"One step beyond emotional intelligence measurement in the career development of adult learners: A bifactor exploratory structural equation modeling framework"

Pirsoul, Thomas ; Parmentier, Michaël ; Nils, Frédéric

ABSTRACT

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One step beyond emotional intelligence measurement in career development of adult learners: a bifactor exploratory structural equation modeling framework

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One step beyond emotional intelligence measurement in career development of adult learners: a bifactor exploratory structural equation modeling framework

Abstract

Emotional intelligence has been recognized as an important meta-competency for helping individuals to navigate throughout their career. However, the multidimensionality of emotional intelligence has seldom been fully investigated at the measurement level, and it remains unclear how specific dimensions predict career-related outcomes over and above the general factor of emotional intelligence. We addressed this issue using a bifactor-ESEM framework among a sample of Belgian adult learners (N = 445), and explored the incremental and predictive validity of emotional intelligence dimensions on important career-related outcomes (i.e., emotional exhaustion, work-family conflict, family-work conflict, and career satisfaction). Beyond the predictive effect of the general factor of emotional intelligence on career-related outcomes, we demonstrated the specific contribution of several dimensions (comprehension, regulation and utilization). Our results support the importance of distinguishing the specific effects of emotional intelligence dimensions and bring important contributions for guidance counselors and for designing tailor-made interventions.

Keywords: emotional intelligence, emotional exhaustion, work-family conflict, career satisfaction, bifactor model, ESEM, bifactor-ESEM.

One step beyond emotional intelligence measurement in career development of adult learners: a bifactor exploratory structural equation modeling framework

Emotional intelligence has been recognized as an important factor in adaptive functioning in a wide range of life domains (Mikolajczak et al., 2015). Over the last decade, substantial interest has also been devoted to the role of emotional intelligence in career development. The work in this field has led researchers to propose emotional intelligence as a crucial meta-competency that supports individuals in developing adaptative behaviors towards important career events and that, ultimately, builds sustainable careers (Potgieter, 2014).

Several measures and techniques have been used to evaluate the impact of emotional intelligence on career development. Earlier studies have demonstrated that the global score of emotional intelligence was a strong predictor of career decision processes (Di Fabio et al., 2013) and employability (Nelis et al., 2011). In these studies, the total emotional intelligence score was based on a sum-score of observed variables (i.e., items). Other studies have also shown through structural equation modeling that the global factor of emotional intelligence was a strong predictor of career adaptability (Parmentier et al., 2019; 2021), self-perceived employability, and career indecision, through the mediating role of career adaptability (Udayar et al., 2018). Scholars have also shown that emotional intelligence dimensions (e.g., self-emotion appraisal or emotion regulation) predicted career decision-making processes (Di Fabio & Kenny, 2011; Santos et al., 2018) and career success (de Haro García & Costa, 2014). In these studies, emotional intelligence was modeled as a latent variable by confirmatory factor analyses (CFA), and observed indicators (i.e., items) represented it.

Despite the increasing recognition of emotional intelligence as an important meta-competency, the measurement models that are currently in use have presented significant limitations that risk undermining the validity of research findings. The most commonly adopted

measurement models for examining emotional intelligence are the single factor CFA, the hierarchical CFA, and the first-order CFA. In the single factor CFA (model A in Figure 1), all items load onto a single factor, and this single factor is used in structural relations with other variables. By grasping the common variance shared between dimensions and partialling out their unique variances from the measurement model, unidimensionality is imposed on a multidimensional construct and this is likely to lead to biased structural parameter estimates (Rodriguez et al., 2016). In the hierarchical CFA (model B in Figure 1), each item loads on its respective first-order factor (e.g., emotion identification), and these factors also load on a higher-order factor (i.e., emotional intelligence factor). A limitation of this model involves the imposition of a proportionality constraint between observed indicators likely to be too unrealistic in real data. In other words, the ratio of the higher-order construct/dimensions variance and dimensions/items variance are considered equal for all observed indicators. By reducing the model to a unique higher-order construct, conventional CFA limits researchers' ability to investigate the relative predictive validity of both the higher-order constructs and its specific dimensions (Morin et al., 2015). This is unfortunate because understanding the specific effects of dimensions is crucial if we are to fully comprehend what contributes to the development of positive outcomes and, ultimately help guidance counselors in their interventions. Notably, this type of CFA makes it difficult to identify which emotional intelligence dimensions are trainable during interventions (Di Fabio & Kenny, 2011; Hodzic et al., 2018). Finally, the first-order CFA (model C in Figure 1) assumes that each observed indicator loads on a single factor, constraining non-target loadings (i.e., cross-loadings) to zero. These overly restrictive assumptions have been shown to lead to biased parameter estimates (Asparouhov & Muthén, 2009).

In order to address these issues, recent studies have shown the relevance of bifactor models (Blasco-Belled et al., 2019; Nozaki et al., 2019; Palmer et al., 2005) and exploratory structural

equation modeling (ESEM; Nozaki, 2019; Perera, 2015) in research on emotional intelligence. Similar claims have recently been made in the vocational literature (Giordano et al., 2020). On the one hand, the bifactor model (model D in Figure 1) is designed to model a general factor as well as independent dimensions. This model partitions the variance between all items and a general factor in which the residual variance is explained by the specific dimensions (Rodriguez et al., 2016). Therefore, it is possible to evaluate the specific contributions of each dimension while controlling for the variance explained by the general factor. On the other hand, ESEM (model E in Figure 1) combines exploratory factor analysis, confirmatory factor analysis, and a structural equation modeling framework to model latent variables for multidimensional constructs and is characterized by the possibility of estimating cross-loadings (Asparouhov & Muthén, 2009). Recently, a bifactor-ESEM (model F in Figure 1) framework has been developed, blending the characteristics of these two separate models (Morin et al., 2015).

Insert Figure 1 here

Although bifactor-ESEM models have been considered as particularly relevant for examining multidimensional constructs, no studies have yet investigated emotional intelligence through this framework. Additionally, and more importantly, there is no line of research investigating the specific contributions and predictive validity of emotional intelligence over and above the general factor in career development. Accordingly, the present study aimed to extend the measure of emotional intelligence through the adoption of a bifactor-ESEM framework as well as investigate the measurement qualities of emotional intelligence compared with conventional measurement models (e.g., CFA). Moreover, to demonstrate the relevance of bifactor models in the career domains for guidance counseling and interventions, we also aimed

to investigate the predictive validity of both the general factor of emotional intelligence and its dimensions on important career-related outcomes (i.e., emotional exhaustion, work-family conflict, family-work conflict, and career satisfaction).

Emotional intelligence

Over the last few decades, a large number of definitions and theoretical models have been proposed for the concept of emotional intelligence. Currently, two major conceptual approaches – ability emotional intelligence and trait emotional intelligence – coexist. Ability emotional intelligence, which was principally developed by Salovey and Mayer (1990), refers to the mental ability to process emotional information and to use it to guide one's thinking and actions. Salovey and Mayer developed a four-branch ability model that divided emotional intelligence into four abilities: 1) perceiving emotions; 2) using emotions to facilitate thought; 3) understanding emotions; and 4) managing emotions. As for the trait emotional intelligence model, it refers to a panel of emotion-related dispositions rooted in individuals' personalities that influence behavior and adaptation in emotional situations (Petrides & Furnham, 2001). A third wave of scholars have not seen these models in opposition to one another, but have developed mixed models such as Bar-On's model of emotional social intelligence (Bar-on, 2006) which considers other non-cognitive characteristics such as social skills, adaptability, and empathy, among others. To reconcile previous theoretical debates, some authors have developed a fourth kind of model. These are known as integrative models of emotional intelligence and include approaches such as Mikolajczak, Quoidbach, Kotsou, and Nélis' (2009) tripartite model of emotional intelligence. In line with these theoretical developments, we have decided to focus on Mikolajczak et al. definition that considers emotional intelligence as the way individuals identify (i.e., ability to identify and differentiate emotions), understand (i.e., ability to understand why individuals feel what they feel and to understand the message conveyed by emotions), express (i.e., express

emotions in a socially acceptable manner), regulate (i.e., ability to exert control on own positive and negative emotions), and use emotions (i.e., ability to use emotional information to guide thoughts and behaviors). This particular model offers a state-of-the-art conceptualization and an integrative model of emotional intelligence. The tripartite approach acknowledges three levels of emotional intelligence: knowledge related to emotions, abilities related to emotions, and dispositions related to emotions (Mikolajczak et al., 2009).

