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The relationships between intrinsic motivation, extrinsic motivation, and achievement, along elementary school

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Abstract

Investigating the relationships between student's intrinsic (IM) and extrinsic motivation (EM) and their effects is critical for offering a more complex perspective on which types of motivation promote optimal learning and achievement.

The goal of this study was to analyse IM and EM as two independent forms of motivation or, alternatively, as two opposite poles of a continuum ranging from a *poor* (extrinsic) to a *good* (intrinsic) form of motivation. Participants were 200 students, who were longitudinally assessed along elementary school using separate measures of IM and EM, and academic of achievement.

Results supported that IM and EM can coexist and are not contradictory. Whereas IM was steadily associated to better achievement, a negative relationship emerged between EM and student's achievement by the end of elementary school.

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Key words: intrinsic motivation; extrinsic motivation; elementary school; academic achievement

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1. Introduction

1.1. The Relations between Intrinsic and Extrinsic Motivation

The study of intrinsic and extrinsic motivation in the school context has received considerable attention (e.g. Guay, Boggiano, & Vallerand, 2001; Harter, 1981; Newman, 1990; Vansteenkiste, Lens, & Deci, 2006; Vansteenkiste, Soenens, Verstuyf, & Lens, 2009; Wong, Wiest, & Cusick, 2002), given their association with learning and achievement.

Studies of intrinsic and extrinsic motivation usually rely on an unidimensional model reflecting the degree to which students endorse intrinsic reasons over extrinsic reasons to perform academic activities. However, as some authors have noted students may engage in an academic task both by intrinsic and extrinsic reasons (Harter, 1981; Harter & Jackson, 1992). Similarly, research within the framework of *Achievement Goal Theory* also showed that students can adopt different combinations of intrinsic and more external achievement goals (e.g. Eccles et al., 1998; Elliot, 2005; Lemos, 1996; Meece & Holt, 1993; Pintrich, 2000; Urdan & Maehr, 1995).

This bidimensional view also raises the hypothesis that extrinsic motivation may not necessarily undermine intrinsic motivation, as was implied in earlier research (e.g. Deci, 1971; Kruglanski, Friedman, & Zeevi, 1971; Lepper, Greene, & Nisbett, 1973). Indeed, two recent studies (Bateman & Crant, 2003; Lepper, Corpus, & Iyengar, 2005) have addressed this issue, and found no significant negative relationship between intrinsic and extrinsic motivation.

Trying to contribute to clarify these relations, the present study assessed intrinsic and extrinsic motivation separately, empirically examined the independence of the underlying dimensions and analysed the relationships between them. The study by Lepper and collaborators (Lepper, Corpus, & Iyengar, 2005) has already analysed the relations between separate measures of intrinsic and extrinsic motivation for doing school work, and found only modest (positive and negative) correlations between them. The present study used a similar procedure but offers a further contribution, by directly examining the empirical separateness of the two motivational orientations. Moreover, this study analysed the relations between intrinsic and extrinsic motivation along elementary school.

1.2. Relationships with Achievement

While several studies found positive relations between intrinsic motivation and academic achievement (e.g. Cordova & Lepper, 1996; Deci & Ryan, 1985; Gottfried, 1985, 1990; Harter & Connell, 1984; Lloyd & Barenblatt, 1984), less is known about the relations between extrinsic motivation alone and students' achievement.

Research conducted using constructs similar to extrinsic motivation (e.g. performance goals) indicates that extrinsic motives may be associated with adaptive patterns of learning but only under certain circumstances, depending on the outcomes assessed, on student's age, or on the classroom context (e.g. Barron & Harackiewicz, 2001; Elliot & McGregor, 2001; Greene, Miller, Crowson, Duke & Akey, 2004; Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002; Midgley, Kaplan, & Middleton, 2001; Pintrich, 2003; Senko & Harackiewicz, 2005).

It is also possible that, for unpleasant and unappealing academic activities, extrinsic motivation, rather than detrimental, might represent a strategic process to support learning.

Finally, given the relative decline in intrinsic motivation that has been described across elementary school (e.g. Harter, 1981; Harter & Jackson, 1992; Newman, 1990), it is important to understand if this entails changes in the relations between each of the two forms of motivation and academic achievement along time.

