

*Autonomy in the career decision-making process  
of high school students: A motivational profile  
approach.*

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Olímpio Manuel Lino Brás Paixão

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**Título:** Autonomia no processo de tomada de decisão de carreira em alunos de ensino secundário: Uma abordagem aos perfis motivacionais.

### **Resumo**

Este estudo procurou identificar perfis motivacionais de alunos de ensino secundário (N= 396; M= 17.02) utilizando uma análise de *clusters*, e verificar as diferenças entre os mesmos em termos de exploração e indecisão de carreira. Foram identificados três perfis motivacionais. Relativamente ao seu comportamento vocacional, o grupo de alunos autodeterminados mostrou ser o mais adaptativo e o grupo não autodeterminado foi o menos adaptativo. Verificou-se ainda o surgimento de um terceiro grupo de alunos altamente motivados e externamente regulados. No geral, os resultados sugerem que a Teoria da Autodeterminação (SDT) pode oferecer importantes reflexões acerca dos processos motivacionais envolvidos na exploração e tomada de decisão de carreira.

**Palavras-Chave:** perfis motivacionais, exploração de carreira, indecisão de carreira.

**Title:** Autonomy in the career decision-making process of high school students: A motivational profile approach.

### **Abstract**

This study sought to identify distinct motivational profiles using a cluster analytic approach in high school students (N= 396; M= 17.02), and to examine group differences in their career exploration behavior and career indecision levels. Three motivational distinct clusters of students were identified. Regarding the vocational behavior, the self-determined group was the most adaptive cluster, and the non self-determined group was the least adaptive cluster. A third cluster of highly motivated and externally regulated students emerged. Overall, results suggest that self-determination theory (SDT) can provide important insights into the motivational processes involved in career exploration and career decision making. Implications for career intervention are discussed.

**Keywords:** motivational profiles, career exploration, career indecision

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## Introdução

A exploração vocacional é um processo psicológico de exploração do mundo e de si próprio (Flum & Blustein, 2000; Jordaan, 1967; Taveira, 2001), crucial no desenvolvimento de carreira dos estudantes de ensino secundário, sobretudo pela proximidade aos momentos de tomada de decisão relativamente ao prosseguimento dos estudos no ensino superior ou à transição para o mundo do trabalho (Porfeli & Lee, 2012; Skorikov, 2007b). Diversos autores sustentam ainda que este processo vocacional garante a adaptabilidade de carreira (Blustein, 1997; Savickas, 2005), e facilita a tomada de decisão (Blustein, Pauling, DeMania, & Faye, 1994; Creed, Patton, & Prideaux, 2007; Patton & Porfeli, 2009; Taveira & Moreno, 2003) e as transições de carreira, ao longo do ciclo de vida (Patton & Porfeli, 2007; Phillips & Blustein, 1994; Phillips, Blustein, Jobin-Davis, & White, 2002; Praskova, Creed, & Hood, 2013), sendo por essa razão um dos mais frequentes focos das intervenções vocacionais (e.g., Betz, 1999; Blustein, 1992; Spokane, 1991).

Os estudos relativos aos antecedentes da exploração revelam que a variância explicada pelos preditores até agora considerados é bastante modesta (Bartley & Robitschek, 2000; Blustein, 1997). Vários autores apontam o funcionamento motivacional como um fator individual capaz de explicar a exploração e a tomada de decisão de carreira (e.g., Blustein, 1988, 1989, 1997; Blustein & Flum, 1999; Flum & Blustein, 2000; Porfeli & Lee, 2012; Stumpf, Colarelli & Hartman, 1983, Taveira, 2001). Neste âmbito, a Teoria da Autodeterminação (SDT, Deci & Ryan, 1985, 2000, 2008; Ryan & Deci, 2000b) surge como um quadro conceptual capaz de explicar o investimento nas atividades de exploração e de tomada de decisão de carreira (e.g., Blustein 1988, Guay, Senécal, Gauthier, & Fernet, 2003; Kiener, 2006), sobretudo devido ao foco que coloca na qualidade da motivação em detrimento da sua faceta mais quantitativa (Blustein, 1997; Vallerand, Pelletier, & Koestner, 2008).

Tanto quanto sabemos, são escassos os trabalhos empíricos que procuraram integrar as dimensões do funcionamento motivacional no estudo da exploração vocacional e da tomada de decisão de carreira. Para além disso, na maior parte das vezes, a análise da relação entre variáveis motivacionais e construtos vocacionais centra-se nas relações entre as variáveis (*variable centered approach*), o que, por sua vez, ignora a existência de diferentes perfis motivacionais na população em estudo (Moran, Diefendorff, Kim, & Liu, 2012; Vallerand, 1997; Vansteenkiste, Sierens, Soenens, Luyckx, & Lens, 2009).

Em resposta a esta insuficiência, diversos autores recorreram à análise de *clusters* (*person centered approach*) no estudo do impacto dos perfis motivacionais nas variáveis de

resultado, designadamente no contexto académico (e.g., Boiché, Sarrazin, Grouzet, Pelletier, & Chanal, 2008; Hayenga & Corpus, 2010; Liu, Wang, Tan, Koh, & Ee, 2009; Ratelle, Guay, Vallerand, Larose, & Senécal, 2007), no contexto profissional e do trabalho (e.g., Moran, Diefendorff, Kim, & Liu, 2012), e no contexto do desporto e atividade física (e.g., Ntoumanis, 2002).