Based on the tripartite model of emotional intelligence, Brasseur and colleagues (2013) have developed the Profile of Emotional Competence (PEC) questionnaire. This scale evaluates the five dimensions in Mikolajczak and collaborators' model at the intrapersonal and interpersonal levels, thereby comprising a total of ten dimensions. The PEC has become widely used in the emotional intelligence domain and demonstrates incremental validity over the Big Five personality traits (Brasseur et al., 2013). However, a recent investigation of the PEC has revealed a poor fit through CFA models (Nozaki et al., 2019). Nozaki et al. (2019) have therefore performed Bayesian structural equation modeling (a close measurement model to ESEM) to examine the PEC's factor structure. Nozaki et al. (2019) have demonstrated that the utilization dimension did not load on the intrapersonal emotional intelligence factor and have also highlighted the importance of differentiating the effect of intrapersonal and interpersonal emotional intelligence. Following this recommendation and based on the assumption that intrapersonal emotional intelligence was more strongly related to health indices (Mikolajczak et al., 2015) and subjective stress (Pekaar et al., 2019), we focused on intrapersonal emotional intelligence in the present study. The investigation of intrapersonal emotional intelligence was also motivated with regards to the dependent variables (i.e., emotional exhaustion, work-family conflict, family-work conflict, and career satisfaction), which were mainly predicted by the intrapersonal dimension of emotional intelligence in past research.

Emotional intelligence can be conceptualized as a general factor of adaptive functioning because it has been demonstrated to have a significant impact in many different spheres of life, such as physical health (Mikolajczak et al., 2015), mental health (Sánchez-Álvarez et al., 2016), social relationships (Malouff et al., 2014), and work domains (Miao et al., 2017). Research over the last decade has also demonstrated its importance in the career domain. Scholars have shown the positive influence of emotional intelligence with regards to career decision-making processes (Di Fabio & Kenny, 2011), career success (de Haro García & Costa, 2014), and employability (Nelis et al., 2011). Furthermore, research has demonstrated that emotional intelligence was a predictor of self-perceived employability and career decision processes through the mediation effect of career adaptability (Udayar et al., 2018). Studies in this domain have also shown that emotional intelligence was a predictor of career adaptability in longitudinal studies (Parmentier et al., 2019). These results have led researchers to consider emotional intelligence as a key resource in career development because individuals with a high level of emotional intelligence seem to be better at setting career goals, adapt more efficiently to different organizational cultures, develop and understand relationship dynamics as well as anticipate the emotional consequences of career challenges, transitions, and difficulties (Potgieter, 2014).

The present study

Going one step beyond emotional intelligence measurement: A bifactor-ESEM approach

The first objective of this study was to investigate the multidimensionality of emotional intelligence with the intrapersonal subscale of the PEC (Brasseur et al., 2013). More precisely, we aimed to evaluate how the bifactor-ESEM framework presents a better depiction of emotional intelligence construct than conventional measurement models (e.g., CFA). In line with previous research demonstrating the relevance of bifactor models and ESEM in the realm of emotional intelligence (Blasco-Belled et al., 2019; Palmer et al., 2005; Perera, 2015), we expected bifactor-

CFA and ESEM to provide a better representation of emotional intelligence compared to conventional CFA. We also expected that a bifactor-ESEM would be the best solution compared to alternative models. Finally, following a recent investigation of the PEC among 14,591 participants (Brasseur et al., 2013; Nozaki et al., 2019), we also expected that the utilization dimension would not load onto the emotional intelligence factor.

The predictive validity of emotional intelligence

A second objective of the present study was to evaluate the extent to which emotional intelligence and the dimensions would predict important career-related outcomes using the bifactor-ESEM framework among a sample of adult learners. In order to attain this objective, we performed bifactor models that took into account the general factor and specific dimensions as well as offered the possibility of predicting outcome variables to evaluate how each dimension would have a specific contribution while controlling for the general factor. We decided to focus our study on adult learners because this population faces important challenges and career changes. In Belgium, the country in which the research was conducted, the status of "adult learner" encompasses common characteristics. Typically, as adult learners generally experience a career interruption, most of them are older than traditional students and enrolled in a master's degree program between 30 and 35 years old. Also, they have to manage multiple roles simultaneously, such as those of workers, parents, and students, by attending courses outside working hours (Fairchild, 2003). Therefore, beginning an adult education program is a particular event involving a vocational transition and multiple task roles. It is also a challenging period entailing substantial professional development. Despite the specific challenges involved, very few scholars have focused on this particular population. Hence, we aimed to investigate how the general factor and specific dimensions of emotional intelligence (by controlling for the general

factor) predict their level of emotional exhaustion, work-family conflict, family-work conflict, and their level of career satisfaction.

General predictions about emotional intelligence

The appendix lists all of our hypotheses. We first hypothesized that having a high level of emotional intelligence would predict a lower level of emotional exhaustion. Our hypothesis was based on the assumption that emotionally intelligent individuals are more able to use appropriate emotional regulation strategies regarding their work, tend to evaluate stressful situations as a challenge rather than a threat, and have confidence in their abilities to face challenging situations (Peña-Sarrionandia et al., 2015). Also, prior research has revealed that increasing emotional intelligence via training decreases the level of job burnout in experimental studies (Karahan & Yalçin, 2009). Second, we hypothesized that having a high level of emotional intelligence would predict a lower level of work-family conflict. Accordingly, Weinzimmer and colleagues (2017) have shown that individuals with a higher level of emotional intelligence presented a lower level of work-family conflict. These results are explained by the fact that individuals with high emotional intelligence are able to identify the expectations from work and family environments. They are also able to express and regulate their emotions adaptatively, allowing them to respond to work and family expectations. Our third hypothesis was that a high level of emotional intelligence would predict a lower level of family-work conflict. Building on the results of Weizimmer et al. (2017) and the spillover theory explaining the mutual effects of work and family on one another (Edwards & Rothbard, 2000), we hypothesized that the ability to manage work and family demands at the same time would also lead to a lower level of family-work conflict. Our fourth hypothesis was that a high level of emotional intelligence would predict a higher level of career satisfaction because emotionally intelligent individuals are less anxious and better regulate their emotions during career decision-making processes, leading to more

adaptative career-related choices (Emmerling & Cherniss, 2003). In doing so, they choose jobs in accordance with their needs and aspirations, leading to greater career and life satisfaction.

An additional objective of our study was to demonstrate the predictive validity of emotional intelligence dimensions beyond the general factor. We therefore developed specific hypotheses for each dimension of emotional intelligence based on the tripartite model of Mikolajczak et al. (2009).

Identification of emotions

With regards to the identification dimension, we first hypothesized that a high level of identification would predict a lower level of emotional exhaustion. Accordingly, a systematic review has demonstrated that a higher level of emotional identification was negatively associated with emotional exhaustion (Mérida-López & Extremera, 2017). This hypothesis was also based on the assumption that individuals with a higher level of identification are better at identifying their emotions. Furthermore, those with lower levels of emotional identification have more adverse outcomes, such as depression due to interpersonal issues (Joormann & Gotlib, 2006). Second, we hypothesized that having a high level of identification would predict a lower level of work-family conflict. Accordingly, prior research has demonstrated that emotion identification has been associated with the quality of interpersonal relationships (Brasseur et al., 2013). Third, we hypothesized that a high level of identification would predict a lower level of family-work conflict. Fourth, we hypothesized that having a high level of identification would predict a higher level of career satisfaction. As emotion is a message of the satisfaction of our needs, Young et al. (1996) have also highlighted that emotional identification is crucial in order to understand our career interests and to carry out actions in accordance with these emotions.

