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Multidimensional measure of employability: internal structure and associations with motivational and emotional features in unemployed persons

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Abstract
This study describes validity and reliability evidence of the Multidimensional Measure of Employability (MME) based on the internal structure and relations to other measures in a sample of unemployed persons in Portugal. Altogether, 216 individuals participated in an online survey. The MME's internal structure was tested by confirmatory factor analyses, suggesting good fit. The factors' reliability was good, as assessed by four types of coefficients. Multiple linear regressions considering motivational and emotional features allowed for the identification of validity evidence based on the relationships with other constructs. Thus, MME is a valid and reliable measure to assess employability among unemployed persons.

Keywords Employability · Validity · Reliability

The COVID-19 pandemic has impacted Portugal mostly at the socioeconomic level (Ferrão et al., 2022). The quarantines provoked a sharp increase in unemployment, particularly in regions more reliant on tourism (Instituto de Emprego e Formação Profissional [IEFP], 2021). A very enlightening example is Algarve, a region located in the Southern side of Portugal, where revenues generated during the vacation period play the most important role in its employment structure (Ferrão et al., 2022). Amidst the pandemic, Algarve witnessed the highest increase in unemployment in the whole country (around 150%), counting 33,571 unemployed persons (IEFP, 2021). While economic recession affects everyone, unemployed persons are the most vulnerable to its consequences (Drosos et al., 2021). Thus, tackling unemployment should be a key priority for governments and public authorities. In this realm, career interventions focused on the employability resources of unemployed persons can be

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a valuable solution (Fuertes et al., 2021). To this end, it is necessary to have career resource assessment instruments with good psychometric properties. In this sense, we intend to evaluate the validity and reliability of a multidimensional measure of employability in a sample of unemployed persons in Algarve.

Employability

Employability has been studied in psychology (Di Fabio, 2017) and management (Moore, 2019), among other disciplines. Despite the lack of consensus on its definition (Fuertes et al., 2021), the current literature seems to be complementary rather than contradictory (Guilbert et al., 2015). Research on employability has changed over time (Van der Heijden et al., 2018), with theoretical approaches following micro-level perspectives (focused on individual characteristics), meso-level perspectives (focused on intra-organizational flexibility of employees), and macro-level perspectives (focused on the needs of industry and society). In psychology, employability has been mostly studied from a micro-level perspective. An old psychological definition of employability advocates that the concept entails a multidimensional construct embracing career identity, personal adaptability, and social and human capital (Fugate et al., 2004). Fugate et al. (2004) identified conceptual commonalities between the dimensions and conceived employability as an active adaptability specific to work.

More recently, psychologists have acknowledged the need to combine the micro-, meso-, and macro-level perspectives on employability (Guilbert et al., 2015). For instance, Lo Presti and Pluviano (2016) developed a heuristic model on employability orientation and activities. At the micro-level, employability is conceived as the personal resources that favor professional development and, consequently, career success. At the meso-level, making sense of previous and future work experiences is fundamental for acquiring skills to improve formal and informal career networks, and explore social environments. Lastly, at the macro-level, work experiences and external factors function as antecedents; career success as a proximal result; whereas job search, life satisfaction, and commitment are distal results of employability (Lo Presti & Pluviano, 2016). Therefore, employability results from dynamic interactions between individual characteristics (e.g., age), personal resources (e.g., self-efficacy), and external factors (e.g., employment policy; Lent & Brown, 2020). A positive interaction results in the ability to achieve a valued career path, as well as improve one's career development to promote employability (Di Fabio, 2017; Fuertes et al., 2021; Guilbert et al., 2015; Lo Presti & Pluviano, 2016).

According to Cheng et al. (2020), this employability definition complements the career development concept. Career development is an intentional process that allows people to increase awareness of goals, expectations, work experiences, career networks, skills, opportunities, and barriers in the environment. Since the strategies for developing employability resources coincide with those for career development, employability resources can be considered a means of career development in themselves. Thus, the development of these resources may promote

the creation of proactive strategies to face life roles and challenges (Lo Presti et al., 2019). Conversely, applying career development theories to the contexts of career challenges, such as unemployment, is a rising research line (Cheng et al., 2020). The existing literature states that some employability dimensions (e.g., career identity, adaptability, and social and human capital) are predictors of job search and job re-entry (Koen et al., 2013). Therefore, studying and measuring employability resources among unemployed persons may elucidate the phenomenon to inform psychological, social, and political interventions.

The assessment of employability

There are several psychometric measures assessing employability in a unidimensional and multidimensional approach. An example of a unidimensional measure is the Employability Orientation Scale (EOS), created by Van Dam (2004) to assess the attitudes of employees toward developing their employability in their organizations. The EOS distinguishes the antecedents and consequences of employability orientation (i.e., employees' attitudes toward developing their employability for the organization) without considering the multidimensionality of employability acknowledged in the literature.

