The Patterns of Adaptive Learning Survey: History, Development, and Psychometric Properties

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Abstract

Achievement goal theory has become one of the most prominent theories of motivation over the last 25 years. In this paper we describe efforts, directed by Carol Midgley, to develop and validate survey instruments assessing mastery, performance-approach, and performance-avoidance goals. The instrument, called the *Patterns of Adaptive Learning Survey* (PALS) was developed and used in a longitudinal study following students from 5th grade through 9th grade. This sample was ethnically and socio-economically diverse and was drawn from four school districts in Michigan. The instrument has also been used by numerous researchers and with other middle school, high school and college samples. These measures of achievement goals are among the most widely used in the field and have strong psychometric properties. They also have strong predictive and concurrent validity. Recommendations for inclusion in national datasets are presented.

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Definitions of Goals

Achievement goal theory has emerged as one of the most prominent motivational theories over the last 25 years. According to this theory, individuals' perceptions about the purposes of achievement provide an organizing framework. This framework involves cognitions about the value of the task and self-perceptions, explanations about the causes of success or failure on the task, and affective reactions to success and failure. Unlike more narrowly defined performance objectives (e.g., the goal of getting 90% or an A on a test), achievement goals represent beliefs and concerns about the meaning of getting an A on the test. Whereas performance objectives focus on *what* the individual is trying to achieve (e.g., Bandura, 1986; Wentzel, 1989), achievement goal theorists are concerned with students' perceptions of *why* they are trying to achieve. What is the perceived purpose of getting a score of 90% on the test? Goals, when defined in this way, represent "more superordinate classes of goals that are behind the particular outcomes individuals strive for**"** **(**Dweck, 1992, p. 165). Goal theorists are generally concerned with the quality of motivation rather than the absolute amount of motivation (Ames**,** 1987, 1992; Ames & Ames, 1984; Covington, 1984; Dweck, 1986; Maehr & Nicholls, 1980; Nicholls, 1989; Urdan, 1997). Two students may be equally motivated to complete an assignment, but may have different reasons for doing so.

Current research on achievement goals generally includes three types of goals: Mastery, performance-approach, and performance-avoidance. Although a fourth type of goals, mastery avoidance, has been posited (Pintrich, 2000), there is currently little research that has examined that goal. In this paper, therefore, we focus on the first three goals mentioned. Mastery goals represent a concern with understanding, developing competence, and improvement. Performance-approach goals involve a desire to *demonstrate* competence, often by outperforming others. Performance-avoidance goals represent a concern with *not* appearing *incompetent* or less competent than others. When pursuing mastery goals, individuals tend to rely on internal frames of reference to judge success and failure at a task, whereas both types of performance goals involve social comparison. Research suggests that the particular achievement goals individuals adopt in a given achievement situation depend in part on stable personality characteristics, such as need for achievement and fear of failure (Elliot, 1997), as well as situational characteristics (Ames, 1992).

How Goals Have Been Measured

Research on achievement goals has generally been conducted using two methodologies: experimental manipulation and questionnaires. Survey measures have varied widely across research programs. Some researchers have measured goals by asking students when they feel most successful (e.g., "I feel most successful when I learn something new" in the Nicholls, Patashnick and Nolen, 1985 study). Other measures, including the one described in this paper, usually ask students more directly about their goals (e.g., "I want to do better than other students in this class"). In addition, some measures combined different types of goals into a single construct, whereas other

measures only included items that divided into unique constructs. For example, the Nicholls et al. (1985) measure includes a scale called "Ego and Social Goals." In this measure, ego goals are merged with social goals to form an "Ego and Social Orientation" scale that includes demonstration of ability items ("I feel most successful I show people I'm smart"), social approval items ("I feel most successful if the teacher likes my work"), and social interaction items ("I feel most successful if I work with friends") (p. 685). More recent measures, including the ones described in this paper, assess single constructs, such as mastery goals or performance-approach goals (Elliot & Church, 1997).