Comprehension of emotions

Regarding the comprehension dimension, we first hypothesized that having a high level of comprehension would predict a lower level of emotional exhaustion. Individuals with a higher level of comprehension are more able to understand why they feel and what they experience as well as being able to better comprehend what their emotions mean (e.g., unsatisfied needs). The comprehension dimension has also been recognized as a strong predictor of health outcomes (Mikolajczak et al., 2015). Our hypothesis was also based on prior research demonstrating that the comprehension dimension was associated with a lower level of emotional exhaustion (for a systematic review, see Mérida-López & Extremera, 2017). Second, we hypothesized that having a high level of comprehension would predict a lower level of work-family conflict. Through the comprehension of emotions, individuals with a high level of comprehension are able to discern what is important for them and act in accordance with their needs in their professional and personal relationships. Thus, understanding and fulfilling needs play a crucial role in interpersonal conflict resolution (Kelman, 1996). Accordingly, we third hypothesized that having a high level of emotion comprehension would predict a lower level of family-work conflict. Finally, Young and Valach (1996) assumed that understanding our career needs via our emotions can lead to better career choices. Fourth, we therefore hypothesized that having a high level of comprehension would predict a higher level of career satisfaction.

Expression of emotions

Expressing emotions in a socially acceptable manner is also crucial because it regulates social relationships (Keltner & Kring, 1998). During a stressful situation, such socially acceptable expressions limit the risk of having a high workload, and, in the end, emotional exhaustion. Accordingly, we hypothesized that having a high level of expression would predict a lower level of emotional exhaustion. Second, we hypothesized that having a high level of expression would predict a lower level of work-family conflict. Having a high level of emotion expression

promotes clear communication between work and family environments, reducing the risk of work-family conflicts. Third, we thus also hypothesized that having high scores on emotion expression would predict a lower level of family-work conflict. Moreover, a higher level of emotion expression can lead to the clearer communication of an individual's career interests and values during career counseling sessions, which in turn can lead to finding a job that meets their expectations (Emmerling & Cherniss, 2003). Finally, we hypothesized that having a high level of expression would predict a higher level of career satisfaction.

Emotion regulation

Regarding emotion regulation, we first hypothesized that having a high level of regulation would predict a lower level of emotional exhaustion. Accordingly, prior research has already showed that the ability to regulate emotions moderates the links between job demands and emotional exhaustion (Van de Ven et al., 2013). Second, we hypothesized that having a high level of regulation would predict a lower level of work-family conflict. Brasseur et al. (2013) have already shown that emotion regulation was related to the quality of social relationships. In the same vein, we third hypothesized that having a high level of regulation would predict a lower level of family-work conflict. Fourth, we therefore hypothesized that having a high level of regulation would predict a higher level of career satisfaction. Prior research has also demonstrated that emotion regulation is a predictor of career satisfaction (de Haro García & Costa, 2014). Moreover, a previous study conducted in Belgium with the PEC found that emotion regulation was the most predictive dimension of mental health outcomes (Mikolajczak et al., 2015). Consequently, we also hypothesized that emotion regulation would be the strongest predictor among the different dimensions of emotional intelligence regarding the four career-related variables.

Using emotions

Finally, emotion utilization refers to the capacity to use emotional information to guide one's thinking and actions (Salovey & Mayer, 1990). Previous research has noted that a higher level of emotion utilization predicted confidence in achieving one's career goals or predicted regulation in career decision processes (Santos et al., 2018). However, a meta-analysis and other studies have demonstrated that the utilization dimension did not load coherently on the emotional intelligence factor (Fan et al., 2010; Nozaki et al., 2019). Given the diverging and inconsistent results regarding the psychometric properties and construct validity of the utilization dimension, we did not propose specific hypotheses.

Method

Participants

The sample consisted of 445 adult learners, ranging in age from 20 to 61 years old (*Mean age* = 31.08, *SD* = 8.67). In the sample, 71% were female (n = 316), 24.5% were male (n = 109) and 4.5% did not report their gender (n = 20). Additionally, 19.8% of the sample was in the first year of their studies. Also, 62.2% were married, 31.9% were single, and 5.8% did not report their marital status. 36.6% of the sample were parents, 57.3% were not, and 6.1% did not report if they had children. Tenure/Job experience ranged from 0 to 34 years (*Mean tenure* = 6.88, *SD* = 7.09). As a proportion of the participants had no job experience (i.e., tenure was 0), we removed their responses for the career satisfaction variable.

Among the 445 adult learners, 1.6 % of the total sample were partial respondents. The results showed that there were no differences between females and males with regards to age, $t(415) = .1.401$, $p = .162$, tenure, $t(408) = 1.308$, $p = .192$, marital status, $\chi^2(1) = 1.929$, $p = .165$, emotional intelligence $t(423) = 1.195$, $p = .233$, emotional exhaustion $t(420) = -.907$, $p = .385$, work-family conflict, $t(419) = -.736$, $p = .462$, family-work conflict, $t(419) = -.319$, $p = .750$, and career satisfaction, $t(381) = -1.97$, $p = .232$.

Procedure

The participants were recruited among a sample of adult learners enrolled in a master's degree in Educational Sciences in Belgium. This program was created to develop their knowledge and expertise in the domain of educational sciences. The majority of participants in the program are headteachers, schoolteachers, adult trainers, civil servants, or human resources employees. Adult learners had to enroll in one of four specializations: adult education, teacher education, management of socio-educational organizations, and school-based learning.

The participants were invited to respond to the survey during their courses via a paper and pencil questionnaire. The inclusion criteria for participating in the study was enrollment in the Master of Educational Sciences and to speak French. We indicated that the survey was confidential and anonymous. After a first page describing the anonymity and the confidentiality of the study, participants were invited to respond to the different measures. They first completed the career satisfaction items, followed by the work-family and family-conflict items, the emotional exhaustion items, and the emotional intelligence items. The end of the questionnaire was composed of socio-demographic items.

Measures

Emotional intelligence

Emotional intelligence was assessed in French with the intrapersonal emotional intelligence subscale of the *Profile of Emotional Competence* (Brasseur et al., 2013, i.e., 25 items). The original measure is a Likert-type scale validated in French, including 50 items ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). In the present study, the scale comprised a global score of intrapersonal emotional intelligence (α = .849, 95% CI [.827; .869]) and five intrapersonal emotional intelligence dimensions with five items each: identification (i.e., "*I am good at describing my feelings,*" α = .72, 95% CI [.678; .761]), comprehension (i.e., "*When I am feeling*

low, I easily make a link between my feelings and a situation that affected me," α = .77, 95% CI [.730; .799]), expression (i.e., "*If I dislike something, I manage to say so in a calm manner*," α = .68, 95% CI [.626; .722]), regulation (i.e., "*I easily manage to calm myself down after a difficult experience*," α = .75, 95% CI [.714; .787]),) and utilization (i.e., reversed, "*I never base my personal life choices on my emotions," α* = .74, 95 % CI [.702; .779]).

Emotional exhaustion

Emotional exhaustion was assessed in French with the five-item subscale of the *Maslach Burnout Inventory-General Survey* (MBI-GS; Maslach, Jackson, & Leiter, 2010). To this end, we used a back-translation from the original version in English to French (Brislin, 1981). A sample item is "*I feel emotionally drained from my work*". This Likert-scale type ranges from 1 (*never*) to 7 (*every day*). Cronbach's α in the present study was .784, 95 % CI [.750; .815]. The omega coefficient was 0.775, 95% CI [.744; .805]. The one-dimensional model fitted the data satisfactorily in light of the CFI and the SRMR, except for the TLI and the RMSEA ($\chi^2(4)$ = 37.436; $p < .001$; CFI = .946; TLI = .866; RMSEA = .138 [.099; .179]; SRMR = .040).

Work-family and family-work conflict

Work-family conflict was assessed with the French version of the *Survey Work-Home Interference Nijmegen* (SWING; Geurts et al., 2005; Hansez et al., 2006). To reduce the length of the survey, we used the three highest loading items from the SWING. This Likert-type scale ranging from 1 (*never*) to 5 (*always*) evaluates the extent to which participants' work negatively influences the home situation. A sample item is "*How often does it happen that you find it difficult to fulfill your domestic obligations because you are constantly thinking about your work?*". Cronbach's α in the present study was .848, 95% CI [.821; .871].