The multidimensional measures of employability assess different types of personal features, such as beliefs, competences, and resources. The most popular measure assessing beliefs is the Self-Perceived Employability Scale (SPES), which distinguishes internal beliefs (e.g., beliefs regarding internal attributes) and external beliefs (e.g., beliefs regarding the labor market) in employees (Rothwell & Arnold, 2007), students (Rothwell et al., 2008), and postgraduate students (Rothwell et al., 2009). The SPES is globally recognized, including in Portugal (Gamboa et al., 2022), and inspired the development of other measures, such as the Perceived Future Employability Scale (PFES; Gunawan et al., 2018). The PFES measures participants' perceptions of their skills, experience, networks, personal traits, knowledge of the labor market, and reputation of one's educational institution (Gunawan et al., 2018). Conversely, the Career and Employability Beliefs Inventory (CEBI; Barros, 2020) was created in Portugal to assess effort/accomplishment, proactivity/initiative, flexibility/openness to change, acceptance of challenges/risks, optimism and autonomy.

The measures assessing employability as a competence often conceives employability as a set of individual differences, skills, abilities, and psychological variables that favor job search and maintenance. An example of this kind of approach is the Employment Readiness Scale (ERS; Ward & Riddle, 2003), which measures one's capability to get and keep an appropriate job as well as to manage transitions to new jobs as needed. However, the most popular measure is the Dispositional Measure of Employability, created by Fugate and Kinicki (2008) to assess work and career resilience, openness to changes at work, proactivity at work and in the career, career motivation, and work identity. Subsequently, several other measures were created to assess different types of competencies. For instance, the Employability Attributes Scale measures professional self-management, cultural

competence, self-efficacy, career resilience, sociability, business orientation, and proactivity (Bezuidenhout & Coetzee, 2010). The Employability Scale evaluates search efficiency, search difficulty, optimism, and responsibility (Campos, 2011). The Employability Appraisal Scale assesses job protection, job risk and job-seeking behaviors, self-control, and self-learning (Llinares-Insa et al., 2018). Lastly, the Short-Form Employability Instrument measures professional experience, anticipation and optimization, personal flexibility, corporate sense, and balance (Van der Heijden et al., 2018).

To our knowledge, the Multidimensional Measure of Employability (MME) is the only measure that assesses employability resources. The MME is grounded on Lo Presti and Pluviano's (2016) definition of employability as a "personal resource that individuals develop across their working lives aimed at increasing one's career success" (p. 5). In this model, employability is conceived as a mindset that develops over time and thus results in different actions aimed to develop its distinct dimensions. This dynamic process depends on the importance given to certain aspects (i.e., networking) and the efforts made to achieve one's career goals (Lo Presti & Pluviano, 2016). Employability is thus seen as an instrumental resource rather than a competence or a belief. From this perspective, Lo Presti and Pluviano (2016) emphasized that employability enables individuals to overcome challenges and seize opportunities in the labor market.

The MME's current form has 28 items answered in a five-point scale varying from 0 (not at all) to 4 (completely). The content was based on 15 interviews with experts in the field that assessed their opinions regarding employability and its facets. Exploratory and confirmatory factor analyses were carried out and the four-dimension internal structure proposed by Lo Presti and Pluviano (2016) was established. Human capital and professional development refers to individual resources that allow for the acquisition of knowledge, skills, and abilities that, in turn, may contribute to the achievement of career goals. Social capital and networking entails individual resources that stimulate the analysis of the context and the identification of potential relationships that may favor career success. Career identity and self-management embraces the individual resources that promote career awareness and enable one to make sense of past experiences and anticipate the future. Environmental monitoring pertains to individual resources that favor the acknowledgement of opportunities, restrictions, barriers, and requirements in the environment, as well as the selection of the best timing for decision-making (Lo Presti et al., 2019). The reliability index of the employability dimensions and total scale was good ($0.81 \leq \alpha \leq 0.92$) and the adjustment index of confirmatory analyses supported the four-factor hierarchical structure (chi-squared = 816.12, DF = 338, RMSEA = 0.04, CFI = 0.94, GFI = 0.93, NNFI = 0.94, SRMR = 0.04, ECVI = 1.36) (Lo Presti et al., 2019). The MME has been adapted to Portugal (Gamboa et al., 2022), with good validity and reliability evidence (Cronbach's alpha between $\alpha = 0.74$ and $\alpha = 0.94$). However, the validation only considered adults in general and thus is not yet possible to confirm its suitability for the unemployed population.

To our knowledge, there are no measures specific for the assessment of employment resources among unemployed persons. Very recently, Lo Presti et al.

(2022) used the MME with a sample of unemployed persons. Nevertheless, no validity and reliability evidence were introduced besides full-scale Cronbach's alpha ($\alpha = 0.94$).

Objectives and hypotheses

This article introduces the MME's validity and reliability evidence based on the internal structure and relations to other measures in a sample of unemployed persons in Algarve, Portugal. The specific goals are: (1) to test the MME's internal structure, (2) to identify the factors' reliability, and (3) to identify the associations of the MME's dimensions with other measures of motivational and emotional features.

Motivational and emotional features are personal features related to the means through which objectives become valued or expected (motivation) and the evaluative reactions of a person during the interaction with the environment or the self (emotion) (Coscioni et al., 2023). We considered seven additional constructs assessed in four questionnaires, which are next described. The additional measures were selected based on the validity and reliability evidence identified in previous studies with Portuguese samples.

