

Motivational climate, satisfaction, engagement, and academic success in Angolan and Dominican students

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Abstract

The aim was threefold: to validate the Portuguese and Spanish versions of the Motivational Orientation and Climate Scale (MOC), to test for measurement invariance across large Dominican and Angolan students' samples, and to study the relationships of motivational orientations and climates with relevant educational outcomes. Participants were 2302 Dominican and 2028 Angolan students from 14 to 18 years old. Confirmatory Factor Analyses were used to study factorial structure of the MOC. Main results showed that the hypothesized four dimensions fitted the data from both samples well. Regarding the relationships analyzed, the most relevant results shown that students' perceptions of mastery class climate was positively related with school engagement and academic success in both Dominican and Angolan samples, while perceptions of performance class climate was negatively related to these school variables. Results are discussed within the achievement goal framework and in regard to the implications for educational practices.

Keywords: Motivation; self-concept; adolescents.

Clima motivacional, satisfacción, compromiso y éxito académico en estudiantes angoleños y dominicanos

Resumen

El objetivo fue triple: validar las versiones portuguesa y española de la Escala de Orientación y Clima Motivacional (MOC), evaluar la invarianza métrica en muestras de estudiantes dominicanos y angoleños, y estudiar las relaciones de las orientaciones y climas motivacionales con aspectos educativos relevantes. Participaron 2302 estudiantes dominicanos y 2028 angoleños de 14 a 18 años. Mediante Análisis Factorial Confirmatorio se comprobó que las cuatro dimensiones hipotetizadas del MOC se ajustaban bien a los datos de ambas muestras. Los resultados más relevantes mostraron que las percepciones de los estudiantes sobre el clima de maestría se relacionaron positivamente con el compromiso escolar y el éxito académico en ambas muestras, mientras que las percepciones del clima de ejecución se relacionaron negativamente con estas variables escolares. Los resultados se discuten en el marco de la teoría de las metas de logro y en relación con las implicaciones para la práctica educativa.

Palabras clave: Motivación; autoconcepto; adolescentes.

Clima motivacional, satisfação, engajamento e sucesso acadêmico em estudantes angolanos e dominicanos

Resumo

O objetivo do estudo foi triplo: validar as versões em português e espanhol da Escala de Orientação e Clima Motivacional (MOC); avaliar a sua invariância métrica em amostras de estudantes dominicanos e angolanos; e estudar as relações das orientações e climas motivacionais com os aspectos educacionais relevantes. Participaram 2.302 estudantes dominicanos e 2.028 angolanos, de 14 a 18 anos. A Análise Fatorial Confirmatória mostrou que as quatro dimensões da hipótese do MOC se ajustaram bem aos dados de ambas as amostras. Os resultados mais relevantes mostraram que as percepções dos alunos sobre o clima de ensino estavam positivamente relacionadas ao engajamento escolar e ao sucesso acadêmico em ambas as amostras, enquanto as percepções do clima de desempenho estavam negativamente relacionadas com ditas variáveis. Os resultados são discutidos no âmbito da teoria das metas de realização e com relação às implicações para a prática educacional.

Palavras-chave: Motivação; autoconceito; adolescentes.

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Introduction

As Wang and Holcombe (2010) stated, the lack of adolescents' engagement with school has become a critical issue among school psychologists and educational managers around the world. It is important because it has been found that student engagement is directly related to an increase in academic success and greater satisfaction with school. School engagement may be defined as the students' participation in academic achievements (Christenson, Reschly, & Wylie, 2012). UNESCO (2013) indicated that about 14 million students in the world drop out of school without completing their studies. Factors that may influence this situation are diverse, among which the motivational class climate is one of the most important (Awang-Hashim, Kaur, & Noman, 2015).

In the educational psychology arena, the socio-cognitive perspective of motivation that emphasizes how students derive meaning from their experiences in achievement settings has gained prominence along the last three decades (for example, Ames, 1992; Androutsou & Anastasiou, 2014; Barkoukis & Hagger, 2013; Duda, 2005; Mello & Leme, 2016; Nicholls, 1984; Porto & Gonçalves, 2017; Skaalvik & Federici, 2016). One of the most prominent theories of achievement motivation at schools is the Achievement Goal Theory (AGT; Elliot, 2005; Nicholls, 1984). As a line of research, the AGT has focused on aspects of the learning environment that relate to the goals that students take in a given context to demonstrate competence (Ames, 1992). Numerous investigations have found a significant relationship between students' goal orientations at school and their beliefs about how often success is achieved in that context. Factor analytic studies have revealed at least two independent dimensions of both personal academic goals and beliefs about the causes of school success. The first dimension, task orientation, consists of the goal of improving one's skill or gaining insight or knowledge and the beliefs that, in order to succeed, students must work hard, attempt to understand schoolwork, and collaborate with their peers. The second dimension, ego orientation, is defined by the goal of establishing one's superiority over others and the beliefs that success in school requires attempts to beat others and superior ability (Duda & Nicholls, 1992).

