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ABSTRACT

Theoretical and empirical literature developed over recent years supports the concept of employability as a construct combining complex interactions of individual and contextual dimensions. This study aimed to identify differentiated profiles in graduates, combining personal and contextual variables related to employability. For this, 182 graduates from a public university were surveyed about their sociodemographic and educational pathways and employment status 18 months after university-to-work transition. Then, a latent class analysis was performed, which allowed the emergence of four distinct groups: *well-equipped, high demand, vulnerable* and *non-traditional* pathways. By adopting a person-centered approach, this study allowed the identification of different combinations of factors that, although recognized in current literature, seem to organize themselves differently among the heterogeneous population that presently obtain a higher education degree. This study also raises some practical implications, namely the importance of differentiated interventions, taking into consideration the specificities of each group.

Introduction

The topic of graduate employability has gained particular relevance, especially as access to Higher Education has become more widespread over the past few years (Bennett 2019; OECD 2018). In addition to that, new social and economic demands, largely resulting from globalization and rapid technological advances, have led Higher Education institutions to rethink the education and training offered, so that it can better adapt to the current needs of society and employers' organizations (Bennett 2019; Clarke 2018; Donald, Ashleigh, and Baruch 2018; Sin and Amaral 2016). Entrance into the labor market might be challenging for new graduates, particularly for graduates from areas where there are fewer job offers, such as the Humanities and Social Sciences (Allen and van der Velden 2007), and young adults will need to be able to identify and generate new opportunities (Bennett 2019; Morgeson, Delaney-Klinger, and Hemingway 2005). The current complexity of the world of work suggests that newcomers to the labor market will need to activate and mobilize a complex set of attributes that may change over time and in different contexts (Savickas 2012).

Theoretical and empirical literature developed over recent years supports the concept of employability as a construct combining complex interactions of individual and contextual factors (Dacre Pool and Sewell 2007; Raffe 2014; Tomlinson 2017; Yorke and Knight 2004). Given such complexity,

different approaches to employability have been presented, namely the competence-based approach and the dispositional-based approach (Vanhercke et al. 2014). The first emphasizes the perceptions of abilities, skills and capacities as promoters of employability (Heijde and Van der Heijden 2006). The second is based on the perceptions of proactive attitudes regarding career and work (Fugate and Kinicki 2008). Both of these approaches focus on a micro and subjective level, under the perspective that self-perceptions have an important role in determining their own employability (Vanhercke et al. 2014). Taking a cross-sectional view of the various approaches found in employability literature, several variables are hereinafter described.

Factors influencing employability

Gender and employability

Gender inequalities have been established as an issue in relation to several employment outcomes, namely salary levels, career promotions, self-employment and reaching executive positions (Álvarez, Gradín, and Otero 2013; Bertrand, Goldin, and Katz 2010; Gayle, Golan, and Miller 2012; Ginther and Kahn 2004), with disadvantageous results for women. Likewise, women apparently derive less profit from extracurricular experience, work experience and training for career development (Stevenson and Clegg 2012; Tharenou, Latimer, and Conroy 1994). Concerning university-to-work transition, previous studies have also demonstrated gender differences, with female graduates presenting less positive perceptions of preparation and lower expectations of successful transitions (e.g. Monteiro, Almeida, and Garcia-Aracil 2016); men, on the other hand, show a greater propensity to secure permanent and full-time employment and to reach better matches between their educational level and employment (e.g. Vuorinen-Lampila 2016).

Age and employability

Age is considered a controversial variable in the field of employability because it might be difficult to disentangle from other variables, particularly at older ages (Froehlich, Beausaert, and Segers 2015). Probably for this reason, previous empirical research addressing age's relationship with professional success is ambiguous. For example, Purcell, Wilton, and Elias (2007) suggest that mature students up to 30 years old present similar experiences to their younger peers. Blasko et al. (2002) report that students taking part in HE between 21 and 24 years of age experience some advantages in the LM in comparison to younger colleagues, such as engaging in professional activity commensurate with their level of education and experiencing greater professional satisfaction. Nevertheless, several authors have identified greater difficulties from older workers adapting to career changes, especially when workers have maintained the same profession and job for a long time (Heckhausen, Wrosch, and Schulz 2010; Van der Horst, Klehe, and Van der Heijden 2017). Such ambiguity between studies may result, on one hand, from the accumulation of experience that typically follows the advancement of age, which increases individual heterogeneity (Staudinger and Bowen 2011). On the other hand, different results seem to derive from different age ranges (Woodfield 2010). Moreover, core individual differences can play an important role in activating career adaptive resources and amortizing the impact of age on career transitions (Van der Horst, Klehe, and Van der Heijden 2017).