Career exploration self-efficacy and career decision-making self-efficacy are assessed in the Career Exploration and Decision-Making Self-Efficacy Scale (CEDSE; Lent et al., 2016). Career exploration self-efficacy is the perceived ability to identify and engage with information about the self and the environment related to career development, whereas career decision-making self-efficacy is the perceived ability to successfully complete tasks to make significant career decisions (Lent et al., 2016). The strengthening of employability beliefs may improve self-efficacy beliefs (Berntson et al., 2008). In turn, self-efficacy beliefs may predict employability resources (Taveira et al., 2017) and other career prospects (Wujema et al., 2022). Therefore, we expect the two dimensions of career self-efficacy beliefs to predict all dimensions of the MME.

Secondly, we considered two life project constructs assessed in the Life Project Scale (LPS; Coscioni, 2021). Identification entails awareness of one's intended future and involvement refers to the enactment of plans and behavior in favor of one's intended future (Coscioni, 2021). We expect the two LP dimensions to predict career identity and self-management as it is a dimension of employability related to the importance of future career awareness.

We considered two constructs related to future time orientation assessed in the Future Time Orientation Scale (FTOS; Coscioni et al., 2021). Impact assesses the extent to which one's psychological future influences current decisions and behavior, whereas distance entails perceptions of time distance into the future (Coscioni et al., 2021). We expect the two FTOS dimensions to predict environmental monitoring as this is the dimension of the MME related to the ability to situate oneself in the present and be aware of one's actions in the future.

Finally, we considered life satisfaction as assessed in the Satisfaction with Life Scale (SWLS; Diener et al., 1985). Life satisfaction is a key indicator of mental

health and is positively related to positive personal, psychological, behavioral, social, and interpersonal outcomes (Diener et al., 1985). As life satisfaction is a distal outcome of employability behavior, we expect it to predict all MME dimensions, though with a low magnitude.

The associations between variables were assessed in two steps. First, Pearson correlations were computed to test the bivariate relationships between the MME scores and additional measures. All hypothesized correlations were expected to be moderate, except for the associations with satisfaction with life, which were expected to be weak. Next, multivariate linear regressions were implemented to identify the associations between MME scores with each motivational and emotional feature controlling for the effects of the others. This is a relevant procedure considering that motivational and emotional features are often correlated one to the other (Coscioni et al., 2023). Based on this approach, we were able to identify the best predictors of employability resources among the selected independent variables.

Methods

Participants and procedure

Data collection occurred within the framework of the Careers Project (ALG-06-4234-FSE-000047), a partnership for social impact that aims to support employability in Algarve. Participants were unemployed persons invited by a governmental institution responsible for employment policies in Algarve to participate in a career psychological intervention. Those interested in the intervention filled in a survey online, on the Qualtrics platform, from April to May 2022. Participants provided their consent form before answering the survey and the research procedures were approved by an ethical commission from Portugal (CEICSH 002/2022).

Altogether, 226 people responded to the survey. After data management, ten participants were removed, of which seven filled in the same response category in several scales, and three had unusual patterns of responses (i.e., Mahalanobis distance per degree of freedom above 3.0) in three or more scales out of five. Therefore, the answers of 216 participants aged from 18 to 67 years old (M = 42.8, SD = 10.57) were analyzed. Participants were predominantly female (n = 151, 69.9%) and nearly one-fifth (n = 39, 18.1%) were not from Portugal. All participants were fluent in Portuguese, since this was an inclusion criterion for participation in the study. Regarding their qualification degree, 42 (19.4%) had not finished high school, 82 (37.8%) had completed high school, and 91 (42.1%) had a college degree.

Measures

Multidimensional measure of employability—European Portuguese version

We used the European Portuguese version of the MME developed by Gamboa et al., (2022), which retained the same internal structure as the original version. In this study, the instructions were adapted to adjust the data collection with unemployed persons. Thus, a note was added to the instruction alerting participants that, in case of unemployment, they should respond to the scale thinking about previous jobs and/or possible future jobs they may have. The psychometric properties of the scale are introduced in the Results.

Career exploration and decision-making self-efficacy scale

The CEDSES was originally created in the USA (Lent et al., 2016) and has already been adapted to Portugal (Taveira et al., 2017). The scale contains two subscales that assess career exploration self-efficacy (four items, e.g., "Dealing with disappointment if first choice doesn't work") and career decision-making self-efficacy (eight items, e.g., "Identify careers that make the best use of your abilities"). Each item is answered through a five-point scale varying from "totally disagree" to "totally agree." In the sample of this study, the subscales' reliability met excellent results, $\alpha = 0.96$, $\Omega = 0.95$, and AVE = 0.77, and $\alpha = 0.93$, $\Omega = 0.93$, and AVE = 0.85, respectively.

Life project scale

The LPS was originally created in Portuguese (both European and Brazilian) and English (Coscioni, 2021). The scale contains two subscales that measure life project's identification (four items, e.g., "I am aware of what I want for my future life") and involvement (four items, e.g., "I'm making efforts to achieve what I want for the future"). Items are responded to in a seven-point scale ranging from "totally disagree" to "totally agree." In the sample of this study, the subscales' reliability met good to excellent results, $\alpha = 0.91$, $\Omega = 0.90$, and AVE = 0.74, and $\alpha = 0.89$, $\Omega = 0.86$, and AVE = 0.67, respectively.

