MOTIVATIONAL PROFILES AND FLOW IN PHYSICAL EDUCATION LESSONS

ALVARO SICILIA CAMACHO

Almeria University, Spain

JUAN ANTONIO MORENO MURCIA

Murcia University, Spain

ANTONIO J. ROJAS TEJADA

Almeria University, Spain

Please address correspondence to:

Dr. Juan Antonio Moreno Murcia

Facultad de Ciencias del Deporte

Universidad de Murcia

Parque Almansa

30730 San Javier, Murcia, España

E-mail: morenomu@um.es

Tel: 968 39 86 78

Fax: 968 39 86 72
Summary. The purpose of this study was to examine the solutions of the cluster analysis procedure for studying differences in goal orientation and motivational climate profiles. A secondary purpose was to examine whether there were differences among the various goal and climate profile groups on perceived flow experiences. Nine hundred and eighty-three students of 14 to 15-year-olds ($M = 14.8$, $SD = 0.91$) from a large Spanish metropolitan school district were participants in this study and completed questionnaires assessing goal orientations (POSQ), motivational climates (PMCSQ-2) and perceived flow (DFS). Results revealed three distinct clusters with 40.28% of the sample with a ‘high motivational’ profile, 27.57% in a ‘low motivational’ cluster and 32.15% in a ‘mastery’ cluster. These three clusters differed significantly in their perceived flow experiences. Clusters also showed different composition according to gender. The implications of these results with regard to teaching instructional actions in physical education classes are discussed.

Key words: goal orientation, motivational climate, flow, physical education.
INTRODUCTION

For the past 20 years, achievement goal theory (Ames, 1984; 1992a, b; Dweck, 1986; Elliot & Dweck, 1988; Nicholls, 1984, 1989) has evolved into one of the most common theoretical approaches for understanding students’ motivation and their experiences within physical education classes (Goudas, Biddle, & Fox, 1994; Papaioannou, 1995, 1998a; Duda, 1996; Spray & Biddle, 1997; Treasure, 1997; Carpenter & Morgan, 1999; Treasure & Roberts, 2001; Xiang & Lee, 2002; Xiang, Bruene & McBride, 2004; Xiang, McBride & Guan, 2004). This social-cognitive theory assumes that children’s motivation to learn is influenced by their judgments about their competence, i.e., how a child defines success and failure in an achievement setting. These judgments are presumably determined by achievement goals that are influenced by one’s goal orientation, perceptions of the motivational climate, and cognitive maturity levels (Nicholls, 1984, 1989). It also contends that the goal of action in achievement settings, such as physical education lessons, is to demonstrate ability. Nevertheless, in the research literature there are two dominant achievement goals that define the concept of ability: task or learning and ego or performance (Nicholls, 1984, 1989; Dweck & Leggett, 1988). These goal perspectives, also known as dispositional goal orientations, refer to the way a student construes his/her level of competence and, consequently, define success in specific settings. Students with a task orientation use self-referenced criteria to judge their own competence, strive to demonstrate mastery, seek ways to improve their abilities and endeavor to learn new abilities, so that they feel successful after high levels of effort and mastery of a task. Conversely, students with an ego orientation tend to orient themselves to achieve a positive evaluation of their current abilities and base their performance on social comparison, i.e. after demonstrating more ability than the reference group or equal performance with less
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effort (Nicholls, 1984, 1989; Ames, 1992a, b; Duda, 2001). Studies have shown correlation among cognitive, affective and behavioral patterns of these two goal orientations in physical education settings (Duda & Hall, 2000). Students whose goals are task-related usually choose challenging tasks and focus on effort more than ego-oriented students do (Solmon & Boone, 1993; Duda, 2001; Roberts, 2001). Generally, ego-involved goals have been associated with fewer adaptive motivational patterns, such as attributing success or failure to natural ability, while task-involved goals have been associated with the belief that success is a consequence of effort and with a positive attitude towards physical education classes (Goudas et al., 1994; Goudas, Biddle, & Underwood, 1995; Papaioannou, 1995; Treasure, 1997; Carpenter & Morgan, 1999; Spray, 2002; Gano-Overway & Ewing, 2004).

Goal perspective may represent a dispositional tendency towards judging one’s competence or it may be fostered within the situational context creating a perceived motivational climate (Nicholls, 1984, 1989; Dweck & Leggett, 1988; Ames, 1992a, b). Students’ perceptions of achievement goals are affected by situational factors, such as teachers. These situational factors can influence students’ conceptions of ability. According to the two dominant goal orientations, there are two dominant perceived motivational climates in classroom contexts. In a task-involving climate, teachers emphasize effort and evaluate students on mastery and skill improvement, whereas in an ego-involving climate, teachers emphasize social comparison and evaluate students on performance outcomes. Teachers have an influence on the perceived motivational climate in the classroom using factors such as task purposes, evaluation, rewards and student relationships (Ames & Archer, 1988). Students’ perceptions of a motivational climate have proved to be stronger predictors of cognitive and affective responses after controlling for dispositional goal orientations. In particular, perception of a task-
involving climate was associated with a strong intrinsic motivation, preference for
challenging tasks and the belief that success resulted from effort and motivation instead
of external factors (Cury, Biddle, Famose, Goudas, Sarrazin, & Durand, 1996; Treasure
& Roberts, 2001).

