames, 1992).

The relation between a task goal orientation and adaptive patterns of learning is remarkably consistent across a host of studies. An ability goal orientation is sometimes found to be associated with adaptive and sometimes with maladaptive patterns of learning. We believe that this inconsistency may be related to the failure, until recently, to distinguish between the approach and avoidance components of achievement goals. Traditionally, theorists have distinguished between approach and avoidance motivational orientations (e.g., McClelland, Atkinson, Clark, & Lowell, 1953). A task goal is conceptualized as an approach motivational orientation. Individuals who are task-oriented strive to increase their understanding and skill. Success is defined in relation to the task and progress is measured in self-referential terms. An ability goal is conceptualized as including both approach and avoidance components (Dweck & Leggett, 1988, Nicholls, 1989, Elliot & Harackiewicz, 1996). Individuals who are ability-oriented strive to gain favorable judgments of their competence, or to avoid unfavorable judgments of their competence. Success is defined in relation to others. Although ability goals
have been conceptualized in terms of both approach and avoidance components, much of the research using a goal orientation framework has focused on the approach component. Recently, Elliot and Harackiewicz (1996) pointed out this discrepancy between the theory and the research, and partitioned ability goals into independent approach and avoidance motivational orientations.

In an experimental study, Elliot and Harackiewicz (1996) created a task-focused condition as well as two different ability-focused conditions, one in which success was made salient and one in which failure was made salient. They found similar results for the task and ability with success conditions. Only ability goals grounded in the avoidance of failure undermined intrinsic motivation. In a survey study, Elliot and Church (1997) found that task goals were linked to achievement motivation, ability-avoid goals were linked to fear of failure, and ability-approach goals were linked to both. They concluded that students who are concerned about their ability espouse approach or avoidance goals depending on whether achievement situation is construed as a challenge or as a threat. They also found that perceived ability was an antecedent of achievement goal adoption: high perceived ability was antecedent to task and ability-approach goals, whereas low perceived ability was antecedent to performance-avoid goals.

The role of perceived ability in the adoption of goals has been the subject of considerable debate. In their experimental studies, Dweck and her colleagues elicited task or ability goals by orienting students more toward evaluations of ability or more toward the value of the skill to be learned (Elliot and Dweck, 1988). They predicted and found that level of perceived competence moderated the relation between ability goals and patterns of behavior. In the condition that highlighted the value of learning, students demonstrated a mastery pattern regardless of their level of perceived ability. In the condition that highlighted evaluation, students who were high in perceived ability exhibited a mastery pattern, whereas students who were low in perceived ability exhibited the helpless pattern. It should be noted, however, that studies based on survey data have failed to replicate this finding (Kaplan & Midgley, in press; Miller, Behrens, Greene, & Newman, 1993). Further research is needed to clarify the relationship between perceived ability and task, ability-approach, and ability-avoid goals.

**ASSESSING ACHIEVEMENT GOALS**

Our approach to assessment is based on the definition of achievement goals as purposes or reasons for achievement behavior, and in that way the items in our scales differ from those of several other goal theorists. We have tried to avoid items that assess correlates of goals, such as worries, anxieties, or concerns. In addition, we have developed scales to assess task, ability-
approach, and ability avoid goals.\(^1\) We first used our scales with four different samples of elementary and middle school students from a working class community near a major Midwestern city. Approximately 80% of each sample was European American, 15% African American, and 5% “other.” Approximately 15% of the students in each sample received free or reduced fee lunches at school, based on level of family income. Two additional samples of students (sixth graders and eighth graders) were recruited from a middle school in a small lower-to-middle class community near the University of Michigan. In each sample, approximately 55% of the students were European American and 45% were African American; 50% of the students in this middle school qualified for the free or reduced fee lunch program. The most recent sample included over 850 students in four ethnically and economically diverse school districts in southeastern Michigan. This sample was 1% American Indian, 2% Asian American, 8% Hispanic, 43% European American, and 46% African American. Of this total, 40% qualified for free lunch, 5% qualified for reduced fee lunch, 50% did not receive a lunch subsidy, and data were missing on this variable for 5%. Five waves of data have been collected from these students to date (fall and spring of fifth grade, fall and spring of sixth grade, spring of seventh grade), and four additional waves of data collection are planned (fall and spring of eighth and ninth grade). The confirmatory factor analyses of the three goal orientation scales (task, ability-approach, ability-avoid) reported later in this paper, were conducted on the fourth wave of data obtained from this sample. The fourth wave was selected because it was the first time that a scale was included in the surveys to assess ability-avoid goals. One item that had been used previously on the ability-approach scale was eliminated because it cross-loaded on the ability-avoid scale. Additionally, although the items in the scales were somewhat similar in all the samples, those used with this most recent sample reflect minor changes that have been made over time to improve the quality of the scales.