Relativamente aos objetivos do estudo, recorreremos à análise de *clusters* no sentido de, em primeiro lugar, identificar perfis motivacionais, com base na SDT, recorrendo a uma escala de avaliação da autonomia para a tomada de decisão de carreira (e.g., CDMAS, Guay, 2005). Num segundo momento, conhecendo a forma como se organizam os participantes pelos perfis, procurámos verificar em que medida os grupos se diferenciavam nos comportamentos de exploração e na indecisão de carreira.

Numa amostra de 396 alunos de ensino secundário ( $M = 17.02$ ,  $SD = 1.12$ ) foram encontrados três perfis teoricamente relevantes. Dois desses grupos podem ser considerados opostos, isto é, um perfil de alunos autodeterminados ( $n = 114$ ), que apresentaram um comportamento vocacional mais favorável, e, por outro lado, um perfil de estudantes não autodeterminados ( $n = 95$ ), que revelaram um comportamento vocacional mais desfavorável (e.g., Deci & Ryan, 1985, 2000, 2008; Ryan & Deci, 2000a; Boiché, Sarrazin, Grouzet, Pelletier, & Chanal, 2008). O terceiro agrupamento ( $n = 75$ ) é constituído por alunos motivados mas externamente regulados (e.g., Ntoumanis, 2002), o que, por sua vez, sustenta a ideia de que em contextos naturais, como será o caso da escola, podemos observar a coexistência de formas mais externas e de formas mais internas de regulação num mesmo indivíduo (Duchesne, Mercier, & Ratelle, 2012; Ratelle, Guay, Vallerand, Larose, & Senécal, 2007; Vansteenkiste et al., 2009).

Na população em estudo, a identificação de estudantes com diferentes perfis motivacionais (incluindo os seus níveis de regulação) sublinha a importância de se adotar os princípios da diferenciação na organização das intervenções de carreira, uma vez que a promoção do interesse e do envolvimento nas questões do desenvolvimento de carreira deve ter em conta as características individuais dos orientandos, sobretudo ao nível das razões subjacentes ao envolvimento neste tipo de actividades (Blustein & Flum, 1999; Ryan & Deci, 2000b).

Através de uma perspetiva mais relacional e da adequada distinção das estratégias a utilizar com cada um dos grupos, podemos esperar benefícios no que se refere à promoção envolvimento dos alunos no seu próprio desenvolvimento de carreira, nomeadamente nos

processos de exploração e tomada de decisão de carreira (Blustein, 2011; Blustein & Flum, 1999; Flum, 2001; Porfeli & Lee, 2012; Savickas, 2005; Skorikov, 2007a).



## Literature Review

Career exploration plays a crucial role in high school students' career development, particularly for those who experience urgency to make decisions regarding the prosecution of studies in higher education or the transition to the world of work (Porfeli & Lee, 2012; Skorikov, 2007a). While a complex psychological process of exploration of the self and external environment (Flum & Blustein, 2000; Jordaan, 1967; Taveira, 2001), ensures career adaptability (Blustein, 1997; Savickas, 2005), facilitates the decision-making process (Blustein, Pauling, DeMania, & Faye, 1994; Creed, Patton, & Prideaux, 2007; Patton & Porfeli, 2009; Taveira & Moreno, 2003), and the career transitions that take place throughout the life-span (Patton & Porfeli, 2007; Phillips & Blustein, 1994; Phillips, Blustein, Jobin-Davis, & White, 2002; Praskova, Creed, & Hood, 2013). Therefore, career exploration is pointed out as one of the main and most frequent outbreaks of career interventions (e.g., Betz, 1999; Blustein, 1992; Spokane, 1991). Thus, it is essential to understand the contextual and individual antecedents of this important vocational process (Blustein & Phillips, 1988; Taveira, 2001).

Regarding individual factors, the literature highlights the growth initiative, openness to experience, *locus* of control (e.g., Fan, Cheung, Leong & Cheung, 2011; Kracke, 2002; Nauta, 2007), self-efficacy (e.g., Bartley & Robitschek, 2000; Blustein, 1989; Kracke, 2002; Nauta, 2007), and ones' expectations and career goals (e.g., Rogers & Creed, 2011; Rogers, Creed & Glendon, 2008). With respect to contextual factors, supportive environments (e.g., Cheung & Arnold, 2010; Rogers et al, 2008), which provide high levels of autonomy (e.g., Blustein, 1988; Kiener, 2006) and a great diversity of learning experiences (e.g., Flum & Blustein, 2000; Gamboa, Paixão & Jesus, 2013, Ryan & Deci, 2000a) are good predictors of the career exploration.

However, previous studies on career exploration have not produced very consistent results (Blustein, 1988, 1997, Patton & Porfeli, 2007), since the variance explained by the predictors considered until now is still very modest (Bartley & Robitschek, 2000; Blustein, 1997). Consequently, there are several authors that raise the hypothesis of the existence of other individual factors able to explain the exploration and career decision-making, in particular within the motivational functioning field (e.g., Blustein, 1988, 1989, 1997; Blustein & Flum, 1999; Flum & Blustein, 2000; Porfeli & Lee, 2012; Stumpf, Colarelli & Hartman, 1983, Taveira, 2001).

In this context, Self-determination Theory (SDT, Deci & Ryan, 1985, 2000, 2008; Ryan & Deci, 2000b) appears as a conceptual framework capable of explaining the investment in

exploration and career decision-making activities (e.g., Blustein 1988, Guay, Senécal, Gauthier, & Fernet, 2003; Kiener, 2006). In accordance with Blustein (1997) and Vallerand, Pelletier and Koestner (2008), the relationship that is established between the SDT and the referred vocational constructs is especially sustained by the focus that this theory gives to the measure of the quality of motivation over its more quantitative facet.