The Achievement Goal Theory framework has normally been used to understand
how the climate created by teachers to enhance motivation might impact a student’s
goal orientations and achievement strategies. This theoretical framework was used in
this study to understand how a student’s goal orientations and the climate created by the
teacher to enhance motivation might be associated with perceived flow experiences in
physical education classes.

The flow concept was originally introduced by Csikszentmihalyi (1975, 1997) and
applied in the sport and physical activity contexts by Jackson (1996) and Jackson and
Marsh (1996). According to Csikszentmihalyi (1975), flow is an enjoyable
psychological state that is reflected by a holistic sensation that people feel when they
are totally involved in the activity they are doing. Optimal experiences or flow can be
defined by a set of dimensions or factors, including a merging of action and awareness,
clear goals, unambiguous feedback, focused attention, loss of self-consciousness,
altered sense of time, a sense of control, and perceived challenge-skill balance
(Csikszentmihalyi & Csikszentmihalyi, 1988; Csikszentmihalyi, 1990, 1993, 1997). The
set of these factors would be the global flow state (Jackson & Marsh, 1996; Marsh &
Jackson, 1999; Vlachopoulos, Karageorghis, & Terry, 2000)

Research so far has examined flow experiences in different contexts, suggesting
that people who experience flow usually want to be engaged in the activity (Deci &
Ryan, 1985; Pelletier et al., 1995; Csikszentmihalyi, 1990), they consider the activity as
an optimal and enjoyable experience (Csikszentmihalyi, 1997; Jackson, 1992, 1996)
and have positive feelings after exercise (Karageorghis, Vlachopoulos, & Terry, 2000). Researchers have also tried to identify flow antecedents (Csikszentmihalyi & Csikszentmihalyi, 1988). One of the antecedents that emerged from the research was motivation (Jackson, 1992, 1995). In fact, there has been a clear association between the flow concept and intrinsic motivation. Csikszentmihalyi (1988, 1990) described flow as an intrinsically rewarding experience, since it is an immediate subjective experience and an emotional state that occurs when a participant is engaged in an activity. Similarly, Deci & Ryan (1985) made a reference to flow as a moment of high intrinsic motivation. In addition, the importance of motivation in flow experiences has been widely highlighted in research (Jackson, 1992, 1995; Kowal & Fortier, 1999).

Past studies on flow have found that goal orientations are related to the experience of this psychological state. A high level of motivation to engage in the task has been described as a facilitator of perceiving flow in elite sportspeople. In the study by Jackson & Roberts (1992) a positive and significant connection was discovered between task orientation and frequency of flow when the latter was assessed at a situational level. Specifically, athletes who showed a disposition to focus on the task more than on the results to be achieved were more likely to perceive flow experiences. Later, Jackson, Kimiecik, Ford & Marsh. (1998) studied how certain psychological factors were related with flow. However, the authors did not find any relation between perceived flow experiences and goal orientations. Contrary to Jackson & Roberts (1992), Jackson et al. (1998) assessed all of the variables at a contextual level. Accordingly, the relationship between motivational antecedents and flow has not yet been understood.

Nevertheless, the importance of motivation in flow experiences also seems to be critical in situations of play and in non-competitive settings. In fact, Stein, Kimiecik,
Daniels, & Jackson (1995) found that the perceived difficulty of the challenge dimension was associated with the perception of flow more strongly for participants in recreational than in competitive settings. The connections that have been found between the perception of challenge and flow experiences in artistic activities and in everyday situations seem to back this hypothesis (Moneta & Csikszentmihalyi, 1996; Voelkl & Ellis, 1998; Martin & Cutler, 2002).

A high performance and motivation in the student would have theoretical and practical benefits. Understanding the relationship between motivation and flow can enable us to discover the motivational factors that disrupt and facilitate flow experiences in physical education classes. In addition, guidance for teachers in creating settings that promote optimal experiences during physical activity classes should be encouraged.