Family-work conflict was assessed with the French version of the *Survey Work-Home Interference Nijmegen* (SWING; Geurts et al., 2005; Hansez et al., 2006). To reduce the length of

the survey, we used the three highest loading items from the SWING. This Likert-type scale, which ranges from 1 (*never*) to 5 (*always*) evaluates the extent to which participants' home lives negatively influence their work. A sample item is "*How often does it happen that you do not fully enjoy your work because you worry about your home situation."* Cronbach's α in the present study was .852, 95% CI [.827; .875]. The omega coefficient for both factors was .932, 95% CI [.925; .939]. The two-dimensional model fitted the data well ($\chi^2(8) = 31.454$; $p < .001$; CFI = .983; TLI = .969; RMSEA = .082 [.053; .113]; SRMR = .037).

Career satisfaction

Career satisfaction was assessed with the French version of the *Career Satisfaction Scale* (Bravo-Boussy, 2005; Greenhaus et al., 1990). This measure is a Likert-type scale, including 5 items ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). This scale evaluates the extent to which participants are satisfied with the success achieved in their career and the progress made to reach their career goals. A sample item is "*I am satisfied with the success I have achieved in my career*." Cronbach's α in the present study was .852, 95% CI [.827; .875]. The omega coefficient was 0.824, 95% CI [.835; .873]. The one-dimensional model fit the data satisfactorily in light of most of indices, except for the RMSEA ($\chi^2(5) = 34.041$; $p < .001$; CFI = .971; TLI = .941; RMSEA = .113 [.077; .153]; SRMR = .026).

Results

Assessment of the alternative measurement models

Statistical analyses were conducted using the M*plus* 8 maximum likelihood estimator (ML) and followed a three-step strategy. This estimation method is recommended when the number of answer categories is higher than five (Rhemtulla et al., 2012). The first step involved the modeling and the comparison of eight alternatives measurement model: (1) a higher-order confirmatory factor analysis (H-CFA), composed of five first-order factors (i.e., five dimensions

of emotional intelligence) with a second order factor representing the factor of emotional intelligence in which no cross-loadings were allowed; (2) a first-order confirmatory factor analysis, composed of five correlated dimensions (CFA) in which no cross-loadings were allowed; (3) a method factor model for the H-CFA and the CFA in order to take into account the negative wording of items (Podsakoff et al., 2003); (4) a bifactor-CFA, in which all items were allowed to define a general factor and five specific factors but no cross-loadings were allowed; (5) a random intercept factor analysis (RIFA), in which the random intercept factor represented common method variance (e.g., social desirability; Maydeu-Olivares & Coffman, 2006); (6) an ESEM model composed of five correlated dimensions in which cross-loadings were allowed but constrained as close as possible to zero; and (7) a bifactor-ESEM model, combining bifactor-CFA and ESEM models specificities. Model(s) fit(s) was assessed with several goodness-of-fit statistics in order to evaluate model comparisons: the Comparative Fit Index (CFI), the Tucker Lewis Index (TLI), the Root Mean Square Error of Approximation (RMSEA) with a 90% confidence interval, and the Standardized Root Mean Residual (SRMR). CFI and TLI have to be greater than 0.90 to support an acceptable fit. Also, the RMSEA and the SRMR have to be smaller than 0.08 to support an acceptable fit of the data (Hu & Bentler, 1999). To compare the alternative models, we also analyzed the information criteria (AIC, CAIC, BIC, ABIC), where the lower values inform which model(s) fit the data better.

The goodness-of-fit indices for the eight alternative models of emotional intelligence are reported in Table 1. The H-CFA, CFA, and bifactor-CFA fitted the data unsatisfactorily (CFI and TLI <.80; RMSEA and SRMR >.08). However, both the ESEM and bifactor-ESEM models revealed a good fit which significantly improved compared to alternative models. As expected for the method factor and RIFA models, the bifactor-CFA, ESEM, and bifactor-ESEM models

presented a better fit. These results indicated that the general factor in the bifactor models did not represent a common method variance, such as social desirability or acquiescence.

Insert Table 1 here

As each model is able to absorb unmodeled sources of construct-relevant multidimensionality, an examination of the different models at the goodness-of-fit indices-level and the statistical and theoretical conformity-levels is important. After comparing the fit, Morin et al. (2015) proposed examining CFA to ESEM solutions. In these models, factors are correlated, but the importance of examining them relates to the modeling of cross-loadings. When the results show a different pattern of factor correlations, the ESEM solution should be retained. The second comparison involves contrasting the retained model with its bifactor modeling (bifactor-CFA or bifactor-ESEM). Here, selecting a bifactor model relates to the observation of a well-defined general factor by strong factor loadings and the observation of lower values for cross-loadings in a bifactor-ESEM solution compared to an ESEM solution. Factor loadings and item residuals for H-CFA, CFA, ESEM, bifactor-CFA, and bifactor-ESEM are reported in Tables S2, S4, S5, S6, and Table 3, respectively.

The factor correlations for CFA and ESEM solutions are reported in Table 2. Regarding the factor correlations between the CFA and the ESEM solutions, the ESEM solution presented lower values compared to the CFA, demonstrating the inflation of factor correlations in CFA models. As expected, results also showed positive correlations among the different emotional intelligence dimensions, with the exception of the utilization dimension. The H-CFA also revealed that the utilization dimension did not load onto the general factor of emotional intelligence.

Insert Table 2 here

Regarding the bifactor-CFA and bifactor-ESEM solutions, we observed that all items loaded positively and significantly on the general factor of emotional intelligence. However, a series of items of the utilization dimension in both solutions did not load significantly on the general factor. When items loaded significantly, they sometimes loaded negatively. Regarding the specific dimensions, all items did not load on their specific factor in the bifactor-CFA (i.e., identification and comprehension). In the bifactor-ESEM solution, reported in Table 3, items did not load on their specific dimension for the identification dimension, and two items did not load on their specific dimension for the comprehension dimension. These results indicate that the general factor explains the majority of the variance for identification and comprehension items. For expression, regulation, and utilization dimensions, all items loaded on their specific dimension (except for item C2 in the bifactor-CFA solution), suggesting their specific contribution over and above the general factor.

Insert Table 3 here

We then followed Rodriguez and colleagues' (2016) recommendations by examining other indices, namely explained common variance (ECV) at factor and item-level and omega coefficients (omega (ω), omega$_S$ (ω_S), omega$_H$ (ω_H), omega$_{HS}$ (ω_{HS}) and relative omega). It is also recommended to examine the percentage of uncontaminated correlations (PUC) in conjunction with the ECV. A description and the cut-off values of these additional indices are reported in Table S9.

The psychometric indices of the bifactor-CFA and bifactor-ESEM are also reported in Table S7 and S8, respectively. First, the general factor of emotional intelligence accounted for 47% of explained common variance for the bifactor-CFA (ECV = .47) and 43% for the bifactor-ESEM solution (ECV = .43). The average of explained common variance at item-level was .53 for the bifactor-CFA and .45 for the bifactor-ESEM. The PUC in the present study was .83. As an ECV superior to .70 in conjunction with a PUC superior to .70 supports the unidimensionality of the construct (Rodriguez et al., 2016), our results, on the whole, supported the multidimensionality of the emotional intelligence construct and the relevance for investigating the different dimensions. Regarding the omega coefficients, ω values were high for the general factor and acceptable for five dimensions (ω > .70), indicating good reliability. However, the dimensions accounted for less reliable variance (ω_{HS} for bifactor-CFA = .16-.50, ω_{HS} for bifactor-ESEM = .00-.07) – with the exception of the utilization dimension in the bifactor-CFA (ω_{HS} = .76) – in comparison to the general factor (ω_{H} for bifactor-CFA = .73, ω_{H} for bifactor-ESEM = .74). Regarding the relative omega, the general factor accounted for the most reliable variance compared to dimensions, except for the utilization dimension in the bifactor-CFA (.99). This indicated that 99% of the reliable variance in the utilization dimension is independent of the general factor in the bifactor-CFA versus 8% in the bifactor-ESEM.