As Nicholls (1984) stated, mastery goals and performance goals are sometimes referred to as task goals and ego goals when discussed as individual differences (dispositional orientations), while they are referred to as task-involvement and ego-involvement, respectively, when discussed as states (situational climates).

AGT evidence and applications indicate that adherence to educational behavior can be facilitated by learning environments emphasizing improvement and personal progress, which make pursuits of mastery goals meaningful for students (Ames, 1992). Considerable evidence suggests that elementary and secondary students show the most positive motivation and learning patterns when their school settings emphasize mastery, understanding, and improving skills and knowledge. Whereas school environments that are focused on demonstrating high ability and competing for grades can

increase the academic performance of some students, research suggests that many young people experience diminished motivation under these conditions (Meece, Anderman, & Anderman, 2006). Therefore, especially in educational contexts in which competition is not a priority, it is recommended that students are more task-oriented than the ego-oriented (Lee, Hayes, Seitz, DiStefano, & O'Connor, 2016).

Although a dominant predisposition to be either task- and/or ego-oriented has been identified, due to the theoretical orthogonal nature of goal orientations, it could be possible to be high or low in both. Research on youth has demonstrated that a high task orientation, either singly or in combination with a high ego orientation, are related to adaptive cognitive, affective, and behavioural patterns (e.g., Papaioannou, Ampatzoglou, Kalogiannis, & Sagovits, 2008).

Whether or not a certain achievement goal is adopted will depend on the importance this goal has for the individual, the perceptions of the salient goals in the situation, and the influence of significant others (such as parents, teachers, or peers) who reinforce or emphasize one goal perspective over the other (Duda, 2005). Mastery climates or performance are related to how the 'significant others' structure the different environments. Mastery climate can be characterized by promoting learning and support from teachers as well as the students' perception of an atmosphere of help when the effort is important to improve. Conversely, a performance climate can be described by teachers' promotion of competition and normative comparison of students, as well as students' perception of intra-students' rivalry, normative praise, and unequal recognition, the view that mistakes are punished, and students' worries about mistakes (Ames, 1992; Duda, 2005).

As the scientific literature has shown, both students' goal orientations and the students' perception of motivational class climate have meaningful relationships with different variables of students' life and school context (Meece et al., 2006; Wang & Holcombe, 2010). Students' dispositional orientation and motivational climate have been related, among others, with intrinsic motivation (Froiland & Worrell, 2016), academic self-concept (Seaton, Parker, Marsh, Craven, & Yeung, 2014), adolescent adjustment (Travers, Bohnert, & Randall, 2013), adolescent well-being (Moltafet & Firozabadi, 2014; Travers, Bohnert, & Randall, 2013), school engagement (Fonsêca et al., 2016; Wang & Eccles, 2013; Wang & Holcombe, 2010), perceived autonomy support (Barkoukis & Hagger, 2013; Stornes, Bru, & Idsoe, 2008), or academic achievement (Androutsou & Anastasiou, 2014; Skaalvik & Federici, 2016; Wang & Holcombe, 2010). Thus, the evaluation of motivational climate and students' goal orientations has become important in recent decades.

School performance is at the core of educational psychology, and this performance has been tightly related to students' motivation (Green et al., 2012; Meece et al., 2006). Generally speaking, motivation theorists are interested in explaining task engagement and persistence, as well as cognitive activities such as problem solving and decision making (Elliot, 2005). In educational research, motivation theories are most often used to explain students' activity choice, en-

agement, persistence, help seeking, and performance in school (Lee et al., 2016; Martin, Collie, Mok, & McInerney, 2016).

In this context, the Motivational Orientation and Climate scale (MOC; Stornes & Bru, 2011; Stornes et al., 2008) is a measure that was developed to assess personal goal orientations and perceptions of motivational climate. It was developed based on a Norwegian version of the Perceived Motivational Climate in Sport Questionnaire (Ommundsen, Roberts, & Kavussanu, 1998), and the Perception of Success Questionnaire (Roberts, Treasure, & Balagué, 1998).

