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Perceptions of Motivational Climate and Teachers’ Strategies to Sustain Discipline as Predictors of Intrinsic Motivation in Physical Education

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This study examined the relationship among pupils’ perceptions of the motivational climate, pupils’ perceptions of teachers’ strategies to maintain discipline and pupils’ intrinsic motivation in physical education. A sample of 2189 Spanish adolescents, ages 13 to 17 years, completed Spanish versions of the EPCM, SSDS, and IMI. Confirmatory factor analyses were carried out to confirm the factorial validity of the scales. Then, the relationship among the variables was explored through Structural Equation Modelling. The most important predictors of pupils’ intrinsic motivation were the perceived mastery climate, and perceived teachers’ emphasis on intrinsic reasons to maintain discipline. Perceived performance climate and perceived teachers’ strategies to maintain discipline based on introjected reasons and indifference, predicted pupils’ tension-pressure. Results are discussed in the context of theoretical propositions of self-determination theory and practical issues of enhancing adolescents’ motivation in physical education.

Keywords: learning environment, motivation, discipline, physical education, self-determination theory.

Se han analizado las relaciones entre las percepciones del alumnado del clima motivacional, las estrategias del profesorado para mantener la disciplina, y la motivación intrínseca en educación física. Una muestra de 2189 adolescentes españoles de 13 a 17 años, completaron versiones españolas de la EPCM, SSDS e IMI. Mediante Análisis Factoriales Confirmatorios y Modelos de Ecuaciones Estructurales se ha verificado la validez de las escalas y la relación entre variables. Los predictores más importantes de la motivación intrínseca han sido la percepción del clima de maestría y el énfasis del profesorado en razones intrínsecas para la disciplina. El clima de ejecución y las estrategias basadas en razones introyectadas e indiferentes ante la disciplina, han predicido la tensión-presión del alumnado. Se han discutido los resultados en el marco de la auto-determinación de cara a potenciar la motivación de los adolescentes en educación física.

Palabras clave: ambiente de aprendizaje, motivación, disciplina, educación física, teoría de la auto-determinación.
Currently, so many youngsters are turned off by their physical education (PE) classes, do not engage in adequate physical activity, and are risk of developing serious health conditions (obesity, diabetes, etc.). Thus, it is imperative that children and adolescents be encouraged to adopt a physically active lifestyle (Taylor & Ntoumanis, 2007).

It is generally accepted that school PE is likely to play a key role in encouraging pupils’ participation in regular physical activity (Biddle & Chatzisarantis, 1999; Digelidis, Papaioannou, Laparidis, & Christodoulidis, 2003). There is evidence that PE can involve people in daily physical activities and fosters healthy lifestyles (Digelidis et al., 2003; Haywood, 1991; Sallis & McKenzie, 1991), and that students who feel motivated toward physical activity in PE are more likely to participate in physical activities in their leisure time (Biddle & Chatzisarantis, 1999; McKenzie, 2003; Portman, 2003). Because of this, enhancing adolescents’ motivation is an important objective in contemporary physical education as adaptive motivation has been linked to exercise participation outside of school (Theodosiou & Papaioannou, 2006) and to prepare children for a lifetime physical activity (Bryan & Solmon, 2007; Standage, Duda, & Ntoumanis, 2003).

Although most pupils are intrinsically motivated to participate in PE lessons, there are many children who are extrinsically motivated or lack motivation to participate (Ntoumanis, 2001, 2005). Interest and participation in PE gradually declines with age (Digelidis & Papaioannou, 1999; Hassandra, Goudas, & Chronis, 2003; Koka & Hein, 2003; Midgley, Kaplan, & Middleton, 2001; Mitchell, 1996). Thus, examining pupils’ motivation for participation in PE is important for gaining information on the determinants of physical activity in young people.

Though motivation has been well studied in organized sport settings (Cecchini, González, Carmona, & Contreras, 2004; Goudas & Biddle, 1994; Moreno, Cervelló, & González-Cutre, 2008; Ntoumanis, 2005), there is a dearth of research relation to motivation for participation in school PE (Escarti & Gutiérrez, 2001; Papaioannou, Tsigilis, Kosmidou, & Milosis, 2007).