Work experience and employability

Similarly, work experience seems to positively affect the development of other competencies (Allen and van der Velden 2011), professional awareness (Beavis, Curtis, and Curtis 2005), and 'job-getting skills', such as CV and interview preparation (Hillage and Pollard 1998), although its impact apparently also depends on the type (being study-related or not), reflection on and duration and evaluation of

such experiences (Allen and van der Velden 2009; Blasko et al. 2002; Dacre Pool and Sewell 2007; Harvey 2005).

Parental education and employability

Parental education is one common representative variable of a social and cultural background, due to the strong impact it seems to exert on family income, future child occupation (Erola, Jalonen, and Lehti 2016) and relevant cultural capital and soft skills for increasing the chances of securing a job (Malar 2011). Blasko et al. (2002) identify direct effects across graduates from disadvantaged backgrounds when experiencing conditions of unequal access to the labor market, despite similar educational pathways, and indirect effects when such inequality arises from disadvantageous educational conditions. From this same perspective, Tomlinson (2017) argues that graduate capital is a crucial dimension for promoting access to human, social, cultural, identity and psychological resources, which in turn, will impact employment outcomes.

Competencies and employability

Graduates' competencies are among the domains that have been most strongly correlated with employability, namely with higher perceived employability and perception of preparation to work (García-Aracil, Monteiro, and Almeida 2018; Qenani, MacDougall, and Sexton 2014; Vanhercke et al. 2014; Wittekind, Raeder, and Grote 2010). Some researchers have specifically addressed the question of correspondence between competencies developed through education and competencies required in the labor market. The overall results suggest that technical competencies are well-developed, but, in contrast, transversal competencies are below the current contextual requirements (McMurray and Dutton 2016; Monteiro, Almeida, and Garcia-Aracil 2019; Teijeiro, Rungo, and Freire 2013).

Career management resources and employability

Research has also suggested that graduates' competencies impact on professional development can occur not only in a direct way, but also indirectly, being mediated by career management competencies (Monteiro, Ferreira, and Almeida 2020; Rocha 2012; Savickas 2013; Taber and Blankemeyer 2015). Career management resources, such as career adaptability, which refers to the set of resources that enable coping with predictable tasks and unpredictable adjustments (Savickas 1997), have been proposed as crucial conditions for individuals to take best advantage of their attributes to adapt to contextual demands and to continuously develop new competencies (Bridgstock 2009; Dacre Pool and Sewell 2007; Savickas 2013).

The present study

The diversity and complexity of factors that have shown a relationship with employment outcomes, especially in a context of high turbulence and job unpredictability, suggests there are several pathways that might open doors for employability. Most studies in this field have used variable-oriented approaches, which means that knowledge is developed through the relationships between variables. The concept of employability that underlies this study integrates the importance of the interconnection of the individual with his/her surrounding context and arises from the definition proposed by Fugate, Kinicki, and Ashforth (2004, 15): *a psychosocial construct that embodies individual characteristics that foster adaptive cognition, behaviour, and affect, and enhance the individual-work interface.* For this reason, a person-oriented approach in the field of employability is considered relevant, because it allows aggregating similarities in groups of samples that are characterized by a high level of heterogeneity. This type of approach in the topic of employability is still rare (Rudolph,

Zacher, and Hirschi 2019). Some studies using latent profile analysis were identified with employees in later career stages, namely, focusing on job characteristics profiles (Mäkikangas et al. 2018), types of career orientation (Gerber et al. 2009), job insecurity profiles (De Cuyper et al. 2019) and job types and employee outcomes (De Spiegelaere, Ramioul, and Van Gyes 2017). The study of employment profiles, taking individual characteristics together with perceptions of competencies and career resources during university-to-work transition, represents a novelty in the field.

Taking the above-mentioned factors into account, the main aim of this study is to gain a deeper understanding of employability for higher education graduates, considering its recognized complexity. To this end, we will search for different employability profiles, using the latent class technique. With this technique, groups will be characterized from the list of variables described in a literature review: gender, age, parental education, work experience, competencies, career management resources and employment situation.