The SDT suggests the existence of three types of motivation that operate on a *continuum* that allow us to see the level of individuals' adjustment, namely: intrinsic motivation, extrinsic motivation and amotivation. The intrinsic motivation is reflected by an internal interest and personal satisfaction to a particular activity (here we verify the highest level of self-determination), while the extrinsic motivation refers to performing a task by the individuals' external forces. Underlying this type of motivation there are four levels of regulation: external regulation (the least self-determined; an intention to receive a reward or avoid a punishment), introjected regulation (avoidance of guilt or anxiety), identified regulation (recognition of the importance of an action to achieve a goal) and integrated regulation (the most self-determined; congruence between the consequences of a behavior and the individuals' values and needs - full internalization) (Deci & Ryan, 1985, 2000, 2008). Finally, the amotivation refers to the lack of motivation to a given goal, not existing any contingency between the actions and the consequences (Ryan & Deci, 2000b). In general, we consider that the analysis of an individuals' motivational functioning must take into account the internalization levels of the task values in the *self* and the regulation and self-determination levels (Deci, Eghrari, Patrick, & Leone, 1994; Ryan & Deci, 2000b; Vansteenkiste, Sierens, Soenens, Luyckx, & Lens, 2009).

In accordance with Blustein (2011) and Blustein and Flum (1999), the approach to the study of the relationship between motivation and career exploration should be focused on more relational dimensions. Thus, this vocational construct can be taken as a basic process in the career development (Taveira, 1997, 2001). In this line of thought, Flum and Blustein (2000), integrating SDT's contributions, propose a vocational exploration typology which distinguishes type A explorers: who tend to be intrinsically motivated and self-determined, who are actively involved in the construction and reconstruction of their identity, in order to achieve a higher level of coherence; and type B explorers, who, due to their lower autonomy for the vocational exploration, can be driven to become involved in the process because of external reasons. Once involved in these activities, it is assumed that the actual exploration process, in certain circumstances, can enhance the internalization, leading to more intrinsic motivation forms (Blustein & Flum, 1999).

The results found in the studies of the relationship of the SDT with the exploration and the career decision-making reveal that individuals who are externally regulated tend to look at exploration activities as unappealing or uninteresting, while the more self-regulated engage themselves more easily in these processes (Blustein, 1988).

Very recently, Jung's (2013) study (N= 349) reveals the existence of a strong relationship between high school students amotivation for university entrance and indecision about this event. In studies with university students, Kiener (2006) and Guay and colleagues (2003) found that students who are more intrinsically regulated are, as well, more attentive to their own needs and feelings, have better ability to introspection and are less susceptible to external suggestions. In addition, they are less undecided and more autonomous in relation to career decision-making, revealing also a more positive self-concept. In turn, Guay (2005), with the same type of sample, found that the most self-regulated students presented higher levels of autonomy for vocational exploration tasks and lower indecision levels. In the same line, Duchesne, Mercier and Ratelle's (2012) study (N= 521; M= 13.72) sought to differentiate vocational exploration profiles. Results revealed that the group of students that was more active in exploration presented higher levels in regulations closer to the intrinsic motivation, explored in a more diversified way and internalized more easily the tasks values that were assigned to them in school context (due to a higher level of awareness about the long-term consequences). However, these students had equally high levels of introjected regulation, which, according to Vansteenkiste and colleagues' (2009) work, can coexist with more self-regulated forms of motivation in natural contexts.

### **Present study**

As far as we know, there are very few empirical studies that considered the dimensions of motivational functioning in the study of career exploration and career decision-making. In addition, in educational context, the research that has examined the relationship of motivational variables (SDT) with the vocational constructs, adopted, most of the times, a variable centered approach, which ignores the existence of different motivational profiles in the population (Moran, Diefendorff, Kim, & Liu, 2012; Vallerand, 1997; Vansteenkiste et al., 2009). Aiming to fill this empirical gap, there are several authors who have resorted to a person centered approach (cluster analysis) to study the motivational profiles impact in the outcome variables, particularly in academic performance (e.g., Boiché, Sarrazin, Grouzet, Pelletier, & Chanal, 2008; Hayenga & Corpus, 2010; Ratelle, Guay, Vallerand, Larose, & Sénécal, 2007), in communication skills and metacognitive processes (e.g., Liu, Wang, Tan,

Koh, & Ee, 2009), in the professional performance and work autonomy perception (e.g., Moran et al., 2012), and in the effort and satisfaction with sports and physical activity (e.g., Ntoumanis, 2002).

In the present study, we used cluster analysis to identify different motivational profiles, based on the SDT. This exploratory multivariate technique categorizes the participants in homogeneous groups, based on characteristics shared by them, allowing the analysis of the differences between the different profiles (e.g., Härdle & Simar, 2003). Considering that high school students engaged themselves in career exploration and career decision-making for several reasons (e.g., Blustein & Flum, 1997; Flum & Blustein, 2000; Duchesne et al., 2012; Jordaan, 1969) and adopting different vocational strategies (e.g., Gamboa, Paixão, & Jesus, 2014; Germeijs & Verschueren, 2007), the relevance of cluster analysis is also justified by the need to describe and analyze the growing heterogeneity of secondary education students in Portugal, in particular with regard to their motivational functioning (Almeida, 2002; Alves, Almeida, Fontoura, & Alves, 2001). Therefore, and in line with Guay's (2005) and Guay and colleagues' (2003) suggestions, we chose to use a scale that evaluates precisely the autonomy for career decision-making (e.g., CDMAS, Guay, 2005) in the definition of motivational profiles. This scale allows the measurement of individuals' adjustment for the exploration and decision-making tasks and activities, i.e., the underlying reasons for task involvement, and not the results of that particular process (ex. indecision levels or frequency of exploratory behaviors).