A theoretical framework that is being increasingly used to study motivation in PE is self-determination theory (SDT; Deci & Ryan, 1985), in order to gain a better understanding of the reasons individuals possess for their behavior. This perspective views the need for autonomy to be critical in promoting psychological growth, development of the self, and feelings of intrinsic motivation (Ryan & Deci, 2000, 2002). SDT distinguishes among three types of behavioral regulation with varying degrees of self-determined motivation: intrinsic motivation, extrinsic motivation, and amotivation. Intrinsic motivation represents the highest degree of self-determined motivation and refers to situations in which individuals freely engage in activities that they find interesting and enjoyable and that offer the opportunity for learning. When people are intrinsically motivated they experience interest in an activity, enjoyment, and feelings of competence and control (Deci & Ryan, 1985; Mitchell, 1996). Intrinsically motivated behaviors are associated with psychological well being, interest, enjoyment, fun, and persistence (Ryan & Deci, 2000). In contrast, extrinsic motivation is evident when individuals perform an activity because they value its associated outcomes more than the activity itself (Vallerand et al., 1992). Amotivation is evident when individuals lack the intention and willingness to engage in a particular behavior (Ryan & Deci, 2002).

Incorporating elements from the self-determination perspective in the Hierarchical model of intrinsic and extrinsic motivation, Vallerand (1997) proposed that social factors influence athletes’ perceptions of competence, autonomy, and relatedness, which in turn determine their motivation.

As it is mentioned by specialized literature, motivation in students depends at a high extent of motivational climate perceived in their classes (see Duda, 2001; Ntoumanis & Biddle, 1999; Papaioannou & Goudas, 1999; Papaioannou, Marsh, & Theodorakis, 2004). However, little is known about the influence of perceived motivational climate in PE lessons from the Spanish perspective.

Motivational climate is defined as a situational induced psychological environment directing goals of an action. The term ‘perceived motivational climate’ refers to individual composite views regarding the situational emphasized goal structures operating in achievement settings (Ames, 1992). Two classes of achievement goals have been described. When success and failure are defined in comparison to the performance of others, a performance goal orientation is adopted, but when self-referenced criteria of success are used, a mastery goal orientation prevails (Ames, 1992; Ames & Archer, 1988; Nicholls, 1989; Papaioannou et al., 2007). In the literature, various authors have used the terms mastery/learning and performance/comparison climates to denote task- and ego-related situational goals respectively (Ames, 1992; Biddle et al., 1995; Mitchell, 1996; Morgan & Carpenter, 2002), whereas others have used task-involving and ego-involving climate (e.g. Papaioannou, 1998; Spray, 2002).

Extensive research has established that the effect of a mastery climate on positive motivational outcomes as intrinsic motivation is large and positive, whereas the effect of performance climate on positive outcomes is small and negative (Cox & Williams, 2008; Ntoumanis & Biddle, 1999; Papaioannou et al., 2007). By contrast, the impact of mastery climate on negative motivational outcomes as tension or pressure is small and negative, whereas the impact of performance climate on negative outcomes is moderate and positive (Biddle et al., 1995; Dorobantu & Biddle, 1997; Papaioannou, 1995, 1998).

Several investigators have found significative relationships between the perception of motivational climate or learning environment, and intrinsic motivation in
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PE (e.g. Escartí & Gutiérrez, 2001; Goudas & Biddle, 1994; Hassandra et al., 2003; Koka & Hein, 2003; Mitchell, 1996; Sproule, Wang, Morgan, McNeill, & McMorris, 2007).

As stated by Mitchell (1996), perceived learning environment was a valid predictor of intrinsic motivation for middle school pupils. Similar results found Koka and Hein (2003) studying the perceptions of learning environment as predictors of intrinsic motivation. Goudas and Biddle (1994) reported that the mastery dimension of classroom climate emerged as the main predictor of students’ self-reported intrinsic motivation in PE classes. A mastery climate affords choice, self-determined criteria for success and, hence, autonomy. Performance climates, however, are more controlling (Ntoumanis & Biddle, 1999). Sproule et al. (2007) found significant relationships between pupils’ perceived mastery motivational climate in PE classes and goal adoptions, intrinsic motivation and intentions to be physically active.

Nevertheless, perhaps the factor with the largest impact on students’ self-determination in PE is the teacher and his/her teaching style (Jaakkola & Digelidis, 2007; Mosston & Ashworth, 2002; Taylor & Ntoumanis, 2007), and, as a part of the teaching approaches, exist different strategies employed by teachers in order to keep discipline at class. As Bryan and Solmon (2007) point out, teachers can design PE class environments and use strategies to sustain discipline with a high grade of pupils’ self-determination to foster motivation and engagement in active lifestyles. Teachers must make use of strategies that elicit desirable behaviors from students without being controlling in nature, because there is clear evidence that an autonomy-supportive environment is preferable to a controlling environment (Hagger, Chatzisarantis, Culverhouse, & Biddle, 2003; Standage et al., 2003). A teaching style that provides students with opportunities to make choices appears to have a positive effect on their intrinsic motivation (Biddle et al., 1995; Papaioannou, 1995).

