DOCUMENT RESUME

ED 425 376 CG 028 923

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TITLE Examining the Factor Structure of a Measure of Learning and Performance Goal Orientations for Older High School Students.
PUB DATE 1997-11-00
NOTE 23p.; Paper presented at the Annual Meeting of the Mid-South Educational Research Association (Memphis, TN, November 12-14, 1997).
PUB TYPE Reports - Research (143) -- Speeches/Meeting Papers (150)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Academic Achievement; *Goal Orientation; Grade 11; *High School Students; High Schools; *Learning Motivation; Mastery Learning; Performance; Student Motivation; *Test Validity

ABSTRACT

Goal orientations in high school students may be grouped into learning (e.g., mastery) and performance (e.g., grades, competition) goals. Past research on students' goals is reviewed. Students' motivation for achievement is complex. Given the importance of fostering and strengthening learning goal orientations in high school as well as in college, this study investigates whether the Roedel Goals Inventory designed for college students is suitable for measuring learning and performance goals held by older students in high school (N=185). Data analysis was conducted in two steps: (1) item analysis to assess convergent and discriminant validity of the items for high school students; (2) exploratory factor analyses to further investigate the structure of the Goals Inventory for this population. Means and standard deviations are presented for each item. Item analyses and factor structure are reported and discussed. It appears that the Goals Inventory has a different factor structure for high school students than for college students. For both groups there is a distinct factor related to external performance; differences emerge in the area of learning goals. Findings and next steps are discussed. (EMK)

Running head: EXAMINING THE FACTOR STRUCTURE

# Examining the Factor Structure of a Measure of Learning and Performance Goal Orientations for Older High School Students

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Paper Presented at the Meeting of the

Mid-South Educational Research Association

Memphis, Tennessee

November, 1997

# Examining the Factor Structure of a Measure of Learning and Performance Goal Orientations for Older High School Students

Past research shows that students' cognitive engagement in achievement activities is motivated by a complex set of goals (Dweck & Elliot, 1983) such as learning and performance goals, indicating that students' processes of thinking in problem solving and other learning activities are related to their goal orientations. Students pursue different achievement goals depending on their individual needs and competencies or on the demands of the particular learning situation (Meece, Blumenfeld, & Hoyle, 1988).

Goal orientations are behavioral intentions that determine how students approach and engage in learning activities (Meece, Blumenfeld, & Hoyle, 1988). "Goals are assumed to provide students with direction for learning behavior, especially in terms of choice and persistence behavior" (Pintrich & Garcia, 1991 p. 371). Dweck and Leggett (1988) proposed that the goals individuals are pursuing create the framework within which they interpret and react to events. In the domain of intellectual achievement they identified two categories of goals: Learning (mastery) goals in which individuals are concerned with increasing their competence and performance goals in which individuals are concerned with gaining favorable judgements of their competence.

Orientations toward different goals lead individuals to different adaptive patterns of affect, cognition, behavior (Dweck & Leggett, 1988) and especially in students' engagement in learning activities (Dweck & Elliot, 1983; Hagen & Weinstein, 1995; Maehr & Nicholls, 1980; Nicholls, Patashnick, & Nolen, 1985). Different goal orientations, such as learning versus performance (Dweck & Elliot, 1983), task-involved versus ego-involved (Nicholls, Patashnick, & Nolen, 1985), mastery learning versus ability goal orientations (Ames & Ames, 1984), and mastery goal orientations versus performance goal orientations (Garcia & Pintrich, 1991; Hagen, 1994; Hagen & Weinstein, 1995; Pintrich & Garcia, 1991), have been proposed to explain differences in students' behavior patterns in learning.