General purpose

The aim of this research has been to analyze the relationships among motivational climate, school engagement and academic success, in samples from Angolan and Dominican Republic populations.

Specific objectives

(1) To validate the Spanish and Portuguese versions of the MOC; (2) To test for measurement invariance across large Dominican and Angolan students' samples; and (3) Study the relations of motivational orientations and climates with relevant educational outcomes.

Hypotheses

(a) The factorial structure of Spanish and Portuguese versions of the MOC will be coincident with the structure proposed by Stornes and Bru (2011); (b) There will be a measurement invariance of the MOC scale across the two studied samples; (c) Mastery orientation and perceived mastery class climate will be positively related to students' engagement and academic success; (d) Performance orientation and perceived performance class climate will be negatively related to students' engagement and academic success.

Method

Participants

Samples of students from two countries, Dominican Republic and Angola, were used to validate the scale. The Dominican Republic is a Spanish-speaking country in the Caribbean area of America, while Angola is a Portuguese-speaking country in the South-West of Africa. The sample from the Dominican Republic was composed of a total of 2302 students studying middle education in Santo Domingo, the capital of the Dominican Republic. Their mean age was 15.50 years old (SD= 1.57). 58% of them were women. Most of

the students went to public schools (58.3%), private schools' students were 22.8%, and the remaining 18.8% of the students went to polytechnics. The Angolan sample had a total of 2028 students studying seventh to twelfth grades in the Benguela province (Angola). Their mean age was 17.41 years old (SD = 2.29). 51.0% were women. 52.7% were lived in urban areas. The participants were recruited in their schools, by means of incidental or convenience sampling.

Procedure

The procedure was the same for the two samples. First, permission from the authorities of the Angolan and Dominican Ministries of Education was requested to develop the research. Then, authorities of the schools who have expressed their willingness to cooperate were contacted to explain what the research is and get their permission to carry it out. Finally, the students were informed of the research aim and were given a letter addressed to the family of minors, requesting permission for their participation in the study. All participating students do so voluntarily, after returning the informed consent. This study complies with the ethical values required by the American Psychological Association (APA) ethical code.

The survey was self-administered. Response rates for both samples were more than 99%. The self-administered instruments were applied by a member of the research team, in the students' classrooms and during normal classroom hours, without the presence of their teachers to maximize the anonymity of the answers and guarantee the confidentiality of the process. Interviewers were present just to solve doubts or hesitations the participants may have had.

Measurement instruments

The survey included socio-demographic information and scales relevant for the school engagement research arena. Among them, *the Motivational Orientation and Climate scale* (MOC; Stornes & Bru, 2011) was used. As Stornes et al. (2008) related, the scale was adapted for school settings and consisted of items that tap performance versus mastery oriented cues in the classroom environment as perceived by the students. This scale is composed of 15 items and covers the four dimensions of the AGT: mastery orientation, performance orientation, mastery climate, and performance climate. Items for motivational climate and goal orientation had five response categories ranging from 'totally disagree' to 'totally agree'. As Stornes and Bru (2011) informed, the Cronbach's alpha coefficients were: Performance orientation (.88), Mastery orientation (.78), Performance motivational climate (.74), and Mastery motivational climate (.75).

Additional to this scale, other measures were used for validation purposes. All instruments were scaled with a five point Likert-type scale. Specifically:

- i. *Perceived autonomy support. Students' perception of*

teachers-provided autonomy support was assessed with the six-item short version of the Learning Climate Questionnaire (LCQ, Jang, Kim, & Reeve 2012). Sample items were: "I feel that my teacher provides me with choices and options" or "My teacher listens to how I would like to do things". Alpha for the Angolan sample was .70, while the alpha in the Dominican sample was .90.

- ii. *Engagement scale* (Nie & Lau, 2009). A scale of five items measuring a single factor of students' perception of their attention, effort and participation in classroom activities. Sample items were "In my class I listen carefully when the teacher explains something" or "In my class I try my best to complete class work". Alpha for the Angolan sample was .74, and it was .88 for the Dominican sample.
- iii. *School satisfaction* (Nie & Lau, 2009). A scale of four items measuring a single factor with an alpha of .76 for both samples. Sample items were "I am glad to be in this school" or "I think it is nice to study in this school".
- iv. *Academic Success Questionnaire* composed of five items measuring a single dimension (Plunkett, Henry, Houlberg, Sands, & Abarca-Mortensen, 2008). Sample items were "Grades are very important to me," or "I usually finish my homework on time". Alpha estimate was .60 in the Angolan sample and .64 for the Dominican sample.
- v. *Academic Self-concept* measured with the four items employed in Brunner et al. (2010). Sample items were: "I learn things quickly in most school subjects" or "I perform well in most school subjects". Reliability estimates were: .73 for Angolan students and .88 for Dominican students.