In their self-determination theory, Deci and Ryan (1985) identified reasons of self-responsibility and caring along with external, introjected, intrinsic, and no reasons as the six internally consistent factors which describe the reasons for being disciplined. According to Deci and Ryan (1991), people’s reasons for acting can vary from very external to being intrinsic. The behaviors of people are regulated by the following reasons: Intrinsic (reflecting fun, enjoyment or satisfaction while people perform an activity), external (refer to behavior shaped by external rewards or to avoid punishment), introjected (comprise internal pressures to act in order to avoid negative feelings as guilt and shame), and identified (actions determined by personal values and goals) (Papaioannou, 1998; Zounhia, Hatziharistos, & Emmanouel, 2003).

In this sense, Papaioannou (1998) examined the relationship between perceived motivational climate and perceived teachers’ strategies aimed at sustain discipline, and has argued that a perceived task-involving environment was positively linked to perceived teaching strategies promoting student-determined reasons for exercising discipline. However, the perception of an ego-involving climate corresponded positively to students’ perceptions of a teacher who emphasizes strategies promoting introjected and extrinsic reasons of discipline and to their perception of a teacher who is not interested in sustaining discipline. Spray (2002) also found a positive association between pupils’ perceived task-involving climate and their perceptions of teaching strategies promoting pupils’ internal locus of causality for the regulation of discipline behavior. On the other hand, the perception of an ego-involving climate was linked with the promotion of an external locus of causality. Moreover, different combinations of perceived climate were associated with perceived teaching strategies to keep discipline. The perceptions of a teacher emphasizing more internalized reasons for discipline was stronger among pupils perceiving a high task-involving PE climate, regardless of their perceptions of the salience of a prevailing ego climate. The results obtained by Papaioannou (1998) and Spray (2002) suggest that perceived situational goals, and the motivation continuum proposed in SDT may be useful in explaining pupils’ disciplined behavior in PE.

As reported by Hassandra et al. (2003), the social-environmental factors that have been shown to influence pupils’ intrinsic motivation in PE classes are the motivational climate, teaching style, content of the lesson, and adult encouragement.

In accordance with the above mentioned, the purposes of the present study were twofold. Firstly, the psychometric properties of the EPCM, SSDS, and IMI were examined in a Spanish setting. Even though, validations of the three scales already exist: SSDS (Moreno, Cervelló, Martínez, & Ruiz, 2008), EPCM (Carratalá, Guzmán, Martí, & Carratalá, 2004), IMI (García Calvo, 2004), all of them have been obtained by means of an exploratory factor analysis. Also both EPCM and IMI have been analyzed in sport context, and not in physical education field. Secondly, the relationship between perceived motivational climate, teachers’ disciplinary strategies and intrinsic motivation were investigated.

We hypothesized that pupils’ perception of motivational climates would determine the perception of teachers’ strategies to sustain discipline, which in turn influence intrinsic motivation in PE. More specifically, we assumed that perceptions of mastery involving climates would favor the perceptions of teachers’ strategies to sustain discipline based on intrinsic reasons and predict the positive aspects of intrinsic motivation. On the other hand, it was hypothesized that perceptions of performance involving climates would be related to perceptions of teachers’ strategies based on introjected reasons and indifference to maintain discipline, and predict the negative aspect of intrinsic motivation.
Method

Participants

Participants were 2189 secondary education students ages 13 to 17 years ($M = 14.78$, $SD = 1.32$), 1106 were boys and 1083 girls (Table 1), in a total of 43 school (28 public, 15 concerted), trying to represent all secondary educational centres of the Valencian Community in Spain. A convenience sample was used.

Measures

Motivational climate. Students’ perceptions of the motivational climate in the PE classes were assessed using a Spanish translation of the ‘Perception of Motivational Climate Scale’ by Escartí and Gutiérrez (2001). This scale is an English translation of the French EPCM (L’Echelle de Perception du Climat Motivational; Biddle et al., 1995). The 19-item EPCM scale is composed of five factors: Pursuit of progress by pupils, Promotion of learning by the teacher, Pursuit of comparison by pupils, Worries about mistakes, and Promotion of comparison by the teacher. Responses were made following the stem ‘In my PE class’, on a 5-point Likert type scale (1: strongly disagree, 5: strongly agree). Sample items are “The pupils learn new things and feel pleased”, “The PE teacher is pleased when each pupil learns something new”, “Pupils try to do better than one another”, “The pupils worry about making mistakes”, and “The PE teacher only bothers with those who do well in sport”. All alphas coefficients obtained by Biddle et al. (1995) were satisfactory (.88; .79; .81; .89; and .78, respectively).