So far, we have not heard of studies that have related motivation and flow within the context of physical education. However, factors such as the autotelic experience of flow seem to be key concepts within the study of motivation in educational scenarios. In this respect, different studies in the context of physical education have shown that task orientation and the perception of a task-oriented motivational climate are related to having more fun (Ames & Archer, 1988; Kavussanu & Roberts, 1996; Ntoumanis & Biddle, 1999), a positive attitude towards class and more satisfaction (Solmon & Boone, 1993; Goudas et al., 1994; Goudas et al., 1995; Papaioannou, 1995, 1997, 1998a; Cury et al., 1996; Solmon, 1996; Treasure, 1997; Cervelló & Santos-Rosa, 2000; Treasure & Roberts, 2001). Theoretically, an individual who is intrinsically motivated should be more prepared to experience flow because he will be interested in the task he is doing (Deci & Ryan, 1985).
In contrast, boredom in PE classes has been associated with the student’s perception of an ego-involving climate (Duda & Nicholls, 1992; Seifriz, Duda, & Chi, 1992; Cervelló & Santos-Rosa, 2000). When participants are ego-oriented and the key factors in the setting reward aspects related to the demonstration of superior competence, then the participants can have less fun, as they do not have much control over the key factors in the setting. High ego-oriented individuals are less likely to perceive high flow levels, since success is based on normative comparison and, therefore, personal improvement is not enough to satisfy the goal of demonstrating superior ability (Xiang et al., 2004). In addition, ego-involved students must pay more attention to their peers than to the task due to the fact that they have to outperform others to perceive a sense of achievement. This could lead to more levels of anxiety (Ntoumanis & Biddle, 1998; Papaianou & Kouli, 1999), a psychological factor that has been described as precisely the opposite to what the flow experience represents (Csikszentmihalyi, 1975, 1988; Jackson et al., 1998). As Jackson et al. (1998) described, participants that perceive a high challenge are more likely to increase their concentration and involvement. However, they tend to relate negatively to the desire to do the activity and the enjoyment while doing it.

Finally, students would tend to perceive high levels of flow when the emphasis in the classes is based on personal improvement and effort levels than performance and comparison with the rest of their peers. In fact, the perception of a task-involving climate has been associated with strong intrinsic motivation, preference for challenging tasks and the belief that success resulted from effort and motivation instead of external factors (Cury et al., 1996; Treasure & Roberts, 2001). The development of students’ personal goals in conjunction with the challenge-skill balance might facilitate the perception of flow (Karageorghis et al., 2000).
Both task and ego goal orientations and task- and ego-involving motivational climates are dispositional and situational variables that are reasonably orthogonal—not bipolar. To date, only a few studies have specifically paid attention to the orthogonality of goal states and motivational climates (Hodge & Petlichkoff, 2000; Smith & Harwood, 2002; Gernigon, D-Arripe-Longueville, Delignières, & Ninot, 2004). Nevertheless, because the subscales are independent, Duda (2001) suggested the usefulness of measuring goal orientation and perceived climate profiles. Research maintains that individuals can be “high” or “low” in both task and ego subscales, or high in one subscale and low in the other in both motivational disposition and in climate perception (see Roberts, 2001; Duda, 2001). The interaction between ego and task subscales in both the goal orientation variable and motivational climate provides useful information to analyze the relationship between motivation and flow beyond what can be explained when each subscale is considered separately.

Research employing goal profiles has usually used either a median or mean-split procedure to create groups. Nevertheless, although these procedures are efficient methods to create four goal profiles groups, they force the data into “high” or “low” grouping, eliminating any attempt to examine effects of “average” responses on either the task or the ego orientation and climate scales. Furthermore, the number of groups in the mean-split procedure is created arbitrarily and the group labels are predetermined. More recently, cluster analysis has gained in popularity as an analytical procedure to examine varying goal profiles in sport (Hodge & Petlichkoff, 2000; Vlachopoulos et al., 2000; Wang & Biddle, 2001; Wang, Chatzisarantis, Spray & Biddle, 2002; Moreno, Cervelló, González-Cutre, 2007) and physical education psychology (Ntoumanis, 2002). It is designed to derive a classification scheme for grouping a number of individuals into clusters, so that individuals within clusters are similar in some respect.
and unlike those from other clusters (Aldenderfer & Blashfield, 1984; Hair, Anderson, Tatham, & Black, 1998). This procedure also affords researchers the opportunity to combine the study of orientation and climate and examine different solutions rather than solely imposing an arbitrary four-group structure on either the orientation or climate data.

The objective of this research was to examine the solutions of the cluster analysis procedure for studying differences in goal orientation and motivational climate profiles. A secondary purpose was to then examine whether there were differences among the various goal and climate profile groups on perceived flow experiences.

METHOD

Participants and procedure

Our study sample consisted of 983 students ($M = 14.8$, $SD = 0.91$). There were 498 boys and 485 girls, all members of physical education classes in schools in a large Spanish city. All participants volunteered to participate in the study. Twenty-six educational centers were used, where all the participants had Spanish nationality with an age range from 14 to 16.

