'Possunt, quia posse videntur': They can because they think they can. Development and Validation of the Work Self-Efficacy Scale: Evidence from two Studies

Barbaranelli, C, Fida, R, Paciello, M & Tramontano, C

'Possunt, quia posse videntur[*]': They can because they think they can. Development and Validation of the Work Self-Efficacy Scale: Evidence from two Studies

[*](Virgil, 70-19 BC, line 231) Virgilio Marone, Publio *Aeneid*: Book V.

Claudio Barbaranelli[1], Roberta Fida[1,2], Marinella Paciello[3], Carlo Tramontano[4]**

[1]Department of Psychology, Sapienza University of Rome, Rome, Italy

[2]Norwich Business School, University of East Anglia, Norwich, United Kingdom

[3]UninettunoTelematic International University, Rome, Italy

[4] Centre for Advances in Behavioural Science, Coventry University, Coventry, United Kingdom

***Authorship is alphabetical, and all authors contributed equally to this work*

Abstract

Self-efficacy (SE) has been recognised as a pervasive mechanism of human agency influencing motivation, performance and well-being. In the organisational literature, it has been mainly assessed in relation to job tasks, leaving the emotional and interpersonal domains quite unexplored, despite their relevance. We aim to fill this gap by presenting a multidimensional work self-efficacy (W-SE) scale that assesses employees' perceived capability to manage tasks (task SE), negative emotions in stressful situations (negative emotional SE), and their conduct in social interactions, in terms of both defending their own point of view (assertive SE) and understanding others' states and needs (empathic SE). Results from two independent studies (Study 1, N=2,192 employees; Study 2, N=700 employees) adopting both variable- and person-centred approaches support the validity of the scale. Findings of factor analyses suggest a bi-factor model positing a global W-SE factor and four specific W-SEs, which are invariant across gender and career stages. Multiple regressions show that global W-SE is associated with all considered criteria, task SE is associated positively with in-role behaviours and negatively with counterproductive behaviours; negative emotional SE is negatively associated with negative emotions and health-related symptoms; empathic SE is positively associated with extra-role behaviour; and, unexpectedly, assertive SE is positively associated with counterproductive work behaviour. However, results from a latent profile analysis showed that the relationship between the SEs and criteria is complex, and that W-SE dimensions combine into different patterns, identifying four SE configurations associated with different levels of adjustment.

Keywords: Self-Efficacy, In-Role Behaviour, Extra-Role Behaviour, Counterproductive work behaviour, Well-being , Self-regulation, Bi-factor model

Introduction

From a social cognitive theoretical perspective, self-efficacy (SE), defined as 'people's beliefs in their capability to exercise some measure of control over their own functioning and over environmental events' (Bandura, 2001, p.10), is a key variable to study how people manage themselves and their behaviour at work. Indeed, SE has been recognised as the most central and pervasive mechanism of human agency, influencing motivation, well-being and personal achievement and fulfilment (Bandura, 1997).

Bandura highlighted that 'the efficacy beliefs system is not a global trait but a differentiated set of self-beliefs linked to distinct realm of functioning' (2006, p. 307). Hence, SE should be operationalised considering the range of capabilities (e.g. task-related, emotional, interpersonal), which is particularly relevant in the context under study. As suggested by Bandura (1997), focusing attention mainly on one SE dimension may result in a partial understanding of how the human self-regulatory system operates and affects employees' performance, adaptive behaviour and well-being. Since employees must not only complete tasks but also manage their emotions and interpersonal relationships, the adoption of a multidimensional approach when assessing SE at work would be pivotal. The relevance of considering emotional and interpersonal domains, in addition to cognitive ones related to the management of tasks, is consistent with the broader literature on competence and intelligence, which has extended its theoretical models integrating these three domains (Boyatzis, 2008; Goleman, 1995; 2006).

The multidimensional approach would be also relevant considering that people's beliefs about their capabilities are not stable, as suggested by career literature (e.g., Klassen et al., 2011; Maurer, 2001; Tschannen-Moran & Woolfolk Hoy, 2007), and that employees have to face different task-related, emotional and interpersonal challenges over their career and during transition periods. Indeed, their self-beliefs are likely to change as a consequence of dynamic processes of gains and losses (Baltes, 1987), of the feedback received from the environment and of reappraisal processes

(Bandura, 1997). Hence, a scale capable of assessing, in a valid and reliable way, different work-related SEs throughout the professional stages would be a further asset.