The research questions that will drive this study are: (i) are there different employability profiles among the participants of this study? If yes, (ii) how do these different groups are characterized? and (iii) which differences emerges between those groups?

According to the literature, it can be expected that women and individuals with lower parental education may represent a group with more difficulties and, consequently, express lower levels of employability. In relation to age, although in isolation it may be a disadvantageous factor for employability, it might be expected to be a favorable factor in cases where it is associated with longer work experience. Lastly, it is expected that individuals with higher perceptions of competencies and career resources will demonstrate higher employability levels. Beyond these individual and education variables, some differentiation between groups according with their study field is also expected, namely, students coming from engineering fields with more favorable employment rates compared to students coming from the domain of the Social Sciences.

Method

Participants

A convenience sample of 182 graduates from a public university participated in this study, from four study fields: Economics (27%), Social Sciences (32%), Law (7%) and Engineering (34%). The average age of the participants was 25 years old and nearly 60% of the participants were female (n=108). Parents' education of the participants was heterogeneous among a maximum of 4 years of schooling (15%), maximum of 9 years of schooling (40%), secondary school (30%) and higher education (17%). About 60% of the participants reported having had some sort of work experience during their Higher Education studies.

Procedure

Data presented in this study are part of a broader longitudinal project that aimed to study graduates' employability, with several research aims: (i) to develop and validate instruments that can contribute to the understanding of graduate employability (Monteiro and Almeida 2015; Monteiro, García-Aracil, and Almeida 2019); (ii) to characterize graduates with regard to their perceptions of competencies and preparation to work transition (García-Aracil, Monteiro, and Almeida 2018; Monteiro, Almeida, and Garcia-Aracil 2016); (iii) to explore the relation between graduates and employers' perceptions about competencies developed during higher education studies (Monteiro, Almeida, and Garcia-Aracil 2019); (iv) to explore the role of career adaptability in graduates' employability (Monteiro, Ferreira, and Almeida 2020; Monteiro, Taveira, and Almeida 2019). The study design of this project consisted in an initial contact of the participants in the final year of their Master's course, in a classroom context, where they provide general information concerning sociodemographic and educational pathways, such as age, gender, study field, work experiences and parents' education, and signed

an informed consent form that included a description of the aims of the study (wave 1). Then, about 18 months after work transition, participants were contacted by email, to complete an online survey, where they reported their employment status and completed the instruments described below (wave 2).

Measures

Perceived competencies

Participants were surveyed about their perceived scientific, practical and transversal competencies. For this, a 5-point Likert item was formulated, ranging from 1 ('very weak') to 5 ('very strong'): 'Overall, how do you rate the quality of your university education regarding your development in each of the following areas of knowledge/competency?' A short definition of the competencies was presented to participants, as follows: scientific competencies – theoretical content of the course; practical competencies – technical training to perform a job; transversal competencies – the set of competencies transferable to various professional activities, following the classification proposed by Garcia-Aracil and van der Velden (2008): communication competencies – speaking and writing clearly and effectively; methodological competencies – ability to use tools and resources, such as problem analysis, information technologies, speaking a foreign language; interpersonal competencies – ability to work and interact with others, and to lead, manage conflicts, work in a team, motivate others, etc.; participative competencies – initiative, autonomy, self-motivation, decision-making, identification of opportunities, innovation, lifelong learning, etc.; organizational competencies – ability to organize tasks, to plan, to collect and process information, to be attentive to detail, etc.; socio-emotional competencies – ability to manage emotions and tolerate stress, self-confidence, self-control, etc.; generic competencies – general knowledge, sense of citizenship, ethical awareness, etc.; and employability competencies – job search strategies, adaptability and career decisions. The instrument revealed good validity evidence base on the internal structure. The original dimensionality (one-factor structure) was confirmed by a CFA using the WLSMV estimator ($\chi^2(35) =$ 93.390; $p < 0.001$; $\chi^2/df = 2.668$; $n = 182$; $CFI = .975$; $NFI = .960$; $TLI = .967$; $SRMR = .076$; $RMSEA = 0.096$; P(RMSEA) ≤ 0.05; $= .001$; 90% CI].073; .120[) and reliability (internal consistency) for the single lantent factor ($\alpha = .86$; $\omega = .80$). In addition, concerning university-to-work transition, participants were asked about their perceived preparation and expectations of success on a 5-point Likert scale, and about anticipated difficulties (dichotomous yes/no item).