Statistical analyses

Confirmatory Factor Analyses (CFA) were performed, estimated and tested in Mplus 7.3. MLR estimation was used given that data were markedly non-normal. In order to test model-data fit, several indices of fit were used, indices that come from different rationale: (a) the chi-square statistic; (b) the comparative fit index (CFI); (c) the root mean squared error of approximation (RMSEA); and (d) the Standardized Root Mean Residual (SRMR). A model with a CFI of .90 (better if CFI > .95) or larger and RMSEA and SRMR of .08 or lower would be indicative of reasonable fit between the hypothesized model and the data (for example, Hu & Bentler, 1999). These CFA involved the study of the factorial structure of the MOC in both Angolan and Dominican Republic samples, and accordingly a formal test of measurement invariance was used.

In order to establish measurement invariance to run a set of confirmatory factor analyses of increasing sets of constrictions is required. It is also required to test whether

differences between the cited models are significant either from statistical or a practical point of view (van de Schoot, Lugtig, & Hox, 2012). As a first step, the theoretical model was tested in each group. Then, a configural model, with no parameter constraints across groups, was simultaneously tested for both groups to establish the baseline model. This model tested configural equivalence (or same factor structure holding for all groups). If this unconstrained multisample model fits the data well, then factor loadings are constrained across groups (metric invariance). Metric invariance is used to know if respondents gave the same meaning to the dimensions under study. The next step in the sequence was to test a model with constrained item intercepts for scalar invariance, implying that the meaning and the levels of the items are equal across groups. This type of invariance is called scalar or strong invariance, and it is needed in order to make meaningful comparisons among latent means across groups. Models in the invariance routine are nested, and they can be compared with the statistical and the modelling rationales. Constrained and unconstrained models are compared, with a statistical rationale (χ^2 differences, $D\chi^2$), or with a modelling rationale (comparing CFI values, ΔCFI). The statistical approach has been criticized, among others, by Cheung and Rensvold (2002) that recommended the modelling approach that uses practical fit indices in order to determine the adequacy of a fitted model. A cut-off criteria of CFI differences lower than .01 is usually employed to declare invariance (Cheung & Rensvold, 2002).

Additionally to the confirmatory models, other statistical analyses were employed. Cronbach's alphas and Composite Reliability Indexes (CRI) were used to estimate the reliability of the dimensions under study. Cronbach's alpha is the widest used estimator of internal consistency, but it has been criticized as being only completely appropriate with essentially tau-equivalent items and tests, over or underestimating reliability (more often the latter) in the case that tau-equivalence does not hold. An alternative to alpha is the Composite Reliability Index, which may be calculated using estimates from confirmatory factor analyses (Graham, 2006). Both estimates of internal consistency were calculated. Finally, zero-order correlation coefficients were calculated among the four dimensions in the scale and the set of measures with which motivational climates and orientations should be theoretically related. Alpha and zero-order correlations were estimated in SPSS 22.

Results

Measurement invariance by country

The hypothesized factor structure was a four-factor model with two dimensions related to students' mastery or performance orientation and other two dimensions related to classroom performance or mastery climates. This factor structure was separately specified and tested in both sam-

Table 1. Set of hierarchical model to test for measurement invariance across countries.

Model	χ^2	df	p	$\Delta \chi^2$	Ddf	P	CFI	ΔCFI	SRMR	RMSEA	90% CI
Configural	1031.74	169	<.001	--	--		.917	--	.050	.049	.046-.052
Metric	1051.45	180	<.001	23.8	11	.013	.916	.001	.052	.047	.045-.050
Scalar	1499.56	191	<.001	548.5	11	<.01	.874	.042	.061	.056	.054-.059
Scalar with 3 item intercepts freed	1211.85	188	<.001	188.1	8	<.01	.901	.012	.054	.050	.048-.053

ples. For the Angolan sample the four-factor model fitted the data quite well ($\chi^2(84)= 386.5, p < .001$; CFI= .92; RMSEA= .042 [.038 - .046]; SRMR= .038). In the same vein, the four-factor model also fitted the Dominican data well ($\chi^2(84)= 638.3, p < .001$; CFI= .92; RMSEA= .053 [.030 - .057]; SRMR= .05).