However, while the multidimensional approach when assessing SE has been adopted in other psychological fields (e.g. education, development and personality), this is not the case in the organisational context. Indeed, in this setting measures developed within Bandura's theory generally operationalised SE only in relation to more or less specific job tasks, leaving the role of other domains (e.g. emotional and interpersonal) quite unexplored, despite their relevance for employees' performance and well-being (e.g. Hayes 2002; Kim, Cable, Kim, & Wang, 2009).

The aim of this research is to present and validate a multidimensional work-SE (henceforth W-SE) scale, to assess individuals' efficacy beliefs in four self-regulatory capabilities: task, negative emotional, empathic and assertive W-SEs. We conducted two studies, which integrate the variable-oriented and the person-oriented approaches (Bergman & Wangby, 2014), to investigate the potential benefits of adopting this multidimensional approach. In particular, the research objects are:

-to investigate the factorial structure of the W-SE scale and test its invariance across gender and career stages (Study 1);

-to investigate the criterion validity of the W-SE scale by exploring the association of each SE dimension with in-role, extra-role and counterproductive work behaviours, negative emotions, and health-related symptoms (Study 2);

-to investigate the incremental validity of the specific SE dimensions against a global SE factor in relation to various criteria (Study 2);

- to further investigate the validity of the W-SE scale by examining whether it is possible to identify groups characterised by different SE configurations and exploring whether and how these configurations are differently associated with the aforementioned criteria as well as gender and career stages (Study 2).

In the following section, after providing a review of the literature on SE in the organisational context and across different psychological fields, we detail the rationale guiding the inclusion of the

four chosen SE dimensions over others. We acknowledge that the work context is extremely complex and requires individuals to put into play a wide variety of self-regulatory capabilities. However, rather than attempting to include all possible specific dimensions, we opted to identify a sub-set of self-regulatory capabilities that are: (1) related to different domains of self-regulation, including behavioural, emotional and interpersonal; and (2) rooted in well-established theoretical frameworks.

The multidimensional approach adopted to develop the W-SE scale has the advantage of providing a nuanced and comprehensive picture of individuals' beliefs on their capabilities. Assessing only one self-regulatory capability (e.g. task-related) may indeed result in partial understanding. In line with Bandura (1997; 2006), it is important to explore SE beliefs in different self-regulatory capabilities to investigate how they are combined with each other and to understand how individuals orchestrate them to fulfil their goals and manage themselves in challenging and demanding situations. Indeed, an employee may perceive themselves as highly efficacious in accomplishing tasks but less efficacious in managing negative emotions associated with demanding and conflict situations. Similarly, two employees may perceive themselves as equally efficacious in accomplishing tasks but quite differently efficacious in empathising with others or in defending their own opinions and rights.

This multidimensional approach has practical implications since management and HR could use the scale to gain an all-round understanding of their employees over the course of their career by providing a valid and reliable tool to assess and monitor individuals' beliefs in relation to different self-regulatory capabilities. Consequently, this may result in tailoring interventions and trainings aimed at strengthening individual resources.

The Rationale for the Multidimensional W-SE Scale

The assessment of SE in a variety of domains of functioning has been commonly adopted in educational, developmental and personality psychology, while it has been quite rare, if not absent, within the organisational literature. Indeed, in this context, SE has been mainly operationalised in

terms of employees' belief about their capability to manage and accomplish work-related tasks. More in details, while some authors have investigated employees' SE beliefs in relation to narrow tasks (e.g. Cinamon, 2006; Sullivan, O'Connor, & Burris, 2006), others have examined it in relation to broader tasks relevant across occupations (e.g. Parker, 1998; Rigotti, Schyns, & Mohr, 2008). The exclusive focus on tasks is also common among scholars developing occupation- specific SE measures (e.g. Tschannen-Moran & Woolfolk Hoy, 2001; Wang & Netemyer, 2002) as well as in the vocational literature, where SE has been assessed in relation, for instance, to job seeking (Saks, Zikic, & Koen, 2015) and career decisions (Betz, Hammond, & Multon, 2005).

Within the educational, developmental and personality psychology literatures, scholars have highlighted the relevance of investigating also SEs related to managing emotions and interpersonal relationships. For instance, several studies have examined emotional SE, which refers to perceived confidence in regulating negative emotions experienced during stressful or adverse events (Caprara et al., 2008). It is relevant in relation to performance and positive adjustment. In particular, students with high emotional SE perform better even if they experience high anxiety (Galla & Wood, 2012), exhibit fewer internalising problems such as anxiety and depression (e.g. Dou, Wang, Bin, & Liu, 2016), and are less likely to engage in deviant and transgressive behaviour (Caprara et al., 2008). In addition, emotional SE is associated with good graduate employability and, in turn, with high career satisfaction (Dacre Pool & Qualter, 2013).