Future time orientation scale

The FTOS was originally created in Portuguese (both European and Brazilian) and English (Coscioni et al., 2021). The scale contains two subscales that measure impact (five items, e.g., "I value activities that may benefit me in the long run") and distance (three items, e.g., "Two years in the future seems to me like a short period of time"). The items are responded to in a seven-point scale ranging from "strongly disagree" to "strongly agree." In the sample of this study, the subscales' reliability

met reasonable to good results, α = 0.84, Ω = 0.80, and AVE = 0.52, and α = 0.70, Ω = 0.69, and AVE = 0.49, respectively.

Satisfaction with life scale

The SWLS was originally created in the USA (Diener et al., 1985) and has already been adapted to Portugal (Lent et al., 2014). The scale contains five items (e.g., "I am satisfied with my life") answered in a seven-point Likert scale varying from "strongly disagree" to "strongly agree." In the sample of this study, the scale's reliability met good results, α = 0.89, Ω = 0.88, and AVE = 0.64.

Data analysis

The MME's internal structure was assessed via confirmatory factor analyses (CFA) using the software R 4.1.2 (R Core Team, 2022) and the package lavaan 0.6-9 (Rosseel, 2012). Variables were considered ordinal and thus the polychoric correlations matrix was used. As Mardia's test suggested violation of multivariate normality (M_{skewness} = 7239.6, $p < 0.001$, and M_{kurtosis} = 28.8, $p < 0.001$), the weighted least squares mean and variance adjusted (WLSMV) estimation method (Asparouhov & Muthen, 2010) was selected. The WLSMV has been acknowledged as an appropriate method for the assessment of ordinal data (Li, 2016). The following fit indices assessed the goodness of fit of the tested models: comparative fit index (CFI), Tucker–Lewis index (TLI), root mean square error approximation (RMSEA), and standardized root mean residual (SRMR). The following cutoffs indicate good fit: CFI ≥ 0.95, TLI ≥ 0.95, RMSEA < 0.08, and SRMR ≤ 0.08 (Schreiber et al., 2006). Alternatively, the following cutoffs are considered acceptable: 0.90 ≤ CFI < 0.95, 0.90 ≤ TFI < 0.95, 0.080 ≥ RMSEA > 0.100, and 0.080 > SRMR ≥ 0.100 (Brown, 2006).

Three internal consistency coefficients tested the factors' reliability, i.e., Cronbach's ordinal alpha (α), McDonald's omega (Ω), and Spearman–Brown coefficient (r_{kk}). The following values informed the reliability level: results below 0.50 are unacceptable; between 0.51 and 0.60 are poor; between 0.61 and 0.70 are questionable; between 0.71 and 0.80 are moderate; between 0.81 and 0.90 are good; and above that, excellent (Gliem & Gliem, 2003). Average variance extracted (AVE) was tested and values above 0.50 was expected (Fornell & Larcker, 1981). Reliability was assessed in R (R Core Team, 2022) using the packages semTools 0.5-5 (Jorgensen et al., 2021) and multicon 1.6 (Sherman, 2015).

The associations with additional measures were firstly tested by Pearson correlations using the software R (R Core Team, 2022) and the package psych 2.3.3 (Revelle & Revelle, 2015). The factor scores were computed by the maximum a posteriori method (Bock & Aitkin, 1981) considering the factor loadings resulting from CFA with WLSMV estimation[1]. Correlation coefficients were interpreted

[1] In the case of the LPS and the FTOS, the two first response categories were merged because two items had no answers in the first response category.

using the following cutoffs: $r < 0.30$, spurious; $r < 0.30$, weak; $r < 0.50$, moderate; otherwise, strong (Cohen, 1988).

Multiple linear regressions were implemented to identify the effect of each independent variable controlling for the effect of other independent variables. Four regression models considered MME's factors as dependent variables and the additional measures' factors as independent variables. As we wanted to identify the most predictive features among the independent variables, a sequential method was selected rather than the traditional method enter. Thus, regression models were specified by the method forward, which first enters all independent variables in the model and then gradually removes those with nonsignificant regression coefficients ($\alpha = 0.05$). The method forward is preferred over other sequential methods (such as stepwise) because it avoids the elimination of variables that actually contributes to the prediction of the dependent variable due to the partial correlations between independent variables (Field, 2013).

To ensure the validity of the regression models, several assumptions were verified. The relationships between standardized residuals and predicted values were plotted to assess the residuals' normality and homoscedasticity (Hair et al., 1998). In addition to the graphic representation, the residuals' normality and homoscedasticity were assessed by the Shapiro–Wilks test and the Breusch–Pagan test, respectively. The autocorrelations between residuals were assessed by the Durbin–Watson test, with values close to 2.0 being expected (Field, 2013). Multicollinearity was tested by correlation coefficients, tolerance, and variance inflation factor, with low tolerance, high correlations, and high variance inflation factor suggesting high multicollinearity (Hair et al., 1998). Potential atypical and influential observations were identified by Mahalanobis distance and Cook distance, respectively. Bootstrapping correction (500 resampling; 95% CI BCa) was used to adjust potential violations of assumptions and provide more reliable confidence intervals (Haukoos & Lewis, 2005). The regressions were all implemented in R (R Core Team, 2022) using the packages car 3.0-13 (Fox et al., 2012), rstatix 0.7.0 (Kassambara, 2021), and olsrr 0.5.3 (Hebbali & Hebbali, 2017).