Given that the four-factor solution fitted both samples well, it was therefore appropriate to test for measurement invariance. Table 1 shows the goodness-of-fit indices for the sequence of nested models in the measurement invariance routine. First, an acceptable model fit must be established for the configural model, a multi-group model in which no constraints on across groups are made. This configural model fitted the data reasonably well. Accordingly, the sequence of constrained models that test for measurement invariance was tested. Constraints on factor loadings (metric invariance) was tenable, because the fit was not deteriorated, and even in the case of the RMSEA was better. Then, item intercepts were constrained across groups (scalar invariance), and fit indexes shown an important deterioration. This deterioration in model fit was indicative of relevant inequalities in item intercepts or a lack of scalar invariance. Modification indices allowed finding those constraints that were not correctly imposed from a statistical point of view. The item intercepts that could not be considered equal in Angola and Dominican Republic were those of items 1, 2 and 9. Therefore, those three constraints were removed and the correspondent partial scalar invariance model tested. This partial scalar invariance model fitted the data well, and it was the retained model. Standardized factor loadings for this retained model are shown in table 2 for both samples.

Internal consistency

Cronbach's alphas and CRI estimates for the four factors in the Dominican sample were respectively: .77 and .83 for Performance Orientation; .64 and .72 for Performance Climate; .81 and .87 for Mastery Orientation; .71 and .80 for Mastery Climate. Cronbach's alpha and CRI estimates for the four factors in the Angolan sample were respectively: .61 and .67 for Performance Orientation; .55 and .62 for Performance Climate; .65 and .75 for Mastery Orientation; .60 and .72 for Mastery Climate. Table 2 also offers item-total correlation for the 15 items in both samples. All of them may be considered adequate.

Relationships among motivations, school satisfaction and engagement, and academic success

In order to test for the nomological validity of the four factors in the MOC scale, their correlations with a number of variables theoretically related to the motivational orientation and climate were calculated. Table 3 shows the relationships among the four dimensions in the MOC scale and teachers support for autonomy, school engagement and satisfaction, academic self-concept and perceived academic success. In general, the four dimensions were consistently and significantly related to the nomological net. As expected, the relationships of both mastery orientation and climate were larger with all positive outcomes considered as criteria (satisfaction, engagement and academic achievement) than they were with the performance orientation and climate. It is worth noting that performance climate was low and/or even negatively related with the criteria, all of them positive outcomes of the school environment and the learning process.

Discussion and conclusions

Based on the AGT framework, the aim of this study was threefold: (1) to validate the Spanish and Portuguese versions of the MOC; (2) to test for measurement invariance across large Dominican and Angolan students' samples; and (3) study the relations of motivational orientations and climates with relevant educational outcomes.

With respect to the factorial validity of both versions of the MOC scale (Portuguese and Spanish), a structure of four factors, two of them of motivational climate (performance and mastery), and two of them motivational orientations (also performance and mastery) was expected. These four factors adequately fitted the observed data in both samples. This was not only found in the original Norwegian version of the scale developed by Stornes and Bru (2011) and Stornes et al. (2008) based on the Perceived Motivational Climate in Sport Questionnaire (Ommundsen et al., 1998), but also in other scales (Duda & Nicholls, 1992; Roberts et al., 1998). Moreover, the dimensionality was also coherent with the AGT (Elliot, 2005; Nicholls, 1984) that posits these two climates and orientations, either with the labels of performance and mastery or with the labels of ego and task (Nicholls, 1984).

Table 2. Standardized factor loadings and item-total correlations (homogeneity) for the four-factor model in the Dominican and Angolan samples.

Factor	Item	Item summary description	Dominican	Dominican	Angolan	Angolan
			λ	r_{it}	λ	r_{it}
Perform. Orientation	1	I feel successful when I am the best	.51	.43	.36	.31
	5	I feel successful when I am besting others	.76	.64	.61	.44
	9	I feel successful when I am clever than others	.77	.65	.61	.40
	13	I feel successful showing the others that I am the best	.68	.58	.51	.40
Perform. Climate	2	Only successful students are taken notice of	.64	.45	.59	.42
	6	The teacher gives most attention to the successful students	.72	.52	.65	.40
	10	Students are encouraged to outperform others	.46	.32	.42	.28
Mastery Orientation	3	I feel content when I succeed	.63	.55	.48	.36
	7	I feel successful when I am making a good effort	.76	.66	.59	.45
	11	I feel successful when I work hard and succeed	.71	.61	.56	.44
	14	I feel successful when I work to the best of my ability	.70	.61	.63	.47
Mastery Climate	4	Teacher expects us to learn new skills and gain new knowledge	.70	.55	.59	.42
	8	Teacher is engaged in broadening our underst. for the subject	.69	.57	.55	.44
	12	Students encouraged to practice skills that they not yet have been successful with	.51	.42	.42	.32
	15	Improvement is important for every student	.56	.41	.54	.37

Note: All factor loadings statistically significant $p < .01$.