Survey measures of mastery goals have generally been consistent across research programs. These measures typically include items assessing the desire to learn, understand, and master concepts, as well as the goal of improving skills. Measures of performance goals have been less consistent. As previously mentioned, some measures merged social comparative goals with other goals, such as social goals (Nicholls et al., 1985), extrinsic goals, and preference for challenge (Pintrich & Garcia, 1991). Earlier versions of the PALS included social approval items ("I feel bad when I do well in class and the teacher doesn't say anything about it") and challenge preference items ("I like problems that are easy") in the performance goal scale (Midgley, Maehr & Urdan, 1993). Before the recent distinction between performance-approach and performance-avoidance goals, some measures of performance goals only included items assessing performance-approach goals, whereas others included both performance-approach and performance-avoidance items, but failed to distinguish between the two (Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002). The varied and imprecise measurement of goals,

particularly performance goals, has created a somewhat unclear pattern of results regarding the effects of pursuing these goals. Fortunately, recent measures of goals, including PALS, have corrected some of these shortcomings (Elliot & Church, 1997; Midgley et al., 2000; Skaalvik, 1997).

Summary of Results

For the most part, examinations of mastery goals have yielded consistent results. Briefly, when oriented toward mastery goals, students tend to attribute failure to lack of effort, persist in difficult situations, choose moderately challenging tasks, have relatively positive feelings about school and school work, use deep cognitive processing strategies, use more self-regulating strategies, and are more intrinsically motivated than when low in mastery goal orientation (see Ames, 1992; Anderman & Maehr, 1994;, Pintrich & Schunk, 2002; Urdan, 1997, for reviews). Because mastery goals are generally associated with a positive constellation of outcomes, they have sometimes been said to represent an "adaptive" motivational orientation (Dweck, 1986). Despite this characterization, research has often failed to find an association between mastery goals and measures of achievement (Harackiewicz et al., 2002).

For performance goals, in contrast, the picture is much less clear. When performance-goal oriented, students have been shown to be more likely to attribute failure to ability, prefer less challenging tasks, use more surface and less deep processing learning strategies, give up when faced with difficulty, and have more negative affect about school than when task goal oriented (see Ames, 1992; Dweck & Leggett, 1988; Midgley, 1993 for reviews). Accordingly, some have labeled a performance goal

orientation "maladaptive" (Ames, 1992; Dweck & Leggett, 1988). This characterization may not always be warranted, however.

There are several reasons to be cautious. First, there is now considerable evidence that performance-approach goals often are related positively to beneficial learning outcomes, including academic achievement, task value, and academic self-concept (see Harackiewicz et al., 2002 for a review). In addition, research has also often yielded null associations between performance goals and outcomes. For example, Nicholls et al. (1985) found no relation between ego-social goals and college plans, satisfaction with learning, perceptions of ability, or grade point average. Nolen (1988) found no relation between ego-social goals and the use of deep processing strategies. Midgley and Urdan (1995, 2001) found no association between performance-approach goals and self-handicapping. Results of a number of studies revealed no association between performance-approach goals and intrinsic motivation (see Harackiewicz et al., 2002). Second, past research often did not distinguish between performance-approach and performance-avoidance goals. Performance-avoidance goals are usually negatively related to beneficial learning and performance outcomes, and including avoidance items in some performance goal measures but not others likely produced mixed effects for performance goals across studies. Third, important individual differences may affect the relations between performance goals and various outcomes.. Midgley, Kaplan and Middleton (2001) suggested that performance-approach goals may have more negative consequences for early adolescent students than for college students. Similarly, Urdan and his colleagues (Urdan & Giancarlo, 2001; Enos & Urdan, 2002) found a positive association between performance-approach goals and academic achievement for students

with an individualistic sense of self, but not among students with a collectivist sense of self.