Therefore, the second major aim of this study was to examine separately the links between each of the two types of motivation and academic achievement, and whether and how those links develop through elementary school.

2. Method

2.1. Participants

Two groups of students participated in this study: a cross-sectional group (these data were used to the previous dimensional analysis of the intrinsic and extrinsic motivation constructs), and a longitudinal group (to examine the evolution of the relations between IM and EM, and between each of these two forms of motivation and academic achievement). Participants in the first group were 200 students from the 3rd (25%), 4th (22.5%), 5th (26%) and 6th (26.5%) grades (mean age of 10.02 years), equitably distributed by gender (47.5% boys and 52.5% girls). Participants of the longitudinal group were 200 third-grade students (at M1) from eighteen public elementary schools in the North of Portugal (Table 1), approximately equally divided by gender (58% boys, and 42% girls).

Table 1. Participants from the longitudinal group at each of the four moments (M) of data collection

Moments	**M_1**	**M_2**	**M_3**	**M_4**
Students	200	201	210	216

2.2. Measures and instruments

Intrinsic and Extrinsic Orientation in the Classroom. Intrinsic motivation (IM) and extrinsic motivation (EM) were assessed using a decomposed version (Lemos & Veríssimo, 2006) of the *Scale of Intrinsic versus Extrinsic Orientation in the Classroom* (Harter, 1981). Rather than forcing participants to choose between one intrinsic and one extrinsic reason for performing each behavior presented, this transformed scale inquired students to rate the degree to which both intrinsic and extrinsic reasons independently accounted for their academic behavior. So, each original item of Harter's scale was decomposed in two items (see Figure 1). Based on preliminary validity and reliability analysis 12 items of the original Harter's scale were selected.

Original Item					
Really true for me	Sort of true for me			Sort of true for me	Really true for me
☐	☐	Some kids work really hard to learn new things.	Other kids work really hard to have good school marks.	☐	☐

Transformed Item				
I work really hard because I really like to learn new things.				
Exactly like me	Very much like me	More or less like me	Just like me	Not at all like me
I work really hard to have good school marks.				
Exactly like me	Very much like me	More or less like me	Just like me	Not at all like me

Figure 1. *Example of an item from Harter's (1981) original scale and the transformed item (decomposed scales) used in the present study*

Academic achievement. Teaches' ratings of student's academic performance in *Portuguese Language* and *Mathematics* in a five-point scale were used as measures of academic achievement. A single academic achievement score was computed by averaging scores for language arts and math.

3. Results

3.1. Assessment of intrinsic and extrinsic motivation

To empirically test the independence of intrinsic and extrinsic motivation, principal components method was used. Results revealed the existence of two separate factors, consistently interpretable as *intrinsic motivation* and *extrinsic motivation* (Table 2).

Table 2. Dimensions and item loadings from p*rincipal component analysis (oblimin rotation)*

Items	**Communalities**	**IM**	**EM**
8. *Enjoy hard school work*	.532	**.699**	**-.140**
12. *Solving problems by my own*	.485	**.688**	**-.037**
7. *Enjoy having many things to learn*	.464	**.676**	**-.023**
4. *Work hard to learn new things*	.460	**.670**	**.173**
3. *Work hard to get good grades*	.443	**.662**	**.138**
2. *The school work is stimulating*	.439	**.661**	**.101**
9. *Learn new school work by my own*	.228	**.464**	**.155**
6. *To do only the school work that I have to*	.561	**.321**	**.705**
11. *Prefer teachers' help*	.483	**-.031**	**.688**

5. *Do not like a lot of thinking*	.490	**-.238**	**.632**
1. *Do school work because I have to*	.344	**.397**	**.469**
10. *Learn new school work with teachers' help*	.192	**.082**	**.437**
	% of variance	**27.5**	**15.2**

Results suggested that for these students intrinsic and extrinsic motivation can be viewed as mostly independent constructs. The first dimension includes seven items and the second dimension comprises the other five items. In general, items loaded on the expected dimension, with *interest, challenge, curiosity* and *autonomy* loading on the intrinsic dimension and *dependence on the teacher and preference for easy work* forming a separate extrinsic dimension. However, the item reflecting children's desire to achieve good grades (labelled as EM in the original scale) clearly gathered on the intrinsic scale.