Career adaptability

Career adaptability resources were measured through the Career-Adapt-Abilities Scale (Monteiro and Almeida 2015), adapted from the original version developed by Savickas and Porfeli (2012) and from the Portuguese version published by Duarte et al. (2012). This scale is composed of four subscales: (i) concern – awareness of and planning for vocational future; (ii) control – self-discipline to shape the self and the environment in order to cope with challenges; (iii) curiosity – propensity for the exploration of self and contextual situations; (iv) – confidence – self-efficacy in relation to career aspirations and career decisions (Porfeli and Savickas 2012). Each of these subscales comprised 6 items, formulated on a 5-point Likert scale ranging from 1 ('strongly disagree') to 5 ('strongly agree'). '). The instrument revealed good validity evidence base on the internal structure. Such validity was good both in terms of dimensionality, where the original second-order model was confirmed through a CFA using the WLSMV estimator ($\chi^2(248) = 398.573$; $p < 0.001$; $\chi^2/df = 1.607$; $n = 180$; $CFI = .989$; $NFI = .973$; $TLI = .988$; $SRMR = .075$; $RMSEA = 0.058$; P(RMSEA) ≤ 0.05; $= .101$; 90% CI].047; .069[) and reliability (internal consistency) with both second-order ($\omega_{partial\ L1} = .96$; $\omega_{L1} = .88$; $\omega_{L2} = .91$) and first-order ($\alpha_{Concern} = .82$; $\omega_{Concern} = .82$; $\alpha_{Control} = .83$; $\omega_{Control} = .83$; $\alpha_{Curiosity} = .87$; $\omega_{Curiosity} = .87$; $\alpha_{Confidence} = .89$; $\omega_{Confidence} = .89$) reliability estimates showing good values. Since the first-order dimensions were used individually in the subsequent analyses, the common method variance was tested using the

Table 1. Descriptive statistics of the variables inserted in the model.

Variables		Mean	Standard Deviation	Min.	Max.	Skewness	Kurtosis
Employment		1.21	0.41	1	2	1.38	−0.09
Individual characteristics	Gender	1.41	0.49	1	2	0.38	−1.87
	Age	24.91	5.82	21	53	2.57	6.97
	Parental education	2.78	1.03	1	4	−0.48	−0.91
	Work experience	1.60	0.49	1	2	−0.39	−1.86
	Course	2.44	1.20	1	4	0.23	−1.51
Perceptions of competencies	Theoretical	3.98	0.66	2	5	−0.20	−0.10
	Practical	3.26	0.92	1	5	−0.32	−0.33
	Communication	3.75	0.70	2	5	0.10	−0.56
	Methodological	3.70	0.75	2	5	−0.22	−0.24
	Interpersonal	3.85	0.80	1	5	−0.49	0.55
	Participative	3.79	0.74	2	5	0.03	−0.61
	Organization	3.97	0.74	1	5	−0.51	0.66
	Socioemotional	3.64	0.89	1	5	−0.55	0.56
	Generic	3.79	0.77	1	5	−0.32	0.16
	Employability	3.25	0.91	1	5	−0.34	−0.08
Perceptions	Preparation transition	3.30	0.84	1	5	−0.21	−0.18
	Expectations transition	3.38	0.91	1	5	−0.51	0.37
	Difficulties anticipated	1.64	0.48	1	2	−0.59	−1.66
Career Adapt	Concern	3.97	0.53	2.17	5.00	−0.42	0.54
	Control	4.19	0.48	2.50	5.00	−0.27	0.03
	Curiosity	3.93	0.53	2.83	5.00	0.12	−0.62
	Confidence	4.22	0.46	2.83	5.00	−0.05	−0.41

Harman's Single-Factor Test (Podsakoff and Organ 1986), which explained only 25% of the total variance.