Finally, a number of researchers (Ainley, 1993; Barron & Harackiewicz; 2000; Meece & Holt, 1993; Pintrich & Garcia, 1991; Urdan, 1994; Wolters, Yu, & Pintrich 1996) have found that the interaction of mastery and performance-approach goals reveals few ill effects of being performance-approach goal oriented when simultaneously having a mastery goal orientation, and some potential benefits of performance-approach goals for individuals low in their mastery goal orientation. Some research indicates that the pursuit of performance-approach goals can slightly weaken the positive relation between mastery goals and strategy use, self-efficacy, and task value (Wolters et al., 1996) and between mastery goals and interest (Elliot & Church, 1997), but most research reveals few interactive effects of mastery and performance-approach goals (see Harackiewicz et al., 2002).

Summary

Hundreds of studies examining the effects of achievement goals have been conducted during the last two decades. Surveys have been used in a substantial portion of these studies. Recent studies have employed measures that clearly have distinguished between mastery, performance-approach, and performance-avoidance goals, and these measures generally do not include references to other motives, a problem found in previous measures. Research with these improved measures has generally found positive motivational and behavioral correlates of mastery goals, although these goals are often not associated with measures of achievement. Similarly, recent research has typically found a negative pattern of outcomes associated with performance-avoidance goals and a

somewhat mixed pattern of associations with performance-approach goals. One of the most widely used survey measures of goals is the *Patterns of Adaptive Learning Survey*. A description of that measure, including how it was developed and validated, follows.

The Patterns of Adaptive Learning Survey

The *Patterns of Adaptive Learning Survey* (PALS) has been under development for over a decade. In its current form, it contains highly reliable and valid measures of students' personal mastery, performance-approach, and performance-avoidance goal orientations. These measures have been used repeatedly in both cross-sectional and longitudinal samples. Downloadable manuals and documentation for the PALS are available on the world wide web (http://www.umich.edu/~pals/pals/).

History of PALS

Measures for PALS initially were developed in the early 1990s. The various measures have been refined and improved throughout the past decade. Over time, the measures were improved by reducing the number of items in some of the scales, by improving the internal consistencies of scales, by honing the questions to focus on the core aspects of the major goal orientations, and by developing separate measures for performance-approach and performance-avoidance goal orientations.

Initially, Carol Midgley and Martin Maehr received federal funding to apply goal orientation theory to the reform of elementary and middle schools. One middle school and one elementary school each incorporated the basic tenets of achievement goal orientation theory in order to help school personnel to implement theory-guided motivation-based reform. Each school also had a matched comparison school that did not

implement such changes. Throughout the course of this three-year intervention, the PALS measures were again utilized and further refined (see Maehr & Midgley, 1996, for a description of this project). In this project, initial versions of the PALS served as the primary evaluation tool (e.g., Anderman, Maehr, & Midgley, 1999).

Carol Midgley and Martin Maehr then received funding from the W.T. Grant Foundation to conduct the Patterns of Adaptive Learning Study. This longitudinal study examined changes in students' achievement goals, using a large sample of early adolescents. Students were followed from the fifth grade through the ninth grade, completing measures at least once per academic year. The personal goal orientation measures were greatly improved during this study, and several other measures also were developed (see Midgley, 2002, for a summary of this study).

Near the end of the 1990s, Julianne Turner and Carol Midgley were funded by the Spencer foundation to conduct an additional longitudinal study of students' achievement goals, across the transition from elementary school to middle school (J. Turner & C. Midgley, *Avoidance Beliefs and Behaviors Before and After the Transition to Middle Level Schools: Classroom Influences*). Students were surveyed twice during the sixth grade (in elementary school), and again twice during the seventh grade (after the transition to middle school) (Turner et al., 2002). This again served as an opportunity to still further examine and refine the psychometric properties of PALS.

A variety of other research programs have incorporated various versions of PALS. Some examples of these include a study in the People's Republic of China (Mu et al., 1997), a study that included multiple ethnic groups (Urdan & Giancarlo, 2001), and a

study of over 5000 adolescents who viewed the Channel One television news program (Anderman & Johnston, 1998; Johnston, Brzezinski, & Anderman, 1994).