Meece et al. (1988) found that a goal framework is useful for conceptualizing the influence of individual and situational variables on students' motivational patterns in classroom learning situations. Students who have learning goal orientations are assumed to interpret their effort as positively related to their ability to accomplish the task (Pintrich & Garcia, 1991) and they primarily focus on mastering the course material. They value the learning process itself and they often look for challenging assignments where they put in more effort and use more effective learning strategies to learn the material (Hagen & Weinstein, 1995; Meece, Blumenfeld, & Hoyle, 1988; Meece & Holt, 1993). Dweck and Leggett (1988) found that mastery-oriented students, when confronted with difficult problems, took them as challenges to be mastered

through effort. They engaged in extensive solution oriented self-instruction, self-monitoring and problem solving strategies.

When students are learning goal oriented, self-improvement or skill development is their main objective (Meece, Blumenfeld, & Hoyl, 1988). They would effect an active form of cognitive engagement in classroom activities, which means that they would use metacognitive and self-regulated learning strategies in their academic learning. They derive a sense of accomplishment from the inherent qualities of the learning activities. They persist longer, show a positive affect toward the learning task, and use diverse learning strategies to achieve conceptual understanding (Ames, 1984; Elliot & Dweck, 1988). Meece and Holt (1993) found that, as long as the students had learning (mastery) goal orientations, they reported higher use of self-regulatory learning strategies. Students' having learning goals is often associated with higher self-efficacy and higher use of self-regulated learning strategies (Ames, 1992; Garcia & Pintrich, 1991; Hagen, 1994; Hagen & Weinstein, 1995; Meece & Holt, 1993; Pintrich & Garcia, 1991).

According to Hagen and Weinstein (1995), students who have performance goals often focus their attention on the immediate outcome of the learning. They are basically interested in getting a good grade or at least avoiding getting a bad grade (Dweck, 1986). They tend to use less effective strategies in their learning tasks as they are only concerned with the immediate outcome or the good grade and for them learning is only a means to an end (Meece et al., 1988; Hagen & Weinstein, 1995).

They derive a sense of accomplishment from demonstrating superior ability in the performance of the particular task regardless of the learning involved (Meece et al., 1988) and their concern is about the task outcome with failure leading to attributions regarding the lack of ability (Pintrich & Garcia, 1991).

In an experimental study where they manipulated students' goals, Elliot and Dweck (1988) found support for the proposed pattern of cognition in terms of students' attributions for their performance and in the pattern of their affective reactions as a function of goal adoption (Pintrich & Garcia, 1991). Elliot and Dweck (1988) also found that high and low ability students' strategies for solving a problem task varied under different goal orientation conditions, but in the performance-goal-orientation condition low ability students showed a deterioration in the use of appropriate learning strategies. Students with low mastery (learning)-goal-orientations or performance-goal orientations reported a lower use of self-regulatory learning strategies (Meece & Holt, 1993).

Nicholls, Patashnick, and Nolen (1985) and Meece, Blumenfeld and Hoyle (1988) found a strong consistency of goal orientation patterns across different learning activities. The amount of importance students place on different goals influences their choice of achievement tasks, definitions and attributions for academic success and selection of learning or problem solving strategies ( Ames, 1984; Elliot & Dweck, 1988; Nicholls, Patashnick, & Nolen, 1985; Nolen, 1987, 1988). For this reason, students' goal orientations are presumed to be important mediators and determinants of behavioral,

cognitive and affective patterns in learning or achievement situations (Meece, Blumenfeld, & Hoyle, 1988).

Dweck and Leggett (1988) proposed that mastery learning and performance goals lead students to different affective reactions and behaviors. Performance-goal oriented students are more likely to experience anxiety about their success and failure, and, if they fail, they suffer loss of self-esteem. The avoidance of challenge and persistence and deterioration of performance in the face of obstacles and failures characterize their performance-oriented pattern of cognition-affect-behavior. Students oriented toward mastery learning goals seek challenging tasks and strive hard to improve their performance. These behaviors would result in an increase in mastery feelings and intrinsic motivation. Under threat of failure learning or mastery goal-oriented students generate effective strategies, sustain engagement with the task and persevere and maintain effective striving (Diener & Dweck, 1978, 1980; Dweck & Leggett, 1988; Meece, Blumenfeld & Hoyle, 1988). In the face of failure learning goal-oriented students exhibit constructive self-instruction and self-monitoring, a positive outlook, positive affect and effective problem-solving strategies (Diener & Dweck, 1978). Performance goals, on the other hand, are associated with a vulnerability to challenge avoidance, negative ability attributions, negative affect, and low persistence in the face of difficulty (Dweck & Leggett, 1988).