For all the samples, the items assessing students’ achievement goal orientations were included with items assessing other constructs on a survey (Patterns of Adaptive Learning Survey-PALS, Midgley, Maehr, Hicks, Roeser, Urdan, Anderman, Kaplan, Arunkumar, & Middleton, 1997) that was administered to students in their classrooms. Research assistants described the purpose of the study and illustrated the use of 5-point anchored scales. Students were encouraged to ask questions during survey administration if anything was unclear and were assured that the information they provided would be confidential. Research assistants read the questions on the survey aloud while students followed along and responded. For each sample, exploratory factor

\(^1\) Ability-avoid goals have also been referred to as performance-avoidance goals and self-defeating ego goals.
GOAL ORIENTATION SCALES

analysis was used to guide the construction of scales and the internal consistency of each of the scales was assessed using Cronbach’s alpha.

INTERNAL CONSISTENCY

In all the samples, Cronbach’s alpha for the scale assessing a task goal orientation was greater than .70 and was often greater than .80. Alphas for the task goal scales in samples of middle school students were generally higher than in samples of elementary school students. For example, in a longitudinal study assessing students’ task and ability goals at the sixth and eighth grade levels (Roeser, Midgley, & Urdan, 1996), the alpha on the task goal scale was .73 when students were in the sixth grade and .81 when students were in the 8th grade. The alpha coefficients for the scales assessing an ability-approach goal orientation were somewhat lower in our samples, especially in the earlier studies, but were always greater than .60. Again, the coefficients for older students were higher than the coefficients for younger students. In the study by Roeser and his colleagues (above) the alpha was .62 for an ability-approach goal orientation when students were in the 6th grade and .84 when students were in the eighth grade. In the largest and most recent sample, the internal consistency for each of the three scales (task, ability-approach, and ability-avoid goals, adapted for the math domain) was .84 (Middleton & Midgley, 1997).

CORRELATIONS BETWEEN THE GOAL ORIENTATION SCALES

In studies conducted by Nicholls and his colleagues, scales assessing task and ego goal orientation were correlated, but at levels low enough to prompt the statement that they were “more or less orthogonal.” For example, the correlation between task and ego goals was −.28 in a sample of second grade students (Nicholls, Cobb, Wood, Yackel, & Patashnick, 1990) and averaged .31 in four samples of high school students (Nicholls, Patashnick, & Nolen, 1985). In our samples, the correlations between task and ability-approach goals were generally lower than those found by Nicholls and his colleagues. For example, in the most recent sample the correlation between math specific task and ability-approach goals was .04 (Middleton & Midgley, 1997).

The development of scales to assess ability-avoid goals is quite recent. In a study by Elliot and Church (1997) using a sample of undergraduates, six items were used to assess “performance-avoidance” goals. It should be pointed out that many of the items assessing the avoidance component in their study assess worries, fears, and concerns rather than reasons for academic behavior (e.g., “I worry about the possibility of getting a bad grade in this class” and “I often think to myself, ‘What if I do badly in this class?’”). “Mastery” goals were correlated .31 with performance approach and .11 with performance avoidance goals. The correlation between the approach and avoidance components of performance goals was .38. In a sample of
sixth and eighth grade students in Norway, Skaalvik (1997) found that the correlation between the two dimensions of ego goals (which he called “self-defeating” and “self-enhancing”) was .20. The items in his scale assessing self-defeating ego orientation ask students about their concerns at school (e.g., “When I am working on the blackboard I am concerned about what my classmates think about me,” and “When I give a wrong answer in class I am most concerned about what my classmates think about me”). Self-defeating ego orientation was not correlated with task orientation, whereas self-enhancing ego orientation and task orientation were correlated at \( r = .31 \). In our recent study, which included the three goal orientation scales adapted for the math domain (Middleton & Midgley, 1997), task goals were not correlated with either ability approach or ability avoid goals; however, the correlation between ability-approach and ability-avoid goals was .56.