Current Measures of PALS

The PALS has been used in both elementary and secondary school classrooms. The measures typically are worded in a general (non domain-specific) format when used with elementary school samples, since elementary school students generally spend the majority of the day in the same classroom, with the same teacher. In contrast, when used with middle or high school students, the items often refer to a specific academic domain (e.g., math, English, etc.). In most cases, internal consistency is higher for the domain-specific measures, compared to the general measures. In our research with PALS, we have used five point Likert-type scales. We have anchored our items at 1 = "Not at all true," 3 = "Sometimes true," and 5 = "Very true."

Administration of the PALS. We have generally included the goal orientation measures on surveys that also have included other motivation measures. We tend to mix the personal goal orientation items with each other, and with other items that utilize the same anchors and the same introduction.

We suggest that surveys be administered by trained research assistants, in students' regular classrooms. We generally tell students that the survey is not a "test," and that there are no "right" or "wrong" answers; we are merely interested in their opinions and beliefs about these issues. We stress that the information that we collect is confidential, and that their parents and teachers and peers will not see their specific responses to any of the questions. We stress to the students that the survey is very important, and that we really value their thoughts on these issues. We also try to explain

to the students that some questions may sound very similar to others in the survey, but that this is important, to make sure that we really understand what each student thinks. We include a sample question, which the survey administrator goes over with the student, in order to familiarize the participants with the Likert scale. In general, we have read the items and instructions out loud to the students.

Mastery Goal Orientation. The mastery goal orientation scale assesses the extent to which students engage in academic tasks in order to develop their competence. Students who are mastery-oriented are interested in extending their current understanding of a given topic. Students' attention is focused on the task, because the students' main goal is to master the task at hand. The original version of the scale (Alpha = .86) is presented in Midgley et al. (2000). However, the version presented in this paper (Alpha = .85) does not include items that assess intrinsic value, and does not make reference to specific behaviors. Items are presented in Appendix I.

Performance Approach Goal Orientation. Students who endorse this goal orientation are interested in demonstrating their competence. Such students are highly focused on the self. The original version contained 5 items, which referred to how students would feel or what students would want, under certain circumstances (e.g., "I would feel really good if I were the only one who could answer the teacher's questions in class"). This scale displayed excellent internal consistency (Alpha = .86). The revised version primarily refers to students' goals during class (Alpha = .89). Items are presented in Appendix I. As was the case for the measure of mastery goal orientation, for both performance goal orientation measures the original scales included items that referred to specific behaviors, whereas the revised versions focused specifically on students' goals.

Performance Avoidance Goal Orientation. Students who endorse this goal orientation want to avoid the demonstration of incompetence. Such students do not want to be perceived as "stupid" by their peers and teachers. Performance-avoidance oriented students are focused on the self. Similar to the measure of performance-approach goals, the original version of the performance-avoidance goal orientation measure (Alpha = .75) contained items that referred to how students would feel or what students would want when doing class work (e.g., "The reason I do my work is so others won't think I'm dumb"). The current version (Alpha = .74) contains four items, and primarily refers to students' goals during class. Items are presented in Appendix I.

Discriminant Validity

The original PALS goal orientation items were subjected to confirmatory factor analyses, in order to determine whether each construct was distinct from the others. Most of those initial analyses were conducted on data collected during the spring of 1996, on a large sample of 6th grade students. Confirmatory factor analyses were conducted using LISREL8 (Joreskog & Sorbom, 1993). Maximum likelihood estimation was used. Data were assessed using covariance matrices and listwise deletion of data. In addition, multiple fit indices were used, as suggested by Hoyle & Panter (1995). These analyses are explained in detail in Midgley et al. (1998).