The interpersonal SE domain has also been frequently investigated in personality and developmental psychology. In particular, social SE has been extensively studied and generally includes several facets. It refers to beliefs regarding the ability to enlist and build social relationships and be assertive (Bandura, 2006). It is a protective factor in relation to internalising problems associated with withdrawal and depressive tendencies (e.g. Bandura, Caprara, Barbaranelli, Gerbino, & Pastorelli, 2003; Caprara, Gerbino, Paciello, Di Giunta, & Pastorelli, 2010; Smith & Betz, 2000). Social SE also influences personal adjustment in terms of self-esteem and psychological well-being (Fan, Meng, Zhao, & Patel, 2012), interpersonal stress (Matsushima

& Shiomi, 2003) and performance (Dunbar, Dingel, Dame, Winchip, & Petzold, 2016). Within this domain, empathic SE, defined as the perceived capability to recognise and vicariously share others' emotions, and to be sensitive to how one's actions affect others' feelings (Di Giunta et al., 2010), has been further investigated. Individuals higher in this dimension engage more often in prosocial behaviour such as sharing, helping and taking care of others' needs, and engage less frequently in delinquent behaviour (e.g. Caprara et al., 2010). They also have better well-being and adjustment (Di Giunta et al., 2010). Finally, social SE is positively associated with career development and decisional processes (Smith & Betz, 2000).

Hence, based on this literature review and also referring to the theoretical models on behavioural and emotional regulation (e.g. Bandura, 1997; Carver & Scheier, 1981; Erber & Erber, 2000; Gross, 2008) as well as the interpersonal circumplex model of agency and communion (Bakan, 1966; Paulhus & Trapnell, 2008; Wiggins, 1991), we developed a multidimensional W-SE scale to assess task-related, negative emotional, empathic and assertive SE dimensions.

Task SE is defined as an employee's perceived capability to manage performance and work activities oriented towards the achievement of goals. We included this dimension given its particular relevance in relation to job performance and achievement (e.g. Judge, Jackson, Shaw, Scott, & Rich, 2007). In addition, it promotes well-being (e.g. Carroll et al., 2009) and hinders counterproductive work behaviour (Fida et al., 2015). Employees high in task SE are better able to plan actions, achieve goals, modulate their own behaviour according to opportunities and obstacles, and maintain their effort and engagement when facing difficulties, which they perceive as challenges rather than issues (Bandura, 1997). Consistent with theories on control processes in self-regulation (Bandura, 1997; Carver & Scheier, 1981), task SE comprises perceived capabilities involved in behavioural self-regulation. In particular, these capabilities are rooted in *cool executive functions* (Zelazo & Cunningham, 2007) which allow individuals to focus attention, recall pre-existing pertinent and instrumental memories, and anticipate the potential effects of an action. Through these activities individuals are able to manage their tasks and fulfil their goals.

The second dimension assessed in the W-SE scale is negative emotional SE, defined as employees' perceived capabilities to manage negative affective activation elicited by stressful and conflict situations at work and cope with critical situations and failures. We included this dimension based on its relevance in the working context. As McColl-Kennedy & Anderson claimed 'although there has been a reluctance to acknowledge the existence of emotions in a work setting, it is clear that workers in their multiple interactions with fellow workers and leaders are exposed to situations that produce emotions that can potentially influence their feelings, attitudes and behaviors' (2002, p. 547). It is well known that work context is 'one of the most interpersonally frustrating contexts that people have to deal with' (Fitness, 2000, p. 148) and the way individuals regulate their emotions could make a difference in their responses to work events. More in particular, negative emotions experienced at work may hinder performance (e.g. McColl-Kennedy & Anderson, 2002) and are a relevant antecedent of health and well-being (Consedine & Moskowitz, 2007; Watson & Pennebaker, 1989), as well as of dysfunctional conduct such as counterproductive work behaviour (e.g. Bruk-Lee & Spector, 2006; Fida, Paciello, Tramontano, Barbaranelli, & Fontaine, 2014). Negative emotional SE comprises employees' perceived capabilities involved in emotional self-regulation (e.g. Erber & Erber, 2000; Gross, 2008). These capabilities are rooted in *hot executive functions*, which allow individuals to delay gratification by evaluating the immediate versus future benefits and costs, to shift attention, and to manage their physiological responses (Zelazo & Cunningham, 2007). Overall, the literature shows that emotional SE is associated not only with the experience of fewer negative emotions at work but also lower likelihood of engaging in conduct that would potentially jeopardise both work activities and goal achievement (Fida et al., 2015). Indeed, the perception of being able to regulate affective states elicited by difficult and stressful situations allows individuals to cope more adaptively with these situations while inhibiting possible disruptive behavioural reactions and preventing possible negative consequences of strain (Bandura, 1997; Fida et al., 2015).

