A SCALE TO EVALUATE CHILDREN'S MOTIVATION TO LEARN IN ELEMENTARY SCHOOL

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Abstract:
Given the need to discover children's motivation to learn in Mexico, the Scale of Intrinsic versus Extrinsic Orientation in the Classroom, developed by Harter (1981), was adopted. The participants were 173 students in the second, fourth, and sixth grades of public school. The results showed that the scale has moderate internal consistency; factorial analysis identified three principal factors. The scale permitted evaluating children's general motivation to learn while discovering the motives and perceptions of their skills in schoolwork. Continued work on the validity of the instrument's construction is required, including the formulation of questions in which intrinsic motivation is not contrary to the children's perceived relevance of the teacher's opinion.

Keywords: motivation, learning, evaluation, children, basic education, Mexico.

Introduction
Educational lags in our country continue to be considerable. According to the diagnosis made by the National Institute for the Evaluation of Education (Instituto Nacional para la Evaluación de la Educación), two out of every ten sixth-graders do not have basic skills in Spanish and mathematics (INEE, 2005). In spite of the efforts made in public schools through the Quality Schools Program, average achievement in Spanish and mathematics could not be elevated (PEC, 2005). Grade repetition and dropping out also continue to occur; according to recent statistics, the completion rate for elementary school was 90%, and only 78% in secondary school (INEGI, 2007). Such data indicate the need to continue searching for options to promote the scholastic achievement of Mexican children.

Throughout history, educators have been concerned about combating low achievement and dropping out; in 1938, Dewey would have affirmed that the most important attitude for children to have is the desire to continue learning (Dewey, 1963).

The promoters of educational reform observed that small children showed unlimited curiosity, an intense thirst for knowledge, and enormous will to learn outside of school—attitudes that diminished notably in the classroom (Jackson, 1968; Silberman, 1971). Other authors have shown that preschool children are rarely lacking in motivation to learn; however, a few years later in elementary school, motivation begins to be a problem; teachers are obligated to resort to extrinsic incentives and sanctions (Lepper and Hodell, 1989).

One of the most worrisome discoveries of educational research refers to children's decreased motivation to learn at school as they progress through elementary school (Eccles, Wigfield and Shiefele, 1998; Harter, 1981; Wigfield and Eccles, 1992); this finding suggests that schoolwork and the actions of teachers and parents extinguish the child's natural motivation.

Also documented are children's lowered goals for learning and mastery as they enter adolescence (Anderman and Midgley, 1997; Midgley, Anderman and Hicks, 1995). The argument is made that experience with formal education along with an emphasis on formal evaluation and skill, have caused students to be concerned more about goals of performance or grades (Kinlaw and Kurtz-Costes, 2007).

In the search for strategies that promote children's scholastic achievement, motivation has been shown to play a fundamental role in learning since it influences what, when, and how learning takes place (Schunk, 1991).

At the present time, numerous theoretical perspectives of motivation exist; however, to understand the perspective of learning at school, theories of intrinsic motivation and theories focused on beliefs about
competence and efficacy are essential. The first theories answer the question, “Do I want to do the work?” while the second theories are oriented to answering, “Can I do the work?” The reasons for dedicating oneself to an activity are very important, but the expectations of carrying out that activity are determining.

The theories of intrinsic motivation state that when students are intrinsically motivated, they work on tasks because they enjoy doing so; their participation is its own reward and does not depend on outside stimuli. Working on a task because of intrinsic motives not only originates greater pleasure, but also promotes learning and scholastic achievement (Gottfried, 1990). The argument is made that when students are internally motivated, they carry out activities that promote their learning: they pay attention, make more of an effort, dedicate more time to the activity, organize knowledge, relate knowledge to what they already know, and apply knowledge and learned skills in different contexts; meanwhile, learning promotes intrinsic motivation (Pintrich and Schunk, 2002).

According to theories focused on competence-related beliefs, as students develop skills, they perceive their progress and feel more efficacious about learning. Bandura suggests that when individuals acquire self-efficacy beliefs and expectations of positive results, their intrinsic motivation increases, leading to greater learning (1997; Bandura, et al., 2001); the same author states that models and reinforcement influence children’s attempts to master skills along with their internalization of goals and self-reward (Bandura, 1997).

In line with Bandura, the theory of self-determination postulates that individuals have the need to feel autonomous and competent and to maintain an optimum level of stimulation (Ryan and Deci, 2000a); therefore, interest in a task is maintained only when actors feel competent and self-determined. On the way to self-determination, children transform their social values and the extrinsic contingencies in their own system of values (Ryan and Deci, 2000b).