In summary, our results supported the importance of considering the multidimensionality of the emotional intelligence construct, even if the general factor accounted for a larger part of the reliable variance. As the bifactor-ESEM fitted the data well and presented a better statistical and theoretical conformity with regards to our construct, we thus retained this model for investigating the predictive power of the general factor and the specific dimensions while controlling for the general factor simultaneously with the career-related variables.

Emotional intelligence and the prediction of career-related variables with the bifactor-ESEM

Finally, we tested with the bifactor-ESEM framework how the specific effects and incremental validity of emotional intelligence dimensions predicted important career-related outcomes while controlling for the general factor. To this end, we performed a structural equation model analysis in which the general factor and the dimensions predicted emotional exhaustion, work-family conflict, family-work conflict, and career satisfaction. We analyzed regression coefficients from the general factor and dimensions (i.e., identification, comprehension, expression, regulation, and utilization) for each career-related outcome. To test whether emotion regulation was the strongest predictor in comparison to other dimensions and the general factor, we performed a Wald test by constraining parameters to equality. The standardized regression coefficients of the structural equation model are reported in Table 4. For the measurement model, the model fitted the data well ($\chi^2(639) = 1026.86$; $p < .001$; CFI = .945; TLI = .930; RMSEA = .037 [.033; .041]; SRMR = .040). All the indicators of the career-related outcomes loaded on their a priori factors, with standardized loadings ranging from .53 to .74 for emotional exhaustion; .79 to .85 for work-family conflict; .84 to .90 for family-work conflict and .63 to .87 for career satisfaction. We therefore examined the impact of emotional intelligence on the four different constructs. As expected, the general factor of emotional intelligence negatively predicted emotional exhaustion ($\beta = -.21$, $p < .001$), work-family conflict ($\beta = -.11$, $p < .05$), family-work conflict ($\beta = -.29$, $p < .001$), and positively predicted career satisfaction ($\beta = .23$, $p < .001$). Regarding the specific dimensions, comprehension negatively predicted emotional exhaustion ($\beta = -.27$, $p < .001$), work-family conflict ($\beta = -.21$, $p < .001$) and family-work conflict ($\beta = -.12$, $p < .05$) over and above the impact of the general factor of emotional intelligence but not career satisfaction. Moreover, regulation negatively predicted emotional exhaustion ($\beta = -.36$,

$p < .001$) and work-family conflict ($\beta = -.15$, $p < .001$) but not family-work conflict and career satisfaction. The Wald test results also showed that regulation was the strongest predictor of emotional exhaustion with regards to identification (Wald statistic $\chi^2(1) = 24.33$, $p < .001$), comprehension (Wald statistic $\chi^2(1) = 21.29$, $p < .001$), expression (Wald statistic $\chi^2(1) = 11.52$, $p < .001$), utilization (Wald statistic $\chi^2(1) = 73.63$, $p < .001$), and the general factor of emotional intelligence (Wald statistic $\chi^2(1) = 34.72$, $p < .001$). Additionally, the Wald test results also showed that regulation was the strongest predictor of work-family conflict with regards to identification (Wald statistic $\chi^2(1) = 173.14$, $p < .001$), and utilization (Wald statistic $\chi^2(1) = 91.41$, $p < .001$), but not for comprehension (Wald statistic $\chi^2(1) = .02$, $p = .90$), expression (Wald statistic $\chi^2(1) = 2.21$, $p = .14$) and the general factor of emotional intelligence (Wald statistic $\chi^2(1) = 1.85$, $p = .17$). Finally, the utilization dimension positively predicted family-work conflict ($\beta = .14$, $p < .05$). Contrary to our hypothesis, identification and expression dimensions did not predict career-related outcomes.

Insert Table 4 here

Discussion

In attempting to further current emotional intelligence measurement in relation to career development, our study's objectives were twofold. The first objective was to demonstrate the added value and the relevance of the bifactor-ESEM framework for the study of the emotional intelligence construct compared to other measurement models. Based on recent studies demonstrating that bifactor models (Blasco-Belled et al., 2019; Palmer et al., 2005) and ESEM (Perera, 2015) allow for a more valid structure of emotional intelligence compared to conventional CFA, we propose a novel way of investigating emotional intelligence by unifying

both models. The second objective was to test the predictive validity of emotional intelligence by differentiating the specific effects of dimensions over and above the general factor of emotional intelligence on important career-related outcomes (i.e., emotional exhaustion, work-family conflict, family-work conflict, and career satisfaction) for the population of our interest, that is, adult learners. Building on previous research that has demonstrated the importance of intrapersonal emotional intelligence on different outcomes, such as physical health and the subjective experience of stress (Mikolajczak et al., 2015; Pekaar et al., 2019), we decided to investigate the intrapersonal dimension(s) of the Profile of Emotional Competence (Brasseur et al., 2013).

Our results demonstrate the superiority of the ESEM compared to the CFA, which resulted in a better fit, lower factor correlations, and higher discriminant validity between the dimensions. As previously highlighted by Perera (2015), the ESEM framework provides a better representation of the multidimensional structure of emotional intelligence because it takes into account the possibility that items load on more than one construct. Our results also echo the findings of previous research that has demonstrated that conventional CFA represents poorly multidimensional constructs. In addition to a better fit, our results exhibit lower factor correlations. This is consistent with simulation studies demonstrating that factor correlations in CFA can be inflated (e.g., Marsh et al., 2013). With regards to parameter estimates, we also show that different items were strongly loaded on other non-target dimensions.

Apart from our examination of the CFA and ESEM solutions, we also observe negative loadings between the utilization dimension and the general emotional intelligence factor in the H-CFA. Furthermore, our results show negative factor correlations between the utilization dimension and other dimensions. Previous researchers have already questioned the relevance of the utilization dimension in the conceptualization of the emotional intelligence construct. For

example, Palmer et al. (2005) demonstrated that the utilization dimension explained nothing more than the general factor in a bifactor-CFA model. A meta-analysis has also supported the argument that using one's own emotion and emotion perception tapped into the same underlying dimension (Fan et al., 2010). This result led the researchers to remove the utilization dimension from the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT, Salovey & Mayer, 1990).

With regards to the bifactor-CFA model, results show a better fit in the present study than conventional CFA and method factors but is still below the traditional cut-off. This model has been, however, promoted in the domain of emotional intelligence (Blasco-Belled et al., 2019; Palmer et al., 2005) and in the vocational literature (Giordano et al., 2020). This model allows for the partitioning of the total covariance among items into a general factor underlying all items as well as specific factors explaining the residual covariance, which is not explained by the general factor (Rodriguez et al., 2016). In other words, this model offers the possibility of evaluating the specific contribution and variance explained by the dimensions while controlling for the variance already explained by the general factor. To ascertain that the general factor did not represent a common method variance (e.g., social desirability or acquiescence), we performed a RIFA. This model, which has quite a similar structure to the bifactor model, constrains factor loadings to one between the general factor and observed indicators but allows for the intercept to be freely estimated across participants. Our results show that the bifactor models fitted the data better than the RIFA, indicating that the general factor of emotional intelligence does not represent a common factor such as acquiescence.