**STABILITY OF THE SCALES**

A longitudinal study following students from 5th to 6th grade (Anderman & Midgley, 1997) enabled us to assess the stability of the task and ability-approach goal orientation scales over a two year period. It should be pointed out that students made a transition from elementary to middle school during this period, and we assessed stability expecting that there would be some reordering of students on these scales due to developmental and environmental changes. There was moderate stability in the task and ability-approach goal orientation scales over time in both math and English and for both girls and boys and higher and lower ability students (averaging .41 for task goals and .34 for ability-approach goals). We also checked the stability of the task and ability-approach scales in the fall and spring of the fifth grade year in the most recent sample, expecting that there would be greater stability within a school year. The stability coefficient for task goals was .63 and for ability goals was .61.

**CONVERGENT VALIDITY**

Convergent validity is based on evidence that different measures of a construct yield similar results. During the first wave of survey administration to the most recent sample, we included scales developed by Nicholls and his colleagues to assess task and ego goals (Nicholls, 1989) in half of the surveys, in addition to the scales we had developed to assess task and ability-approach goals. The scales developed by Nicholls begin with the stem, “I feel most successful if . . .” Examples of task goal items are “I learn something interesting;” “A lesson makes me think about new things;” “I keep busy.” Examples of ego goal items are “I score higher than other students;” “I am the only one who can answer the question;” “I do the work better than other students.” The task goal scale consists of 8 items and the ego
GOAL ORIENTATION SCALES

goal scale consists of 4 items; the alpha coefficients for both scales in our sample were .83. Similar scales have been used by Nolen and her colleagues (Nolen, 1988; Nolen & Haladyna, 1990) and adaptations of those scales have been used by Blumenfeld, Meece, and their colleagues (Blumenfeld, Puro, & Mergendoller, 1992; Meece, Blumenfeld, & Hoyle, 1988; Meece, Blumenfeld, & Puro, 1990) ("I wanted to find out something new"); "I wanted others to think I was smart"); Nicholls et al., 1990 ("I feel really pleased in math when I solve a problem by working hard"); "I feel really pleased in math when I am the only one who can answer a question"). As expected, the correlations between Nicholls’ scales and our scales were positive and significant (.63 for ego-orientation and ability-approach goal orientation; .67 for the two task-orientation scales). Given the somewhat different wording, and the emphasis in our scales on reasons for achievement behavior, we believe this provides good evidence of convergent validity.

CONSTRUCT VALIDITY

Construct validity is based on the degree to which the goal orientation scales developed by our research team are associated with other constructs in ways that are predicted by theory and in ways that are consistent with other research. To provide evidence of the construct validity of our scales, we limit our consideration to the relation between each of the goal orientation scales and academic efficacy (cognition), reported use of adaptive and mal-adaptive learning strategies (behavior), and affect at school (affect).

Academic Self-Efficacy

In our studies we assess academic self-efficacy. Students are asked how confident they are that they can master the classwork in their current class (e.g., “Even if the work in class is hard, I can learn it”). In some cases these measures are specific to a subject domain (e.g., “I’m certain I can master the skills taught in math this year”). Other goal orientation studies have included measures of perceived ability rather than perceived efficacy. These two constructs differ in important ways and their relation to goal orientations should be considered separately (Pajares & Miller, 1994). Since we have included measures of academic efficacy in most of our studies, we consider evidence of similarities across studies on this construct.

Schunk (1996) found that a task goal orientation was related positively and an ego orientation was related negatively to fourth grade students’ certainty that they could solve a set of fraction problems. Wolters, Yu, and Pintrich (1996) examined the correlations between junior high school students’ academic efficacy (e.g., “I’m confident I can understand the most complex material taught in this class”) and their orientation to task and ability goals (adapted from PALS) in the fall and spring of the same academic year. At both points in time, task and ability goal orientations were positively
correlated with academic efficacy, though the relationship was stronger for task goals than for ability goals.