The final two dimensions included in the W-SE scale, empathic SE and assertive SE, are related to the interpersonal domain. While empathic SE refers to the perceived capability to consider and understand others' states and needs, assertive SE refers to the perceived capability to express and defend one's own point of view. We included the former given its association with prosocial and altruistic behaviour, this is in line with the literature on job performance, which highlights that performance should comprise not only in-role behaviour but also extra-role behaviour, for example, organisational citizenship behaviour (Griffin, Neil, & Parker, 2007). We included the latter to provide a better picture of interpersonal self-regulation. In particular, in line with circumplex interpersonal models (Bakan, 1966; Paulhus & Trapnell, 2008; Wiggins, 1991), it is pivotal to consider two orthogonal interpersonal coordinates, namely agency and communion, which correspond to the two basic psychological motivational determinants orienting and guiding individuals' behaviour in social interactions. In particular, while the agency dimension captures the basic need to *differentiate* oneself from others, the communion dimension captures the basic need to *be with* the others. Moreover, the choice to operationalise the interpersonal dimensions of SE and include both empathic and assertive SE is in line with a previous study conducted by Locke & Sadler (2007) on the general population that integrated the interpersonal model of agency and communion within the social cognitive perspective. In addition, further studies have suggested that individuals high in both dimensions are better able to adapt successfully to their social context (Pruitt & Rubin, 1986). Indeed, both these SE dimensions allow for managing any inconsistencies between one's own and others' needs (as in the case of conflict) through the capability to depict different and often contrasting goals, and identify strategies that will result in a benefit for all actors.

Study 1. The dimensionality of the W-SE Scale

The main aim of this study is to present the W-SE scale and examine its factor structure using a large and heterogeneous sample of employees. We first provide details about the process followed to develop the initial pool of items and then present the results of both measurement model and measurement invariance. To study the factor structure, we capitalise on very recent literature on the

various sources of multidimensionality (Morin, Arens, & Marsh, 2016; Sanchéz-Oliva, Morin, Teixeira, Carraca, & Silva, 2017) within the framework of bi-factor Exploratory Structural Equation Modelling (ESEM, Asparouhov, Muthén, & Morin, 2015). In particular, following the guidelines proposed by Morin and colleagues (2016), we contrast the following alternative models: (a) four-factor Confirmatory Factor Analysis (CFA); (b) four-factor ESEM; (c) hierarchical-ESEM, including four first-order factors and one second-order factor; (d) bi-factor ESEM (B-ESEM), including four specific W-SE factors and one global W-SE factor.

Measurement models based on so-called 'Independent-Cluster Model Confirmatory Factor Analysis' (ICM-CFA), which implies that cross-loadings linking the items to non-target factors are fixed at zero, generally fail to account for sources of construct-relevant psychometric multidimensionality (Morin et al., 2016; Sanchéz-Oliva et al., 2017). Indeed, items 'might be associated with more than one source of true score variance' (Morin et al., 2016, p. 117). In particular, (a) in the assessment of constructs that are conceptually interrelated, items referring to a construct may be validly associated with one or more of the others and this is often manifested by non-trivial cross-loadings. Further, (b) when a scale is intended to measure an overarching construct (e.g. SE at work) using statements that refer to specific dimensions (e.g. task, negative emotional, assertive, and empathic SEs), items may reflect two different sources of 'true' variability: one related to the overarching global construct, and the other related to the corresponding specific dimensions. These two sources of multidimensionality can indeed be accounted for by the B-ESEM framework. Hence, contrasting the suggested alternative models would result in a better understanding of the sources of construct-relevant multidimensionality that may be involved in the W-SE scale. To the best of our knowledge, a similar approach has been used in only two studies validating SE scales (Cornick, 2015; Tripp et al., 2013).

These different models will be tested using a cross-validation approach, based on a random split of the sample, and further generalised within a factorial invariance framework (Meredith, 1993) considering gender and job tenure as grouping variables capable of defining predetermined and

meaningful subgroups of participants (Sánchez-Oliva et al., 2017). Both these variables are considered the most useful for systematic testing of generalisability of results with respect to participants' characteristics (Lukaszewski & Stone, 2012). Indeed, the literature suggests gender differences in personality and self-regulatory behaviours (Bussey & Bandura, 1999; Costa, Terracciano, & McCrae, 2001). While women are generally more emotionally vulnerable, men are generally more assertive. In addition, women are generally more agreeable, prosocial and empathic (Eisenberg & Fabes, 1999), while males are generally more aggressive (Bettencourt & Miller, 1996). We also consider job tenure to examine the stability of the W-SE scale factor structure across career stages (early, mid and late). The rationale for this is twofold: (a) mastery experience is one of the main sources of SE beliefs and, depending on the stage of their career, individuals may rely on a more or less broad history or successes and failures; and (b) employees may restructure their SE beliefs mid-to late career (Bandura, 1997).