Permission to conduct this research was received from head teachers. The pupils were told the purpose of the research, their rights as study participants and asked to sign a consent form. The instruments for measuring the different variables were administered in a classroom to the chosen participants when the teacher was not present. The measures were given to all students in the same order. Each participant took 15-20 minutes to complete the questionnaires and responses to the instrument were kept anonymous. The participants were told to ask for help if confused concerning either instructions or the clarity of particular items. No problems were encountered in completing either of the inventories or understanding the nature of the questions.
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Measures

Perception of Success Questionnaire (POSQ). To measure students’ dispositional goal orientation in physical education classes, the Spanish version (Cervelló, Escartí, & Balagué, 1999; Cervelló & Santos-Rosa, 2000, 2001; Martínez Galindo, Alonso, & Moreno, 2006) of the Perception of Success Questionnaire was used (Roberts, Treasure, & Balagué, 1998). This questionnaire has 12 items, of which six measure Task Orientation (e.g. “In physical education classes, I feel successful when I reach a goal”) and six measure Ego Orientation (e.g. “In physical education classes, I feel successful when I win”). The replies are rated on a Likert-type scale, in which each item has a response range from 1 to 10 (anchors: 0 = strongly disagree and 10 = strongly agree). The Spanish version of this questionnaire showed a factor distribution and internal consistency coefficients similar to those obtained for American athletes and physical education students (Cervelló et al., 1999; Escartí, Roberts, Cervelló, & Guzmán, 1999; Cervelló & Santos-Rosa, 2000, 2001). Likewise, the inventory for this study showed adequate internal consistency for each subscale, with Cronbach alpha coefficients from .92 for the ego orientation subscale and .89 for the task orientation subscale.

Perceived Motivational Climate in Sport Questionnaire-2 (PMCSQ-2). To measure students’ perception of a motivational climate in physical education classes, the version translated into Spanish by Balagué, Guivernau, Duda, & Crespo (1997) of the Perception of Motivational Climate in Sport Questionnaire-2 (Newton & Duda, 1993; Newton, Duda, & Yin., 2000) was adapted. The Spanish version of this questionnaire has two higher-order factors, which measure the Perception of a Task-Involving Motivational Climate and the Perception of an Ego-Involving Motivational Climate. In the Spanish version, the task-involving climate factor is composed of 11 items. Examples of the items included: “In physical education classes, students feel
good when they try their best” and “In physical education classes, students help each other learn”. The ego-involving climate factor includes 13 items (e.g. “In physical education classes, the teacher has his/her favorites”). The replies to the questionnaire were indicated on a Likert-type scale with a range response of 0 to 10 (0 = strongly disagree to 10 = strongly agree). Studies carried out with Spanish athletes have shown a factor distribution and internal consistency coefficients similar to those found in athletes and students in other countries (Balaguer et al., 1997; Cervelló & Santos-Rosa, 2000). This inventory has indicated adequate internal consistency for each subscale, with Cronbach alpha coefficients from .77 for the ego-involving motivational climate subscale and .73 for the task-involving motivational climate subscale.

Dispositional Flow Scale (DFS). We used the Spanish version (García Calvo, Jiménez, Santos-Rosa, Reina & Cervelló, 2007) of the Dispositional Flow Scale (Jackson et al., 1998) for measuring the variable of dispositional flow. As stated previously, this scale assesses nine dimensions of flow based on theory and qualitative research: challenge-skill balance (csflow), action-awareness merging (aaflow), clear goals (cgflow), unambiguous feedback (ufflow), concentration on the task at hand (ctflow), sense of control (scflow), loss of self-consciousness (lsflow), transformation of time (ttflow), and autotelic (intrinsically rewarding) experience (aeflow) (see Jackson and Marsh, 1996, for the wording of the items). Taking into account the multidimensional and hierarchical structure of the DFS, the different dimensions as a whole perform reasonably good flow experiences (Jackson & Marsh, 1996; Marsh & Jackson, 1999; Vlachopoulos et al., 2000). The activity related questions were designed to ground the respondent in the experience of physical education to which he or she was responding. The version of the DFS used was composed of 36 items. Examples of items included: “I really enjoy the experience (autotelic); it is really clear to me how my
performance is going” (unambiguous feedback)…”. The replies to the questionnaire were indicated on a Likert-type scale with a range response of 0 to 10 (0=strongly disagree to 10=strongly agree). The Dispositional Flow Scale has received psychometric support through confirmatory factor analyses (Jackson & Marsh, 1996; Marsh & Jackson, 1999; García Calvo et al., 2007). Likewise, the DFS for this study showed adequate internal consistency for global flow state, with a Cronbach alpha coefficient from .94. There was also adequate internal consistency for the nine flow dimensions, with a minimum value of the Cronbach alpha coefficient of .74, except for the ttflow dimension, which obtained a value of .65. Nevertheless, the internal validity observed for ttflow can be considered marginally acceptable, given the small number of items which comprise the subscale (Nunnally & Bernstein, 1994; Hair et al., 1998).

RESULTS

In this section, firstly, the descriptive statistics, the estimated reliability coefficients and the correlations of the variables analyzed are shown. Secondly, in order to study the relation among motivational climates, goal orientations and perceived flow in more depth, the students were classified on the basis of their motivational climates and goal orientations using a cluster analysis. Later, a MANOVA was performed with the profiles resulting from the cluster analysis as an independent variable and the perceived flow dimensions as dependent variables. Next, specific ANOVAs were performed to check whether there were differences in both global dispositional flow and in the different flow subdimensions on the basis of those profiles.