Meece, Blumenfeld, and Hoyle (1988) posited that students who perceive themselves as being academically competent develop an intrinsic motivational

orientation and they prefer challenging tasks and seek opportunities that allow them to satisfy needs for competence, curiosity, and mastery. In essence, these two orientation patterns are analogous to the two goal orientation conditions: learning or mastery and performance.

Pintrich and Garcia also found that the nature of the relations between students' motivational beliefs and their use of self-regulatory learning strategies and their actual course performance varied as a function of students' goal orientation. Students who were low in intrinsic motivation (who could be possibly identified as performance goal oriented students) had their motivational and cognitive strategy use more strongly related to their academic performance. It appeared that having learning or mastery goal orientation has a facilitative effect on students' motivational beliefs, their use of cognitive strategies and self-regulation of their learning.

Many studies bring into focus that learning and performance goals are independent of one another (Meece & Holt, 1993; Miller, Behrens, Greene, and Newman, 1993; Roedel, Schraw, & Plake, 1994; Schraw, Horn, Thorndike-Christ, & Bruning, 1995). Schraw, Horn, Thorndike-Christ and Bruning (1995) examined the relative impact of different goal configurations: high learning, high performance; high learning, low performance; low learning, high performance; and low learning, low performance. In this study they focused on whether academic achievement, strategy use, and self-reported metacognitive knowledge of students in an introductory science course differ as a function of their goal configurations. They found that college students

high on the learning dimension demonstrated higher course achievement, more metacognitive knowledge and using more learning strategies than students who had low-learning goal orientations; This means that college students with different goal orientations differed with respect to achievement, strategy use, and metacognitive knowledge.

Despite the importance of social, motivational and cognitive constructs associated with effective learning little effort had been made to construct and develop a valid goal orientation inventory. Miller, Behrens, Greene, and Newman (1993) did a study including learning and performance sub-scales as components of a larger instrument. But in this study, according to Roedel, Schraw, and Plake (1994), psychometric adequacy of the learning and performance sub-scales has not been appropriately evaluated. Roedel, Schraw, and Plake (1994) carried out a study with an undergraduate sample in an educational psychology course to "construct an inventory that was suitable for measuring learning and performance goals held by older students and to examine the psychometric properties of the inventory" (p.1014).

Given the importance of fostering and strengthening learning goal orientations in high school as well as in college, our purpose for the present study was to investigate whether the Goals Inventory constructed and validated by Roedel et al. is suitable for measuring learning and performance goals held by older students in high school.

## Method

### Participants

Participants were 185 students, 113 female and 72 male, from grade 11 classes in three high schools in a southeastern state. They included 134 Caucasian, 49 African American, one Hispanic and one Asian American.

### Instrument

The instrument used was the Goals Inventory (Roedel, Schraw, & Plake, 1994). The Goals Inventory is a 25-item scale that assesses attitudes and perceptions of behaviors that are typically associated with learning oriented goals and performance oriented goals. The Likert type items are scaled with a five point scale, ranging from 1 representing "not at all true of me" and 5 representing " very true of me." The Goals Inventory consisted of twelve items that assess learning-orientation, five items that measure performance orientation, and eight filler items. In previous research (Roedel et al., 1994), factor analyses of the seventeen learning and performance items yielded the two aforementioned factors, even though there was some indications of a potential though weak third factor. The Goals Inventory demonstrates adequate internal consistency, Cronbach's alpha = .79 in this sample.