Strategies to maintain discipline. A Spanish translation of the Strategies to Sustain Discipline Scale (SSDS; Papaioannou, 1998) by Gutiérrez (2003) and in agreement with the version offered by Moreno et al. (2008) was used. This instrument includes 27 items measuring students’ perceptions of strategies used by their teachers to sustain discipline in PE classes. The stem for all items was, “In order to sustain discipline in this PE class, the teacher…” and responses were indicated on a 5-point Likert-type scale (1: strongly disagree, 5: strongly agree). As reported by Papaioannou (1998), the SSDS comprises four factors: Teacher’s emphasis on intrinsic reasons to maintain discipline, Teacher’s emphasis on introjected reasons to maintain discipline, Teacher’s indifference to maintain discipline, and Teacher’s emphasis on external reasons to maintain discipline. Sample items are “Attracts our attention by making the lesson more interesting”, “Makes us feel ashamed if we are not disciplined”, “Really does nothing to keep discipline”, and “Reminds us that it is the rule”. Alpha coefficients of the four subscales obtained by Papaioannou (1998) were: .93; .76; .62; and .76, respectively.

Intrinsic motivation. Intrinsic motivation was assessed using a Spanish version of the Intrinsic Motivation Inventory (IMI; McAuley, Duncan and Tammen, 1989) by Escartí and Gutiérrez (2001). It is comprised of 18 items suitably reworded for the specific context of the PE class. The IMI contains four subscales: Interest/Enjoyment, Effort/Importance, Perceived Competence, and Tension/Pressure. Sample items are “I enjoyed PE very much”, “I think I am pretty good at PE”, “I put a lot of effort into PE”, “I felt tense while doing PE”). Students rated their answers on a 5-point scale (1: strongly disagree and 5: strongly agree). Alpha coefficients obtained by McAuley et al. (1989) for each of the subscales were: Interest-Enjoyment ($\alpha = .78$), Perceived competence ($\alpha = .80$), Effort-Importance ($\alpha = .84$), and Tension-Pressure ($\alpha = .68$).

Procedure

All participants were recruited through their schools. With approval from educational personnel, authors met with PE teachers to explain the purpose of the study and to invite to collaborate. Letters to parents and parental consent forms were sent home. Students who returned a signed parental consent form participated in the study. Participants gave their consent and were previously informed about the goals of the research.

Table 1
Sample distribution by gender and age

<table>
<thead>
<tr>
<th>Age</th>
<th>Boys</th>
<th>Girls</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$n$</td>
<td>%</td>
<td>$n$</td>
</tr>
<tr>
<td>13</td>
<td>251</td>
<td>11.5</td>
<td>241</td>
</tr>
<tr>
<td>14</td>
<td>232</td>
<td>10.6</td>
<td>233</td>
</tr>
<tr>
<td>15</td>
<td>272</td>
<td>12.4</td>
<td>259</td>
</tr>
<tr>
<td>16</td>
<td>211</td>
<td>9.6</td>
<td>217</td>
</tr>
<tr>
<td>17</td>
<td>140</td>
<td>6.4</td>
<td>133</td>
</tr>
<tr>
<td>Total</td>
<td>1106</td>
<td>50.5</td>
<td>1083</td>
</tr>
</tbody>
</table>
The scales were administered to the participants in regular PE sessions during April and May when all students had attended their PE class for at least 6 months. The scales were applied by a member of the research group, without the presence of the PE teacher in the classroom, to prevent answers from not being spontaneous. Completion of questionnaires took about 20 minutes.

**Data analysis**

The data were examined at two levels. First, Confirmatory Factor Analyses (CFAs) were conducted to examine the factorial structure of the EPCM, SSDS, and IMI, based on the orientations by Hambleton (2005), and Merenda (2007) for the cross-cultural use of the psychological tests. Then, Structural Equation Modelling (SEM) with observed variables was employed to explore the pattern of relationships within the data set. SEM is a multivariate methodology that tests a hypothesized model in a simultaneous analysis of all the variables, in order to determine the extent to which the model is consistent with the data.