The second hypothesis was that there would be a measurement invariance of the MOC scale across the two studied samples. The four dimensions represented well the scores for both samples, but more importantly, the invariance routine found metric invariance (same meaning across versions) and partial scalar invariance. Only three items, two of them from the performance orientation and one for performance climate, were found scalar invariant. To our knowledge, this is the first measurement invariance study done with MOC scale. Future studies should carefully try to replicate the partial scalar invariance results in this study, attending at which particular items are invariant, if any. If other countries, versions, etc., find that these three non-invariant items remain problematic, this could lead to changes in the scale.

With respect to reliability, results are adequate for the Spanish version of the scale, and very similar to the reliabilities found in Stornes and Bru (2011). However, there were lower reliability estimates in the Angolan, and specifically for performance climate and orientation, precisely the dimensions the three non-invariant items belong to. Nevertheless, having into account that factor loadings (the estimates in which the CRI are based) can be considered invariant across groups, this particular lower reliabilities do not seem particu-

larly troublesome. In sum, the results of the research have proven the validity of the scale for both countries. One implication of this result is that as is the first that it has been validated in Spanish and Portuguese, native speakers of these languages in other countries could use this scale as a useful tool until further investigations are performed specifically for their respective countries.

In relation to the third hypothesis, which stated that mastery orientation and perceived mastery climate would be positive related to students' engagement and academic success, results of this study were those indeed. The correlations were in line with all previous literature (Ames, 1992; Androutsou & Anastasiou, 2014; Lee et al., 2016).

The fourth hypothesis was that performance orientation and perceived performance climate would be negatively related to students' engagement and academic achievement. This hypothesis has been partially supported by our data, especially in terms of the perceived performance climate, which has an inverse relation with engagement and academic success, more in Dominican sample than in the Angolan one. In general, these results are in line with those of Barkoukis and Hagger (2013), or Lee et al. (2016).

Table 3. Relationships among MOC's dimensions and the criteria in both samples.

Criteria	Dominican				Angolan			
	PO	PC	MO	MC	PO	PC	MO	MC
Teachers support for autonomy	.17**	-.15**	.43**	.53**	.22**	.13**	.35**	.43**
Engagement	.17**	-.08**	.53*	.53**	.13**	.10**	.37**	.41**
Satisfaction with school	.03	-.18**	.27**	.37**	.25**	.03	.18**	.25**
Academic success	.17**	-.11**	.41**	.40**	.24**	.08**	.30**	.33**
Academic Self-Concept	.15**	-.08**	.39**	.38**	.23**	.08**	.30**	.27**

Notes: * $p < .05$; ** $p < .01$; PO = Performance Orientation; PC = Performance Climate; MO = Mastery Orientation; MC = Mastery Climate.

Regarding the relationships of the four dimensions of climate and motivational orientation with important educational variables as support for autonomy and satisfaction with school, the results were also in line with previous studies. In particular, all found relationships agree with previous studies about self-concept (Seaton et al., 2014), school engagement (Wang & Holcombe, 2010), perceived autonomy support (Barkoukis & Hagger, 2013; Jang et al., 2012; Stornes et al., 2008), or academic achievement (Meece et al., 2006; Wang & Holcombe, 2010).

From an applied perspective, the results of this study highlight the importance of teachers promoting learning environments in which a mastery climate predominates, because of its greatest positive impact on all personal and school variables studied here. The results indicate that although the perception of performance climate also had some positive effects on educational outcomes, those obtained when students perceived mastery climate were greater.

Current research also has some limitations. Both studied samples were large. However, they were not random samples and generalization of these results is therefore limited. Additionally, the studied relationships within a cross-sectional design do not allow for a strong causal interpretation, and further longitudinal studies should shed light on causal chains.