Participants and Procedure

Participants were employees selected using a convenience sampling procedure. Data were collected in Italy from master's students as part of empirical research for their dissertation. The students used preliminary results, showing the factorial structure and the reliability of the scales; all studies used partial samples, and none used the total sample presented here. None of these studies have been published and none of the students contributed in defining scale items or the hypotheses tested in this research. Each student provided participants with a questionnaire (in a blank envelope) and asked them to fill it in individually and return it by the following week. Before starting, students explained that responses would be kept confidential and that the research was not commissioned by the organisation for which they worked. In addition, they clarified that participation was voluntary and no rewards were to be expected. The research protocol was approved by the ethical board of the department to which the first author is affiliated.

The final sample comprised 2,192 Italian employees (51% women) with a mean age of 39.8 years (SD = 9.6). All employees were from the central-southern area of Italy. In terms of educational

level, 8.6% finished have junior high, 56% finished senior high, 28% had a bachelor, 7% had

master's or PhD degree. Regarding marital status, 35% were single, 58% were married, 6% were

divorced, and 1% were widowed. Participants have been working on average for 17.0 years (SD =

10.4) and they have been in their current organisation on average for 12.1 years (SD = 9.7). About

54% of the participants were employed in a private organisation, with a permanent contract (76%),

working full-time (85%) on average for 36 hours per week (SD= 9.5). Overall, almost a quarter of

the sample work in the healthcare sector (25.9%), 8.5% in the education sector, 6% in the financial

and insurance sector, 6% in the wholesale and retail sector, 5% in the manufacturing sector and the

remainder in the other sectors.

Measures

    Work Self-Efficacy scale construction.

  The process of item construction followed a twofold approach. Using a 'top-down' approach, we

conducted a rational examination of the literature on SE referring to four self-regulatory capabilities

previously defined. Using a 'bottom-up' approach, the item generation process benefitted from the

implementation of the 'critical incident' technique with nine groups of employees from different

professional contexts (bank, school, travel agency, factory of furniture, public administration,

factory of alimentary goods, tour operator and call centre). In each group, participants (from 3 to

30) were invited to identify a number of situations and tasks in their daily work activities that

seriously challenged their expertise. They were then asked to identify the specific capabilities they

recognised as the most effective and necessary to successfully manage those challenges and master

their profession. This enabled the identification of a range of core transversal and frequently

challenging situations employees need to face in their daily work activities.

  These two approaches informed the generation of a set of 26 items that were worded following

Bandura's (1997, 2006) guidelines. Before administering the questionnaire, the full list of items has

been read independently by three experts followed by a discussion on the way items were worded to

agree on the best formulation. The Table 1 presents the complete list of items: eight assessing *Task*

SE, seven assessing *Negative Emotional SE*, six assessing *Assertive SE*, and five items assessing *Empathic* SE. Participants were asked to indicate using a 7-poin Likert scale (from 1=*not at all* to 7 = *completely*) the score that best represents their degree of confidence in their ability to do each of things described.

Data Analysis

As noted above, four different models have been tested:

1. The ICM-CFA model posits four correlated factors, each measured by the corresponding W-SE items with all the cross-loadings on non-intended factors fixed at zero.

2. The ESEM model posits four correlated factors. In contrast to the ICM-CFA model, cross-loadings are not constrained to be fixed at zero. This feature of ESEM enables limitations of ICM-CFA models to be overcome, while remaining within the realm of SEM. In fact, when cross-loadings are fixed at zero, the un-modelled sources of relevant multidimensionality due to overlapping constructs produce inflated factor correlations. In our study, following Sánchez-Oliva et al. (2017), we used oblique target rotation to specify an ESEM that would be of a substantial confirmatory nature, due to the pre-specification of a target loading pattern where the principal loadings are freely estimated but the cross-loadings, although freely estimated, are 'targeted to be as close to zero as possible' (Sánchez-Oliva et al., 2017, p. 176).

3. Hierarchical-ESEM is specified using the ESEM-within-CFA approach (Morin et al., 2016), with four first-order factors specified as related to a single higher-order factor. The second-order factor is posited to test the presence of an overarching dimension underlying the responses to multiple items.