Our research is also the first to compare a bifactor-CFA model and ESEM model, but the superiority of the ESEM in regard to the fit is probably linked to the restriction of cross-loadings to zero, which has been related to measurement problems in other areas involving multidimensional constructs (e.g., Morin et al., 2015). However, the relevance of the general

factor of emotional intelligence is crucial for distinguishing the specific effect of the dimensions while controlling for the general factor. We therefore investigated a bifactor-ESEM solution, combining the best of bifactor-CFA and ESEM models. We first observe that the bifactor-ESEM had a better fit compared to alternative models. We also compared a bifactor-CFA solution to a bifactor-ESEM solution. Results also show that factors for the identification dimension loaded only on the general factor but not on the specific factor of identification. These results indicate that the identification dimension was mainly explained by the general factor and that the specific dimension explains little to no variance. This is surprising because prior research has demonstrated the incremental validity of identification dimension in comparison to the general factor of emotional intelligence (Palmer et al., 2005). Other studies have however found a negative association between identification and life satisfaction (Blasco-Belled et al., 2019). We also observe that factors for the utilization dimension did not load as coherently as the other dimensions onto the general factor (i.e., sometimes negatively). More precisely, most utilization items loaded on the utilization dimension but not on the general factor. Palmer et al. (2005) have already shown that the utilization dimension explained nothing more than the general factor of emotional intelligence. Our results therefore question the relevance of the utilization dimension in the models of emotional intelligence. As previously explained in relation to the ESEM solution, our results with the bifactor-ESEM do not support the hypothesis of Nozaki et al. (2019), suggesting that the utilization facet would be expressed by another dimension(s). If this were the case, the a priori utilization items would have mainly loaded positively and significantly on other dimensions. However, our results do not suggest that the utilization dimension was a distinct dimension either because some items loaded significantly onto the general factor of emotional intelligence. Future research is therefore needed to shed light on the identification and utilization

dimensions in order to demonstrate if these dimensions are distinct dimensions of emotional intelligence or whether individuals identify and use their emotions with another dimension(s)[1].

As Rodriguez et al. (2016) have highlighted, a large majority of the research in this field has relied only upon a "*good fit*" to conclude that bifactor models are superior to alternative models. However, a close examination of parameter estimates and additional psychometric indices (i.e., ECV, PUC, and omega coefficients) is crucial if we are to conclude which model should be retained. We demonstrate that the ECV and the sum of I-ECV indices supported the multidimensionality of our construct. Moreover, results from the Omega coefficients supported that the general factor, which did not appear to be a method common variance, accounted for a larger part of the reliable variance. Following Rodriguez and collaborators' (2016) recommendations, the PUC also has to be analyzed in conjunction with the ECV in order to determine the unidimensional/multidimensional nature of the construct. Our results did not provide enough clear information to make such a determination in this case. It appears that the emotional intelligence construct evaluated with the PEC support a multidimensional construct with a substantive and strong general factor. Thus, we decided to retain the bifactor-ESEM model for its theoretical and statistical relevance.

Based on these conclusions, we evaluated whether specific dimensions made a specific contribution while controlling for the general factor regarding career-related variables. As expected, the results from the structural equation modeling show that the general factor of emotional intelligence negatively predicted emotional exhaustion. These results are in line with previous experimental studies which show that emotional intelligence is a strong predictor and

[1] Additional analyses showed that, when removing the utilization dimension from the model, most items of the identification dimension loaded on their respective dimension and the general factor. In this model, identification only predicted emotional exhaustion over and above the general factor. Interested readers can contact the first authors for complete results.

protective factor for job burnout (Karahan & Yalçin, 2009). Moreover, the general factor also negatively predicted work-family and family-work conflict, in agreement with prior research which has demonstrated that emotional intelligence is a significant predictor of work-life balance and well-being outcomes (Weinzimmer et al., 2017). Emotionally intelligent individuals can better manage the stress involved in their multiple roles because they implement appropriate emotion regulation strategies and have confidence in their capacities to face differing environmental demands (Peña-Sarrionandia et al., 2015). Finally, the general factor positively predicted career satisfaction in accordance with research demonstrating the effect of a general factor of emotional intelligence with bifactor-CFA on life satisfaction (Blasco-Belled et al., 2019). Individuals with a higher level of emotional intelligence tend to be less anxious during career decision-processes, which leads them to choose jobs in accordance with their career aspirations and needs (Emmerling & Cherniss, 2003).

Concerning the dimensions, we observe that comprehension negatively predicted emotional exhaustion, work-family conflict, and family-work conflict. As explained by Clore et al. (2001), emotion is important information for humans. Emotionally intelligent individuals are more capable of using this information to determine their needs, guide their judgment, and make important decisions according to their needs. They are also more competent in determining the needs underlying the trigger of particular emotional situations. However, comprehension did not predict career satisfaction, which is consistent with de Haro García and Costa (2014).

In line with our hypothesis, regulation negatively predicted emotional exhaustion and was the strongest predictor compared to the general factor and other dimensions. Regulation also predicted work-family conflict (and was a stronger predictor than identification and utilization) but not family-work conflict and career satisfaction. Based on previous studies, it is not surprising that regulating one’s own emotions had a specific effect over and above the general

factor of emotional intelligence. Previous longitudinal studies have, for example, demonstrated that the ability to seek emotional support–an emotional regulation strategy–during a period of distress at work moderates the effect of emotional job demands on emotional exhaustion (Van de Ven et al., 2013). Additionally, the ability to regulate one's own emotions was associated with the quality of social relationships (Brasseur et al., 2013). Mikolajczak and colleagues (2015) also demonstrated that regulation was the strongest predictor of mental health outcomes.

Finally, utilization positively predicted family-work conflict, suggesting that using one's own emotions to guide thoughts and behaviors predicts more conflict in the work environment related to family life. Individuals who are more adept at using their emotions may be able to identify their needs better and, as a result, spend more time with the family, leading to negative outcomes in the work sphere. At the same time, the utilization dimension displayed an incoherent pattern in our measurement models. The results from the bifactor-ESEM solution suggest that it might be necessary to reconsider the utilization dimension in Mikolajczak and colleagues' (2009) tripartite model of emotional intelligence. Negative correlations and the analyses of psychometric indices suggest that utilization is possibly a separate concept of emotional intelligence, which can lead to divergent results. Future investigation will be needed to clarify this.

Limitations and future directions

The current study is not without limitations. First, our study was mainly composed of adult learners. Even if our objective was to target a specific population confronted with multiple challenges, future research should aim to replicate our findings in other professions and adult learners' situations. Second, our study was cross-sectional. It thereby excluded the possibility of determining the directionality of the effects between emotional intelligence and career-related outcomes. Future research should focus on longitudinal designs to evaluate how the general factor of emotional intelligence and its dimensions will fluctuate across time and in relation to

career-related outcomes. Third, several fit indices of the one-dimensional models were below the traditional cut-offs. Although these career-related outcomes were validated in the literature and our general model for the structural regression fitted the data well, it would be worthwhile to evaluate whether adjustments of these scales could be beneficial for adult learners population. Fourth, there may be potential limitations in the ESEM and bifactor-ESEM models because there is a lack of a priori hypothesizing regarding cross-loadings. Bayesian ESEM has already been used in relation to emotional intelligence with the PEC to address this issue (Nozaki et al., 2019). Even if the Bayesian ESEM model allows for directly estimating a priori cross-loadings, the main limitation is the absence of goodness-of-fit indices, which leads to difficulties in comparing alternative models and invariance constraints. Fifth, our research has mainly investigated the intrapersonal domain of emotional intelligence. However, past research has shown the importance of interpersonal emotional intelligence in vocational literature (Santos et al., 2018). Future research is needed to investigate the specific contributions of interpersonal emotional intelligence dimensions over and above the general factor of emotional intelligence and differentiate the specific effects between intrapersonal and interpersonal emotional intelligence in career development. Sixth, our results question the reliability and validity of the PEC. Previous authors have also pointed out the difficulty in disentangling the specific effects of the different dimensions due to their closeness and the high number of dimensions when using the PEC (Pekaar et al., 2018). Even if the current study addressed this issue, our results also demonstrate the necessity of developing a more parsimonious emotional intelligence model. To this end, the Rotterdam Emotional Intelligence Scale provides a relevant alternative. Recent studies using this scale have demonstrated the capacity to differentiate the specific effect of the intrapersonal and interpersonal dimensions of emotional intelligence (Pekaar et al., 2019). This scale also displayed a good convergent validity with the PEC. The bifactor-ESEM framework could also be applied to

the Trait Emotional Intelligence Questionnaire and the MSCEIT to provide additional evidence on their factor structure (Petrides & Furnham, 2001; Salovey & Mayer, 1990). Finally, even if additional psychometric indices have been proposed to evaluate the multidimensional/unidimensional nature of constructs (Rodriguez et al., 2016), clear cut-off values are still scarce within the current literature (e.g., $omega_{HS}$). Thus, the theory remains crucial when it comes to making decisions about the nature of the construct. In the present study, the ECV was below .70, but the PUC was superior to .80. We found no clear indications as to how we might have solved this issue in the literature. Moreover, few studies have examined how psychometric indices (e.g., relative omega) are calculated when cross-loadings are computed in the model estimation. Although bifactor models address several issues concerning conventional measurement models, future research is needed to clarify and advance statistical guidelines for bifactor models further.