Data analysis

The analyses were performed using the statistical software R (R Core Team, 2018). The xlsx package (Dragulescu and Arendt 2019), version 0.6.1, read and imported the excel data file containing the dataset of the study in an R environment. The depmixS4 package (Visser and Speekenbrink 2019), version 1.4-0, performed the latent class analysis, which is based in the assumption there is an underlying and unobserved categorical variable that organizes a population into mutually exclusive groups (Collins and Lanza 2010). Seven models were compared using the Bayesian Information Criterion (BIC). This criterion was used to choose the number of latent classes, where each model was composed by different number of classes (Dean and Raftery 2010). Such models can then be compared using the BIC which is consistent under certain regularity conditions, it estimates consistently the number of mixture components, when all variables are relevant to the grouping (Keribin 2000). Altogether, the BIC is a consistent model selection criteria also on a practical level (Fraley 1998). The best model was the one that showed the lowest BIC value. Alternatives BIC for high-dimensional models were proposed as the one proposed by Gao and Song (2010) that should be used if researchers increase the use of variables with a certain increment of the sample size.

Variables inserted in the models are listed in Table 1 with the corresponding descriptive statistics.

The DescTools package (Signorell 2019), version 0.99.28, calculated the confidence interval of the binomial and multinomial variables from the best model of the latent class analysis, while the confidence interval of numerical variables were performed through the following R function:

```
confidence_interval <- function(vector, interval) {

    # Standard deviation of sample

    vec_sd <- sd(vector)

    # Sample size
```

```
n <- length(vector)

# Mean of sample

vec_mean <- mean(vector)

# Error according to t distribution

error <- qt((interval + 1)/2, df = n - 1) * vec_sd / sqrt(n)

# Confidence interval as a vector

result <- c("lower" = vec_mean - error, "upper" = vec_mean + error)

return(result)

}
```

Results

Seven models, presented in Table 2, were performed. Model one assumed the presence of only one latent class, while model two assumed the presence of two latent classes, model three assumed three latent classes, and so on. The model with four latent classes was the best, showing the lowest Bayesian Information Criterion (BIC). This best model will be shown and discussed throughout this paper.

Table 3 presents the obtained results, indicating percentages for categorical variables and mean values for ordinal variables. Ninety-five percent confidence intervals are presented to enable group comparisons.

In Figure 1, it is possible to observe group differences graphically, when there is no overlap at the lower and upper limits of the confidence intervals.

The group composing class 1 represents the smallest group with 27 participants (14.84%) and an estimate of 89% of participants employed. This class is heterogeneous in terms of graduates' fields of study. The average age (26.07), together with 74% of participants having work experience, suggests this group might include non-traditional students that typically access Higher Education when older than 17–19 years old. Class 1 presents superior and significant differences from classes 2, 3 and 4, except for communication and employability competencies, where the differences only emerged between classes 1 and 3. Similarly, participants from class 1 are also characterized by more positive perceptions of preparation than classes 2 and 3 and more positive expectations regarding university-to-work transition than classes 2, 3 and 4. Regarding anticipation of difficulties, the scores are significantly lower than class 3. Concerning career adaptability resources, class 1 also stands out from the other classes for the subscales of concern, control and confidence and from classes 1, 2 and 3 for the subscale of curiosity. Taking this set of characteristics, this group was designated as *well-equipped*.

The group derived from class 2 is the most numerically expressive, with 65 participants (35.71%) and an 82% likelihood of being employed. This group has more engineering graduates than graduates from the social sciences and law. The average age (22.67) and the lowest percentage of having work experience (43%) indicate that traditional students mostly compose this class. Concerning perceptions of competencies, preparation and expectations for labor market transition, there are intermediate values, ranging from 3.5–4 points, similar to group 4. Group 2 presents lower career adaptability scores than class 1, for all the subscales, and significantly lower scores than class 3 for the subscales of concern and confidence. Because of the study field of the participants that form this class (more engineering graduates than from other courses), it might be a group that benefits from the most advantageous market conditions. For this reason, it was called *high demand*.

The group organized by class 3 represents 58 participants (31.87%) and is the least likely to be employable, with an estimate of 62% of the participants being employed. This class has significantly more female graduates than class 4, and significantly more graduates from the social sciences, compared to class 2. Nearly half of the participants reported previous work experience and, considering

Table 2. Models and its values from the Bayesian Information Criterion.