The items assessing personal mastery goal orientation, performance-approach goal orientation, and performance-avoidance goal orientation were entered into the analysis. A measurement model in which the three goal orientation measures were hypothesized to be distinct albeit correlated was tested. The model displayed excellent fit [χ^2 (132, N = 647) = 389.77, $p<.001$; GFI = .94; TLI = .93; CFI = .94; RMSEA = .055

with P (0.05) = .94]. When one item that cross-loaded on both the performance-approach and performance-avoidance scales was eliminated, the model fit was improved [χ^2 (116, N = 647) = 298.55, *p<.001*; GFI = .95; TLI = .95; CFI = .96; RMSEA = .049 with P (0.05) = .55]. The model was subsequently tested separately for Euro and African American students, and separately for female and male students (see Midgley et al., 1998).

The revised goal orientation items also were examined using confirmatory factor analysis, using LISREL8. The goal orientation measures again loaded on three distinct factors (GFI = 0.97, AGFI =0.95). The factors represented the hypothesized mastery, performance-approach, and performance-avoid goal orientations (Midgley et al., 2000).

Other Psychometric Properties of the PALS

Various members of our research team have conducted analyses assessing other psychometric aspects of the PALS personal goal orientation scales. All of these analyses indicate that the scales are both reliable and valid.

For example, Anderman and Midgley (1997) conducted a longitudinal study, examining the stability of the mastery and performance-approach goal orientation scales, using a sample of fifth and sixth grade students, over a two year period, over the transition from elementary to middle school. Because much research indicates that students' motivation and beliefs change over the middle school transition, we expected that the scales would not necessarily prove to be stable. Nevertheless, moderate stability was found in scales assessing personal goal orientations in both English and math. Stability was found for both females and males, and for both high and low ability students. Analyses from a subsequent sample assessed stability within the same school

year. Those analyses indicated fairly high stability (.63 for mastery goals, .61 for performance-approach goals) within the school year (Midgley et al., 1998).

Midgley et al. (1998) also examined the convergent validity of these measures, using a large sample of fifth graders. Specifically, Midgley and colleagues included scales developed by Nicholls and his colleagues, and examined the relations between several PALS measures and Nicholls' scales. Nicholls' scales and the PALS scales were related: specifically, the correlation between Nicholls' ego-orientation scale and our performance-approach goal orientation scale was .63; the correlation between Nicholls' task-orienation scale and our personal mastery goal orientation scale was .67.

Finally, several studies indicate that PALS demonstrates good construct validity. Specifically, the PALS goal orientation measures are related in expected ways to other measures. In a number of studies, we have demonstrated that our measure of personal mastery goals is related positively to perceived academic efficacy (e.g., Anderman & Young, 1994; Middleton & Midgley, 1997; Midgley & Urdan, 1995; Roeser, Midgley, & Urdan, 1996). As expected, personal performance-avoidance goals are related negatively to academic efficacy (Middleton & Midgley, 1997). For performance-approach goals, there are mixed results, with some studies finding approach goals positively related to academic efficacy (e.g., Midgley & Urdan, 1995), some finding approach goals negatively related to academic efficacy (Anderman & Young, 1994), and some finding no relation between performance-approach goals and academic efficacy (Middleton & Midgley, 1997).

A number of studies have indicated that mastery goals are related positively to the use of adaptive learning strategies (e.g., Meece, Blumenfeld, & Hoyle, 1988; Nolen,

1988). Our analyses with PALS have yielded similar findings (e.g., Anderman & Young, 1994; Middleton & Midgley, 1997, 1999; Ryan, Hicks, & Midgley, 1997).

In addition, our analyses indicate that performance-avoidance goals tend to be related to the use of maladaptive strategies, such as self-handicapping (e.g., Midgley & Urdan, 2001). The relations between performance-approach goals and maladaptive strategies are somewhat mixed. For example, in some studies, personal performance-approach goals were unrelated to self-handicapping (Midgley & Urdan, 2001), although in one study, we found a positive relation between personal performance-approach goals and self-handicapping for African American students (Midgley, Arunkumar, & Urdan, 1996). In both our studies and other research, performance-approach goals appear to be related positively to the avoidance of help-seeking (Middleton & Midgley, 1999; Ryan & Pintrich, 1997; Ryan et al., 1997).