According to SDT, we could expect the emergence of two distinct motivational profiles. However, taking into account the empirical studies we analyzed (e.g., Boiché et al., 2008; Hayenga & Corpus, 2010; Liu, et al., 2009; Moran et al., 2012; Ntoumanis, 2002; Ratelle et al., 2007), in the present study were explored solutions with more than two clusters, in order to be able to find groups with intermediate motivation levels. In addition, some authors argue that in natural contexts, as will be the school, it is possible to coexist more than one type of motivation (e.g., Duchesne et al., 2012; Vansteenkiste et al., 2009; Ratelle et al., 2007).

As a second objective, we wanted to verify how those motivational profiles differentiate among exploratory behaviors and career indecision levels. According to the literature, we expected that self-determined students profile presented high levels of exploration and low levels of indecision (e.g., Blustein, 1988; Guay, 2005; Kiener, 2006), whereas the group of non self-determined students would present low levels of exploration and high levels of indecision (e.g., Blustein 1988, Guay et al., 2003; Jung, 2013). However,

concerning the intermediate profile, we adopted an exploratory approach to conceptualize the relationship between motivational and vocational variables.

## **Method**

### **Participants**

Participants were 396 eleventh and twelfth grade students (175 boys, 44.2 %; 221 girls, 55.8 %). Ages ranged between 15 and 21 years old ( $M = 17.02$ ,  $SD = 1.12$ ). Regarding studies path, 84.8% were regular/academic students and 15.2% were vocational education students (VET). The socioeconomic status (SES) was determined by the highest qualification of both parents and then recoded in three levels (low = fourth grade or lower, medium = between fifth and twelfth grade, high = university degree). Thus, 34.2 % of the sample was coded as low SES, 39.8 % as medium SES, and only 26 % of the students were coded as high SES.

### **Measures**

A *Demographic Questionnaire* was used to collect information about students' age, gender, studies path, scholar retentions, and socioeconomic status.

*Autonomy for career decision-making* - The Portuguese version of Career Decision-Making Autonomous Scale (CDMAS; Guay, 2005; Silva, 2013) was used to assess motivational constructs posited by SDT (Deci & Ryan, 1985, 2000, 2008; Ryan & Deci, 2000). It consists of 32 items, equally distributed in eight activities related to career decision making: (1) seeking information on careers, (2) seeking information on school programs, (3) identifying options for a school program or a career, (4) working hard to attain a career goal, (5) identifying career options in line with a career goal, (6) identifying steps to follow in order to complete a school program, (7) identifying what one values the most in a career option, and (8) identifying a career option that is congruent with one's interest and personality. For each activity the participant indicates, on a 7-point item Likert-type response format (1 = does not correspond at all, 7 = to corresponds completely), the reason why he is participating in the activity. Specifically, we assessed motivations underlying actual behaviors and behavioral intentions. As referred, each activity has four items that correspond to CDMAS' subscales: Intrinsic Motivation ( $\alpha = .89$ ), Identified Regulation ( $\alpha = .86$ ), Introjected Regulation ( $\alpha = .94$ ), and External Regulation ( $\alpha = .94$ ). Other studies used the CDMAS and established

evidences that support its good psychometric properties (e.g., Guay, 2005; Guay et al, 2003; Silva, 2013).

*Career exploration* - Students' career exploration was assessed using the Portuguese version of the Career Exploration Survey (CES; Stumpf, Colarelli, & Hartman, 1983; Taveira, 1997). The CES is a multidimensional self-administered scale with 54 items using a Likert-type response format, designed to assess beliefs, processes and reactions to career exploration. However, we only used the items referring to the four processes of exploration - self exploration ( $\alpha = .70$ ), environment exploration ( $\alpha = .76$ ), intended- systematic exploration ( $\alpha = .62$ ), and amount of information ( $\alpha = .68$ ). The validity, reliability, and multidimensionality of the CES have been widely demonstrated (e.g., Bartley & Robitschek, 2000; Kiener, 2007; Koestner, Taylor, Loiser & Fichman, 2010; Taveira, 1997). Regarding the Portuguese version, confirmatory factor analysis (CFA), conducted by Taveira (1997), with a sample of ninth and twelfth grade students, supported a 12 first-order factor structure of the CES. Cronbach's alpha values presented above relate to the present study.

*Career indecision* - the Career Indecision subscale of the Portuguese version of the Career Decision Scale (CDS; Silva, 1997) was used to measure career indecision. Items 3-18 assess the extent and nature of career indecision. In this subscale, responses are recorded on a 4-point Likert-type scale (1 = low similarity of the student to the item, 4 = high similarity). Higher scores indicate more certainty and indecision respectively. Extensive research on the CDS has established strong evidence in support of its good psychometric properties (e.g., Creed et al., 2005; Guay, 2005; Guay et al., 2003; Osipow, Carney, Winer, Yanico, & Koschier, 1976; Silva, 1997; Skorikov, 2007a). In our study, internal reliability coefficient of the indecision subscale was .86.