3.2. Relationships between intrinsic and extrinsic motivation and their evolution along elementary school

The data indicated that, when assessed independently, intrinsic and extrinsic motivation showed only modest correlations (Table 3). Moreover, the strength and direction of the relationships between intrinsic and extrinsic motivation varied through grade-level (M_1 to M_4).

Table 3. Correlations between intrinsic (IM) and extrinsic motivation (EM) at the four moments (M)

	EM M_1	EM M_2	EM M_3	EM M_4
IM M_1	**.26****	ns	ns	-.23*
IM M_2	ns	**ns**	-.15*	-.22**
IM M_3	ns	ns	**ns**	-.19**
IM M_4	ns	ns	ns	**-.20****

Note. $^{*}p<.05$ $^{**}p<.001$

More specifically, the data showed a modest positive correlation between intrinsic and extrinsic motivation at M_1 (p <.001), no significant correlation at moments M_2 and M_3 (*ns*), and a modest negative correlation at M_4 (*p<.001*).

3.3. Relationships with academic achievement

The subsequent goal was the analysis of the implications of the two separate motivational orientations for academic achievement (Table 4).

Table 4. Correlations between academic achievement (AA), intrinsic motivation (IM), and extrinsic motivation (EM) at the four moments (M)

	M_1		M_2		M_3		M_4	
	IM	EM	IM	EM	IM	EM	IM	EM
AA M_1	**.21****	**ns**	.31**	ns	.25**	-.18*	.17*	-.35**
AA M_2	.20*	ns	**.24****	**ns**	.16**	-.26**	.20*	-.39**
AA M_3	.18*	ns	.26**	ns	**.20****	**-.31****	.28**	-.40**
AA M_4	ns	ns	.17*	ns	.21**	-.23**	**.30****	**-.39****

Note. ns=not significant; *p<.05; **p<.001

As expected, there was a significant positive correlation between student's academic achievement and intrinsic motivation trough the four moments along elementary school. However, the correlation between extrinsic motivation and academic performance was only significant (and negative) at 4th grade (M_3 and M_4).

4. Discussion

The first goal of this study was to analyse whether intrinsic and extrinsic motivation represent opposite poles of the same dimension or, rather, distinct, independent dimensions of motivation. Findings clearly revealed two separate dimensions, one intrinsic and one extrinsic, offering dimensional support to the correlational findings of the previous study by Lepper and collaborators (Lepper, Corpus, & Iyengar, 2005). This means that both intrinsic and extrinsic reasons may underlie the student's classroom achievement behavior. That is, doing school work to comply with teacher demands and help seeking from the teacher for learning new material may coexist with interest and curiosity-based learning.

Thus, the present study undoubtedly corroborates the worth of developing independent assessments of both intrinsic and extrinsic motivations. Intrinsic and extrinsic motives represent two qualitatively different forms of motivation (based on the reasons why student's engage in classroom learning), thus providing a valuable complement to other traditional scales that assess quantitative aspects of motivation (how much students enjoy certain activities or content domains).

The present study adds to efforts to improve such a measure by suggesting that the items assessing children's desire to achieve good grades should be included in the scale of intrinsic motivation (rather than including it on the extrinsic motivation scale as in Harter's original scale or removing it as Lepper and collaborators suggested). Supporting this hypothesis, some recent conceptual arguments and empirical findings (Grant & Dweck, 2003; Lemos, 1996; Mouratidis, Lens, & Sideridis, 2010; Tuominen-Soini, Salmela-Aro, & Niemivirta, 2008; Urdan, 2004; Urdan & Mestas, 2006) have distinguished between competitively pursuing good grades or anticipating grades as an extrinsic incentive, from just to get good grades as an equivalent for learning and mastery.