References

- Ames, C. A. (1992). Classrooms: goals, structures, and student motivation. *Journal of Educational Psychology, 84*, 261-271.
- Androutsou, D.; Anastasiou, A. (2014). The relationship between school climate and student performance in the classroom: An empirical study concerning the factors that modulate the school climate in primary education in Greece. *International Journal of Academic Research in Business and Social Sciences, 4*(1), 253-267.
- Awang-Hashim, R.; Kaur, A.; Noman, M. (2015). The interplay of socio-psychological factors on school engagement among early adolescents. *Journal of Adolescence, 45*, 214-224. doi:10.1016/j.adolescence.2015.10.001
- Barkoukis, V.; Hagger, M. S. (2013). The trans-contextual model: perceived learning and performance motivational climates as analogues of perceived autonomy support. *European Journal of Psychology of Education, 28*(2), 353-372. doi:10.1007/s10212-012-0118-5
- Brunner, M.; Keller, U.; Dierendonck, C.; Reichert, M.; Ugen, S.; Fischbach, A.; Martin, R. (2010). The structure of academic self-concepts revisited: The nested Marsh/Shavelson model. *Journal of Educational Psychology, 102*(4), 964-981. doi:10.1037/a0019644
- Cheung, G. W.; Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing MI. *Structural Equation Modeling, 9*, 235-255. doi:10.1207/S15328007SEM0902_5
- Christenson, S. L.; Reschly, A. L.; Wylie, C. (2012). Preface. In Christenson, S. L.; Reschly, A. L.; Wylie, C. (Eds.), *Handbook of research on student engagement*. New York: Springer.
- Duda, J. L. (2005). Motivation in sport: The relevance of competence and achievement goals. In Elliot, A. J.; Dweck, C. S. (Eds.), *Handbook of competence and motivation* (pp. 318-335). New York: Guilford Press.
- Duda, J. L.; Nicholls, J. G. (1992). Dimensions of achievement motivation in schoolwork and sport. *Journal of Educational Psychology, 84*, 290-299. doi:10.1037/0022-0663.84.3.290
- Elliot, A. J. (2005). A conceptual history of the achievement goal construct. In Elliot, A.; Dweck, C. (Eds.), *Handbook of competence and motivation* (pp. 52-72). New York: Guilford Press.
- Fonsêca, P. N.; Lopes, B. J.; Palitot, R. M.; Estanislau, A. M.; Couto, R. N.; Coelho, G. L. (2016). Engajamento escolar: explicação a partir dos valores humanos. *Psicologia Escolar e Educacional, 20*(3), 611-620. doi:10.1590/2175-3539201502031061
- Froiland, J. M.; Worrell, F. C. (2016). Intrinsic motivation, learning goals, engagement, and achievement in a diverse high school.