Descriptive Statistics, Reliability and Correlations

The descriptive statistics of the instruments used in the research, the estimated reliability coefficients and the correlations between the variables analyzed in the study are shown in Table 1.
The means of the factors show that our physical education students had moderate ego orientation and high task orientation. They also perceived a low ego-involving climate and a moderate task-involving climate. Moreover, the students had moderate levels of perception of global flow.

Reliability was adequate, with the values in all the scales exceeding .70 (Nunnally, 1978). There were positive and significant correlations between the perception of ego orientation and an ego-involving motivational climate and between the perception of task orientation and a task-involving motivational climate. Similarly, there were negative and significant correlations between the perception of task orientation and an ego-involving motivational climate and between the latter and a task-involving motivational climate. Nevertheless, positive and significant correlations between the perception of ego orientation and the perception of task orientation were also found.

On the other hand, there were positive and statistically significant correlations between the perception of flow, and all its nine dimensions, and both ego and task orientation. Moreover, the perception of a task-involving motivational climate was positively associated with flow and its nine dimensions. On the contrary, no significant correlation was found between the global flow dimension and an ego-involving motivational climate. This last variable only showed statistically significant correlations with four of the nine flow dimensions (aaflow, ctflow, ttflow and aeflow), although these correlation coefficients are low.

Physical education motivational profiles

To identify the different patterns in physical education classes, a cluster analysis using motivational climates and goal orientations (four variables: ego and task-
involving climate and ego and task orientation) was performed. All the variables were standardized using Z scores (mean of 0 and standard deviation of 1).

The best solution found was the three cluster one, because when the number of clusters was increased, some of them lost psychological significance and stability when they were calculated in subsamples and it was, therefore, not possible to interpret them. Table 2 shows the three-cluster solution obtained using the K-means cluster analysis. In Table 3 you can see that all the variables contribute significantly to the formation of clusters (Ego-involving climate $F_{2,980} = 133.03, p < .001$; Task-involving climate $F_{2,980} = 151.54, p < .001$; Ego orientation $F_{2,980} = 305.21, p < .001$; Task orientation $F_{2,980} = 222.94, p < .001$).

The characteristics of each cluster are shown in Table 2 and Figure 1 (“100% sample”). The first cluster (396 participants, 40.28% overall) tended to be moderate in ego and task-involving climate and high in ego and task orientation. This cluster was labeled as the “high motivational profile” group. The second cluster (271 participants, 27.57% overall) tended to be high in ego-involving climate, and low in task-involving climate and ego and task orientation. This group was called the “low motivational profile”. Lastly, the third cluster (316 participants, 32.15% overall) was called the “mastery motivational profile” group because participants scored higher in the variables that involve task (task-involving climate and task orientation) than in the variables that involve ego (ego-involving climate and ego orientation).

Solutions from cluster analyses can be unstable. It is, therefore, advisable to use additional analyses to check the solutions. In order to validate the stability of the cluster solution, three K-means cluster analyses were performed with different sized samples chosen randomly from the original sample: with 75% of the participants of the total...
sample, with 50% of the sample and with 25% of the sample. The results confirmed the
consistency (Figure 1) of the three cluster solution in terms of size of the profiles and
size of the clusters.

(FIGURE 1 HERE)

Differential profiles and flow

A MANOVA was performed to check whether the three profiles found (high, mastery and low motivational profile) differed in the values of the different dimensions of perceived flow (csflow, aaflow, cgflow, ufflow, cfflow, scflow, lsflow, ttflow, aeflow). The results showed that the global MANOVA produced statistically significant differences depending on the profiles used (Wilk’s lambda of .79; $F_{18,1944} = 13.52; p < .001$). ANOVAs were performed for every one of the flow dimensions, as well as for Global Flow, in order to specify which independent variable values produce the differences found. The results are shown in Table 4.

(TABLE 4 HERE)

Statistically significant differences appeared in both global flow and in the different dimensions that form it depending on the cluster. The mean value in global flow for cluster 1, “high motivational profile”, was 6.58 ($SD = 1.57$). For cluster 2, “low motivational profile”, the mean value of global flow was 5.09 ($SD = 1.43$). Cluster 3, “mastery motivational profile”, had a mean flow value of 6.15 ($SD = 1.43$). These differences in global flow were statistically significant ($F_{2,980} = -82.24; p < .001$). After completing post hoc comparisons using the Scheffé test, there were statistically significant differences ($p < .002$) between all the two-by-two comparisons of the clusters. This pattern was repeated in all the other dimensions. Only in the cgflow and aeflow dimensions were there no statistically significant differences ($p > .05$) between the “high motivational profile” cluster and the “mastery motivational profile” cluster.
As far as gender is concerned, there was a higher percentage of boys than girls in the cluster characterized by high motivation, whilst the girls were more numerous in the mastery motivational profile group. However, the percentage of girls and boys in the low motivational cluster was similar.