Across a large number of studies, we found that an orientation to task goals was positively associated with academic self-efficacy (e.g., Anderman & Young, 1994; Anderman & Midgley, 1997; Kaplan & Midgley, in press; Midgley & Urdan, 1995; Roeser et al., 1996). Ability goals sometimes were associated negatively (Anderman & Young, 1994), sometimes were related positively (Midgley & Urdan, 1995), and sometimes were unrelated to academic efficacy (Kaplan & Midgley, in press). In a study comparing elementary and middle school students, Midgley, Anderman, and Hicks (1995) found that task goals were related to efficacy at both school levels, but ability goals were unrelated to efficacy at the elementary level and positively related to efficacy at the middle school level. In a longitudinal study, Anderman and Midgley (1997) found that task goals in both math and English were more positively related to efficacy in the fifth grade than in the sixth grade. Ability-approach goals were unrelated to efficacy in the fifth grade and were positively related to efficacy in the sixth grade. The more ability-oriented nature of the middle school as compared to the elementary school learning environment (e.g., Midgley, 1993; Urdan, Midgley, & Wood, 1995) may account for these differing relationships between ability goals and efficacy at the two school levels. Including the avoidance dimension of ability goals may also help to clarify these relationships. Middleton and Midgley (1997) found that a task goal orientation was positively related, an ability-avoid orientation was negatively related, and an ability-approach orientation was unrelated to efficacy in a sample of sixth grade middle school students.

Learning Strategies

In general, task goals have been associated positively with the reported use of adaptive learning strategies. However, research on the relation between task goals and maladaptive learning strategies has been somewhat inconsistent. In a study of fifth and sixth grade students focusing on the science domain, Meece and her colleagues (1988) found a strong correlation between task goals and “active cognitive engagement,” (the reported use of cognitive and metacognitive strategies), and a negative correlation between task goals and “superficial engagement” (strategies to get work done with minimal effort expenditure). Nolen (1988), in a study of eighth grade students reading expository passages, found that a task goal orientation was positively correlated with strategies requiring the deep processing of information, and to a lesser degree to the use of surface level strategies. The relation between ability goals and the use of learning strategies also has been somewhat inconsistent. In her study, Nolen (1988) found that an ego orientation was positively related to the use of surface level strategies but unrelated to the use of deep strategies. Meece and her colleagues (1988) found that
ego/social goals were related positively to both active and superficial cognitive engagement.

The results from our studies examining the relationship between goal orientation and use of adaptive and maladaptive learning strategies are somewhat more consistent than those cited above. Anderman and Young (1994) found that task goals were highly correlated with deep strategy use in science and negatively correlated with surface strategy use. In contrast, ability goals were negatively correlated with deep strategy use and positively correlated with surface strategy use. Kaplan and Midgley (in press) found that task goals were positively related to adaptive learning strategies and negatively related to maladaptive learning strategies, whereas ability goals were positively related to maladaptive strategies in both math and English. However, ability goals were uncorrelated with adaptive learning strategies. Middleton and Midgley (1997), in a study including all three goal orientations, found that reports of self-regulated learning were strongly positively correlated with task goals but unrelated to both the approach and avoidance components of ability goals in mathematics.

Affect

Several studies have examined the relationship between students’ goal orientations and indices of positive affect. In general, task goals have been related to positive indices of affect and ability goals have either been negatively related or unrelated to affect. Meece and her colleagues (1988) found that task goals were positively related to attitudes toward science (e.g., “Science is an enjoyable subject”), whereas ego/social goals were negatively (but not significantly) related to these attitudes. Nicholls et al. (1985), across four different samples of high school students, found that task goals were positively related, and ego-social goals were unrelated to satisfaction with learning (“At school I usually like thinking about schoolwork” and “At school I usually am bored”–reversed). Nolen and Haladyna (1990), in a study examining college bound and non-college bound ninth, eleventh, and twelfth grade high school students, found that task goals were positively related, and ego goals were unrelated to affective response to science in all groups. Seifert (1995) included measures of both negative emotions (“When I am in school, I usually feel frustrated”) and positive emotions (“When I am in school, I usually feel proud”) in a study of the relation between academic goals and emotions using a sample of fifth graders. Positive emotions were more strongly correlated with a mastery orientation than with a performance orientation, although the correlations were positive in both cases. Negative emotions were negatively related to mastery goals and unrelated to performance goals.