## **Procedure**

After the initial phase in which the study was presented to the participating schools, we began establishing the groups and organizing the timing of the data collection. Subsequently, appropriate informed consent procedures (i.e., parents', students', and school boards' permissions) were followed in collecting data. The application of the instruments was done by trained co-researchers, in a classroom context, with the assistance of the professor of the class. On average, each assessment session lasted around 50 min. To ensure data confidentiality, an alphanumeric code was given to each questionnaire, then inserted and analyzed with statistical software SPSS (22.0).

## Results

Table 1 presents means, standard deviations, minimum, maximum, internal consistency and correlations between the studied variables. As expected, there were significant correlations between CDMAS subscales, especially between the ones that are closer in SDTs' *continuum*. Thus, the highest correlations values were observed among External and Introjected Regulation ( $r = .50$ ;  $p < .01$ ) and Identified Regulation and Intrinsic Motivation ( $r = .50$ ;  $p < .01$ ).

Results also present positive correlations among Intrinsic Motivation and all career exploration variables. In addition, Identified Regulation showed a positive correlation with Environment Exploration ( $r = .21$ ;  $p < .01$ ) and Self Exploration ( $r = .30$ ;  $p < .01$ ). Less self-determined levels of autonomy for career decision making presented positive correlations, namely among Self Exploration and Introjected ( $r = .22$ ;  $p < .01$ ) and External Regulation ( $r = .10$ ;  $p < .05$ ). Also, we can observe positive correlations between Indecision and External ( $r = .22$ ;  $p < .01$ ) and Introjected Regulation ( $r = .18$ ;  $p < .01$ ).

Regarding sociodemographic variables, Table 1 shows that older students presented higher levels of External Regulation ( $r = .10$ ;  $p < .05$ ) and Indecision ( $r = .23$ ;  $p < .01$ ) and lower scores of Identified Regulation ( $r = -.22$ ;  $p < .01$ ) than younger students. Concerning gender, girls had higher levels of Identified Regulation ( $r = .13$ ;  $p < .05$ ) than boys, which had more favorable Systematic-Intended Exploration ( $r = -.12$ ;  $p < .05$ ) and External ( $r = -.11$ ;  $p < .05$ ) and Introjected Regulation ( $r = -.12$ ;  $p < .05$ ). We can also observe that VET students presented more Indecision ( $r = -.39$ ;  $p < .01$ ), while Academic path students showed higher scores on Identified Regulation ( $r = .33$ ;  $p < .01$ ) and Intrinsic Motivation ( $r = .13$ ;  $p < .01$ ). Furthermore, results indicate that students who have one or more retentions tend to present high levels of External Regulation ( $r = -.19$ ;  $p < .01$ ) and Indecision ( $r = -.19$ ;  $p < .01$ ) whereas students without any retention presented higher levels of Identified Regulation ( $r = .19$ ;  $p < .01$ ). Finally, students from higher socio-economic status also scored higher on Identified Regulation ( $r = .18$ ;  $p < .01$ ).

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A motivational profile approach.

Table 1.

Means, standard deviations, minimum, maximum, internal consistency and correlations between all variables in study

	<i>M</i>	<i>SD</i>	Min/Max	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. ER	2.34	1.47	1/6.88	(.95)	.50**	-.09	-.01	-.03	.10*	.01	-.06	.22**	.10*	-.11*	-.09	-.19**	-.03
2. ITR	2.87	1.36	0.88/6.13		(.94)	.22**	.12*	.10	.22**	.01	.00	.18**	-.02	-.12*	.06	-.07	.04
3. IDR	5.52	1.10	2/7			(.90)	.50**	.21**	.30**	.08	.10	-.12*	-.22**	.13*	.33**	.19**	.18**
4. IM	4.91	1.35	1/7				(.90)	.28**	.28**	.16**	.24**	-.10	-.05	-.01	.13**	.02	.03
5. EE	2.79	.98	1/5					(.77)	.40**	.46**	.52**	-.13*	.05	.05	.00	.02	.02
6. SE	3.23	.89	1/5						(.73)	.27**	.12*	.16**	.02	.06	-.02	.02	.01
7. SIE	2.34	1.01	1/5							(.67)	.37**	-.05	.82	-.12*	-.04	-.05	-.07
8. AI	3.10	.82	1/5								(.73)	-.34**	-.01	-.06	-.03	.08	.06
9. IND	34.81	9.37	16/58									(.86)	.23**	.01	-.39**	-.19**	-.05
10. Age	17.02	1.12	15/21														
11. Sex	Male	Female															
%	44.2	55.8															
12. SP	VET	Academic															
%	15.2	84.8															
13. RET	Yes	No															
%	71.8	28.2															
14. SES	Low	Medium	High														
%	34.2	39.8	26														

1. ER - External Regulation, 2. ITR - Introjected Regulation, 3. IDR - Identified Regulation, 4. IM - Intrinsic Motivation, 5. EE - Environment, 6. SE - Self Exploration, 7. SIE - Systematic-Intended Exploration, 8. AI - Amount of Information, 9. IND - Indecision, 12. SP - Studies Path, 13. RET - Retentions, 14. SES - Socioeconomic status. VET - Vocational Education and Training. \*p < .05 ; \*\* p < .01. Internal consistency is shown between parentheses