To sum up, comparatively speaking, the students in the “high motivational profile” had higher values in both global flow and in its nine dimensions, followed by the “mastery motivational profile” students and, finally, the “low motivational profile” students had lower flow values.

DISCUSSION

This study aimed at clarifying the motivation profile of the physical education by applying the achievement goal theory, and also exploring the relation between extracted motivational profiles and perceived flow experiences.

In order to examine the motivation patterns of physical education as the first purpose, three mixed motivational clusters were extracted. Instead of using mean- or median-split to create the four goal-orientation profiles and the four motivational-climate groups (high task / high ego, high task / low ego, low task / high ego and low task /low ego), this study examined the intra-individual differences in motivational types associated with personal and situational factors using cluster analysis. This way of identifying homogenous grouping may be more realistic than artificially imposing a structure on the observed data.

The first motivational cluster was called “high motivational profile”. Students in this cluster had relatively high levels of ego and task orientation and perceived relatively moderate ego- and task-involving climate levels. Bearing in mind the significantly negative association found between the perception of an ego-oriented climate and the perception of a task-oriented climate, in line with other research
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(Jagacinski & Nicholls, 1984; Duda & Nicholls, 1992; Cury et al., 1996; Papaioannou & Theodorakis, 1996; Escarti et al., 1999; Cervelló & Santos-Rosa, 2000;), and considering that the perception of an ego-oriented climate has been associated with cognitive, affective and maladaptive behavioral patterns (Nicholls, 1984, 1989; Ames, 1992a, b; Reinboth & Duda, 2004), we could have anticipated that the students in this first cluster would report low levels on the perception of an ego-oriented climate in this first cluster. Unexpectedly, the results show that a relatively moderate level of perception of an ego-oriented climate can be combined with moderate or high levels of a task-oriented climate and task and ego orientation. Recent research has shown that the combination of high task- and ego-involving motivational climates has positive effects on enjoyment (Papaioannou, Marsh, & Theodorakis, 2004), whereas the effects of an ego-involving climate are negative when the task-involving climate is low (Roberts, 2001). It is clearly worth paying attention to this subject in future research. It would be interesting to understand which factors make a student feel ego- and task-oriented and perceive an ego-oriented and a task-oriented climate, all at the same time. The research should also determine if this profile is relatively stable in the physical education context or whether it is something transitory, because students will eventually change to a profile more determined by task or ego components.

The most undesirable cluster was the second one, called “low motivational profile”. Students in this cluster reported very low levels of task orientation and relatively low levels of ego orientation and task-involving climate. In contrast, these children reported relatively high levels of ego-oriented climate. Clearly, these students are motivationally at risk because both motivational dispositions and the perception of a task-oriented climate have proved to be predictors of future participation in physical activity (Papaioannou & Theodorakis, 1996). Similarly, the perception of an ego-
oriented climate has been viewed as a maladaptive pattern for achievement behaviors in sport (Nicholls, 1984, 1989; Ames, 1992a, b; Reinboth & Duda, 2004), unless, as stated above, it is accompanied by moderate levels of perception of a task-oriented climate (Roberts, 2001; Papaioannou et al., 2004).

The third motivational profile that emerged from the cluster analyses represented those students with relatively high levels of task orientation and perceived task-involving climate and relatively low levels in the measures involving ego (ego orientation and ego-involving climate). This cluster is clearly in line with previous studies which point the associations between the dispositional achievement goals and the perception of motivational climates within educational contexts (Ames & Ames, 1984; Ames & Archer, 1988; Ames, 1992a, b). Nevertheless, considering the three profiles that have emerged from the cluster analysis in general, our results are in line with prior studies that have concluded that labeling people into extreme groups of high or low motivation is too simple (Hodge & Petlichkoff, 2000; Wang & Biddle, 2001; Ntoumanis, 2002; Wang, Chatzisarantis, Spray, & Biddle, 2002).

A second aim of this study was to explore the relation between the emerged motivational profiles and the perceived flow experiences. Post hoc comparisons using the Scheffé test highlighted statistically significant differences between the clusters. The mean value in global flow for the high motivational profile group was 6.58 (SD = 1.57) on a scale of 10, 5.09 (SD = 1.43) for the low motivational profile, and 6.15 (SD = 1.43) for the mastery group. This pattern of difference between the clusters was repeated for the flow dimensions. Nevertheless, the significant difference on perceived flow experiences among the three emerged clusters is of particular interest in terms of the relative influence of personal and situational motivational factors.
Out of the entire sample, the students grouped in the low motivational profile group had the lowest scores in perceived flow experiences. Given that this cluster was characterized by a relatively high ego-involving climate and relatively low task and ego orientation and task-involving climate, it would appear that the perception of an ego-involving climate may not be as relevant to flow experiences as the other variables. In fact, the ego-involving motivational climate did not show a significant correlation with the global flow value, and the statistically significant associations with four of the flow dimensions (aaflow, ctflow, ttflow y aeflow) were very weak. Nevertheless, we should also consider that the value of perceived flow experiences differs significantly between the high motivational group and the mastery profile. Given that, relatively speaking, every one of these profile groups was characterized by a moderate to high-task component (task orientation and task-involving climate), it appears that the variation in the ego component (ego orientation and ego-involving climate) might be a contributing factor to explain the differences in flow ratings between these two profile groups.