Eccles and her collaborators developed the expectation-value model centered on motivational beliefs. They focused on the role played by student expectations for academic success and the perceived value of tasks (Jacobs and Eccles, 2000). This theoretical posture considers feelings of competence as well as task values, which are developed mainly through intrinsic and extrinsic interests. Based on a study of different theoretical perspectives of motivation in educational psychology, Eccles and Wigfield (2002) concluded that the focus on beliefs, values, and goals has strengthened in the rational and cognitive processes of motivation, at the expense of affective motivation.

A theory that considers cognitive as well as affective processes is Harter’s (1978, 1981 and 1992) competence motivation theory, which explains the development of intrinsic and extrinsic motivation in children. This author identified the mediating variables of competence motivation, emphasizing the role of socializing agents in experiences of success and failure; she affirmed that the responses of socialization agents to small children’s initial attempts at efficacy, as well as the children’s success or failure in attempts to handle their environment, have an important impact on the orientation of children’s motivation as well as on their perceptions of competence and control over their environment. According to Harter, children with competence motivation show a preference for challenge, work to satisfy their own curiosity, make attempts to master, and show independent judgment and internal criteria of success and failure.

Much evidence has backed the content of intrinsic motivation theories, as well as expectation theories and the links between the two types of theories. Research carried out at different educational levels indicates that intrinsic motivation is positively related to the perceptions of competence, learning, and scholastic achievement, and is negatively related to anxiety (Gottfried, 1990). It has been proven that students who consider themselves competent enjoy tasks more and show greater intrinsic motivation than students who rate themselves as less competent (Boggiano, Main and Katz, 1988; Gottfried, 1990). Studies of goal-analysis have concluded that intrinsic motivation decreases when external control is exercised and negative feedback on competence is given (Cameron and Pierce, 1994; Deci, Koestner and Ryan, 1999). In terms of the influence of external control, the findings indicate that when children are internally motivated to attain something, but external pressures intervene—like parental demands, examinations, or school grades—the children exert effort but show greater anxiety and poor performance (Ryan and Deci, 2000a).
Studies centered on expectations and valor have documented that these factors are powerful predictors of student effort in the classroom and on schoolwork (Trautwein, Lüdtke, Kastens and Köller, 2006). Considerable evidence suggests that students in elementary and secondary school show more positive patterns of motivation and learning when their school setting values the acquisition of knowledge, skills, and individual progress (goals of mastery), more than it values goals of performance involving the ego, competence, and the recognition of others (Meece, Anderman and Anderman, 2006). Schunk (1996) showed that when small children are directed to attaining goals of learning, they present greater dedication to the task and to achievement, than those who are guided by goals of performance. Students oriented to goals of mastery tend to believe that effort is the key to success and failure—which they believe simply implies not using the correct learning strategies, and not necessarily incompetence (Pintrich and Schunk, 1996). Another finding was that when children believe intelligence is malleable, they tend to show goals of learning and greater motivation for improvement; in contrast, children who believe that intelligence is fixed or stable show goals of performance and low motivation (Kinlaw and Kurtz-Costes, 2007). With respect to associated feelings, goals of mastery have been observed as positively related to pride and satisfaction regarding success, and negatively related to anxiety regarding failure (Ames, 1992). On analyzing the specific characteristics of goals, Bandura (1997) and Schunk (1990) found that goals that imply a challenge also promote self-efficacy and improve performance.

Researchers who analyze self-efficacy have found that an individual’s self-concept depends on the value he assigns to mastering the competence he wants to attain; therefore, to maintain his feelings of self-efficacy, he may reduce the value he assigns to tasks in which he expects to fail (Eccles, 1993, Harter 1998). Pintrich and De Groot (1990) noticed that students’ values of learning determine their initial decisions to dedicate themselves to an activity; and that their feelings of self-efficacy facilitate dedication as well as performance, along with cognitive strategies and self-regulation.

Other studies have focused on students’ learning strategies. High levels of intrinsic motivation have shown to promote the use of appropriate learning strategies (Pintrich and Schrauben, 1992) and indicators of learning that are more complete or profound (Schiefele, 1999). Evidence indicates that performance goals are associated with superficial strategies of practice and are not related—or are negatively linked—to a deep level of processing (Elliot, 1999; Pintrich et al., 1993). Students oriented to performance, whose goal is to avoid failure, present a pattern of reduced effort and persistence, as well as disorganized work tendencies—factors that in turn are linked to decreases in subsequent academic performance (Elliot, 1999).

Based on the reviewed literature, the conclusion can be made that students who believe they can do a task and expect to do it well, show greater dedication, make more of an effort, and persist for a longer time when working on the task; self-perceptions of competence and expectations of success serve as mediators between the environmental and cultural context and effort, dedication, and results of scholastic achievement (Pintrich and Schunk, 2002).