### *Cluster Analysis*

We employed a K-means nonhierarchical aggregation algorithm, which initially distributes subjects based on the number of clusters defined by the researcher and the centroid calculated for each K cluster. The Euclidean distance of the centroids to each subject in the database was then calculated to group subjects in the clusters with the nearest centroid. However, because the K-means procedures use Euclidian distances and to ensure that all measures contributed equally to the analysis, the original variables were standardized to generate a set of  $z$  scores (mean of 0 and a standard deviation of 1). Cases with standard scores greater than three were classified as outliers and were removed from further analyses. Due to the absence of a standardized procedure for determining the optimal number of clusters in the analysis, the criteria most frequently mentioned in the literature (e.g., Marôco, 2003) were adopted to ensure that a sufficient number of groups were identified, that the distribution of subjects into clusters was balanced, that statistically significant differences between clusters for each variable were determined, and that the theoretical relevance of each solution was assessed. Additionally, taking into account that the highest correlation coefficient observed was .50, we considered that there was no multicollinearity problems (Hill & Hill, 2005; Maroco, 2003). Finally, cubic cluster criterion was used as indicator for the optimal number of clusters. These criteria produced a three-cluster solution, based on motivational variables, providing the most reasonable interpretation of the data. Table 2 shows global means and standard deviations for all the variables in study, as well as the distribution of the demographic variables in the three-cluster solution. Table 2 also presents the results of the analysis of variance (ANOVA) that were performed to determine the relative contribution of the different motivational variables to the differentiation of the clusters as well as the corresponding effect size ( $\eta^2$ ). The variables that contributed the most to the discrimination among the groups were: Introjected Regulation,  $F(2, 369) = 273.94$ ,  $p < .05$ ,  $\eta^2 = .60$ , followed by Identified Regulation,  $F(2, 369) = 153.81$ ,  $p < .05$ ,  $\eta^2 = .46$ , and Intrinsic Motivation,  $F(2, 369) = 156.86$ ,  $p < .05$ ,  $\eta^2 = .46$ . External Regulation was the one that has the lower effect size,  $F(2, 369) = 85.60$ ,  $p < .05$ ,  $\eta^2 = .32$ .

Cluster 1 ( $n = 114$ ) was labeled as the “Self-determined” group, being characterized by the lowest scores of external and Introjected regulations and  $z$  scores of identified regulation and intrinsic motivation above the global mean value.

Cluster 2 ( $n = 75$ ), with the highest scores of external and introjected regulations and lower  $z$  scores of identified regulation and intrinsic motivation, was labeled as the “External regulated”.

Finally, cluster 3 ( $n = 95$ ) presented the lowest  $z$  scores of identified regulation and intrinsic motivation, as well as levels of external and introjected regulation beyond the mean values. It was labeled as the “Non self-determined” group of students.

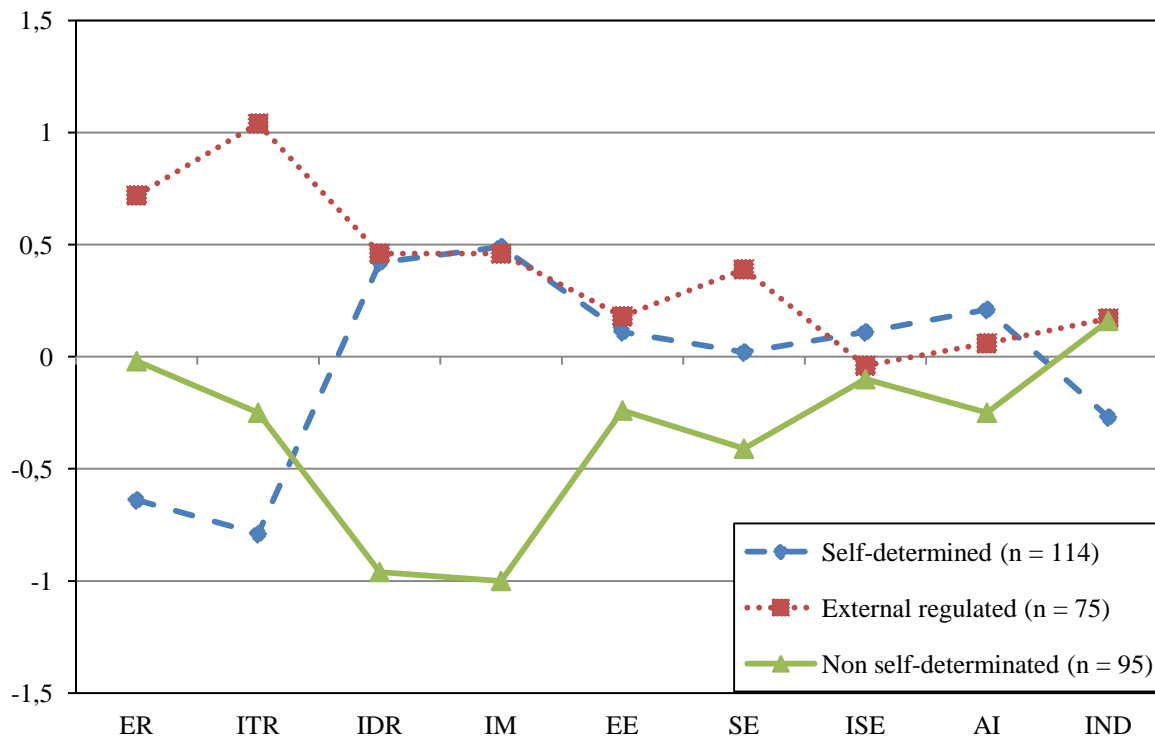
Table 2.