CFAs and structural models were estimated within EQS 6.1 program (Bentler, 2005) using maximum likelihood estimation with Satorra-Bentler’s corrections in standard errors and fit indices, due to the non-normality of the variables (Finney & DiStefano, 2006). For the assessment of model fit, a selection of the better performing indices (Hu & Bentler, 1999) were used: Comparative Fit Index (CFI), Goodness of Fit Index (GFI) and Adjusted Goodness of Fit Index (AGFI), with values of about .9 considered adequate; Standardized Mean Square Residual (SRMR) and Root Mean Square Error of Approximation (RMSEA) should approximate or be less than .08 to be indicative of adequate fit of the model to the data (Kaplan, 2000; Tabachnick & Fidell, 2007).

**Results**

**Validity and Reliability of the Instruments**

**EPCM.** The CFA of the EPCM showed good fit indices: $\chi^2_{42}=395.63$, $p<.001$; CFI = .945; GFI = .917; AGFI = .889; SRMR = .067; and RMSEA = .029, so supported the five dimensions proposed by Biddle et al. (1995): Pursuit of progress by pupils, Promotion of learning by the teacher, Pursuit of comparison by pupils, Worries about mistakes, and Promotion of comparison by the teacher. The first two subscales deal with mastery or learning climate and the last three are associated with comparison or performance climate.

Additionally, to determine whether the EPCM was internally reliable, coefficient alpha for the pupils’ responses was calculated (see Table 2). All alpha coefficients were higher than .70 (Nunnally, 1978), with the exception of the Promotion of comparison by the teacher, which obtained .67.

**SSDS.** In order to examine the factorial validity of the SSDS, we carried out different CFAs based on the factorial solution of Papaioannou (1998). The first CFA revealed poor fit indices. Because of two items with low relationship with their factors (.238; .350), and given the extremely large correlation between two factors (.94), a new model was conducted. This new model with two factors collapsed into one, and the two aforementioned items removed revealed better fit indices: $\chi^2_{272}=1123.29$, $p<.001$; CFI = .904; GFI = .881; AGFI = .898; SRMR = .061; RMSEA = .038. After this modifications, CFA sported reasonably fit and only two items from original scale were reduced, being obtained three factors: Teachers’ emphasis on intrinsic reasons to maintain discipline, Teachers’ emphasis on introjected reasons to maintain discipline, and Teachers’ indifference to maintain discipline, with alpha coefficients between .90 and .66 (see Table 2).

**IMI.** To analyse the factorial validity of the IMI, two CFAs were conducted based on the structure reported by McAuley et al. (1989). The first CFA revealed poor fit indices, and the item 12 showed a low standardized solution (.346). Accordingly, item 12 was deleted and a second CFA was specified. This CFA shown adequate fit indices: $\chi^2_{111}=622.01$, $p<.001$; CFI = .905; GFI = .887; AGFI = .884; SRMR = .063; RMSEA = .045. Four factors were obtained: Interest/enjoyment, Perceived competence, Effort/importance, Tension/pressure, with alpha coefficients between .86 and .67 (see Table 2).

**Descriptive Statistics and Correlational Analyses**

Descriptive statistics, including means and standard deviation, as well as correlational statistics are reported in Table 2. These descriptive statistics for the entire sample revealed moderately high levels of Promotion of learning by the teacher ($M = 4.18$), moderate levels of Pursuit of progress by pupils ($M = 3.89$) and Pursuit of comparison by pupils ($M = 3.70$), and low levels of Worries about mistakes ($M = 2.96$) and Promotion of comparison by the teacher ($M = 2.54$). Related to perception of reasons to maintain discipline, descriptive statistics revealed moderate level of Teachers’ emphasis on intrinsic reasons to maintain discipline ($M = 3.71$), and low levels of Teachers’ emphasis on introjected reasons to maintain discipline ($M = 2.40$) and Teachers’ indifference to maintain discipline ($M = 2.22$). With respect to intrinsic motivation, this sample show moderate levels of Interest-enjoyment ($M = 3.83$), Perceived competence ($M = 3.56$) and Effort-importance ($M = 3.81$), and low level of Tension/pressure ($M = 2.26$).