It can be seen that researchers of motivation have learned much about the reasons people decide to dedicate themselves to different activities. However, in our country, little effort has been made to study children’s motivation to learn; nor do we have an instrument that allows us to discover children’s motives for doing schoolwork.

Given the transcendence of motivation with regard to scholastic learning, and in response to the need for an instrument for obtaining knowledge about the motivation of Mexican children, the purpose of the current research was to adapt the Scale of Intrinsic versus Extrinsic Orientation in the Classroom (Harter, 1980), a scale designed originally for the US population. The scale’s content considers the classroom to be a situational context, since it is in the classroom where the orientation of student motivation is particularly relevant. The scale permits answering the question: To what degree is student motivation determined by intrinsic or extrinsic factors? (Harter, 1980).

The Harter (1980) scale was selected because its characteristics are considered appropriate for discovering the degree of student motivation to learn, given that:
1) It permits identifying the components of intrinsic and extrinsic motivation, instead of dealing with motivation as a global construct.
2) It examines the relative force of intrinsic and extrinsic motivation.
3) The sub-scales consider the motives for schoolwork as well as the perceptions of competence for carrying out the work.
4) The scale is an appropriate measure for different ages, thus permitting a measurement of changes in motivation through development.
5) It is a psychologically significant measurement for children that has shown effectiveness in evaluating children from the third grade up.
6) In its design, particular attention was paid to the instrument’s ecological validity.
7) It can be administered to groups as well as individuals.
8) The response format helps to neutralize the tendency to answer according to what is socially desirable.
9) Its factorial validity, internal consistency, and discriminative and predictive validity have been proven in the North American population.

Method

Participants
To carry out the cultural and linguistic validation of the test, cooperation was requested from six judges (educational psychologists who speak English).

For the pilot test, invitations to participate were extended to twelve second-, fourth- and sixth-graders: two with high motivation (a girl and a boy) and two with low motivation (a girl and a boy) from each grade; the children were selected by their teachers.

In the first application of the version of the scale validated by the judges, the participants were 195 students from the second, fourth, and sixth grades in elementary school (two groups from each grade). The corrected version of the validated scale was given to 173 students in the second, fourth, and sixth grades of elementary school (two groups from each grade). All the participants attended a public school with a medium-low socioeconomic level in the Álvaro Obregón borough of Mexico City.

The selection of the samples was intentional. The goal was to obtain information from different levels of elementary education, taking into consideration that it is during children’s elementary school years that their motivation to learn decreases. Public school and the medium-low socioeconomic level were chosen because the children’s limited resources at school and home prevent them from having an atmosphere that promotes their interest in knowledge; however, their basic needs for housing, food, and child care are covered, revealing differences in motivation that are not affected by extreme shortages.

The sampling decisions also responded to the usefulness of information to obtain; the resulting data permit discovering the level of children’s motivation to learn, among children whose characteristics are the most common in Mexico. Lastly, the feasibility of data collection was taken into account; prior to the study, we had had a professional relationship with the authorities and teachers in the selected school.

Instrument
The Scale of Intrinsic versus Extrinsic Orientation in the Classroom (Harter, 1980), which evaluates the degree and type of internal/external orientation that students present in scholastic learning. It covers five dimensions of classroom learning—dimensions that can be characterized by having one intrinsic and one extrinsic pole of motivation:

- Preference for Challenge versus Preference for Easy Work
- Curiosity and Interest versus Pleasing the Teacher and Obtaining Grades
- Independent Mastery versus Dependence on Teacher
- Independent Judgment versus Dependence on the Teacher’s Judgment
- Internal Criteria of Success and Failure versus External Criteria
The content of the test questions and the test’s response format allow children to select among responses of intrinsic or extrinsic motivation, at two levels: high or middle. Thus the type and degree of motivation presented by each child in each dimension are obtained. Each item is graded on a scale from 1 to 4, where 1 indicates the maximum extrinsic orientation and 4 the maximum intrinsic orientation (Figure 1).

**FIGURE 1**
Response Format and Grading Criteria

<table>
<thead>
<tr>
<th>VERY SIMILAR TO ME</th>
<th>Some-what similar</th>
<th>Some children like difficult work because it is more interesting.</th>
<th>Other children prefer easy work because they do not have to exert much effort.</th>
<th>Some-what similar</th>
<th>VERY SIMILAR TO ME</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 points</td>
<td>3 points</td>
<td></td>
<td></td>
<td>1 point</td>
<td>2 points</td>
</tr>
</tbody>
</table>

The response format that is used counteracts the tendency to answer according to what is socially desirable. Children first have to decide which classmates are more similar, considering two opposite alternatives, and then indicate the degree of similarity. Harter (1980) states that this type of response legitimates any choice the child makes and broadens the range of selections from the true/false format. In addition, no choice implies a “wrong” answer.