### Data Analysis

The data analysis for this paper was conducted in two steps. First, item analyses were conducted to assess convergent and discriminant validity of the items of high

school students. Items were correlated with their own scale (corrected item-total correlations) and with the other scale. Second, exploratory factor analyses were conducted to further investigate the structure of the Goals Inventory for this population.

## Results

Table 1 presents the means and standard deviations for each of the items. The first twelve items are learning-goal oriented, the next five items are performance goal-oriented, and the last eight items are filler items. In the next two sections we present the results of (a) item analyses of the original scale structure, and (b) exploratory factor analysis results to further investigate the structure of the scale.

### Item Analysis Results

Item analyses were conducted to evaluate the convergent and discriminant validity of the learning oriented and performance-oriented scales. Each item was correlated with its respective scale (corrected item-total correlations) and with the total scale for the other goal-oriented scale and the filler items. To the degree that the items correlate more highly with their own scale (e. g. learning-oriented items correlate more highly with the learning-oriented scale) and less highly with the other scale or filler items, the Goals Inventory items demonstrate convergent and discriminant validity. Table 2 shows the results of the correlational analyses. The reliabilities for the two subscales were .80 for the learning scale and .71 for the performance scale.

Based on these results, there are several items that are not clearly discriminable from the items on the other scales. On the mastery sub-scale, items 11, 12, and 22 do

not show good discriminant or convergent validity. Similarly, item 14 on the performance scale does not correlate more strongly on its own scale than the filler items. This indistinctness in the item correlations suggests that the Goals Inventory may have a slightly different factor structure than suggested by Roedel, Schraw, and Plake (1994). In addition, it is possible that students in high school may be different in their goal orientations than college students.

Exploratory Factor Analysis Results

Based on the item analysis results and the fact that the sample used in this study was quite different from the populations, for which the Goals Inventory was developed, we conducted exploratory factor analysis to further investigate the structure of the instrument. We used a maximum likelihood extraction and a Varimax rotation to extract factor solutions from the 17 items on two Goals Inventory subscales. Based on the scree plot, the eigenvalues, and the interpretability of the solution, a three-factor solution was chosen. These three factors accounted for 40% of the covariance among the items.

The factor loadings for each of the items are shown in Table 3. The performance goal items remained together in a single factor. However, the learning goal items yielded two factors, a factor related to perseverance and accomplishment and a factor related to meeting challenges. The first mastery goal factor consists of items that key in on perseverance and personal mastery. This factor implies a sense of internal regulation and control, and it would be hypothesized that students who are low on this

factor would demonstrate an external locus of control and demonstrate lower frustration tolerance levels than those students who had high scores on this factor. The second factor is a challenge factor and appears to be comprised of a willingness to take risks and a preference for more cognitively complex and challenging learning tasks.

## Discussion

Based on the results of the above analysis, it appears that the Goals Inventory has a different factor structure for high school students than for college students. For both groups of students, there is a distinct factor related to external performance. Students who score high on this factor tend to be motivated by competition and external rewards such as grades. However, differences emerged when looking at the learning goals of students.

In previous research, Schraw and Roedel (1993) found that there was what they consider to be a marginally interpretable third factor, persistence, which had an eigenvalue less than 1. However, in a later study (Roedel et al., 1994), they did not find this third factor, which led to their recommendation to researchers who plan to use the instrument to either retain the factor structure revealed in that study or to force a two-factor solution even in cases where there appears to be the presence of a potentially interpretable third factor. We, however, detected a third factor that appears to be strong enough to go against their recommendations.

In short, we found that the learning goal factor was more complex for high school students than reported in Roedel et al (1994). For these students, there were two goal

orientations, one oriented toward perseverance and personal mastery (apparently what Roedel et al label persistence) and the another related to a preference for challenging and cognitively complex learning activities. We consider that these two orientations may be related but distinct factors that contribute to learning goal orientations of students in high school. In other words, perseverance in the face of difficult or complex tasks may be closely related to a preference for such tasks.