Our studies show very similar results. Roeser and his colleagues (1996) found that task goals were positively related, and ability approach goals were
unrelated to affect at school ("Most of the time being in school puts me in a good mood" and "I like being in school") in a sample of eighth graders. Midgley, Arunkumar, and Urdan (1996), in a different sample of eighth grade students, found that task goals were positively related and ability approach goals were unrelated to self-esteem ("On the whole, I am satisfied with myself"), whereas ability goals were positively related and task goals were unrelated to self-deprecation ("At times I think I am no good at all"). Kaplan and Maehr (1997), in a somewhat younger sample (sixth grade) found a positive correlation between task goals and affect at school ("Most of the time, being in school puts me in a good mood" and "I like being in school") and a negative relation between ability goals and affect at school.

FURTHER EVIDENCE OF CONSTRUCT VALIDITY

Further evidence of construct validity is provided in two studies that compare elementary and middle school students (Midgley et al., 1995; Anderman & Midgley, 1997), and in a study comparing students in a more ability-focused school to students in a less ability-focused school (Anderman, Maehr, & Midgley, 1997). A description of policies and practices in elementary and middle schools provides support for the theoretical prediction that middle schools are less task-focused and more ability-focused than are elementary schools (Midgley, 1993). In a cross-sectional study, we found that middle school students were more oriented to ability-approach goals and less oriented to task goals than were upper elementary school students (Midgley et al., 1995). In a longitudinal study, Anderman and Midgley (1997) found that students were less oriented to task goals in sixth grade in middle school than in fifth grade in elementary school. However, there was no change in ability-approach goals. In a study following students from fifth grade in six elementary schools to sixth and then seventh grade in two middle schools, students who were to attend the two different middle schools did not differ in their goal orientations before the transition. However, students who made a transition to the middle school known to be more ability-focused exhibited a greater increase in their ability-approach goal orientation over time than did students who made the transition to the other middle school. Thus, in these three studies, there is evidence that the scales measuring students’ goal orientation reflected the goal structure in the schools they attended.

DISCRIMINANT VALIDITY

Discriminant validity is determined by evidence that a construct can be differentiated from other constructs. In this case, confirmatory factor analyses were conducted to determine if the three goal scales could be differentiated from each other. These analyses, not previously reported, were conducted on data collected during the fourth wave (Spring, 1996 of the sixth grade year) in the current sample. The scales assessed reasons for doing
The scale assessing a task goal orientation has six items ($\alpha = .83$), including “An important reason I do my work in school is because I want to get better at it” and “An important reason I do my work in school is because I like to learn new things.” The scale assessing an ability-approach goal orientation has six items ($\alpha = .86$), including “I want to do better than other students in my classes” and “I’d like to show my teachers I’m smarter than the other students in my classes.” The scale assessing an ability-avoid goal orientation has 6 items ($\alpha = .74$) including “One of my main goals is to avoid looking like I can’t do my work” and “The reason I do my school work is so my teachers don’t think I know less than others.”

**Confirmatory Factor Analysis**

Confirmatory factor analysis was conducted using LISREL8 (Jöreskog & Sörbom, 1993). Following Hoyle and Panter (1995), Maximum Likelihood was used as the estimation method and all analyses were conducted on covariance matrices. Listwise deletion of missing data was used in creating the covariance matrices.

In evaluating the fit of the model we follow recent recommendations (Hoyle & Panter, 1995; Hu & Bentler, 1995; Jaccard & Wan, 1996) and use multiple indexes of fit. Specifically, in addition to reporting the chi-square test statistic, we report the Goodness-of-fit index (GFI), the Tucker-Lewis index (TLI), the Comparative fit index (CFI), and the Root Mean Square of Error Approximation (RMSEA). Each of these indexes evaluates the fit of the model slightly differently (see Hu & Bentler, 1995) and therefore an indication of good fit from these various indexes increases the confidence in the model. The critical value, under which a model is considered to have a questionable fit, that is recommended for the first three indexes is .90. A value lower than .08 of the RMSEA is considered to indicate an adequate fit whereas values lower than .05 indicate a good fit (Browne & Cudek, 1993). The RMSEA index involves testing for the approximation of the fit of the model to the population. This index is therefore accompanied by a $p$ value for a significance test with a critical value of .05. A non-significant $p$ value indicates a close fit.