	Class	1 (n=27)	IC95%		2 (n=65)	IC95%		3 (n=58)	IC95%		4 (n=32)	IC95%	
Individual characteristics	Female	0.59	0.39	0.78	0.55	0.43	0.68	0.74	0.61	0.85	0.41	0.24	0.59
	Age	26.07	23.71	28.51	22.67	22.18	23.09	22.67	22.24	23.14	32.13	29.31	35.50
	PE: max 4 years	0.07	0.00	0.29	0.00	0.00	0.13	0.10	0.00	0.25	0.63	0.47	0.79
	PE: max 9 years	0.52	0.37	0.73	0.45	0.32	0.57	0.34	0.22	0.49	0.31	0.16	0.47
	PE: max secondary	0.15	0.00	0.36	0.37	0.25	0.50	0.38	0.26	0.52	0.00	0.00	0.16
	PE: max HE	0.26	0.11	0.47	0.18	0.06	0.31	0.17	0.05	0.32	0.06	0.00	0.22
	Work experiences	0.74	0.54	0.89	0.43	0.30	0.56	0.52	0.38	0.65	0.94	0.79	0.99
Study Field	Economics	0.33	0.15	0.52	0.28	0.17	0.42	0.07	0.00	0.21	0.54	0.39	0.72
	Engineering	0.30	0.11	0.48	0.48	0.36	0.61	0.36	0.24	0.50	0.09	0.00	0.27
	Law	0.11	0.00	0.30	0.04	0.00	0.19	0.05	0.00	0.19	0.11	0.00	0.27
	Social Sciences	0.26	0.07	0.45	0.20	0.09	0.34	0.52	0.40	0.66	0.26	0.10	0.43
Perceptions of competencies	Theoretical	4.52	4.29	4.75	3.99	3.85	4.15	3.70	3.52	3.86	3.99	3.78	4.22
	Practical	3.85	3.43	4.27	3.61	3.44	3.76	2.59	2.34	2.80	3.30	3.08	3.54
	Communication	4.29	3.90	4.60	3.94	3.78	4.06	3.35	3.19	3.50	3.68	3.44	3.94
	Methodological	4.51	4.29	4.75	3.85	3.71	3.98	3.21	3.02	3.40	3.59	3.37	3.82
	Interpersonal	4.66	4.45	4.89	3.95	3.79	4.09	3.53	3.29	3.78	3.57	3.36	3.77
	Participative	4.66	4.45	4.89	3.84	3.71	3.95	3.37	3.16	3.56	3.71	3.51	3.93
	Organization	4.59	4.37	4.82	3.94	3.78	4.06	3.69	3.50	3.92	3.99	3.71	4.29
	Socioemotional	4.66	4.48	4.86	3.67	3.52	3.80	3.10	2.84	3.33	3.73	3.46	4.04
	Generic	4.82	4.66	4.97	3.72	3.58	3.87	3.46	3.27	3.66	3.64	3.37	3.88
	Employability	3.88	3.49	4.29	3.55	3.40	3.71	2.60	2.37	2.81	3.33	3.05	3.58
Perceptions about work transition	Preparation transition	4.03	3.68	4.39	3.53	3.41	3.67	2.52	2.33	2.68	3.61	3.41	3.77
	Expectations transition	4.14	3.84	4.45	3.70	3.56	3.82	2.68	2.44	2.90	3.37	3.06	3.69
	Difficulties antecipated	0.48	0.29	0.68	0.58	0.46	0.71	0.86	0.74	0.94	0.50	0.31	0.69
Career Adaptability	Concern	4.54	4.43	4.66	3.95	3.85	4.05	3.64	3.49	3.78	4.10	3.96	4.28
	Control	4.62	4.49	4.74	4.18	4.09	4.29	4.00	3.86	4.11	4.20	4.01	4.38
	Curiosity	4.39	4.20	4.59	3.88	3.77	3.98	3.73	3.60	3.86	3.98	3.78	4.20
	Confidence	4.70	4.59	4.82	4.21	4.10	4.30	3.98	3.87	4.08	4.26	4.08	4.45
Employment (yes)		0,89	0,71	0,98	0,82	0,70	0,90	0,62	0,48	0,74	0,93	0,79	0,99

Table 3. Model of four latent classes: characterization of classes.

models	BIC
1	9473.83
2	9098.83
3	9071.73
4	9047.51
5	9168.84
6	9300.33
7	9449.45

the class' average age (22.67), the data suggest the class is composed of traditional students, especially when compared to classes 1 and 4. Class 3 presents significantly lower perceptions of the all competencies compared to class 1; significantly lower perceptions of the all competencies, except for theoretical, organizational and generic competencies, compared to class 2; significantly lower perceptions from class 4 for practical, socio-emotional and employability competencies. It is the group of graduates with the lowest perception of competencies, preparation and expectations for working life, and with more difficulties anticipated. Also, this group is characterized by lower scores regarding career adaptability resources. For all the subscales of career adaptability, class 3 has lower scores than class 1; for the subscales of concern and confidence, it has lower scores than class 2. Taking the several vulnerabilities described, this class was designated as *vulnerable*.