From research on self-regulation and motivation, we see that students who perceive themselves as being capable of accomplishing difficult learning assignments typically possess high self-efficacy beliefs and engage in self-regulation toward achieving their goals (Butler & Winne, 1995). Often in their academic pursuits, these learners have learning or mastery goal orientations as compared to those non-self-regulated learners who are performance-goal oriented. Learning or mastery goal oriented students use self-regulatory strategies in their normal classroom situations more than those with performance goal orientations (Dweck & Leggett, 1988; Meece & Holt, 1993; Meece, Blumenfeld, & Hoyle, 1988; Zimmermann, 1990). Thus, the element of perseverance, which may include a variety of strategies for maintaining self-motivation, as well as cognitive processes associated with self-monitoring, can contribute to students' overall mastery or learning orientation.

The results of this study suggest that it would be beneficial to examine more closely the relationship between perseverance and preference for certain types of cognitively complex activities. Each of these factors may be essential for a true learning

(mastery) goal orientation to exist. The first is important, because perseverance in the face of difficulties can be self-confirming, especially when one is successful in attaining desired goals. In fact, such success may increase one's interest in the topic that is being explored (Hidi, 1990), thereby creating some attraction toward similar activities that enable the student to test his or her capabilities. It has been pointed out, for example, that there may be a reciprocal relationship between interest and knowledge: Increased knowledge about a topic helps sustain interest and interest in the topic helps build increased knowledge (Tobias, 1994).

The second (preference for challenging tasks) is important in that there are intrinsically satisfying results that accompany mastery or success with challenging tasks. It makes good sense that a preference for challenging would be a part of learning goal orientations. Children and adults alike engage in self-chosen activities, such as hobbies, that are intrinsically interesting and satisfying to them. This orientation, therefore, overlaps significantly with intrinsic motivation (Meece, Blumenfeld, & Hoyle, 1988).

In order to resolve the disparity in factors that appear to exist related to this instrument, when it is presented to high school and college students, we may consider that the two groups are not only different in age and in level of schooling but also different in orientations toward education. That is, college students comprise a narrower range of the students who attend high school; not all eleventh-grade students enter college nor do they all aspire to enter college. Therefore, the goal orientations of

college students may be more focused than those of the whole range of eleventh grade students. Such a focus, particularly for those who are strongly learning (mastery) oriented would probably mean that those students integrate perseverance and preference for challenge in their thinking. If that is the case, we would expect to find among high school students in general a greater separation of perseverance and preference for challenge. However, even if there were not this potentially important difference between high school and college students, we still would expect to find that up to four additional years of school and higher educational aspirations would influence the ways that college students view learning.

Next steps related to this instrument would be to enlarge the sample of high school students, looking at those who are college-bound and those who are not, in order to determine if there is some difference in how they view learning, especially related to issues associated with perseverance and challenge. Further detailing of the conditions that support a learning goal orientation would also enable us to understand the ways that learning goal orientations are realized at different points in a person's educational experience.