Results

Before implementing the CFA, the frequency of answers across the five response categories in each item were examined. The first response category was answered by a reduced number of participants ($n < 19$) with two items having no answers at all, and only four items having more than ten answers. Considering that WLSMV is not allowed when response categories are not filled in, the two first response categories were collapsed.

Three models were tested by CFA: the four-factor solution with four correlated factors (M1), the four-factor solution with the four factors loading onto a

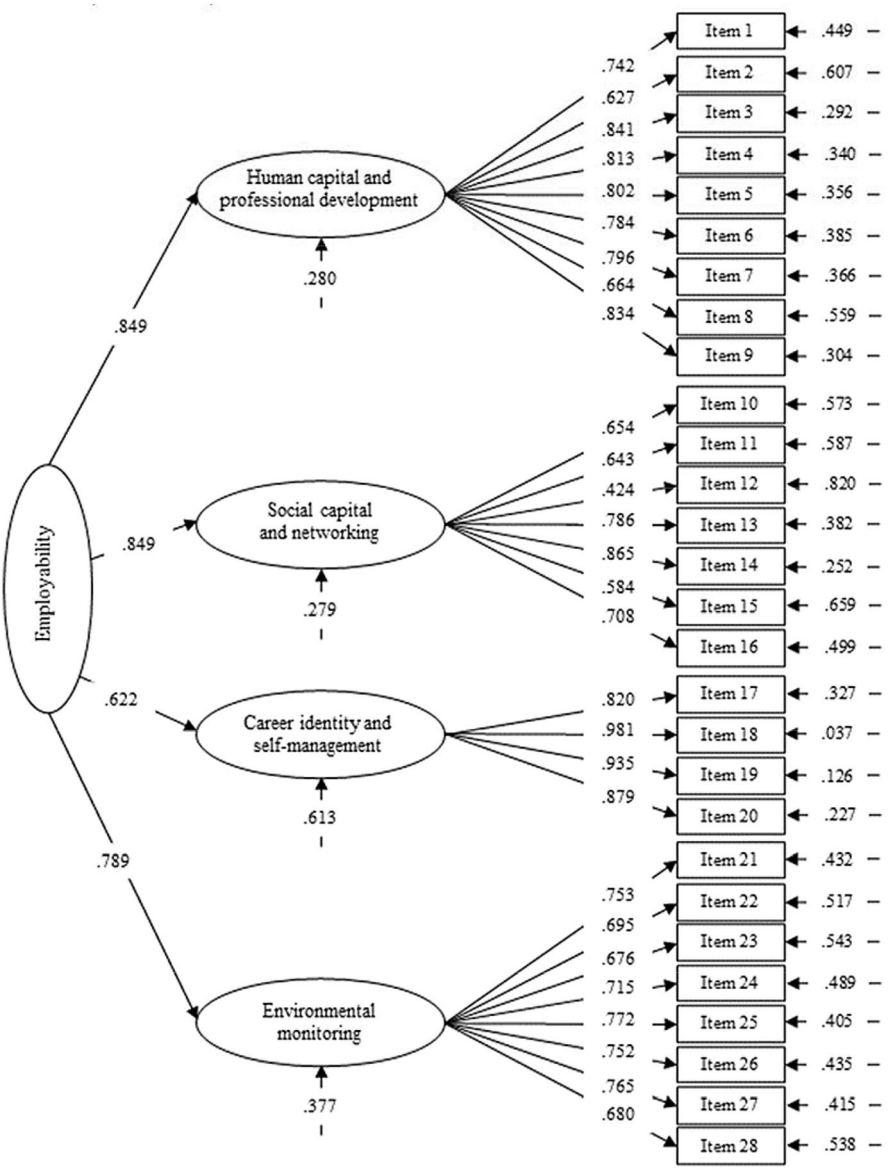

Figure 1 Confirmatory factor analysis. $N = 216$; all factor loadings, latent variables, and correlations significant at $\alpha = 0.001$

second-order factor (M2), and a unidimensional solution with all items loading onto the same factor (M3). M1 met excellent fit indices, chi-squared = 702.6, df = 344, $p < 0.001$, RMSEA (90% CI) = 0.070 (0.062, 0.077), CFI = 0.960, TLI = 0.956, SRMR = 0.075. M2 had slightly better indices compared with M1, chi-squared = 693.6, df = 346, $p < .001$, RMSEA (90% CI) = 0.068 (0.061, 0.076),

Table 1 Descriptive statistics, reliability, and correlations between factors

Factor	Direct scores	Reliability					Correlations			
	M (SD)	α	Ω	r_{kk}	AVE	$\sqrt{AVE}$	F1	F2	F3	F4
F1	3.8 (0.71)	0.92	0.90	0.90	0.59	0.77	1.0**	0.74**	0.50**	0.67**
F2	3.9 (0.58)	0.85	0.80	0.80	0.46	0.68	0.74**	1.0**	0.52**	0.65**
F3	3.4 (0.88)	0.92	0.92	0.90	0.82	0.91	0.50**	0.52**	1.0**	0.53**
F4	3.5 (0.74)	0.89	0.87	0.87	0.53	0.73	0.67**	0.65**	0.53**	1.0**