At first sight, this result seems to contradict the motivational implications of personal and situational factors derived from the achievement goal theory. Researchers in this perspective have defined an emphasis on task orientation and a task-involving climate as a means to maximize adaptive achievement behaviors in sport and physical education settings (e.g. Ames & Archer, 1988; Ames, 1992a, b; Duda & Nicholls, 1992) and, in this way, they have implied that high levels of ego orientation and an ego-involving climate are typically maladaptive. However, a number of studies indicate that the latter are not necessarily bad or maladaptive when paired with a high task orientation or a perceived ego-involving climate (Fox, Goudas, Biddle, Duda, & Armstrong, 1994; Roberts, 2001; Papaioannou et al., 2004). In line with these papers, the difference found in perceived flow between the mastery and the high motivational
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profile group may be explained by the fact that a moderate to high task orientation and
task-involving climate may need to have, respectively, some level of balance
complemented by a moderate to high ego orientation and ego-involving climate to
foster an adaptive goal profile with respect to perceived flow experiences.

In this study, we found that the global mean in the task subscales (task orientation
and task-involving climate) had moderate to high values (7.78 and 6.11 on a scale of
10), whilst the means in the ego subscales (ego orientation and ego-involving climate)
had moderate to low values (5.20 and 3.26). Similar results have been found in other
research (Fox et al., 1994; Hodge & Petlichkoff, 2000; Cervelló, Jiménez, Del Villar,
Ramos, & Santos-Rosa, 2004; Moreno, Cervelló & González-Cutre, 2007).

Consequently, perhaps the issue to facilitate perceived flow experiences does not lie so
much in increasing the task orientation and task-involving climate, but rather in
achieving a balance complementing the latter with average to high values of ego
orientation and ego-involving climate. Our cluster analysis results, at least for this
sample, seem to support this idea with regard to perceived flow experiences. Therefore,
the group of students that showed the highest levels of perceived flow was the one that
combined relatively high levels of ego and task orientation and relatively moderate
levels of ego and task-involving climate. Future research should clarify the extent to
which mastery and performance components should complement each other so that
adaptive motivational behavior can emerge in physical education.

As far as the composition of the cluster is concerned, fortunately a higher number
of students was found in the ‘high motivational’ group (40.28%). Furthermore, another
32.15% of the sample was found in the mastery profile group. As in other studies, the
results indicate that the group with fewer participants was the one that showed the
lowest motivation (Wang & Biddle, 2001; Ntoumanis, 2002; Moreno, Cervelló &
González-Cutre, 2007). However, for the sample in this study, approximately 27% of the students reported relatively low or very low levels of ego and task orientation and task-involving climate. This percentage should be worrying for the physical education context and the teachers and this group should be a focus of attention for the curriculum in classes. In this regard, Spray (2000) has suggested that in a compulsory education context, situational influences can have a stronger impact than goal orientations on motivation to learn. In this way, the results of the research support the idea of students having goals on entering their physical education classes (see Chen, 2001). Therefore, the design of learning tasks would play a critical role in the manipulation of students’ motivational perceptions and in their interest in learning. If that is the case, physical education teachers should participate in their classes using teaching strategies that improve positive emotions and feelings.

Prior studies on motivational profiles have found that girls are usually in the low motivation groups and in mastery-oriented clusters, whilst the boys are usually overrepresented in the high motivation groups (Wang & Biddle, 2001; McNeill & Wang, 2005; Moreno, Cervelló & González-Cutre, 2007). The findings of this study are partially consistent with that research. A greater number of boys were represented in the cluster characterized by high motivation. Moreover, girls were overrepresented in the mastery motivational profile group. Nevertheless, the representation percentage of girls in the low motivational cluster was not much higher than the boys’.