4. The bi-factor-ESEM (B-ESEM) model posits one global factor and four orthogonal specific factors with an orthogonal target rotation. The B-ESEM model is intended to account for two different sources of multidimensionality: one referring to overlapping constructs (through the specification of the ESEM pattern of loadings for specific factors) and one related to the presence of an overarching construct (through the specification of a global factor). Morin and colleagues (2016)

underlined the advantages of this model with respect to hierarchical ESEM.

Based on Hoyle's (1995) recommendations, and according to a multifaceted approach to an assessment of the model fit, we considered the following fit indices: Comparative Fit Index (CFI) and Tucker and Lewis Index (TLI); Root Mean Square Error of Approximation (RMSEA) along with 90% confidence interval limits and with the *test of close-fit*; and Standardized Root Mean Square Residual (SRMR). Additionally, we report traditional chi-square statistics. To contrast the four alternative models, we considered changes in CFI (cut-off: ΔCFI≤ 0.01) and RMSEA (cut-off: ΔRMSEA≤ 0.015). As suggested by Cheung and Rensvold (2002), changes below the suggested cut-off indicate that the model with fewer parameters and more degrees of freedom is preferred.

The robust maximum likelihood estimator MLR included in Mplus 8.0 software was used to take into account multivariate non-normality. Along with the four posited models, we implemented a further model testing a one-factor solution to provide evidence of the absence of bias due to common-method variance: if common-method variance is present, then the one-factor measurement model would fit the data well (Harman, 1976).

For the best-fitting model, we report standardised factor loadings (λ) and uniquenesses (δ). As estimates of model-based reliability, we included the omega coefficient of composite reliability (McDonald, 1970: $\omega = (\Sigma|\lambda_i|)^2 / ([\Sigma|\lambda_i|]^2 + \Sigma\delta_{ii})$. This index is preferred over Cronbach's alpha because it has the advantage of explicitly considering the parameters of the measurement model.

Following a cross-validation approach, we randomly split our sample in half; we tested the models on the first half and validated them on the other half. The first random sample comprises 1,117 employees, the second one comprises 1,075 employees. The random split was performed using IBM-SPSS facilities.

Factorial invariance tests across gender and career stages were conducted within the framework developed by Meredith (1993), considering the following four levels of measurement invariance: configural, metric, scalar and strict. To examine the model fit, the same indices described above were used. To compare nested models, the chi-square difference test was considered along with the

difference in CFI. Gender invariance was tested on 1,037 men and 1,126 women (29 participants did not report their gender). For career stages, we considered three groups: 'early career' employees with less than five years of job tenure (N=273; M age = 26.7, SD = 3.3, 48% males); 'mid-career' with job tenure ranging from six to 29 (N=513; M age = 42.6, SD = 4.9, 46% males); and 'late-career' employees with more than 30 years of job tenure (N=358; M age = 55.1, SD = 3.8, 55% males).

Results

Preliminary Items Statistics

As a preliminary analysis, a check of missing data was performed on all items (see online Additional Materials). While 95.4% of the sample had no missing data, 4.2% had only one item missing, and 0.4% had between from two and 11 missing items. By further exploring non-responses, the results provide support for the adoption of Full Information Maximum Likelihood (FIML) to handle missing data (Little's test $\chi^2(519) = 568.08$, p=.07). Items means ranged from 4.36 to 5.72 with negative skewness ranging from -.85 to -.13 and kurtosis ranging from -.59 to .57. Despite univariate normality, multivariate normality was not reached (multivariate skewness = 9.38, p<.001; multivariate kurtosis = 7.27, p<.001).

Factor Structure, Reliability and Measurement Invariance

Results of the four factorial models (Table 1) clearly showed that B-ESEM was the best model. In particular, B-ESEM outperformed both H-ESEM and ESEM considering both ΔTLI and ΔCFI. Moreover, it was the only model for which the test of close fit for RMSEA was not significant.

---------Table 1---------

Table 2 presents the parameter estimates for the B-ESEM solution, which reveals the presence of a global factor that is very well defined by all items. It is worth mentioning that in the B-ESEM solution, factor loadings for specific factors generally tend to be smaller in magnitude than those for the general factor because each item is associated with at least two factors (the global factor and the intended specific factors). With this in mind, the interpretation of factor loadings of specific factors

reveals that task SE is relatively well defined by all its eight items. Assertive SE is adequately defined by all its six items except for item 7 which seems to be much more related to global SE than to the specific assertive SE dimension, and shows similar cross-loadings on other specific dimensions. Negative emotional SE is well defined by all its seven items, with the exception of item 1, which seemed to be much more related to global SE and shows a relevant cross-loading on the task SE. Finally, empathic SE is well defined by all its five items with the exception of item 26, which shows a relevant cross-loading on task SE. Omega reliability coefficients are generally good or adequate except for assertive and empathic SE for which they were marginally adequate.