$N = 216$

**$p < 0.001$, F1 = first factor (human capital and professional development), F2 = second factor (social capital and networking), F3 = third factor (career identity and self-management), F4 = fourth factor (environmental monitoring)

Table 2 Correlation matrix and multicollinearity diagnosis

	Correlations to DVs				Correlations between IVs							Multicollinearity	
	F1	F2	F3	F4	1.	2.	3.	4.	5.	6.	7.	Tolerance	VIF
1. CDMSE	0.47	0.47	0.51	0.49	1.0	0.70	0.52	0.46	0.23	0.43	0.17	0.43	2.34
2. CESE	0.45	0.47	0.41	0.47		1.0	0.42	0.41	0.38	0.42	0.24	0.44	2.28
3. Idn.	0.31	0.33	0.68	0.40			1.0	0.93	0.19	0.52	0.16	0.12	8.38
4. Inv.	0.30	0.32	0.63	0.38				1.0	0.19	0.53	0.14	0.13	8.10
5. SL	0.22	0.28	0.24	0.29					1.0	0.20	0.21	0.83	1.30
6. Imp.	0.33	0.38	0.45	0.43						1.0	0.29	0.63	1.59
7. Dis.	0.11	0.12	0.15	0.19							1.0	0.88	1.14

$N = 216$. All correlations significant at 0.05

DVs dependent variables, *IVs* independent variables, *CDMSE* career decision-making self-efficacy, *CESE* career exploration self-efficacy, *Idn.* identification, *Inv.* involvement, *SL* satisfaction with life, *Imp.* Impact, *Dis.* Distance

F1 = first factor (human capital and professional development), F2 = second factor (social capital and networking), F3 = third factor (career identity and self-management), F4 = fourth factor (environmental monitoring)

CFI = 0.961, TLI = 0.958, SRMR = 0.076. Lastly, M3 poorly fit the data, chi-squared = 1773.8, df = 350, $p < 0.001$, RMSEA (90% CI) = 0.138 (0.131, 0.144), CFI = 0.842, TLI = 0.829, SRMR = 0.140. Figure 1 shows the factor loadings and residual variances of M2. All factor loadings were greater than 0.50, except for item 12.

Table 1 depicts the descriptive statistics of factors' direct scores[2] (i.e., the sum of answers per the number of items), reliability coefficients, and correlations between

[2] Even though MAP scores were used to subsequently compute correlations, direct scores were reported in Table 1 because they are more interpretable than MAP scores. As MAP scores are standardized, the means are zero.

factors. The factors' α, Ω, and r_{kk} met good to excellent results. As for the AVE, the second factor (social capital and networking) was slightly below 0.50. In addition, the square root of the second factor's AVE was below the magnitude of the correlation to the first factor (human capital and career development). This may suggest the factors are indistinguishable. If item 12 (which met low factor loading) was eliminated, the AVE would have improved to 0.50.

Correlations between the MME scores and motivational and emotional features are displayed in Table 2. As expected, most correlations to career self-efficacy were moderate, except for the correlation of career identity and self-management to career decision-making self-efficacy, which was strong. Moreover, rather than moderate, correlations of career identity and self-management to life projects were strong, with correlations to other MME dimensions being moderate. As expected, correlations to satisfaction with life were weak. Finally, correlations to impact were moderate, as expected; whereas correlations to distance were unexpectedly weak.

Table 2 exhibits the multicollinearity test across additional measures. Tolerance and VIF suggest high collinearity between the two LPS factors. Mahalanobis distance suggested one to two potential atypical cases in each regression model. We tested regression models with and without the outliers and the results were very similar. Thus, outliers were retained. Lastly, Cook distance did not identify any influential cases.

Table 3 summarizes the final regression models considering only the significant independent variables. All models were significant, with R^2 ranging from 25.4% (first factor) to 50.1% (third factor). Career decision-making self-efficacy was significant in all models with greater impact on environmental monitoring, and human capital and professional development. Career exploration self-efficacy was a significant predictor of human capital and professional development, and social capital and networking. Impact was significantly associated with social capital and networking and, especially, environmental monitoring. Life project's identification and satisfaction with life were significant predictors of career identity and self-management, and environmental monitoring, respectively. Life project's involvement and distance were not significant in any regression model.

Table 4 reports the regression's statistical assumptions. The standardized residuals were all between −2.0 and 2.0. Durbin–Watson statistics were all close to 2.0, and Breusch–Pagan tests were all nonsignificant, which suggest homoscedasticity. Shapiro–Wilks tests suggest the distribution of regressions' residuals were not normal, except for the model predicting career identity and self-management. The visual inspection of predicted values versus standardized residuals graphics indicated no problems with homoscedasticity or normality. Even if normality is not assumed (as suggested by Shapiro–Wilk tests), the 95% confidence intervals (Table 3) after bootstrapping did not reach zero, which suggest the independent variables are still significant after resampling.