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Table 1

Means and Standard Deviations for Goals Inventory Items

| Item | Mean | SD |
|---|---|---|
| Learning (Mastery)-oriented Items | | |
| I enjoy challenging school assignments (1) | 2.73 | 1.16 |
| I persevere even when I am frustrated by a task (3) | 3.19 | 1.16 |
| I try even harder after I fail at something (6) | 4.30 | .87 |
| I adapt well to challenging situations (7) | 3.52 | 1.05 |
| I work hard even when I don't like a class (9) | 3.44 | 1.10 |
| I am very determined to reach my goals (10) | 4.54 | .75 |
| Personal mastery of a subject is very important to me (11) | 3.94 | .95 |
| I work very hard to improve my self (12) | 4.28 | .91 |
| I am naturally motivated to learn (16) | 3.63 | 1.16 |
| I prefer challenging tasks even if I don't do well at them (17) | 3.31 | 1.18 |
| I feel most satisfied when I work hard to achieve something (22) | 4.34 | 1.04 |
| I give up too easily when faced with a difficult task (25) | 3.45 | 1.31 |
| Performance-oriented Items | | |
| It is important to me to get better grades than my classmates (2) | 3.12 | 1.35 |
| I like others to think I know a lot (13) | 2.95 | 1.35 |
| It bothers me the whole day when I make a big mistake (14) | 3.42 | 1.39 |
| I feel angry when I do not do as well as others (15) | 3.27 | 1.12 |
| It is important to me to always do better than others (24) | 2.72 | 1.33 |

Table 2

Item Analysis Results: Corrected Item Total Correlations and Discriminant Correlations

| Item | Learning scale | Performance scale | Filler items |
|---|---|---|---|
| Learning (Mastery)-oriented Items | | | |
| I enjoy challenging school assignments (1) | .52 | .12 | .19 |
| I persevere even when I am frustrated by a task (3) | .35 | -.04 | .16 |
| I try even harder after I fail at something (6) | .47 | .18 | .30 |
| I adapt well to challenging situations (7) | .48 | .14 | .15 |
| I work hard even when I don't like a class (9) | .44 | .14 | .27 |
| I am very determined to reach my goals (10) | .52 | .16 | .30 |
| Personal mastery of a subject is very important to me (11) | .48 | .12 | .35 |
| I work very hard to improve my self (12) | .57 | .25 | .43 |
| I am naturally motivated to learn (16) | .62 | .15 | .25 |
| I prefer challenging tasks even if I don't do well at them (17) | .51 | .12 | .21 |
| I feel most satisfied when I work hard to achieve something (22) | .33 | .25 | .45 |
| I give up too easily when faced with a difficult task (25) | .28 | -.08 | .07 |
| Performance-oriented Items | | | |
| It is important to me to get better grades than my classmates (2) | .23 | .53 | .16 |
| I like others to think I know a lot (13) | .09 | .41 | .20 |
| It bothers me the whole day when I make a big mistake (14) | .11 | .25 | .26 |
| I feel angry when I do not do as well as others (15) | .13 | .57 | .15 |
| It is important to me to always do better than others (24) | .13 | .60 | .16 |

Table 3

Factor Analysis Results for Goals Inventory Based on High School Student Responses

| Item | Persev-erance goals | Chall-enge goals | Perfor-mance goals |
|---|---|---|---|
| Learning (Mastery)-oriented Items | | | |
| I enjoy challenging school assignments (1) | | .710 | |
| I persevere even when I am frustrated by a task (3) | | .300 | |
| I try even harder after I fail at something (6) | .481 | | |
| I adapt well to challenging situations (7) | | .599 | |
| I work hard even when I don't like a class (9) | .507 | | |
| I am very determined to reach my goals (10) | .656 | | |
| Personal mastery of a subject is very important to me (11) | .489 | | |
| I work very hard to improve my self (12) | .774 | | |
| I am naturally motivated to learn (16) | .459 | .559 | |
| I prefer challenging tasks even if I don't do well at them (17) | | .708 | |
| I feel most satisfied when I work hard to achieve something (22) | .497 | | |
| I give up too easily when faced with a difficult task (25) | | .349 | |
| Performance oriented items | | | |
| It is important to me to get better grades than my classmates (2) | | | .647 |
| I like others to think I know a lot (13) | | | .519 |
| It bothers me the whole day when I make a big mistake (14) | | | .300 |
| I feel angry when I do not do as well as others (15) | | | .654 |
| It is important to me to always do better than others (24) | | | .777 |

Note: Factor loadings less than .30 are not reported

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Jillian Barr Joncas
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