As far as motivational differences are concerned, research usually indicates that boys tend to perceive an ego-involving climate and be more ego-oriented than girls (Duda, 1989; White & Duda, 1994; Spray & Biddle, 1997; White, Kavassanu & Guest, 1998; Duda & Whitehead, 1998; Ntoumanis & Biddle, 1999; Carr & Weigand, 2001). On the other hand, several studies have demonstrated how gender determines children’s
perception within physical education classes and how it affects task engagement. Specifically, research that has examined the treatment of children of different genders has demonstrated that girls receive less positive feedback and do not have the same chances to participate as boys (Martinek, 1989; Lilleg, 1993). As studies have shown, teachers usually encourage boys more strongly than they do girls, and children probably perceive this unequal treatment (Martinek, 1989; Papaioannou, 1995; Cervelló et al., 2004). Results of this study suggest that it could foster certain levels of ego orientation and ego-involving climate and thus facilitate a complementary balance with task orientation and task-involving climate levels, as occurs in the high motivational profile group. In this respect, besides promoting flow experiences with task-involving environments, physical education teachers could create some aspects of an ego-involving motivational environment in order to effectively combine task and ego components. In general, future research should determine the extent and the manner in which both components could be combined to create adaptive achievement behaviors in physical education contexts. The complex nature of interaction between achievement goals, perceived motivational climate and students’ psychological state may depend on physical activity settings. Therefore, research should also be carried out with different physical activity settings and with different students of different ages. In this latter case, understanding the developmental pattern of motivational behavior in education would help us to know whether the high and mastery motivational profiles are more evident in early childhood and controlling low motivational profiles more widespread in late childhood and adolescence.

Certain limitations should also be acknowledged in this research. Firstly, the measurement of the variables was self-reported data and the use of these measurements may create error. In line with this first limitation, we must highlight that our work is a
correlational study and, therefore, the interpretation of the results is speculative and it is based a priori on theoretical assumptions that should be tested experimentally. Furthermore, it should be recognized that the relationships between motivation and flow experiences are probably affected by social and not only instructional goals. In this vein, recent studies have pointed out (Urdan & Maehr, 1995; Stuntz & Weiss, 2003; Guan, Xiang, McBride, & Bruene, 2006) that only using task and ego goal orientations to explain achievement behaviors may be incomplete and, therefore, social goals should also be considered in future studies to define success in achievement situations and understand students’ engagement (Wentzel, 1992, 1999).

REFERENCES


Motivation and flow in PE 31


Motivation and flow in PE 33


TABLE 1

MEANS, STANDARD DEVIATIONS, ALPHA COEFFICIENT AND CORRELATIONS FOR ALL VARIABLES

| Measure                                      | M    | SD   | α    | 1    | 2    | 3    | 4    | 5    | 5.1  | 5.2  | 5.3  | 5.4  | 5.5  | 5.6  | 5.7  | 5.8  | 5.9  |
|----------------------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 1. Ego involving motivational climate        | 3.26 | 1.45 | .77  | -.28 | -.20 | -.17 | .00  | .03  | .10  | -.03 | -.00 | -.08 | -.05 | .04  | .06  | -.11 |
| 2. Task involving motivational climate       | 6.11 | 1.51 | .73  | .04  | .32  | .36  | .31  | .23  | .36  | .29  | .30  | .32  | .19  | .18  | .38  |
| 3. Ego orientation                           | 5.20 | 2.97 | .92  | .38  | .30  | .31  | .28  | .24  | .28  | .19  | .25  | .19  | .25  | .19  |
| 4. Task orientation                          | 7.78 | 2.06 | .89  | .40  | .35  | .27  | .41  | .34  | .38  | .37  | .18  | .14  | .35  |
| 5. Dispositional Flow                        | 6.03 | 1.61 | .94  | .85  | .72  | .85  | .86  | .81  | .86  | .71  | .53  | .79  |
| 5.1. csflow                                  | 5.93 | 1.97 | .76  | .63  | .70  | .74  | .63  | .70  | .54  | .38  | .68  |
| 5.2. aaflow                                  | 5.30 | 2.05 | .76  | .55  | .60  | .47  | .55  | .42  | .37  | .47  |
| 5.3. cgflow                                  | 6.52 | 1.97 | .74  | .74  | .74  | .75  | .53  | .32  | .66  |
| 5.4. ufflow                                  | 6.46 | 2.12 | .80  | .69  | .77  | .55  | .32  | .63  |
| 5.5. ctflow                                  | 6.48 | 2.03 | .78  | .76  | .53  | .29  | .60  |
| 5.6. scflow                                  | 6.29 | 2.05 | .80  | .57  | .34  | .63  |
| 5.7. Isflow                                  | 6.02 | 2.22 | .76  | .32  | .46  |
| 5.8. ttflow                                  | 5.28 | 2.03 | .65  | .37  |
| 5.9. aeflow                                  | 6.44 | 2.15 | .78  |
TABLE 2

FINAL CONGLOMERATE CENTERS AND N FOR THE THREE-SOLUTION OF THE K-MEANS CLUSTER ANALYSIS

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Cluster Characteristics

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*< .001
FIGURE 1

CLUSTER PROFILES FOR THE THREE-CLUSTER SOLUTION OF THE K-MEANS CLUSTER ANALYSIS

100% Sample

75% Sample

50% Sample

25% Sample

-1.5
-1
-0.5
0
0.5
1
1.5
Ego-involving climate
Task-involving climate
Ego orientation
Task orientation
### TABLE 4

**DESCRIPTIVES AND ANOVA OF GLOBAL DISPOSITIONAL FLOW AND FLOW DIMENSIONS BY CLUSTER**

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* $p < .001$