**Procedure**

*Cultural validation and validation of the language on Harter’s (1980) original scale.* The test was translated by taking into account aspects of Mexican culture and the language elementary school children use. Subsequently, the translated test was submitted to validation by judges (six bilingual psychologists). Based on the judges’ suggestions, modifications were made to the language and content of some test questions, as well as to the response options that seemed to be complex for Mexican children.

The pilot test was given to twelve children in the second, fourth, and sixth grades. In each grade, two children had high motivation and two had low motivation (as determined by their teachers). Although Harter’s original scale was designed for third-graders and up, it was tested on younger children to determine the development of motivation during elementary school. Considering the doubts and difficulties that the children presented, further modifications were made to the formulation of some test questions, to the response format, and to the instructions, in order to facilitate understanding and the ease of the children’s responses.

*Presentation of the research project to the school’s director and teachers of the second, fourth, and sixth grades.* They were given an explanation of the research procedure and objectives and invited to cooperate; the agreement was made to report back to them with the obtained results.

*Request for authorization from parents of students in the second, fourth, and sixth grades to participate in the study.* The parents were sent a synthesis of the project, along with a form to indicate if they authorized their children to take the test of motivation. The offer was made to report the results to them upon concluding the study, and to suggest ways of helping their children; all the parents accepted.

*Invitation to children in second, fourth, and sixth grades to participate in the study.* Classroom visits were made to invite the children to take the test of motivation. They were given the explanation that the results would reveal their likes and needs in the classroom, and would serve to guide them as well as their parents and teachers on how to favor their interest in learning.

*Evaluation of motivation to learn in the six groups of students from the second, fourth, and sixth grades.* The Harter Scale, translated and validated, was given to each group in its own classroom. The responses of 195 children were graded and the data inputted.
**First analysis of the validity of construction and internal consistency of Harter’s Scale, translated and validated.** Factorial analysis of the scale was completed and its total reliability verified in terms of internal consistency by using Cronbach’s alpha.

**Restructuring the scale.** In order to improve the reliability and validity of the scale’s construction, further modifications were made to the language of some test questions, to the test format, to the instructions, to the sample test questions, and to the form of presenting and explaining them. In particular, an attempt was made to make the test questions and the response options more simple and understandable; in the adaptation, the basic content of the test questions was respected.

**Second evaluation of motivation to learn at school, in six different groups of students from the second, fourth, and sixth grades, with the modified scale (second version).** Authorization was requested from the teachers and parents, and the students were invited to participate in the study.

The evaluation of 173 children was completed. The test was given to the groups of fourth- and sixth-graders in their classrooms; the children took between 15 and 25 minutes to take the test. The second-graders were evaluated in groups of ten, in order to give students individual attention as necessary. The children finished the test in approximately 30 to 45 minutes, and about one-half of the children did not need help.

**Comparison of the results of the evaluation according to the teachers’ criteria of their students’ degree of motivation.** Before giving the teachers the test results, they were asked to rate the motivation of each of their students, as high, medium, or low.

**Results**

**Analysis of internal consistency and validity of construction of the first culturally validated and translated version of the Harter Scale (1980).**

An analysis was made of the test questions’ capacity of discrimination in the translated version of the test by using the t-test. As a result, five test questions that did not discriminate between children with high and low motivation were eliminated. The internal consistency of the test was analyzed through Cronbach’s alpha and a value of .7157 was obtained.

Factorial analysis of the scale produced four factors with a value greater than 1, composed of a minimum of three test questions each. The eighteen remaining test questions were distributed among factors with less value and with less than three test questions. The internal consistency of the factors was .5082, .5367, .5616 and .5826. These results led to the revision and modification of the scale.

**Analysis of internal consistency and validity of construction of the second modified version of the Harter Scale (1980).**

Descriptive analysis of the data obtained from the modified scale. A descriptive analysis was made of the children’s responses to learn the general characteristics of their motivation to learn. The measures of central tendency were calculated, obtaining a mean of 78, a median of 78, and a mode of 76, thus indicating a normal distribution of the sample’s responses (graph 1).

**GRAPH 1**

*Distribution of Points Obtained on the Scale*
The measures of central tendency were also calculated for the children’s responses to each test question. As Chart 1 shows, the mean fluctuated between 2 and 3, except on question 13, which had a slightly higher mean (3.2) and question 19, which had a slightly lower mean (1.9). The median fluctuated between 2 and 3, except on question 13, which had a median of 4. The mode or more frequent responses were the extreme values: 4 for 18 test questions and 1 for the remaining 12 test questions.