The group created from class 4, composed of 32 graduates (17.58%) has an estimate of 93% being employed, so this represents the highly employable group. A high number of participants from Economics and male graduates form this class. These graduates present a higher average age (32.13) and are those with more work experiences reported. Less-educated parents predominate in this group,
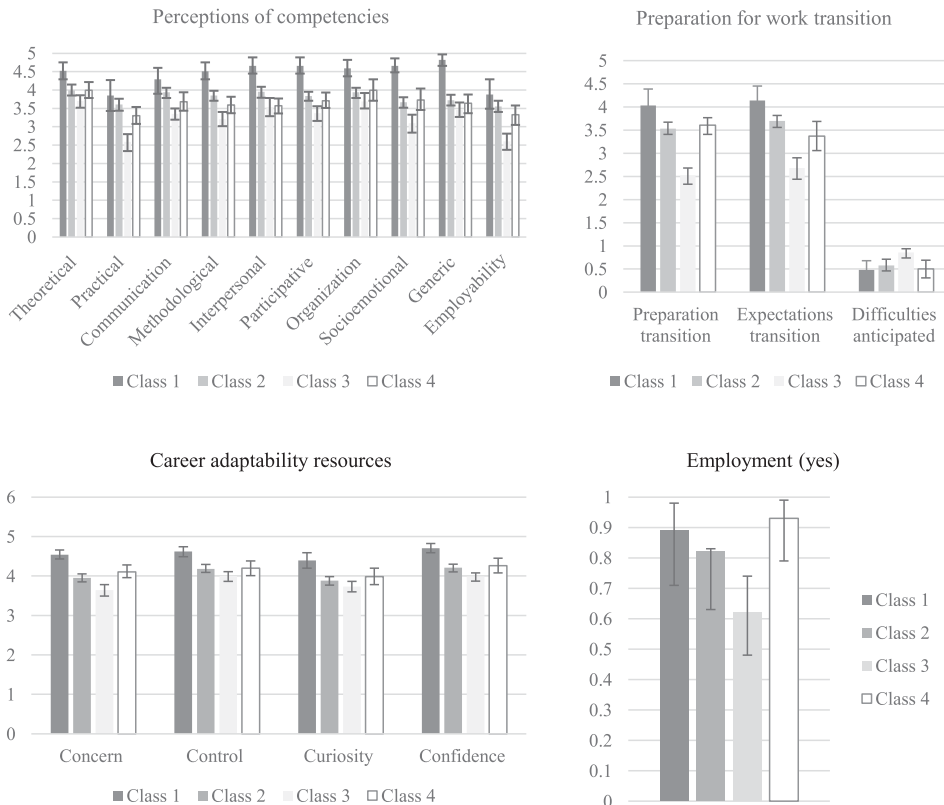

Figure 1. Graphical representation of means and confidence intervals of classes by variable under analysis.

probably because of their older age, which is related to the low level of educational attainment of most of the adult population in Portugal, as in other countries. Regarding perceptions of competencies, intermediate scores are observable, compared to groups 1 and 3, with values ranging from 3 to 4 on the 5-point Likert scale. Despite work experiences registered, perceptions of preparation and expectations of success in the labor market are not very high compared to groups 1 and 2. In terms of anticipated difficulties in the university-to-work transition, it is similar to classes 1 and 2. Also, in regard to career adaptability resources, this group points to intermediate values, with lower scores for the subscales of concern, control and confidence. Taking these characteristics, this class is probably composed of graduates that were already in the labor market and went through Higher Education to upgrade their education. For this reason, it was designated as *non-traditional pathways*.

Discussion

This study aimed to deepen knowledge about the employability of higher education graduates, through the identification of differentiated profiles for graduates. The results obtained allowed the identification of four classes of graduates, combining individual and contextual characteristics, which suggests the existence of distinct employability profiles. Taking the measure of employment rates, significant differences were only identified between groups 3 and 4, confirming that gender – specifically, being a female – and the fields of the social sciences might represent vulnerable factors during university-to-work transition. Also, older ages, in association with previous work experience, relate to higher employment rates after such transition.