To determine the relationships between the dimensions of perceived motivational climate, perceived teachers’ strategies to sustain discipline in class, and intrinsic motivation in PE, Pearson product-moment correlation was
Table 2
Descriptive statistics, alpha reliabilities and bivariate correlations among motivational climate, disciplinary strategies and intrinsic motivation

<table>
<thead>
<tr>
<th>Variables</th>
<th>M</th>
<th>SD</th>
<th>α</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Pursuit of progress by pupils</td>
<td>3.89</td>
<td>.65</td>
<td>.78</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Promotion of learning by teacher</td>
<td>4.18</td>
<td>.72</td>
<td>.82</td>
<td>.66**</td>
<td>1.00</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Pursuit of comparison by pupils</td>
<td>3.70</td>
<td>.80</td>
<td>.73</td>
<td>.26**</td>
<td>.27**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Worries about mistakes</td>
<td>2.96</td>
<td>.98</td>
<td>.84</td>
<td>.06**</td>
<td>-.01</td>
<td>.24**</td>
<td>1.00</td>
<td></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>5. Promotion comparison by teacher</td>
<td>2.54</td>
<td>.85</td>
<td>.67</td>
<td>-.12**</td>
<td>-.24**</td>
<td>.19**</td>
<td>.28**</td>
<td>1.00</td>
<td></td>
<td></td>
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<tr>
<td>6. Emphasis on intrinsic reasons</td>
<td>3.71</td>
<td>.63</td>
<td>.90</td>
<td>.55**</td>
<td>.49**</td>
<td>.11**</td>
<td>-.03</td>
<td>-.16**</td>
<td>1.00</td>
<td></td>
<td></td>
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<tr>
<td>7. Emphasis on introjected reasons</td>
<td>2.40</td>
<td>.91</td>
<td>.72</td>
<td>-.10**</td>
<td>-.18**</td>
<td>.12**</td>
<td>.24**</td>
<td>.32**</td>
<td>-.17**</td>
<td>1.00</td>
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<td>8. Indifference to maintain discipline</td>
<td>2.22</td>
<td>.78</td>
<td>.66</td>
<td>-.21**</td>
<td>-.28**</td>
<td>.07**</td>
<td>.21**</td>
<td>.38**</td>
<td>-.33**</td>
<td>.59**</td>
<td>1.00</td>
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<tr>
<td>9. Interest-enjoyment</td>
<td>3.83</td>
<td>.86</td>
<td>.86</td>
<td>.48**</td>
<td>.40**</td>
<td>.11**</td>
<td>-.12**</td>
<td>-.16**</td>
<td>.64**</td>
<td>-.17**</td>
<td>-.25**</td>
<td>1.00</td>
<td></td>
<td></td>
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<tr>
<td>10. Perceived competence</td>
<td>3.56</td>
<td>.79</td>
<td>.80</td>
<td>.28**</td>
<td>.19**</td>
<td>.13**</td>
<td>-.10**</td>
<td>-.01</td>
<td>.32**</td>
<td>-.01</td>
<td>-.05**</td>
<td>.57**</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>11. Effort-importance</td>
<td>3.81</td>
<td>.81</td>
<td>.81</td>
<td>.42**</td>
<td>.30**</td>
<td>.12**</td>
<td>.02</td>
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<td>-.12**</td>
<td>.60**</td>
<td>.52**</td>
<td>1.00</td>
</tr>
<tr>
<td>12. Tension-pressure</td>
<td>2.26</td>
<td>.75</td>
<td>.67</td>
<td>-.15**</td>
<td>-.20**</td>
<td>.05</td>
<td>.32**</td>
<td>.24**</td>
<td>-.21**</td>
<td>.27**</td>
<td>.29**</td>
<td>-.30**</td>
<td>-.32**</td>
<td>-.10**</td>
</tr>
</tbody>
</table>

*p < .05; **p < .01.
used. As shown in Table 2, on one hand, the perceptions of a mastery-involving climate were positively related with perceived teachers’ strategies to maintain discipline based on Intrinsic reasons, and with Interest/enjoyment, Perceived competence and Effort/importance of the intrinsic motivation. On the other hand, the perceptions of a performance-involving climate were positively associated with perceived teachers’ strategies to sustain discipline based on Introjected reasons and Indifference, and with Tension/pressure of the intrinsic motivation. Additionally, Teachers’ emphasis on intrinsic reasons to maintain discipline in class was positively associated with Interest/enjoyment, Perceived competence and Effort/importance, whereas Teachers’ emphasis on introjected reasons and Indifference to maintain discipline were related with Tension/pressure, the negative dimension of the intrinsic motivation.

Structural Equation Modelling Analyses

As it has been pointed out above, the objective of this study can be found within the frame of a hypothetical model (see Fig. 1) based on works carried out by Ames (1992), Goudas and Biddle (1994), Mitchell (1996), Papaioannou (1998), Spray (2002), and Zounhia et al. (2003). According to this model, we hypothesized that pupils’ perception of motivational climates would determine the perception of teachers’ strategies to sustain discipline, which in turn influence intrinsic motivation in PE.