Figure 1 presents the measurement model. Items from each scale are hypothesized to load only on their respective latent variables. The fit for this model was: $\chi^2 (132, N = 647) = 389.77, p < .001$, GFI = .94, TLI = .93, CFI = .94, RMSEA = .055 with $P (0.05) = .94$. All indexes indicated a good fit for the proposed structure of the scales. However, an examination of the cross-loading of items on scales other than the designated one indi-

---

2 Exploratory and confirmatory factor analyses of math-specific goal orientation scales can be found in Middleton and Midgley (1997).
cated that one item in the ability-approach scale had a loading of .42 on the ability-avoid scale. This item was eliminated and the model was tested again. The fit for the model without this item was: $\chi^2 (116, N = 647) = 298.55, p < .001$, GFI = .95, TLI = .95, CFI = .96, RMSEA = .049 with $P(0.05) = .55$. All indexes of fit improved. An examination of the output indicated that the range of factor loadings of items on their respective scales was .42 to .81 with only four items loading below .60. None of the items had loadings above .25 on latent variables other than the designated one.

We next tested this model for Euro and African American students and for girls and boys. The procedure involves, first, testing a model with the assumptions that all the parameters in the model (factor loadings, error variances, and factor correlations) are identical across the groups. The test proceeds by freeing these constraints one at a time and evaluating the contribution of each step to the fit of the model. The contribution is evaluated by the change in chi-square ($\Delta\chi^2$) between the model that includes the constraint and the one that does not. The significance of this test is evaluated according
to the difference in degrees of freedom (Δdf) between the two models (Jöreskog & Sörbom, 1993). A significant Δχ² indicates that the equality tested should be rejected. This process allows testing for the particular aspects of the model that might be different between the two groups.

**Multi-sample Analysis for Euro and African American Students**

The fit for the model when tested with full constraints for the Euro and African American students in the sample was: \( \chi^2 (269, N_{Euro} = 295; N_{Af.Am} = 287) = 513.85, p < .001, \) GFI = .91, TLI = .93, CFI = .93, RMSEA = .040 with \( P(0.05) = 1.00. \) All indexes indicated good fit for this model. Next, a model was tested with factor loadings freed to be estimated for both groups. The fit for this model was: \( \chi^2 (252, N_{Euro} = 295; N_{Af.Am} = 287) = 500.34, p < .001, \) GFI = .91, TLI = .93, CFI = .93, RMSEA = .041 with \( P(0.05) = 1.00. \) The difference in chi-square between the models (Δχ² = 13.51, Δdf = 17, \( p > .1) \) indicated that the hypothesis concerning equal factor loadings cannot be rejected and the original model is still supported.

As a next step, a model was tested in which the error variances of the items were freed to be estimated. The fit for this model was: \( \chi^2 (266, N_{Euro} = 295; N_{Af.Am} = 287) = 513.25, p < .001, \) GFI = .91, TLI = .93, CFI = .93, RMSEA = .040 with \( P(0.05) = 1.00. \) Again, the difference in chi-square (Δχ² = .60, Δdf = 3, \( p > .1) \) indicated that the hypothesis concerning equal variances cannot be rejected. Finally, a model was tested in which the correlations among the factors were freed to be estimated. The fit for this model was: \( \chi^2 (267, N_{Euro} = 295; N_{Af.Am} = 287) = 509.43, p < .001, \) GFI = .91, TLI = .93, CFI = .93, RMSEA = .040 with \( P(0.05) = 1.00. \) Similar to the previous findings, the chi-square difference (Δχ² = 4.42, Δdf = 2, \( p > .1) \) indicated that the equality of the correlations among the factors cannot be rejected.