---------Table 2---------

The alternative mono-dimensional model resulted in a poor fit, $\chi^2(300, N = 1,117) = 3,319$, $p<.001$, RMSEA = .095 (90% CI = .092, .098), p(RMSEA <.05)<.001, CFI = .75, TLI =.72, SRMR = .132, providing further evidence for the adequacy of the posited four-factor solution and the absence of a relevant common-method bias.

Results of the four factorial models on the second random sample (Table 1 and Table 2) substantially confirm the goodness of fit of the B-ESEM model, although it must be noted that the ESEM and the H-ESEM models also achieved an adequate fit in this case. Results show that for the second random sample all three items that resulted critical in the first random sample (item1, 7 and 26) present adequate factor loadings for the intended specific-factor, and no cross-loadings in the second sample. Omega reliability coefficients are generally better and more adequate than in the first sample.

Table 3 summarises the results of the measurement invariance analysis. As noted above, this analysis was performed on the whole sample to test the replicability of the measurement model across gender and career stages. The findings support the replicability of the B-ESEM solution across both gender and career stages and the tenability of the most stringent level of invariance considered (strict invariance).

---------Table 3---------

Discussion

Results from the first study provide initial support for the factorial structure of the multidimensional W-SE scale. In particular, among the four alternative psychometric models tested, the B-ESEM model shows the best fit in both of the random samples. When considering the bi-factor component of the model, it is evident that W-SE scale items reflect two different sources of construct-relevant psychometric multidimensionality: (a) one global SE factor capturing an overarching SE dimension, referring to a general sense of SE in the work context, and (b) four specific factors, referring to SE beliefs in four different self-regulatory capabilities. Hence, the global SE factor represents employees' general belief about their capability to manage themselves overall at work, while each specific SE factor represents more molecular beliefs about their ability to manage tasks, manage negative emotions in stressful situations, empathically connect with others and, finally, express one's own point of view in situations in which disagreement occurs. If we imagine this as looking at the picture of 'me at work', the global factor provides a 'long shot' of the scene, while each specific factor zooms in on more detailed elements. When considering the ESEM component of the best-fitting model, in which cross-loadings are different from zero, relatedness among the specific SE dimensions emerges. This may reflect the action of shared mechanisms and processes (i.e. shared agentic proprieties) across self-regulatory capabilities, above and beyond their specificity.

Overall, results show that all 26 items, can be considered as factorially valid indicators of a global work SE factor and of the four SE beliefs in specific self-regulatory capabilities, with the exception of Items 1, 7 and 26. In particular, these three items present some inconsistency in terms of stability and generalizability as far as their loadings in the specific factor is concerned. Indeed, while they do not show an adequate factor loading in the first random sample, they reach a satisfactory level in the second sample.

Moreover, the B-ESEM model results are generalisable and stable across gender and career stages, as evidenced by the invariance analyses. In other words, all the factors (global and specific) have

the same meaning for males and females, and for early, mid- and late- career employees. Hence, even though individuals' SE beliefs may be strengthened or weakened by personal successes and failures, the work SE 'architecture' remains the same. As a consequence, the W-SE scale is valid for employees in different career stages and is applicable for monitoring changes over time.

In sum, findings from this study provide initial evidence on the good quality of the W-SE scale, even though further investigation is needed to test the stability of its factorial structure and explore its validity using both variable- and person-centred approaches. The subsequent study is devoted to these aims.

Study 2. Examining the criterion and incremental validity of W-SE Scale

The aim of this study is threefold. First, we test the replicability of the W-SE scale factor structure by examining it on an independent sample. Second, we test the criterion validity by investigating the association of the W-SE factors with different relevant criteria: in-role, extra-role and counterproductive work behaviours; negative emotions at work; and health-related symptoms. Third, we further investigate the validity of the scale within a person-centred approach (Magnusson & Törestad, 1993). In particular, using Latent Profile Analysis (LPA), we aim to identify clusters of employees characterised by different SE configurations and explore their association with the aforementioned criteria.

In relation to the first aim, we anticipate replicating the W-SE scale factor structure and to identify a global SE factor along with the four specific SE dimensions (i.e. task, negative emotional, empathic and assertive).