**CHART 1**

*Measures of central tendency of the children’s responses to each question*

<table>
<thead>
<tr>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>R4</th>
<th>R5</th>
<th>R6</th>
<th>R7</th>
<th>R8</th>
<th>R9</th>
<th>R10</th>
<th>R11</th>
<th>R12</th>
<th>R13</th>
<th>R14</th>
<th>R15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>3.2</td>
<td>2.2</td>
<td>2.3</td>
<td>2.4</td>
<td>3.0</td>
<td>2.7</td>
<td>2.6</td>
<td>2.3</td>
<td>2.4</td>
<td>2.8</td>
<td>2.7</td>
<td>3.2</td>
<td>2.0</td>
<td>2.5</td>
</tr>
<tr>
<td>Median</td>
<td>3.0</td>
<td>2.0</td>
<td>2.0</td>
<td>2.0</td>
<td>2.0</td>
<td>3.0</td>
<td>3.0</td>
<td>2.0</td>
<td>2.0</td>
<td>3.0</td>
<td>3.0</td>
<td>4.0</td>
<td>2.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Mode</td>
<td>4.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>4.0</td>
<td>4.0</td>
<td>1.0</td>
<td>4.0</td>
<td>4.0</td>
<td>4.0</td>
<td>4.0</td>
<td>4.0</td>
<td>1.0</td>
</tr>
</tbody>
</table>

In terms of the variability of response for each test question, the standard deviation was found to fluctuate between 1 and 1.2; the responses were seen to have a minimum value of 1, a maximum value of 4, and a range of 3; however, the four response options on all the test questions were selected by the children.

**Discriminatory analysis of the test questions on the modified scale.** A review was made of the children’s response frequencies for each test question, revealing that most of the test questions did not concentrate more than 70% at either extreme. On question 13, 76.3% of the responses were concentrated at the high extreme (options 3 and 4), and on question 19, 73.4% were concentrated at the low extreme (options 1 and 2). According to these data, the greatest majority of children “...read because they are interested in the topic” and “...do not know how they do on an exam until the graded exam is returned to them”.

The t-test was used on an independent sample to determine if the differences between the groups of high and low motivation were statistically significant, leading to the elimination of test questions 19 and 26. Apparently, the children with motivation as well as those with low motivation, “do not know how they do on an exam until the graded exam is returned to them” and “they believe it is better if the teacher
decides how much time to work on each subject”. As shown, the content of the non-discriminating test questions is centered on the children's dependence on the teacher’s judgment.

Internal consistency of the modified scale. Cronbach’s alpha indicated that the test’s internal consistency rose to .7270 after eliminating test questions 19 and 26.

This analysis also indicated that three of the test questions presented low correlation with the total scale; question 14 had a low correlation of .0690, question 21 of .0551, and question 27 of .0601 (see Chart 3). The responses to these three test questions showed respectively that most of the children “... need to receive their grades to know how they are doing in school”, “...would like for the teacher to take their opinion into account upon selecting the work they will do” and “...have to wait for the teacher to grade them to know if their work is done well”. Once again, the content of these test questions indicates the relevance of the teacher’s judgment for all the children.

After eliminating these three test questions, in addition to the non-discriminating question, a total of 25 questions remained and the confidence level rose to .7415 (chart 2).

CHART 2
Analysis of the scale’s internal consistency after eliminating the test questions that did not permit discriminating between children with high and low motivation, as well as the test questions that had a low correlation with the total scale

<table>
<thead>
<tr>
<th>Item/total correlation</th>
<th>Alpha if the item is eliminated</th>
<th>Item/total correlation</th>
<th>Alpha if the item is eliminated</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1 .3422</td>
<td>.7296</td>
<td>R16 .4216</td>
<td>.7245</td>
</tr>
<tr>
<td>R2 .1628</td>
<td>.7410</td>
<td>R17 .1990</td>
<td>.7387</td>
</tr>
<tr>
<td>R3 .1406</td>
<td>.7429</td>
<td>R18 .2671</td>
<td>.7341</td>
</tr>
<tr>
<td>R4 .1994</td>
<td>.7391</td>
<td>R20 .2232</td>
<td>.7371</td>
</tr>
<tr>
<td>R5 .3089</td>
<td>.7310</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R6 .4449</td>
<td>.7235</td>
<td>R22 .3250</td>
<td>.7302</td>
</tr>
<tr>
<td>R7 .2180</td>
<td>.7378</td>
<td>R23 .2671</td>
<td>.7344</td>
</tr>
<tr>
<td>R8 .4306</td>
<td>.7226</td>
<td>R24 .3716</td>
<td>.7270</td>
</tr>
<tr>
<td>R9 .1604</td>
<td>.7415</td>
<td>R25 .3252</td>
<td>.7301</td>
</tr>
<tr>
<td>R10 .3165</td>
<td>.7308</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R11 .1669</td>
<td>.7407</td>
<td>R28 .2629</td>
<td>.7344</td>
</tr>
<tr>
<td>R12 .1589</td>
<td>.7416</td>
<td>R29 .3664</td>
<td>.7277</td>
</tr>
<tr>
<td>R13 .1855</td>
<td>.7390</td>
<td>R30 .3365</td>
<td>.7293</td>
</tr>
<tr>
<td>R15 .3384</td>
<td>.7293</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Number of cases = 173
Number of test questions = 25
Alpha = .7415