The results of structural equation modelling showed that the fit was acceptable for the proposed relationships ($\chi^2_{20} = 344.57, p < .001; \text{CFI} = .955; \text{GFI} = .970; \text{AGFI} = .885; \text{SRMR} = .050; \text{RMSEA} = .086$), but was tested a second model that offered better fit indices: $\chi^2_{31} = 333.03, p < .001; \text{CFI} = .958; \text{GFI} = .972; \text{AGFI} = .931; \text{SRMR} = .048; \text{RMSEA} = .067$.

The final model offered a direct relationship among Pursuit of progress by pupils and Effort/importance. This link was not theoretical but it appeared as outstanding according to the Lagrange Multipliers Tests (LM-Test). The rest of model modifications responded to not significant links, for that Wald Test has been used. Wald Test has been used to analyze if some of the relationships in structural model could be eliminated without affecting the fit. In any case relationships could be eliminated without impoverishing the fit significantly.

The results of this tested model showed that the motivational climate factor Pursuit of progress by pupils presented a positive relation to perceived Teachers’ emphasis on intrinsic reasons to maintain discipline, and negative relation to Teachers’ indifference to maintain discipline. Promotion of learning by the teacher positively predicted Teachers’ emphasis on intrinsic reasons, and negatively predicted Teachers’ emphasis on introjected reasons and Indifference to maintain discipline. Pursuit of comparison by pupils presented a positive relation to Teachers’ emphasis on introjected reasons and Teachers’
indifference to maintain discipline in class. Worries about mistakes presented a significant positive relation with Teachers’ emphasis on introjected reasons and Teachers’ indifference to maintain discipline. Promotion of comparison by the teacher predicted Teachers’ emphasis on introjected reasons and Teachers’ indifference to maintain discipline in PE classes.

Additionally, Teachers’ emphasis on intrinsic reasons to sustain discipline was positively related to Interest/enjoyment, Perceived competence and Effort/importance, and negatively related with Tension/pressure of the pupils’ intrinsic motivation. Teachers’ emphasis on introjected reasons negatively predicted Interest/enjoyment and was positively related with Tension/pressure. Finally, Teachers’ indifference to maintain discipline predicted pupils’ Tension/pressure in PE classes.

It also must be highlighted a result not hypothesized in theoretical model. In this sense, modification indices pointed out a relevant and directed relationship between the perceived motivational climate Pursuit of progress by pupils and the intrinsic motivation factor Effort/importance.

This model accounted for the following percentages of the variance: Teachers’ emphasis on intrinsic reasons to maintain discipline (32.6%), Teachers’ emphasis on introjected reasons to maintain discipline (15.0%), Teachers’ indifference to maintain discipline (19.9%), Interest/enjoyment (41.7%), Perceived competence (10.2%), Effort/importance (23.7%), and Tension/pressure (11.9%).

### Discussion and Conclusions

Using the SDT as a framework, the present study had two main purposes: First, to provide some psychometric evidence of the factorial validity and reliability for the Spanish versions of established measures to assess perceived motivational climate, teachers’ strategies to

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**Figure 2.** Standardised solution for the proposed model of the relationships between perceived motivational climate, teachers’ strategies to sustain discipline, and intrinsic motivation in PE.

**Note:** All structural relationships are statistically significant ($p < .01$). For the sake of clarity correlations among exogenous variables and errors are not shown.

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sustain discipline, and intrinsic motivation; second, to analyze how the pupils’ perceptions of the motivational environment created by teachers influences pupils’ perceptions of teachers’ strategies to maintain discipline, and this predicts pupils’ intrinsic motivation in PE classes.

The results obtained suggest that the EPCM in PE has satisfactory psychometric properties, confirming adequate fit of the five factor model reported by Biddle et al. (1995), and Gutiérrez and Ruiz (2009). In relation with the SSDS scale, our results do not support the 4-factor model of Papaioannou (1998), because two factors collapsed into one. Therefore our 3-factor model of the SSDS scale also shown differences from the one achieved by Moreno et al. (2008), and Spray (2002). Factorial structures of SSDS proposed by Moreno et al. (2008) was obtained by exploratory factor analysis, while in our case we applied confirmatory factor analysis, more powerful and appropriated than exploratory analysis (Gutiérrez, López, & Ruiz, 2009). The IMI coincide with the structure proposed by McAuley et al. (1989), the only difference being the fact that it includes one item less than in the original scale. Nevertheless, one factor of each scale obtained internal consistency coefficients lower than .70 (.66 and .67), so new revisions for these subscales are needed. However, we decided to retain these subscales in the analyses because their factor loadings were satisfactory (i.e., >.40; Ford, MacCallum, & Tayt, 1986).