**Multi-sample Analysis for Girls and Boys**

The same procedure as described above was followed with girls and boys. The fit for the model with full constraints was: \( \chi^2 (269, N_{girls} = 326; N_{boys} = 309) = 534.74, p < .001, \) GFI = .90, TLI = .93, CFI = .93, RMSEA = .040 with \( P(0.05) = 1.00. \) All indexes indicated that this model fits the data well. The fit for the model with free factor loadings was: \( \chi^2 (252, N_{girls} = 326; N_{boys} = 309) = 520.98, p < .001, \) GFI = .90, TLI = .93, CFI = .93, RMSEA = .041 with \( P(0.05) = 1.00. \) The chi-square difference (Δχ² = 13.76, Δdf = 17, \( p > .1) \) indicated that factor loadings can be assumed to be equal. The fit for the model with free error variances of the items was: \( \chi^2 (266, N_{girls} = 326; N_{boys} = 309) = 526.73, p < .001, \) GFI = .90, TLI = .93, CFI = .93, RMSEA = .039 with \( P(0.05) = 1.00. \) In this case, the chi-square difference (Δχ² = 8.01, Δdf = 3, \( p < .05) \) indicated that there are differences in the error variances of the items between girls and boys. The model testing for equal factor correlations included free error variances as
well. The fit for this model was: $\chi^2(264, N_{\text{girls}} = 326; N_{\text{boys}} = 309) = 523.70, p < .001$, GFI = .90, TLI = .93, CFI = .93, RMSEA = .039 with $P(0.05) = 1.00$. The difference in chi-square ($\Delta \chi^2 = 3.03, \Delta df = 2, p > .1$) indicated that factor correlations can be assumed to be equal for girls and boys. An examination of the output indicated that data for boys and girls differed in the error variances of three items from the task goals scale. The three items were $X_1$, $X_2$, and $X_3$ (see Appendix) and the errors were .69, .39, and .53 for boys and .63, .33, and .51 for girls respectively.

**SUMMARY**

Goal theory has emerged as a prominent approach to achievement motivation, and items assessing different achievement goals are often included on surveys. In this paper we described the development and validation of scales to assess students’ task, ability-approach, and ability-avoid goal orientations. These scales were developed over a period of eight years by a group of researchers at the University of Michigan, many of whom are now at other universities. These scales are included in PALS (Midgley *et al.*, 1997) and have been used with seven different samples of elementary and middle school students along with scales assessing a variety of other constructs. We regularly receive requests for these scales and we felt that it was important to describe the process involved in their development, identify the researchers who contributed to their development, and provide evidence of their concurrent, construct, and discriminant validity. In addition to the studies and samples described here, these scales have been used to examine achievement goals related to current events knowledge in samples of over 5000 adolescents viewing Channel One (Anderman & Johnston, 1998; Johnston, Brzezinski, & Anderman, 1994); in several studies of students participating in the Kentucky school reform (Anderman, Griesinger, & Westerfield, 1998; Nagda, Griesinger, Anderman, Smith, & Newsom, 1997); and in studies conducted in the People’s Republic of China (Mu, Shi, Wang, Live, Kaplan, & Maehr, 1997).

The review of findings from our studies and others, combined with the results of the confirmatory factory analysis conducted in the present study, indicate that the scales demonstrate concurrent, construct, and discriminant validity. In addition, the scales have been found to be reasonably stable over time, and to have good internal consistency. As the results of the confirmatory factor analysis demonstrated, the scales appear to operate similarly with students of different genders and ethnicities. In addition, the scales have been used effectively with students from a wide range of grade levels.