Factorial analysis of the modified scale. To analyze how the children's responses to the test questions were grouped, and to search for the simplest structure, the method of principal components was used. Considering that the correlation among test questions was less than .50, the Varimax rotation was used.

As Chart 3 shows, eight factors with a value of 1 were found. Of these factors, only five were formed by a minimum of three test questions having a factorial weight greater than .40, and which were not repeated in another factor. The value of the components and the minimum weight difference between factors 3 and 4, and 4 and 5 (Cattell's breaking point), indicate that most of the variance of the studied population’s motivation is explained by the first three factors (Cattell, quoted by Kline, 1994).

CHART 3
Factorial analysis of the scale after eliminating the non-discriminating test questions and the questions having a low correlation with the total scale

<table>
<thead>
<tr>
<th>Total Explained Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component</td>
</tr>
<tr>
<td>-----------</td>
</tr>
</tbody>
</table>

...
The internal consistency of the first three factors was low but acceptable for the research (greater than 60), and the internal consistency of the 4 and 5 factors was less than .50 (chart 4).

**CHART 4**
*Internal consistency of the factors obtained through factorial analysis*

<table>
<thead>
<tr>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
<th>Factor 4</th>
<th>Factor 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alpha</td>
<td>.6259</td>
<td>.6202</td>
<td>.6606</td>
<td>.4991</td>
</tr>
</tbody>
</table>

The resulting structure of factorial analysis (Chart 5) shows that the three principal factors have correspondence with part of the content of the sub-scales of the original instrument; therefore, they carry the same name. Factor 4 was integrated into test questions from two Harter sub-scales: the judgment independent from the teacher versus judgment dependent on the teacher, and the internal versus external...
criteria of success. Considering that all the test questions grouped in this factor ask about the child’s need for the teacher’s opinion or criteria, the factor was called judgment independent from the teacher versus judgment dependent on the teacher. Factor 5 was made up of the test questions corresponding to the three Harter sub-scales. Since the common element in the test questions is the child’s initiative in the classroom, the factor was called individual initiative versus obedience to school demands.

Means and standard deviations for each sub-scale by grade. The means of each sub-scale are represented graphically to show the tendencies in each group’s scores (Chart 6). As shown by Graph 2 (a, b, c, d, and e), in the sub-scales of interest in learning and individual initiative, the orientation is high extrinsic in the second grade, and moves to the intrinsic pole the higher the grade in school. On the sub-scales of preference for challenge and independence from the teacher, the orientation is low intrinsic in the second and sixth grades, with very similar average scores; the difference is the score in the fourth grade, since the preference for a challenge increases and independence from the teacher decreases. On the sub-scale of judgment, the means indicate marked dependence on the teacher that rises a few tenths of a point in the sixth grade without reaching the intrinsic level.

CHART 5
Test questions included in the resulting factors of factorial analysis and the naming of the factors to identify the meaning of their content