Finally, we also have examined the relations of mastery and performance goals to various indices of affect. Previous research suggests that mastery goals are related positively to indices of affect, whereas performance goals are related negatively to affect (see Midgley et al., 1998, for a summary). Using the PALS, Roeser et al. (1996) found that personal mastery goals were related positively to affect at school, whereas performance-approach goals were unrelated to affect. Midgley et al. (1996) obtained similar results in examining the relations of goal orientations to self-esteem.

Summary

Goal orientation theory is a prominent and greatly researched theory of academic motivation. The personal goal orientation scales developed for the PALS by Carol

Midgley and her colleagues are among the most reliable and valid measures of these constructs, for use with samples of adolescents. This has been demonstrated in a variety of studies, in both cross-sectional and longitudinal research. The scales have good discriminant, concurrent, and construct validity. They are stable over time, and they are internally consistent.

As noted by Midgley et al. (1998), the PALS goal orientation scales offer several advantages, compared with other goal orientation measures. In the PALS, personal achievement goals have been separated from perceptions of the goal structure in the learning environment. Although we also have developed measures of classroom goal structure (e.g., Anderman, 1999; Anderman & Midgley, 1997; Urdan, Midgely, & Anderman 1998; Turner et al., 2002) and school goal structure (e.g., Anderman & Young, 1994; Kaplan & Maehr, 1997; Midgley & Urdan, 1995), the PALS personal goal orientation scales clearly separate perceptions of students' personal goals from their perceptions of the classroom and school learning environments.

In addition, because research clearly indicates that performance goals can be construed as both approach and avoidance goals, our measures are consistent with current research indicating that these goals are in fact distinct (e.g., Elliot & Harackiewicz, 1996; Middleton & Midgley, 1997; Skaalvik, 1997). In addition, our measures of performance goals do not include items that assess extrinsic goals, social goals, anxiety, or fear.

Motivation is a critical issue in American education, yet we have little nationally representative data on student motivation. Goal orientation theory is perhaps the most prominent of all current motivation theories. The PALS measures are among the best existing motivation measures. They have been demonstrated to be both valid and reliable

in samples of various ages, ethnicities, and cultures. Because they do not include items that measure other motivational variables (e.g., classroom goal structures, other types of personal goals, and other types of motivation), they are "cleaner" than many other measures. They are strongly related to a variety of educational and psychological variables, and they are sensitive to developmental changes in students' goals and beliefs. The inclusion of PALS personal goal orientation scales in nationally representative studies will yield extremely important information concerning students' motivation to learn and achieve, and will be of value to a large number of researchers.

Appendix I

Current PALS Personal Goal Orientation Scales

Personal Mastery Goal Orientation	Alpha = .85
It is important to me that I learn a lot of new concepts this year.	
One of my goals in class is to learn as much as I can.	
One of my goals is to mastery a lot of new skills this year.	
It's important to me that I thoroughly understand my class work.	
It's important to me that I improve my skills this year.	
Personal Performance-Approach Goal Orientation	Alpha = .89
It's important to me that other students in my class think I am good at my class work.	
One of my goals is to show others that I'm good at my class work.	
One of my goals is to show others that class work is easy for me.	
One of my goals is to look smart in comparison to the other students in my class.	
It is important to me that I look smart compared to others in my class.	
Personal Performance-Avoidance Goal Orientation	Alpha = .74
It's important to me that I don't look stupid in class.	
One of my goals is to keep others from thinking I'm not smart in class.	
It's important to me that my teacher doesn't think that I know less than others in class.	
One of my goals in class is to avoid looking like I have trouble doing the	

work.

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