Means, standard deviations and *z* scores for the clustering and criterion variables in the three-cluster solution (ANCOVA)

	Cluster 1 ( <i>n</i> = 114)			Cluster 2 ( <i>n</i> = 75)			Cluster 3 ( <i>n</i> = 95)			<i>F</i>	<i>p</i>	$\eta^2$		
	<i>M</i>	( <i>SD</i> )	<i>z</i>	<i>M</i>	( <i>SD</i> )	<i>z</i>	<i>M</i>	( <i>SD</i> )	<i>z</i>					
External Regulation	2.35	(1.47)	1.38 <sup>a</sup>	(.57)	-.64	3.38 <sup>b</sup>	(1.72)	.72	2.35 <sup>c</sup>	(1.09)	-.02	85.60	.000	.32
Introjected Regulation	2.87	(1.36)	1.82 <sup>a</sup>	(.86)	-.79	4.29 <sup>b</sup>	(.78)	1.04	2.51 <sup>c</sup>	(.96)	-.25	273.94	.000	.60
Identified Regulation	5.52	(1.10)	6.02 <sup>a</sup>	(.75)	.42	6.05 <sup>ab</sup>	(.67)	.46	4.40 <sup>b</sup>	(.95)	-.96	153.81	.000	.46
Intrinsic Motivation	4.85	(1.35)	5.50 <sup>a</sup>	(.95)	.49	5.45 <sup>a</sup>	(.96)	.46	3.49 <sup>b</sup>	(1.04)	-1.00	156.86	.000	.46
Environment Exploration	2.81	(.97)	2.89 <sup>a</sup>	(.92)	.11	2.96 <sup>a</sup>	(1.05)	.18	2.55 <sup>b</sup>	(.90)	-.24	6.48	.002	.03
Self Exploration	3.23	(.89)	3.24 <sup>a</sup>	(.81)	.02	3.57 <sup>b</sup>	(.90)	.39	2.86 <sup>c</sup>	(.82)	-.41	22.59	.000	.11
Intended-Systematic Exploration	2.33	(1.01)	2.45 <sup>a</sup>	(1.11)	.11	2.30 <sup>a</sup>	(.98)	-.04	2.24 <sup>a</sup>	(.91)	-.10	1.90	.150	.01
Amount of Information	3.11	(.81)	3.27 <sup>a</sup>	(.78)	.21	3.14 <sup>a</sup>	(.80)	.06	2.90 <sup>b</sup>	(.82)	-.25	7.18	.001	.04
Indecision	34.92	(9.39)	32.33 <sup>a</sup>	(8.96)	-.27	36.44 <sup>b</sup>	(9.47)	.17	36.30 <sup>ab</sup>	(9.21)	.16	6.04	.003	.04
Cluster characteristics														
Age	16.99	(1.11)	16.88	(1.02)		16.90	(1.10)		17.20	(1.21)				
Studies Path	VET	Academic	VET	Academic		VET	Academic		VET	Academic				
%	15.9%	84.1%	3.5%	31.4%		4.1%	29.5%		8.6%	23%				

VET - Vocational Education and Training, A - Academic

In the next step, in order to verify if there were cluster differences (inter-subject factor) in the criterion variables (self-exploration, environment-exploration, intended-systematic exploration, amount of information and indecision), a multivariate analyses of covariance (MANCOVA) was conducted, being covariates student's age and studies path. Significant between-subjects effects was observed (Roy's Largest Root = 1.84,  $F(4, 363) = 167.21$ ,  $p < .05$ ,  $\eta^2 = .65$ ). Univariate analyses of covariance (ANCOVAs) showed that the three clusters differed significantly in environment exploration,  $F(2, 368) = 6.48$ ,  $p < .05$ ,  $\eta^2 = .03$ , self-exploration,  $F(2, 368) = 22.59$ ,  $p < .05$ ,  $\eta^2 = .11$ , amount of information,  $F(2, 352) = 7.18$ ,  $p < .05$ ,  $\eta^2 = .04$ , and indecision,  $F(2, 338) = 6.04$ ,  $p < .05$ ,  $\eta^2 = .04$ . Figure 1 show the cluster profiles, based on  $z$  score values, for the three-cluster solution with the criterion variables. As we can observe, "Self-determined" group of students presents exploration levels above the global mean value, with particular emphasis to systematic-intended exploration and amount of information (the highest of three groups). Also, this group scored the lowest levels of career indecision of the three-cluster solution. The "External regulated" students had the highest levels of environment and self regulation as well as career indecision. Lastly, "Non self-determined" group presented the lowest levels among all exploration variables and high indecision values.



**Fig.1.** Cluster profiles of the motivational and criterion variables for the three-cluster solution.

Post-hoc Tukey HSD tests were conducted to examine how the groups differed in motivational and criterion variables. Results presented in Table 2 reveal significant differences between “Self-determined” group and “External regulated” group at external, introjected and identified regulation, self exploration and indecision. Likewise, if we compare “Self-Determined” and “Non self-determined” groups we can observe significant differences among all the variables except intended-systematic exploration and indecision. Finally, “External regulated” students are significantly different from “Non self-determined” at external and introjected regulation, intrinsic motivation, environment and self exploration and amount of information.

## Discussion

The purpose of this study was to, firstly, identify motivational profiles based on SDT (Deci & Ryan, 1985, 2000, 2008; Ryan & Deci, 2000a), and, secondly, verify how they differentiate among exploration behaviors and career indecision.