We believe these goal orientation scales have several advantages over previous measures of achievement goals. First, we assess personal achievement goals separately from perceptions of the goal structure in the learning environment. Earlier scales (e.g., Ames & Archer, 1988) included items assessing
personal goals ("I work hard to learn") and perceptions of the goal structure ("Students are given a chance to correct mistakes") in the same scale. We have developed scales to assess the goal structure in the school (Anderman & Young, 1994; Kaplan & Maehr, 1997; Midgley et al., 1995; Midgley & Urdan, 1995; Roeser et al., 1996) and in the classroom (e.g., Anderman et al., 1998; Anderman & Midgley, 1997; Hicks, 1997; Ryan, Gheen, & Midgley, in press; Urdan, Midgley, & Anderman, in press). Evidence of the validity and reliability of our scales assessing perceptions of the goal structure in the classroom is presented in Kaplan and Midgley, 1997 and further validation is underway, using classroom observations. Additionally, we have developed scales to assess teachers’ reports of their use of task and ability approaches to teaching and learning (Ryan et al., in press; Urdan et al., in press). Second, consistent with the current understanding that achievement goals include both approach and avoidance components (Elliot & Church, 1997; Skaalvik, 1997), we developed scales to assess task, ability-approach, and ability-avoid goals (Middleton & Midgley, 1997). Although other measures have included scales assessing the goal to avoid work (e.g., Nicholls et al., 1985), this goal is conceptually different from the goal to avoid the demonstration of lack of ability, which is consistent with the definition of achievement goals as purposes for engaging in academic work. Third, whereas some measures of ability-avoid goals include items that tap into constructs such as anxieties, fears, and concerns (e.g., Elliot & Church, 1997; Skaalvik, 1997), we consider these to be correlates of goals rather than measures of goals. Finally, our scales assessing ability-approach and ability-avoid goals do not include items assessing extrinsic goals or social goals. Nicholls and those who have used his scales (e.g., Meece et al., 1988; Nicholls et al., 1985) often combined items assessing ego and social approval goals, termed ‘‘ego/social’’ goals. Nicholls later regretted this decision, stating that ‘‘on reflection, these social orientation items are more ambiguous than desirable. The nature of social orientations is a topic in its own right and we deal with it poorly in that study’’ (Nicholls, Cheung, Lauer, & Patashnick, 1989, p.70). We have developed separate scales to assess social approval and extrinsic goals (e.g., Anderman et al., 1997; Urdan, 1994, 1997) and they are currently being refined. We are also examining whether there are approach and avoidance components to extrinsic goals.

Despite these strengths of our goal measures, there is some room for improvement. Even though analysis indicated that the ability-approach and ability-avoid scales formed distinct factors, there is some overlap as indicated by the correlation between the two scales. These two scales are more strongly correlated than are similar scales described in both the Elliot and Church (1997) and the Skaalvik (1997) studies. There are, as described above, differences in the items used in the various studies. For example, Skaalvik’s (1997) ego-defeating scale includes items that tap into general self-consciousness.
in school, whereas all of his ego-enhancing items refer to out-performing others. The avoidance scale developed by Elliot & Church (1997), as previously mentioned, includes items that tap into general anxiety in school rather than the desire to avoid the demonstration of lack of ability. Making relative ability the salient feature of all of the items in both our ability-approach and ability-avoid scales may have contributed to the higher than desirable correlation. Although the confirmatory factor analysis revealed good model fit and clear distinctions among the items in the three goal scales, further refinement may help to clarify the distinction between approach and avoidance ability goal orientations.

APPENDIX

Goal Orientation Scales

Task Goal Orientation

X1—I like school work that I’ll learn from, even if I make a lot of mistakes.
X2—An important reason why I do my school work is because I like to learn new things.
X3—I like school work best when it really makes me think.
X4—An important reason why I do my work in school is because I want to get better at it.
X5—I do my school work because I’m interested in it.
X6—An important reason I do my school work is because I enjoy it.

Ability-Approach Goal Orientation

X7—I would feel really good if I were the only one who could answer the teachers’ questions in class.
X8—It’s important to me that the other students in my classes think that I am good at my work.\(^3\)
X9—I want to do better than other students in my classes.
X10—I would feel successful in school if I did better than most of the other students.
X11—I’d like to show my teachers that I’m smarter than the other students in my classes.
X12—Doing better than other students in school is important to me.

Ability-Avoid Goal Orientation

X13—It’s very important to me that I don’t look stupid in my classes.
X14—An important reason I do my school work is so that I don’t embarrass myself.

\(^3\) This item cross-loaded on the ability-approach and ability-avoid scales and thus was eliminated from the analyses.
X15–The reason I do my school work is so my teachers don’t think I know less than others.
X16–The reason I do my work is so others won’t think I’m dumb.
X17–One reason I would not participate in class is to avoid looking stupid.
X18–One of my main goals is to avoid looking like I can’t do my work.

REFERENCES
Hicks, L. (1997). Students’ positive and negative affect in school: The interaction of social goals and perceptions of the educational context. Manuscript submitted for publication.