Assuming that intrinsic motivation and extrinsic motivation are potentially separate constructs, allowed the subsequent analysis of the relationships between the two. Results showed that the two motivational orientations were only modestly related further supporting that in the classroom context intrinsic and extrinsic reasons are not contradictory and can coexist.

Findings also suggested that extrinsic motivation may not necessarily undermine intrinsic motivation. However, it should be noted that although essentially independent, intrinsic and extrinsic motivations showed a trend towards a progressively smaller compatibility along elementary school. Whereas for younger children pleasing the teacher and inherently enjoying the activities seem compatible or even collaborative, later these two motives become more fully independent and, by the end of elementary school, they may be more difficult to reconcile. Further studies should investigate whether this observed shift represents the beginning of a trend that continues and increases over subsequent school years. The confirmation of such a developmental trend would have important implications for the salience of extrinsically-based and intrinsically-based motivational strategies used to stimulate and guide student's classroom learning.

The second major goal of this study was to analyse the academic correlates of each motivational orientation. Recall that the present study used a longitudinal design, thus providing also an opportunity for testing possible developmental change of the relationships observed. Findings showed that intrinsic motivation consistently

enhances performance from the beginning of third grade through the end of the fourth grade, confirming the widely reported benefits of intrinsic motivation (e.g. Cordova & Lepper, 1996; Deci & Ryan, 1985; Gottfried, 1990; Harter & Connell, 1984; Lloyd & Barenblatt, 1984).

Worthy of note was that whereas for younger students extrinsic motivation seems primarily unrelated with performance, by the fourth grade a significant negative relation was apparent. The contemporary emergence of a negative relation of extrinsic motivation also with intrinsic motivation, suggests a shift towards a debilitating role of extrinsic motivation, beginning at late elementary schooling. A close analysis of the extrinsic orientation items shows that they mainly focus on doing schoolwork to please the teacher and on depending on the teacher. Thus, it is possible that, at lower levels of elementary school, learning and performance do not require that much autonomy from the students, and later, as students approach the transition to junior high school, successful performance may entail more autonomous strivings. Complementarily, it is also possible that, when evaluating student's performance, elementary school teachers may even appreciate to a certain extent student's dependent behaviour, valued as pro-social, complying behaviour. However, for older students, intrinsic motivation seems clearly more adaptive than extrinsic motivation, raising the often addressed issue of the possibly debilitating impact of external sources of motivation (e.g. Lepper & Henderlong, 2000).

The confirmation of the substantial independence of the two motivational orientations, make it possible to hypothesize that specific combinations of intrinsic and extrinsic motivation can be helpful and constructive to academic achievement. Indeed, pursuing interesting and enjoyable activities and also attending to extrinsic constraints and incentives is most certainly a requirement of adaptive functioning when students face the complex and multidimensional classroom demands. Future research should identify patterns of student's intrinsic and extrinsic motivation and analyse their effects on learning and performance. Other approaches have also been shedding additional light on the effects of extrinsic motives. For example, self-determination theory suggests that qualitative aspects of motivation (the degree of personal internalization of extrinsic motivation) need to be considered as another important variable that can moderate its effects (see Reeve, Deci, & Ryan, 2004, for a review). Finally, to better understand the role of intrinsic and extrinsic motivation in school learning and performance, research should also focus on their effects on other achievement-related outcomes, such as student's interest, well-being and social adjustment at school.

5. Conclusions

In sum, findings clearly suggested that for these students intrinsic motivation and extrinsic motivation can be viewed as mostly independent dimensions, rather than opposite ends of a single dimension. From this perspective a more complete understanding of the dynamics of student's motivation should independently assess both intrinsic and extrinsic motivations.

Intrinsic and extrinsic sources of motivation also showed different relationships to school performance. Findings supported that intrinsic motivation consistently enhances performance along elementary school. A more complex picture emerged concerning extrinsic motivation. A possible developmental trend in the role of extrinsic motivation was apparent, suggesting that whereas for younger students extrinsic motivation does not undermine (and may even cooperate with) intrinsic interest and academic performance, by the end of elementary school this form of motivation may play a more debilitating role in student's intrinsic interest and achievement.

These findings have important implications for the on-going debate about the motivational orientations that schools should support.

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