<table>
<thead>
<tr>
<th>Factor 1: Independence from Teacher versus Dependence on Teacher</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>8. When some children commit an error, they prefer to find the correct response on their own.</td>
<td>Other children prefer to ask the teacher how to find the correct response.</td>
</tr>
<tr>
<td>24. Some children like to try to solve problems on their own.</td>
<td>Other children prefer to ask the teacher how to solve problems.</td>
</tr>
<tr>
<td>29. Some children do their work in class without the teacher’s help.</td>
<td>Other children prefer for the teacher to help them do their work in class.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Factor 2: Interest in Learning versus Obtaining Grades</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7. Some children do their schoolwork to learn many things.</td>
<td>Other children do their schoolwork to get good grades.</td>
</tr>
<tr>
<td>25. Some children do extra work because they are interested in learning other things.</td>
<td>Other children do extra work to obtain better grades.</td>
</tr>
<tr>
<td>30. Some children study a lot because they are interested in learning things.</td>
<td>Other children study a lot to obtain good grades.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Factor 3: Preference for Challenge versus Preference for Easy Work</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Some children like difficult work because it is more interesting.</td>
<td>Other children prefer easy work because they do not have to exert much effort.</td>
</tr>
<tr>
<td>6. Some children like difficult problems because they enjoy trying to solve them.</td>
<td>Other children do not like to solve difficult problems.</td>
</tr>
<tr>
<td>16. Some children like doing new work that is more difficult.</td>
<td>Other children prefer to continue doing work that is easy.</td>
</tr>
<tr>
<td>22. Some children like subjects that make them think a lot to solve things.</td>
<td>Other children prefer subjects in which it is easy for them to learn the answers.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Factor 4: Independent Judgment versus Dependence on Teacher’s Judgment</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Some children know that they have made a mistake before the teacher tells them.</td>
<td>Other children need for the teacher to tell them when they make a mistake.</td>
</tr>
<tr>
<td>9. Some children know if they are doing well or poorly in school before they see their grades.</td>
<td>Other children need to see their grades to know if they are doing well or poorly.</td>
</tr>
<tr>
<td>15. When some children get stuck on a problem, they continue trying to solve it on their own.</td>
<td>Other children ask for help from the teacher.</td>
</tr>
<tr>
<td>17. Some children believe that the most important thing is their own opinion about their work.</td>
<td>Other children believe that the most important thing is the teacher’s opinion about their work.</td>
</tr>
</tbody>
</table>
23. Some children know their work is good before the teacher tells them. Other children are not sure if their work is really good until the teacher tells them.

**Factor 5: Following Personal Interests versus Obeying School Requirements**

3. Some children like to work with problems to learn to solve them. Other children work with problems to comply with school.

11. Some children try to learn all they can. Other children want to learn only what they are asked for at school.

12. Some children like to learn everything that interests them. Other children believe that it is better to learn only what the teacher says.

18. Some children ask questions in class because they want to learn more. Other children ask because they want to get good grades.

**Chart 6**

*Means and standard deviations for each sub-scale by grade*

<table>
<thead>
<tr>
<th>Independence</th>
<th>Interest</th>
<th>Challenge</th>
<th>Judgment</th>
<th>Initiative</th>
</tr>
</thead>
<tbody>
<tr>
<td>2nd grade</td>
<td>2.80</td>
<td>2.41</td>
<td>2.88</td>
<td>1.89</td>
</tr>
<tr>
<td>4th grade</td>
<td>2.57</td>
<td>2.62</td>
<td>3.06</td>
<td>1.90</td>
</tr>
<tr>
<td>6th grade</td>
<td>2.73</td>
<td>3.00</td>
<td>2.84</td>
<td>2.03</td>
</tr>
</tbody>
</table>
Relation of motivation test results with teacher criteria. 90% of the students rated by the teacher as having high motivation showed medium or high intrinsic orientation in the three sub-scales that do not include the component of teacher judgment (factors 1, 2, and 3). 80% of the students rated by the teacher as having low motivation obtained medium or low extrinsic points on the three previously mentioned sub-scales.

Discussion
On the internal consistency and validity of the modified scale
The results show that the modified scale has acceptable internal consistency (.74); however, continued study is required of its validity of construction. The factorial analysis identified five factors, of which only three are similar to those on the original scale (Harter, 1980); they have low but acceptable internal consistency for research (between .62 and .66).

The fourth factor revealed by factorial analysis, with internal consistency of .49, grouped test questions that evaluate student dependence on the teacher’s judgment and criteria. Considering the factorial weight of this component, it could be stated that in the group studied, intrinsic motivation is not explained by the autonomy of student judgment. The low consistency of the factor indicates that its content should be reviewed and supplemented.

The fifth factor was made up of test questions that coincide in the student’s initiative regarding schoolwork; however, an internal consistency of .46 indicates the content’s heterogeneity and the need to redo content. The percentage of variance of the motivation explained by this component shows that the contents it evaluates have little transcendence with regard to the orientation of classroom motivation.

Factors 4 and 5 should be considered to contain test questions in which intrinsic motivation is opposite to the relevance of the teacher’s judgment in our country, particularly at a medium-low socioeconomic level. United States schools, in contrast, give students greater freedom for making decisions, which seems to favor their motivation to learn.

A reason for the low internal consistency of the five sub-scales could also be that this analysis combined the responses of children from the second, fourth, and sixth grades. According to the studies made by Harter (1980), the differences in motivation that occur in the development of US children have made necessary a separate analysis of data for each grade and sub-scale. Such differences could be analyzed in our population with a sample of at least 150 children from each grade (second, fourth, and sixth).