The four classes identified through the conducted analysis brought out several other aspects that go beyond employment rates and gathered together variables that were identified in the literature. While two groups (*well-equipped* and *vulnerable*) seem to antagonistically aggregate several characteristics that are at the bases of current employability models, essentially focusing on individual resources (Dacre Pool and Sewell 2007; Yorke and Knight 2004), the other two classes (*high demand* and *non-traditional pathways*) bring out other aspects that have been less focused in the literature on graduate employability. Specifically, the *high demand* group, with a quite positive estimated employment rate, is not distinguished from the other groups in terms of stronger perceptions of competencies and career resources. Considering the professional activity of this group of graduates, with more engineers than social and law graduates, it is likely that positive employment outcomes are related to the current high demand for engineers in the labor market (Allen and van der Velden 2007; Direção-Geral de Estatísticas de Educação e Ciência 2018). Concerning the *vulnerable* group, if on one hand it looks like a group with a profile explained by competence-based employability models, in the negative sense (lower perceived competency is related to lower employment rates), on the other hand, this group also seems to aggregate graduates that face greater barriers in their transition to the labor market: being a female and having a degree in the social sciences (Allen and van der Velden 2007; Álvarez, Gradín, and Otero 2013; Monteiro, Almeida, and Garcia-Aracil 2016). The group of *non-traditional pathways* comprises almost 18% of the sample of this study. If we consider political concerns to increase the population attaining tertiary education and the professional qualification of older people and for those already integrated into the labor market (Eurostat 2019), this group deserves special attention. Despite this representing the group with the highest estimated employment rate, it is not the one that stands out the most in perceived competencies and career resources. If, on the one hand, it could be expected that professional experience would favor the development of competencies, career management resources and perceptions of self-efficacy, on the other hand, this group might experience other types of constraints that their peers typically do not experience. Examples of such constraints reported in the literature are a lack of self-confidence, financial difficulties, greater difficulty integrating into higher education, and difficulties related to the reconciliation of academic life with professional or family responsibilities (Humphrey 2006; Osborne, Marks, and Turner 2004). Thus, despite the work experience and likely maturity associated with older ages, these graduates might not benefit from adequate time

for reflection and capitalization of work and life experiences, as has been suggested in the literature (Dacre Pool and Sewell 2007; Turner 2014; Yorke 2004).

While it seems reliable that individual resources and competencies are good indicators and predictors of employability, it is also important to consider what underpins the development of these resources, since our study showed that not all individuals develop such resources in the same way. Current employability models have demonstrated to be very useful for the definition of empirical studies, important for the understanding of graduate's employability. Nonetheless, such models may be limited when it comes to understanding competency development pathways and the influence of contexts on these pathways. By adopting a person-centered approach, this study allowed the identification of different combinations of factors that, although recognized in current literature, seem to organize themselves differently among the heterogeneous population that presently obtain a higher education degree. Taking into account that the public accessing Higher Education is increasingly heterogeneous (OECD 2018), it becomes relevant to explore the specificities inherent to each subgroup. This study raises important indicators of the need for differentiated interventions adapted to the specificities of each group. Indeed, different students' groups, within the same institution, might benefit from different interventions. Even given such specificities inherent to each group, there might exist a risk of generalist interventions not producing the desired effect.

Limitations and further research

This study represents a first attempt to identify employability profiles among higher education graduates. This implies the need for further studies that enable the confirmation of the identified profiles and to overcome some of the limitations this study presents.

The use of the BIC as a criterion of model selection requires larger samples namely when the number of variables in the models is large. In the present study the sample size is not completely satisfactory, as so, future studies should collect larger samples. Also, it should be acknowledged that participants in this study come from one single higher education institution, and from master level. Although this might be helpful for the recognition of the diversity found in graduates' profiles, some caution should be taken in the extrapolation to other realities, where other types of profiles could emerge as a result of the heterogeneity of individual and contextual factors of other Higher Education systems. Furthermore, employability is a broad concept that goes far beyond employment rates or employment estimates. This means that if we would consider other employability outcomes, data found could be different. Therefore, the obtained results should be interpreted and contained within the measure of employability adopted in this study, which corresponded to the likelihood of employment 18 months after university-to-work transition.

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