- Psychology in the Schools*, 53(3), 321-336. doi:10.1002/pits.21901
- Graham, J. M. (2006). Congeneric and essentially tau-equivalent estimates of score reliability: What they are and how to use them. *Educational and Psychological Measurement*, 66, 930-944. doi:10.1177/0013164406288165
- Green, J.; Liem, G. A.; Martin, A. J.; Colmar, S., Marsh, H. W.; McInerney, D. (2012). Academic motivation, self-concept, engagement, and performance in high school: Key processes from a longitudinal perspective. *Journal of Adolescence*, 35, 1111-1122. doi:10.1016/j.adolescence.2012.02.016
- Hu, L.; Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6, 1-55. doi:10.1080/10705519909540118
- Jang, H.; Kim, E. U.; Reeve, J. (2012). Longitudinal test of self-determination theory's motivation mediation model in a naturally occurring classroom context. *Journal of Educational Psychology*, 104(4), 1175-1188. doi:10.1037/a0028089
- Lee, C. S.; Hayes, K. N.; Seitz, J.; DiStefano, R.; O'Connor, D. (2016). Understanding motivational structures that differentially predict engagement and achievement in middle school science. *International Journal of Science Education*, 38(2), 192-215. doi:10.1080/09500693.2015.1136452
- Martin, A. J.; Collie, R. J.; Mok, M. M.; McInerney, D. M. (2016). Personal best (PB) goal structure, individual PB goals, engagement, and achievement: A study of Chinese- and English-speaking background students in Australian schools. *British Journal of Educational Psychology*, 86(1), 75-91. doi:10.1111/bjep.12092
- Meece, J. L.; Anderman, E. M.; Anderman, L. H. (2006). Classroom goal structure, student motivation, and academic achievement. *Annual Review of Psychology*, 57, 487-503. doi:10.1146/annurev.psych.56.091103.070258
- Mello, M. B. J.; Leme, M. I. S. (2016). Motivação de alunos dos cursos superiores de tecnologia. *Psicologia Escolar e Educacional*, 20(3), 581-590. doi:10.1590/2175-3539/2015/02031053
- Nicholls, J.G. (1984). Achievement motivation: Conceptions of ability, subjective experience, task choice, and performance. *Psychology Review*, 91, 328-346. doi:10.1037/0033-295X.91.3.328
- Nie, Y.; Lau, S. (2009). Complementary roles of care and behavioral control in classroom management: The self-determination theory perspective. *Contemporary Educational Psychology*, 34, 185-194. doi:10.1016/j.cedpsych.2009.03.001
- Ommundsen, Y.; Roberts, G. C.; Kavussanu, M. (1998). Perceived motivational climate and cognitive and affective correlates among Norwegian athletes. *Journal of Sports Sciences*, 16(2), 153-164. doi:10.1080/026404198366867
- Papaioannou, A. G.; Ampatzoglou, G.; Kalogiannis, P.; Sagovits, A. (2008). Social agents, achievement goals, satisfaction and academic achievement in youth sport. *Psychology of Sport and Exercise*, 9, 122-141. doi:10.1016/j.psychsport.2007.02.003
- Plunkett, S.W.; Henry, C. S.; Houltberg, B.J.; Sands, T.; Abarca-Mortensen, S. (2008). Academic support by significant others and educational resilience in Mexican-Origin ninth grade students from intact families. *The Journal of Early Adolescence*, 28, 333-355. doi:10.1177/0272431608314660
- Porto, R. C.; Gonçalves, M. P. (2017). Motivação e envolvimento acadêmico: um estudo com estudantes universitários. *Psicologia Escolar e Educacional*, 21(3), 515-522. doi:10.1590/2175-3539/2017/021311192
- Roberts, G. C.; Treasure, D. C.; Balagué, G. (1998). Achievement goals in sport: The development and validation of the Perceptions of Success Questionnaire. *Journal of Sports Sciences*, 16, 337-347. doi:10.1080/02640419808559362
- Seaton, M.; Parker, P.; Marsh, H.; Craven, R.; Yeung, A. S. (2014). The reciprocal relations between self-concept, motivation and achievement: Juxtaposing academic self-concept and achievement goal orientations for mathematics success. *Educational Psychology*, 34, 49-72. doi:10.1080/01443410.2013.825232
- Skaalvik, E. A.; Federici, R. A. (2016). Relations between classroom goal structures and students' goal orientations in mathematics classes: When is a mastery goal structure adaptive? *Social Psychology of Education*, 19, 135-150. doi:10.1007/s11218-015-9323-9
- Stornes, T.; Bru, E. (2011). Perceived motivational climates and self-reported emotional and behavioral problems among Norwegian secondary school students. *School Psychology International*, 32(4), 425-438. doi:10.1177/0143034310397280
- Stornes, T.; Bru, E.; Idsoe, T. (2008). Classroom social structure and motivational climates: On the influence of teachers' involvement, teachers' autonomy support and regulation in relation to motivational climates in school classrooms. *Scandinavian Journal of Educational Research*, 52, 315-329. doi:10.1080/00313830802025124
- Travers, L. V.; Bohnert, A. M.; Randall, E. T. (2013). Brief report: Adolescent adjustment in affluent communities: The role of motivational climate and goal orientation. *Journal of Adolescence*, 36, 423-428. doi:10.1016/j.adolescence.2012.11.009
- United Nations Educational Scientific and Cultural Organization [UNESCO] (2013). *Schooling for millions of children jeopardized by reductions in aid*. Retrieved from <https://unesdoc.unesco.org/ark:/48223/pf0000221129>
- van de Schoot, R.; Lugtig, P.; Hox, J. (2012). A checklist for testing measurement invariance. *European Journal of Developmental Psychology*, 9(4), 486-492. doi:10.1080/17405629.2012.686740

Wang, M. T.; Eccles, J. S. (2013). School context, achievement motivation, and academic engagement: A longitudinal study of school engagement using a multidimensional perspective. *Learning and Instruction, 28*, 12-23. doi:10.1016/j.learninstruc.2013.04.002

Wang, M.T.; Holcombe, R. (2010). Adolescents' perceptions of school environment, engagement, and academic achievement in middle school. *American Educational Research Journal, 47*(3), 633-662. doi:10.3102/0002831209361209

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