Our hypothesis stated that pupils’ perceived motivational class climate would be associated with pupils’ perceived teachers’ strategies to sustain discipline in class and these would predict pupils’ intrinsic motivation in PE. Results from the study offered support for the hypothesis as structural model was found to have good fit. In a general sense, a perceived mastery involving class climate positively predicted perceived teachers’ emphasis on intrinsic reasons to maintain discipline in class and the positive aspects of the intrinsic motivation in PE (interest/enjoyment, perceived competence, and effort/importance), and negatively predicted perceived teachers’ emphasis on introjected reasons and indifference to maintain discipline and the negative aspect of the intrinsic motivation (tension/pressure). On the other hand, a perceived performance involving climate presented a positive relation with teachers’ emphasis on introjected reasons and indifference to maintain discipline, and with tension/pressure of the intrinsic motivation, results that support those reported by Papaioannou (1998), and Spray (2002).

All of these results present evidence of the need to determine which learning climates are developed in PE lessons and the perceptions that pupils have about such climates. This is of the utmost importance because, by modifying the learning environment, pupils’ perceptions of the teachers’ strategies to sustain discipline and intrinsic motivation could be improved, as reported by Digelidis et al. (2003).

The findings of the present study are in line with the existing literature suggesting that the mastery-oriented climate are likely to facilitate intrinsic motivation but performance-oriented climates have no positive impact on intrinsic motivation in PE (Cox & Williams, 2008; Goudas & Biddle, 1994; Mitchell, 1996; Morgan & Carpenter, 2002; Ntoumanis, 2005; Papaioannou et al., 2007; Sproule et al., 2007). Additionally, this study showed that a perceived mastery climate and perceived teachers’ strategies to sustain discipline based on intrinsic reasons had a positive contribution in the explanation of intrinsic motivation in PE.

This study supported the relationship between motivational climate, teachers’ strategies to sustain discipline in class, and intrinsic motivation in PE. From an applied perspective, our findings emphasize the importance of encouraging teachers to create motivational mastery-involving climates in their physical education classes and provide disciplinary strategies based on intrinsic reasons to sustain discipline that leads pupils to perceive self-determined learning environment, instead of performance-involving climates and disciplinary strategies with emphasis on introjected reasons and indifference, in order to maximize positive pupils’ intrinsic motivation in PE.

We agree with Papaioannou and Goudas (1999) when encourage teachers to provide meaningful tasks that promote cooperation among pupils, to employ a variety of teaching strategies that give rise to greater decision-making by pupils, and to give feedback that is directed to self-referenced rather than other-referenced aspects of performance. Such strategies may help pupils to view the teacher as being concerned with class control and discipline, to understand why they should behave appropriately, and to internalize the value of these reasons for being disciplined.

In conclusion, this study has provided evidence for the structural validity of the analysed scales through confirmatory factor analyses, system that differentiates it of other authors that also carried out validations of these instruments in Spanish context (Carratalá et al., 2004; García Calvo, 2004; Moreno et al., 2008), but using exploratory factor-analytic procedures. Additionally, it has confirmed the structural equations model employed to analyze the relationships among the perception of motivational climate, the perceptions of discipline strategies employed by teachers and pupils’ intrinsic motivation in physical education classes.

However, as any study, this also presents its limitations. Although the sample size was good, the data were gathered within a convenience sample. The data utilized in this study are cross-sectional, and no conclusions regarding causal relationships can be drawn. Furthermore, these data are based on students’ self-reports. Future studies should also include observational methods to investigate the relationships among the students’ perceived motivational class climate and the real class climate.
Future experimental researches that take into account the factors object of this study, should evaluate how using certain discipline strategies could affect to the forms more self-determined of motivation, and these, consequently, in the pupils’ effort perception and competence.

Another limitation of this study is to have used the IMI to measure only one dimension of self-determination theory: the intrinsic motivation. It should also be contemplated the other two dimensions, the extrinsic motivation and amotivation. Hence, perhaps it had been more convenient to use the Situational Motivation Scale (SIMS; Guay, Vallerand, & Blanchard, 2000) that shows four subscales: intrinsic motivation, identified regulation, external regulation, and amotivation.

Finally, it is important to point out that the proposed model tested in the structural equations is just one of the possible ones, being able to exist other models that contribute with new explanations to the relationships among the studied variables.

References

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