In spite of the present limitations, the current study provides important information for future research and emphasizes the significance of emotional intelligence in career development. At a theoretical level, this study supports the argument for considering emotional intelligence as a multidimensional construct composed of a strong general emotional intelligence factor and specific dimensions. Recent studies call for using bifactor models when analyzing emotional intelligence (Blasco-Belled et al., 2019; Palmer et al., 2005) and the ESEM framework (Perera, 2015). To the best of our knowledge, our study is the first to unify the best of both worlds. Our results, therefore, suggest investigating the role of emotional intelligence through the bifactor-ESEM framework in future research.

At a practical level, our results indicate that relying upon the general factor and its specific dimensions offers an important resource for guidance counselors and their future interventions in career counseling. As emotional intelligence has been recognized as a malleable self-regulatory

resource that can be improved in a wide range of domains (Hodzic et al., 2018), developing interventions based on bifactor-ESEM will bring crucial practical information. More specifically, our study suggests that it is important to train all dimensions to increase the global level of emotional intelligence, particularly the comprehension and regulation dimensions, to reduce emotional exhaustion, work-family conflict, and increase career satisfaction. Future research is needed to shed light on the dimensions that have a contribution over and above the general factor in order to implement tailor-made interventions according to career-related outcomes.

Finally, the current investigation also promotes the importance of emotional intelligence in adult education contexts. Adult learners hold the dual role of worker and student, in addition to family demands (Fairchild, 2003). At the same time, they have to cope with significant career issues during their training (Vertongen et al., 2009). The current study has shown that a higher level of emotional intelligence (and particularly emotion comprehension and emotion regulation) predicts a lower level of emotional exhaustion, work-family and family-work conflict, and a higher level of career satisfaction. As emotional intelligence can be taught (Hodzic et al., 2018), career counselors who work with adult learners could be particularly attentive to their emotional difficulties and help them develop appropriate emotion regulation strategies throughout their studies. Emotional intelligence also deserves greater attention within school settings and in educational policies in order to develop emotional intelligence training that will help adult learners develop sustainable careers.

CRedit Authorship Contribution Statement

Thomas Pirsoul: Conceptualization, Methodology, Data Curation, Formal analysis, Writing – Original draft; **Michaël Parmentier:** Conceptualization, Methodology, Data Curation, Formal analysis, Writing – Review & Editing; **Frédéric Nils:** Conceptualization, Methodology, Writing – Review & Editing, Supervision.

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Data availability

The datasets analyzed during the current study are available from the corresponding author on reasonable request.

Conflict of interest

The authors declare that they have no conflict of interest.

Ethical Approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent

Informed consent was obtained from all individual participants included in this study.

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Appendix

Hypotheses for the general factor of emotional intelligence and each dimension

General predictions about emotional intelligence

H1a. A high level of emotional intelligence would predict a lower level of emotional exhaustion

H1b. A high level of emotional intelligence would predict a lower level of work-family conflict

H1c. A high level of emotional intelligence would predict a lower level of family-work conflict

H1d. A high level of emotional intelligence would predict a higher level of career satisfaction

Identification of emotions

H2a. A high level of emotion identification would predict a lower level of emotional exhaustion

H2b. A high level of emotion identification would predict a lower level of work-family conflict

H2c. A high level of emotion identification would predict a lower level of family-work conflict

H2d. A high level of emotion identification would predict a higher level of career satisfaction

Comprehension of emotions

H3a. A high level of emotion comprehension would predict a lower level of emotional exhaustion

H3b. A high level of emotion comprehension would predict a lower level of work-family conflict

H3c. A high level of emotion comprehension would predict a lower level of family-work conflict

H3d. A high level of emotion comprehension would predict a higher level of career satisfaction

Expression of emotions

H4a. A high level of emotion expression would predict a lower level of emotional exhaustion

H4b. A high level of emotion expression would predict a lower level of work-family conflict

H4c. A high level of emotion expression would predict a lower level of family-work conflict

H4d. A high level of emotion expression would predict a higher level of career satisfaction

Emotion regulation

H5a. A high level of emotion regulation would predict a lower level of emotional exhaustion

H5b. A high level of emotion regulation would predict a lower level of work-family conflict

H5c. A high level of emotion regulation would predict a lower level of family-work conflict

H5d. A high level of emotion regulation would predict a higher level of career satisfaction

Tables

Table 1

Goodness-of-fit indices of alternatives measurement models of emotional intelligence

Models	χ^2 (df)	CFI	TLI	RMSEA (90% CI)	SRMR	AIC	BIC	CAIC	ABIC
H-CFA	1,166.013* (270)	.766	.739	.086 (.081-.091)	.097	38,070	38,398	38,478	38,144
CFA	1,128.844* (265)	.774	.744	.086 (.080-.091)	.092	38,043	38,391	38,476	38,121
MF-H-CFA	957.271* (259)	.817	.788	.078 (.073-.083)	.100	37,883	38,256	38,347	37,967
MF-CFA	869.38* (254)	.839	.810	.074 (.068-.079)	.080	37,805	38,199	38,295	37,894
RIFA	943.399* (264)	.822	.798	.076 (.071-.081)	.100	37,859	38,212	38,298	37,939
Bifactor-CFA	804.437* (250)	.855	.826	.071 (.065-.076)	.073	37,748	38,158	38,258	37,841
ESEM	409.294* (185)	.941	.905	.052 (.045-.059)	.029	37,483	38,159	38,324	37,636
Bifactor-ESEM	313.662* (165)	.961	.929	.045 (.037-.053)	.025	37,427	38,186	38,371	37,598

Note. H-CFA = higher order confirmatory factor analysis; CFA = first order confirmatory factor analysis; MF = method factor; RIFA = random intercept factor analysis; ESEM = exploratory structural equation modeling; df = degrees of freedom; CFI = comparative fit index; TLI = Tucker-Lewis index; RMSEA = root mean square error of approximation; CI = confidence interval; SRMR = standardized root mean residual; AIC = Akaike information criterion; BIC = Bayesian information criterion; CAIC = constant AIC; ABIC = sample size adjusted BIC.

* $p < 0.001$

Table 2

Standardized factor correlations for the CFA (above the diagonal) and ESEM (below the diagonal) solutions

	1	95% CI	2	95% CI	3	95% CI	4	95% CI	5	95% CI
1. Identification	–	–	.72***	[.66; .78]	.81***	[.75; .87]	.45***	[.36 ; .54]	.18**	[.08; .23]
2. Comprehension	.36***	[.29; .44]	–	–	.55***	[.47; .63]	.42***	[.34; .51]	–.06	[–.16; .03]
3. Expression	.37***	[.28; .46]	.45***	[.39; .52]	–	–	.49***	[.40; .58]	.15*	[.05; .25]
4. Regulation	.31***	[.23; .38]	.35***	[.27; .42]	.27***	[.20; .35]	–	–	–.11	[–.20; –.01]
5. Utilization	.23***	[.16; .30]	.13***	[.21; .05]	–.01	[-.09; .08]	–.09	[–.17; –.01]	–	–

Note.

* p <0.05.