Table 3 Multiple linear regressions

F1	df	Sum squares	M. square	*F*	Sig.	R^2	Adj. R^2
Regression	2	26.481	13.240	36.312	0.000**	0.254	0.247
Residual	213	77.666	0.365				
Total	215	104.147					
	Beta	Std. error	Std. beta	*t*	Sig.	Boot. 95% CI	
						Lower	Lower
Intercept	0.004	0.041		0.103	0.918	−0.078	0.081
CDMSE	0.243	0.067	0.301	3.629	0.000**	0.124	0.385
CESE	0.200	0.068	0.246	2.964	0.003*	0.051	0.341
F2	df	Sum squares	M. square	*F*	Sig.	R^2	Adj. R^2
Regression	3	21.770	7.257	28.613	0.000**	0.288	0.278
Residual	212	53.766	0.254				
Total	215	75.537					
	Beta	Std. error	Std. beta	*t*	Sig.	Boot. 95% CI	
						Lower	Lower
Intercept	0.002	0.034		0.059	0.953	−0.065	0.075
CDMSE	0.158	0.057	0.229	2.759	0.006*	0.038	0.264
CESE	0.166	0.057	0.239	2.897	0.004*	0.052	0.293
Imp	0.173	0.064	0.177	2.714	0.007*	0.055	0.310
F3	df	Sum squares	M. square	*F*	Sig.	R^2	Adj. R^2
Regression	2	58.180	29.090	106.922	0.000**	0.501	0.496
Residual	213	57.951	0.272				
Total	215	116.131					
	Beta	Std. error	Std. beta	*t*	Sig.	Boot. 95% CI	
						Lower	Lower
Intercept	0.009	0.035		0.251	0.802	−0.064	0.071
CDMSE	0.187	0.048	0.219	3.857	0.000**	0.084	0.279
Idn	0.500	0.050	0.569	10.030	0.000**	0.424	0.593
F4	df	Sum squares	M. square	*F*	Sig.	R^2	Adj. R^2
Regression	3	32.401	10.800	33.305	0.000**	0.320	0.311
Residual	212	68.749	0.324				
Total	215	101.151					
	Beta	Std. error	Std. beta	*t*	Sig.	Boot. 95% CI	
						Lower	Lower
Intercept	0.004	0.039		0.104	0.917	−0.072	0.079
CDMSE	0.272	0.051	0.341	5.363	0.000**	0.165	0.382
SL	0.150	0.057	0.155	2.644	0.009*	0.023	0.250
Imp	0.286	0.071	0.254	4.014	0.000**	0.137	0.452

Table 3 (continued)

$N = 216$. F1 = first factor (human capital and professional development), F2 = second factor (social capital and networking), F3 = third factor (career identity and self-management), F4 = fourth factor (environmental monitoring)

CDMSE career decision-making self-efficacy, *CESE* career exploration self-efficacy, *Imp.* Impact, *Idn* identification, *SL* satisfaction with life

* $p < .05$

** $P < .01$

*** $p < .001$

Table 4 Multiple linear regression's assumptions

	Standardized residuals' descriptives				Durbin–Watson		Shapiro–Wilks		Breusch–Pagan	
	Min.	Max.	Skew.	Kurt.	D–W	Sig.	W	Sig.	Chi-squared	Sig.
F1	− 0.36	0.59	0.58	2.64	1.889	0.398	0.964	0.000**	1.361	0.243
F2	− 0.52	0.56	0.13	1.71	2.091	0.480	0.974	0.000**	0.008	0.927
F3	− 0.34	0.41	0.21	0.79	1.854	0.276	0.988	0.078	0.569	0.450
F4	− 0.46	0.63	0.13	1.93	1.914	0.494	0.975	0.000**	0.009	0.926

$N = 216$. F1 = first factor (human capital and professional development), F2 = second factor (social capital and networking), F3 = third factor (career identity and self-management), F4 = fourth factor (environmental monitoring).

* $p < .05$

** $P < .01$

*** $p < .001$

Discussion

This article introduces the MME's validity and reliability evidence based on the internal structure and relations to other measures in a sample of unemployed persons in Algarve, Portugal. CFA indicates the MME original internal structure fit the data, with the four subscales having good-to-excellent reliability. Conversely, the social capital and networking subscale had an AVE below 0.50, which indicates low discriminant validity. In addition, the square root of AVE is below the magnitude of the correlation to human capital and professional development subscale. This suggests the two factors are indistinguishable.

Social capital and networking subscale's reduced AVE might be related to the bad performance of item 12, which reached a factor loading below 0.50. Indeed, its elimination would have improved the AVE to the expected cutoff. Item 12 assesses the degree to which one perceives social support as an added value to one's career. Even though this is clearly a facet of social capital and networking, the expression social support in Portuguese (*suporte social*) is dubious, meaning also state financial support offered to socially vulnerable populations. Future versions of the MME's

Portuguese version may rephrase item 12 using another expression to attenuate the ambiguity of the current form.