The affirmation can be made that the scale has discriminative validity. A high percentage of the individual results coincided with the teachers’ personal criteria regarding their students’ degree of motivation. The scale was very effective for identifying children with high and low motivation from the sixth and fourth grades; only in the case of the second-graders did some minor discrepancies appear. Such results coincide with the conclusions by García and Pintrich (2000), which indicate the skill limitations of children in elementary school in responding to self-reporting instruments regarding their motivation in the school context. These authors name as possible causes the children’s difficulties in understanding the test questions and not having the meta-cognitive awareness to report on their own conduct.

According to the findings of García and Pintrich (2000), in spite of the limitations on validity shown by self-reporting measures—due to students’ tendency to answer in line with the socially desirable—the affirmation can be made that care in constructing questions and administering the instrument may lead to obtaining the necessary levels of precision.

On the scale’s usefulness for evaluating the motivation of children in elementary school
The adapted scale permitted discovering the characteristics of children’s motivation to learn in the second, fourth, and sixth grades of a public elementary school at a low socioeconomic level. In this population, most of the variance in the motivation was determined by three sub-scales:

<table>
<thead>
<tr>
<th>Independence</th>
<th>versus</th>
<th>Dependence on the teacher</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest in learning</td>
<td>versus</td>
<td>Obtaining grades</td>
</tr>
<tr>
<td>Preference for challenge</td>
<td>versus</td>
<td>Preference for easy work</td>
</tr>
</tbody>
</table>

The content of the sub-scales aided in discovering the reasons for schoolwork in addition to the perceptions of competence for completing this work. Thus consideration was given to the factors indicated by the theories of intrinsic motivation (Gottfried, 1990; Harter, 1978, 1981, 1992) as well as the factors emphasized by theories of expectation (Bandura, 1997; Bandura et al., 2001; Ryan and Deci, 2000a and b; Jacobs and Eccles, 2000), to obtain a more precise measurement of children’s motivation to learn.
The modifications made to the content of the test questions, the response format, and the instructions presented by the original scale, facilitated children’s understanding and their ease of response. Responses were given even by the second-graders, who had encountered great difficulty with the first version that was translated and culturally validated.

Based on the analysis, the observation can be made that the format used for the responses helped to neutralize the tendency to answer in line with the socially desirable; the four options of all the test questions were attractive for the sample of participating children. Nonetheless, the mode or most frequent response was 4, followed by 1. This indicates that most of the children tend to select extreme options, perhaps because they are attempting to obtain a high rating and encounter difficulties in identifying with middle or partial postures.

The children’s responses in the three grades reveal the tendencies of their motivation in elementary school. A relative increase is observed toward a more intrinsic orientation in children’s interest in learning and their initiative in the classroom; this increase in their interest in learning is opposite to the results found by the Harter Scale (1980) and other studies (Anderman and Midgley, 1997; Midgley, Anderman and Hicks, 1995). The low intrinsic orientation in independence from the teacher is not the desired orientation since an increase would be expected with age; these results are similar to those found by Harter (1980). The decrease in the sixth-graders’ preference for challenge is of concern since students in the following grade levels will face increasingly greater levels of difficulty and complexity. The scores obtained on this scale do not correspond to the findings of a recent study completed with US children (Kinlaw and Kurtz-Costes, 2007). Other data that attracts attention is dependence on the teacher’s judgment, which prevails even among students close to entering secondary school—a level at which greater autonomy is expected since the students will no longer be under the guidance of a single teacher. On this final scale, the US children show an upward tendency with age, reaching a high intrinsic orientation (Harter, 1980).

Conclusions
This project offers preliminary results on the responses given by Mexican children to a scale that evaluates their motivation to learn at school. The instrument prepared in this first phase of the study showed acceptable effectiveness for use on elementary school children from a medium-low socioeconomic level.

It is imperative to continuing working on adapting the content of the test questions, criteria, and forms of response on the test, in order to make the test more accessible, particularly for second-graders. Once this is accomplished, a new analysis can be made of the validity of construction. A sample of at least 450 children should be used, with 150 children from each grade, from various public schools of a similar socioeconomic level. Subsequently, it would be useful to test the scale on representative samples from different groups from diverse regions of the nation, including public and private schools, or urban, rural, and indigenous schools.

Analysis could also continue on the scale’s discriminative validity, contrasting the results with other criteria of evaluation and proving the test’s validity for predicting scholastic achievement over the short and medium terms. In addition, the obtained information is expected to be used for making educational authorities aware of the need to create models of cooperation between school and home, in order to encourage intrinsic motivation from the time children enter elementary school. Specific results may contribute elements for planning workshops for children, parents, teachers, psychologists, and other professionals in education, and also for preparing materials of consultation and training that are directed to favoring children’s motivation to learn at school.

Note
1 We use the masculine pronoun to facilitate reading but in no way assume a posture regarding gender (Editor’s Note).

References


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