** p<0.01.

*** p<0.001

CI = confidence interval of standardized factor correlations

Table 3

Standardized factor loadings (λ), item residuals (δ) and psychometric indices for bifactor–ESEM

Items	# of items	λ						δ	I-ECV
		General factor	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5		
1. Identification									
Item A1	6	**.50*** **	**-.17**	*–.18***	–.06	-.09	*.21****	.63***	.68
Item A2	16	**.65*** **	**-.03**	.02	.01	.04	*.15****	.55***	.94
Item A3	20	**.44*** **	**.15**	.01	–.05	.03	-.08	.77***	.85
Item A4	48	**.63*** **	**-.02**	*–.08**	–.08	–.15***	.13*	.55***	.88
Item A5	49	**.80*** **	**.21**	.13	–.00	-.07	*-.08**	.29***	.89
2. Comprehension									
Item B1	1	**.53****	.01	**.65*** **	–.05	.02	–.05	.29***	.40
Item B2	2	**.55*** **	–.11	**.78*** **	.02	.04	*–.09**	.06	.33
Item B3	10	**.48*** **	–.23	**-.09**	–.09	–.09	.19***	.66***	.67
Item B4	26	**.56*** **	*.30****	**.20**	.16	.05	*–.14***	.51***	.64
Item B5	43	**.60*** **	*.26***	**.24***	–.01	.02	-.02	.51***	.74
3. Expression									
Item C1	8	**.66*** **	-.17	*–.12**	**.21****	.03	.07	.47***	.82
Item C2	17	**.39*** **	-.11	.03	**.19****	*.26****	.04	.73***	.56
Item C3	25	**.54*** **	.04	.03	**.57*** **	.00	–.07*	.37***	.46
Item C4	38	**.28*** **	.08	–.04	**.58*** **	–.11*	.14*	.57***	.19
Item C5	42	**.27*** **	.04	*.17***	**.28****	.12*	–.02	.80***	.37
4. Regulation									
Item D1	12	**.32*** **	-.03	.05	–.12**	**.72*** **	–.06	.35***	.16
Item D2	15	**.34*** **	.07	-.05	.00	**.61*** **	–.07	.49***	.23
Item D3	37	**.51*** **	*.20****	*.19**	.11	**.30*** **	*–.20****	.52***	.54
Item D4	39	**.32*** **	-.04	-.01	.14**	**.67*** **	–.07	.42***	.18
Item D5	50	**.26*** **	*-.17***	.06	–.02	**.25*** **	.04	.83***	.41
5. Utilization									
Item E1	9	**–.14**	*.31****	.09	.16	–.22**	**.50*** **	.56***	.04
Item E2	21	**.04**	-.02	.02	.02	.05	**.73*** **	.46***	.01
Item E3	22	**.29*** **	-.17	*-.16**	–.14	–.09	**.41*** **	.69***	.26
Item E4	24	**.06**	-.11	*-.14***	–.01	–.02	**.72*** **	.44***	.01
Item E5	41	**.16***	-.09	-.07	–.04	–.08	**.07*** **	.47***	.05

Note. Items which have a non-target factor loading and higher than their target loadings are underscored. Factor loadings of items on their target factor(s) are in bold. For each factor, significant non-target loadings which are higher than at least one target loadings are in italic.

* $p < 0.05$.

** $p < 0.01$.

***$p<0.001$.

Table 4

Structural equation modeling results with the bifactor-ESEM predicting emotional exhaustion, work-family conflict, family-work conflict, and career satisfaction by emotional intelligence

	EI-Factor	Identification	Comprehension	Expression	Regulation	Utilization	
	β (*SE*)	*β* (*SE*)	*β (SE)*	*β (SE)*	*β (SE)*	*β (SE)*	R^2
Emotional exhaustion	–.21 (.06)***	–.10 (.08)	–.27 (.06)***	–.03 (.06)	–.36 (.06)***	.04 (.05)	.26
Work-family conflict	–.11 (.06)*	–.02 (.08)	–.21 (0.05)***	–.09 (.07)	–.15 (.06)**	.02 (.06)	.09
Family-work conflict	–.29 (.05)***	.13 (.08)	–.12 (.06)*	–.11 (.07)	–.11 (.06)	.14 (.05)**	.16
Career satisfaction	.23 (.05)***	.05 (.08)	.02 (.06)	.02 (.07)	.08 (.06)	.04 (.06)	.07

Note. *β* = standardized regression coefficients, *SE* = standard errors; R^2 = proportion of explained variance.

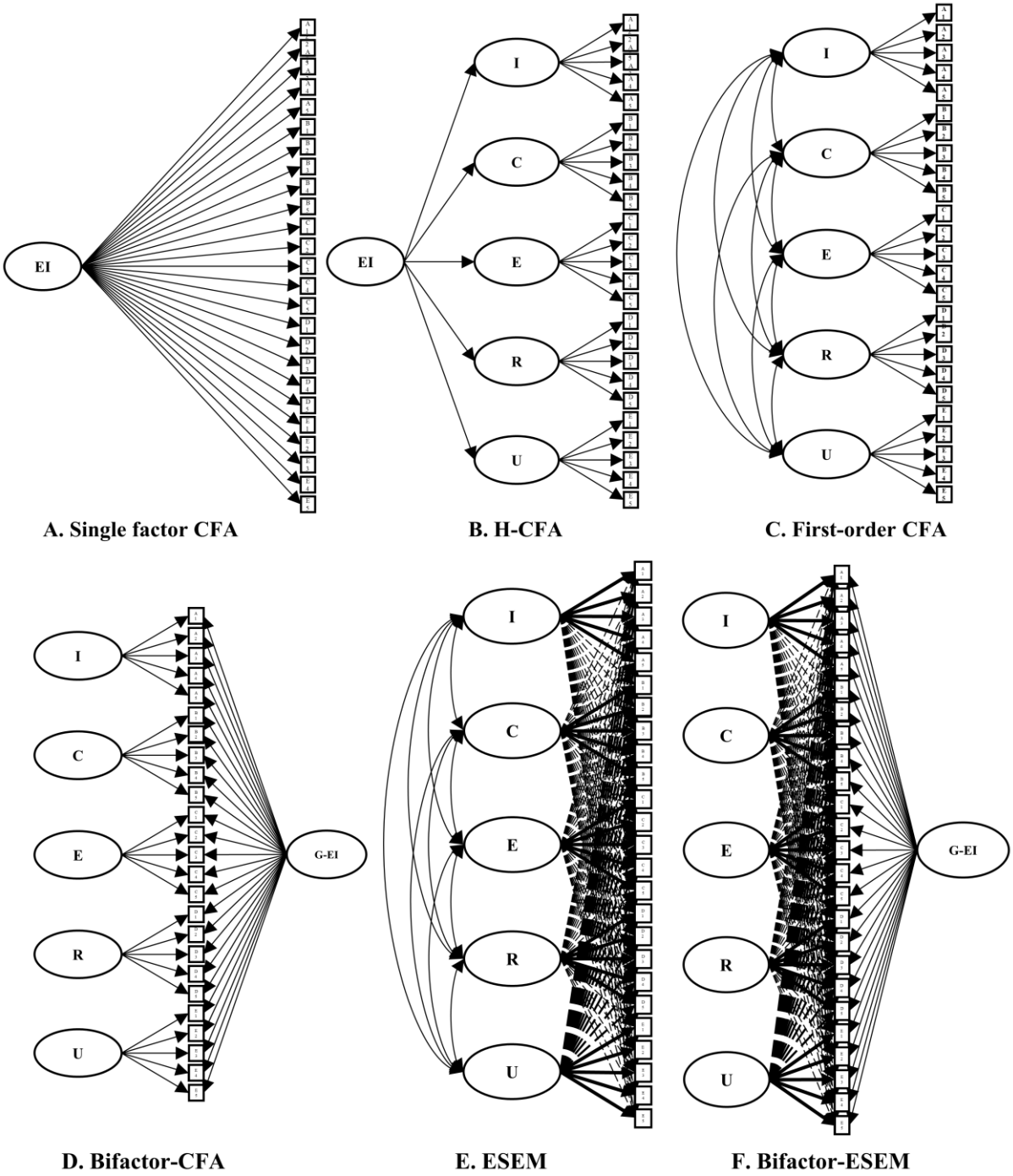
* $p < 0.05$

** $p < 0.01$

*** $p < 0.001$

Figure 1

Graphical representation of the alternative measurement models



Note. H = higher order; CFA = confirmatory factor analyses; ESEM = exploratory structural equation modeling; I = identification; C = comprehension; E = expression; R = regulation; U = utilization; G = general factor; EI = emotional intelligence.