Pearson correlations and regression models partially corroborated our hypotheses. The first hypothesis stated that career exploration and decision-making self-efficacy would predict all MME's dimensions. Despite the findings suggesting career decision-making self-efficacy predicted all factors, career exploration self-efficacy predicted only two dimensions (i.e., human capital and professional development, and social capital and networking) in the regression models. This means that after controlling for the effect of other independent variables, career exploration self-efficacy lost the predictive effect on career identity and self-management, and environmental monitoring. The findings indicate individuals who perceive themselves as able to successfully make career decisions are more likely to be employable. These findings are in line with recent results that acknowledges self-efficacy as a predictor of employability (Taveira et al., 2017) or a mediator of employability and other career variables (e.g., perceived social support, career development learning, work experience; Wujema et al., 2022).

The results also indicate that individuals who perceive themselves as able to successfully explore career paths are more likely to have employability resources related to human capital and professional development, and social capital and networking, but not necessarily to career identity and self-management or environmental controlling. These unexpected results might be related to the characteristics of the sample. In terms of identity and personal management, it is known that over the life cycle, career identity and career plans themselves tend to crystallize (Super, 1990). The results seem to indicate that in this sample, consisting mostly of people over 40 years old, exploration behaviors are inhibited by this crystallization. Regarding environmental control, it is known that in unemployed persons, the expectancy of success predicts exploration intentions (Taveira et al., 2017). Since the beliefs that the current labor market is precarious and demanding are common among jobless people (Drosos et al., 2021), it is possible that these adults are less motivated to explore the environment and consequently have fewer resources to control the environment.

The second hypothesis stated life project's identification and involvement would predict career identity and self-management. Despite the findings suggesting moderate correlations to the other MME dimensions, only career identity and self-management were predicted by life projects (specifically, by identification) after controlling for the effect of other variables. The findings suggest that individuals who are aware of their intended futures are more likely to be conscious of their career identity. This is consistent with the existing literature suggesting that career is an important life domain often retrieved by people narrating their prospective life stories (Zhu & Tse, 2016). As for life project's involvement, the unexpected results might be related to high collinearity between the two LPS factors.

The third hypothesis stated that future time orientation would predict environmental monitoring, with two future time orientation dimensions being assessed (i.e., impact and distance). Despite the moderate correlations between impact and all MME scores, only environmental control, and social capital and networking were predicted by impact after controlling for the effect of other

variables. Distance did not predict environmental monitoring in the regression model and had low correlations to all MME scores. The findings suggest perceptions of time distance into the future does not considerably affect any employability resources. On the other hand, individuals who were more impacted by their psychological futures are more likely to have employability resources related to environmental monitoring. This is in line with the definition of environmental monitoring as choosing the correct timing to act toward one's career goals. In addition, the literature employs career time perspective interventions effectively promotes career planning (Marko & Savickas, 1998) and thus employability resources (i.e., anticipation of future work changes, personal flexibility, corporate sense, and balance) linked to it (Lo Presti el al., 2019). The unexpected prediction of impact on social capital was weak and might be due to the characteristics of the sample.

Finally, the fourth hypothesis stated that life satisfaction would predict all factors, though with low magnitude. Despite the weak correlations to all MME scores, life satisfaction predicted only environmental monitoring in the regression models. This is the employability dimension mostly related to life conditions. Thus, life satisfaction might be related to better living conditions that, in turn, influence environmental monitoring.

The MME is a useful tool for research and practice with unemployed persons. In the research context, it might be used in investigations interested in employability and motivational resources. In the professional context, the MME might be applied in counseling practices to help identify employability resources. Based on its scores, interventions may be designed to directly support the development of employability resources, focusing on activities that may also stimulate motivational and emotional features.

Limitations and future directions

This study has limitations. First, data collection was online and thus future studies may be implemented in more controlled environments (i.e., in person or synchronous online data collection). Second, a considerable number of participants had not finished high school, which might have impacted the comprehension of the test content (especially with regard to item 12, which, as already mentioned, may have been misinterpreted). Third, although 39 foreign participants were included, 35 of them were from countries in which mother language is Portuguese. The remaining participants assured their proficiency in Portuguese, so they were not excluded. Nevertheless, cultural issues may have had an impact on the results and thus future studies should take this variable into account. Fourth, the sample size is small, which may have influenced the results (Kline, 2011). Nevertheless, the results are congruent with previous studies supporting the four-factor hierarchical structures of the measure (Lo Presti et al., 2019). Moreover, the findings are relevant considering that participants belong to a population traditionally hard to reach in research contexts. Fifth, since the sample is limited to the population of Algarve, future studies may include unemployed persons living in other regions in Portugal

and even other countries. Lastly, the scale's instructions asked participants to think of previous or potential future jobs, which may have affected the data collection due to memory or expectation biases. Future studies still need to test the measurement invariance of the MME across different employment situations.

Conclusions

This study describes validity and reliability evidence of the MME in a sample of unemployed persons in Algarve, Portugal. CFA corroborated the original factor structure, with the four subscales meeting good-to-excellent reliability. The social capital and networking subscale's AVE was low, which might be related to the ambiguity of item 12. Associations with career self-efficacy, life projects, future time orientation, and life satisfaction provided validity evidence based on the associations with related measures. Therefore, in addition to describing validity and reliability evidence of the MME among unemployed persons, the study contributes to the literature by introducing empirical models on the relations between employability resources, and motivational and emotional features.

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Declarations

Competing interests The authors declare that they have no conflict of interest.

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