As expected, cluster analysis organized the participants in three distinct and conceptually relevant motivational groups. Theoretically, as suggested by SDT and Boiché and colleagues study (2008), two of these profiles can be considered opposites, i.e., a self-determined and a non self-determined profile of students. However, as in Ntoumanis (2002) a

third group of external regulated students emerged. Therefore, this profile, in line with Duchesne and colleagues (2012), Ratelle and colleagues (2007) and Vansteenkiste and colleagues (2009), supports the idea that in natural contexts, as in schools, we can observe the coexistence of intrinsic and external forms of regulation.

The following step was to clarify how the three clusters differed among exploration and career indecision. As expected, self-determined students presented the most favorable vocational behavior (e.g., Boiché, et al., 2008; Deci & Ryan, 1985, 2000, 2008; Ryan & Deci, 2000a), which resulted in high levels of exploration, especially regarding intended-systematic exploration and amount of information, and the lowest levels of indecision. These results appear to be similar to Blustein (1988), Guay and colleagues (2003) and Kiener (2006) findings, which present these students as more autonomous and involved in the exploration process and having low career indecision levels. Moreover, among the three identified groups, the non self-determined students revealed the most unfavorable vocational behavior. They presented low levels of career exploration and high levels of indecision (e.g., Boiché et al., 2008; Ntoumanis 2002). According to Deci and Ryan (2000), Guay (2005) and Jung (2013), students with this motivational profile tend to have greater difficulty in internalizing exploration tasks and to being more vulnerable to external suggestions from peers, teachers and family. Similar to the self-determined group, the third profile presented high levels of motivation, which seems to be associated to a more active exploration, as observed in Duchesne and colleagues (2012). However, this profile revealed to have the higher levels of career indecision. By comparison with self-determined students, these levels may be associated with the prevalence of external regulation, fewer gathering of information, and less intended-systematic exploration. Thus, it is valid to infer that high levels of exploration don't always result in low levels of career indecision (Germeijs & Verschueren, 2007).

In summary, two of the profiles in this study can fit into the Flum and Blustein (2000) explorers' typology. The non self-determined students would be the type B explorers, due to the highest levels of extrinsic than intrinsic motivation and lowest levels of career exploration. On the other hand, self-determined students correspond to type A explorers, since they present high levels of intrinsic motivation (the highest of the three groups), favorable levels of exploration and low career indecision. In addition, a third group comprising highly motivated students but externally regulated emerged. These students revealed the highest value of career indecision and, from the point of view of the internalization process, they could lie in between type B and type A explorers, as their involvement in career exploration seems to stem partly due to further extrinsic reasons.

## **Implications**

This study contributes to the analysis between motivational dimensions and career development, since motivational profiles can distinguish students among exploration behaviors and career indecision levels. Generally, the results offer great support to the assumption that the relationship between SDT and the referred vocational constructs is sustained mainly on the motivational quality, i.e., the underlying reasons for the individuals' involvement in career exploration and career decision making and not so much in its quantitative facet (e.g., Blustein, 1997; Vallerand et al., 2008; Vansteenkiste et al, 2009).

Consequently, in line with the suggestions of Flum and Blustein (2000), SDT appears to be a clear conceptual frame to organize career interventions aiming to promote more autonomous and self-determined types of career exploration and decision making. Moreover, the possibility to organize the students by their motivational profile (and regulatory levels) lead us to reaffirm the importance of differential practices within the career intervention domain. Thus, the self-determinate group, which presents the most favorable vocational behavior, will benefit from high levels of autonomy regarding the career exploration process, i.e., a great diversity of opportunities to explore the occupational reality and reflect about themselves.

On the other hand, career interventions with the non self-determinate students, which present the lowest levels of career exploration and high levels of indecision, should organize exploration activities, i.e., step by step, following specific goals. In this group, career counselors and practitioners should look for an increase of competence by facilitating the internalization of short-term activities' values to long-term goals, and providing clear and relevant instructions on how to look for, how to process and how to use the information (e.g., Blustein & Flum, 1999, Duchesne et al., 2012). Thus, individuals that, in the first place, may not be aware of the importance of the exploration activities could gradually perceive the potential of these activities to ones' career development.

Lastly, interventions for the external regulated students should privilege challenging yet supportive experiences, aiming to reinforce existing strengths and develop new ones, such as group counseling. Furthermore, enhancing the level of competence could be useful in the transition from a more external to a more internal regulation towards career exploration activities (e.g., Blustein & Flum, 1999; Duchesne et al., 2012). Following these suggestions and based in a relational perspective, school psychologists and career counselors could help high school students to: a) amplify the effort in exploration, helping them to feel as authors of

their own career; b) use the therapeutic relationship to provide emotional and relational support and facilitate the access to their systems (especially peers and family); and c) to promote higher interest in career issues (Blustein, 2011; Blustein & Flum, 1999; Flum, 2001; Porfeli & Lee, 2012; Savickas, 2005; Skorikov, 2007b).

### **Limitations and Future Research**

Concerning the limitations of our study, first, it is important to highlight that the fact of being a cross-sectional study does not allow us to infer causal directions between motivational profiles and career development outcomes. Thus, experimental and longitudinal research is needed to study the factors associated to the stability of motivational profiles (e.g., contextual level and individual level), and their predictive power over career exploration and career decision making development.

A second limitation was the sample size that doesn't allow generalization of results to all high school students. Thus, future research must include the diversity of study paths in secondary education level. Further studies should also try to explain the differences between highly motivated students regarding career decision making process, since they can present either low or high levels of indecision.

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