In relation to the second aim, we adopt the variable-centred approach, which aims to verify general principles and models at the population level by breaking down reality into discrete variables and examining their relationships (Magnusson & Törestad, 1993). Specifically, we examine the unique contribution of the four specific SE dimensions on each criterion, above and beyond the global SE factor. The included criteria were identified in line with the literature review, highlighting the central role of SE in relation to performance (Judge et al., 2007) and, more

generally, to well-being at work (Fida, Laschinger, & Leiter, 2016; Schwarzer & Renner, 2000). In terms of performance, following recommendations from the organisational literature (Griffin et al., 2007), we considered not only in-role but also citizenship behaviours (extra-role behaviour) and counter-performance (counterproductive work behaviour). In addition, considering the evidence from previous studies suggesting their association with SE dimensions (Bandura et al., 2003; Caprara et al., 2010; Fida, Paciello, Tramontano, Barbaranelli, & Farnese, 2015; Park, Sohn, & Ha, 2016), extra-role and counterproductive behaviours are also included. In terms of well-being, negative emotions and health-related symptoms, are included due to evidence suggesting their association with SE dimensions, as summarised in the literature review on emotional and social SE (Bandura et al., 2003; Caprara et al., 2010; Dou et al., 2016).

Overall, we hypothesise that:

a) the global and all the specific SE dimensions are significantly correlated with each criterion. In particular, we expect that these correlations are positive with in-role and extra-role behaviour, but negative with counterproductive work behaviour, negative emotions and health-related symptoms;

b) the four specific SE dimensions are associated with the criteria, above and beyond global SE;

c) the four specific SE dimensions are differently associated with each criterion. Specifically, as described above, we anticipated that while in-role behaviour is highly associated with task SE, extra-role behaviour and counterproductive work behaviour are highly associated with empathic SE. Finally, we hypothesised that negative emotions experienced at work and health-related symptoms are highly related to negative emotional SE and with both assertive and empathic SEs.

In relation to the third aim, we adopt a person-centred approach, which aims to explore how psychological dimensions are configured at individual level. According to this approach, which is often adopted within organisational and vocational psychology (Kossek, Ruderman, Braddy, & Hannum, 2012; Meyer, Morin, & Vandenberghe, 2015), a person should 'not be broken up into pieces' to be examined as 'separate entities' (Bergman & Wangby, 2014, p. 29). Researchers should

instead 'focus on the total constellation of individual traits that define each person, and the way these traits work together as a dynamic, integrated system' (Robins & Tracy, 2003, p. 111).

We aim to examine how global and specific SEs combine with each other to result in distinct clusters characterised by different SE configurations (Magnusson & Torestad, 1993). In line with a recent study exploring different specific SEs (i.e. self-regulated learning, emotional and social SEs) in relation to well-being, using a person-oriented approach, (Paciello, Ghezzi et al., 2016), we expect to identify four clusters that are differently associated with the criteria assessed in this study. In particular, we anticipate finding: (a) a cluster characterised by high levels of both the global and all the specific SEs, corresponding to the most adjusted profile, with higher levels of in-role and extra-role behaviour, and lower levels of counterproductive work behaviour, negative emotions and health-related symptoms; (b) a cluster characterised by low levels of both the global and all the specific SEs, corresponding to the least adjusted profile, with an opposite pattern of association with the criteria compared with the previous cluster; and finally, (c) two intermediate clusters with equivalent intermediate levels of the global SE, but characterised by different configurations in the specific SEs. For these latter clusters, our hypotheses are less definitive in relation to their associations with the included criteria. In particular, each of these two clusters may be characterised by high levels of one or more specific dimensions and low levels of the remainder. Hence, each may be particularly associated with the criterion/a, which is specifically relevant for the corresponding stronger SE dimensions. For instance, a cluster with intermediate level of all the specific SE dimensions but high negative emotional SE, may be associated with lower negative emotions. However, consistent with the principle of equifinality (Moreira et al., 2015), clusters with different configurations may show similar adjustment because SEs may 'compensate' for each other, at least in relation to some of the criteria.

Participants and Procedure

The procedure for data collection was the same as Study 1. The final sample comprised 700 Italian employees (53.7% women) with a mean age of 40.9 years (SD = 12.3). All participants were from

the central-southern area of Italy. In relation to educational level, 9% finished junior high, 51% finished senior high, 31% had a bachelor's degree, 9% had a Master or a PhD degree. Regarding marital status, 36% were single, 57% were married, 6% were divorced, 1% were widowed. They have been working on average for 18.1 years (SD = 11.9) and they have been in their current organisation on average for 11.8 years (SD = 10.6). About 61% of the participants were employed in private organisations, with a permanent contract (69%), working full-time (81%) on average for 37 hours per week (SD = 11.9). Overall, about 16% of the sample worked in the healthcare industry, 11% in education, 10% in finance and insurance, 7% in wholesale and retail, 4% in manufacturing and the remaining participants in the other sectors.

Measures

Participants were administered a questionnaire comprising different scales. For the purposes of this study, we will consider the following:

Work Self Efficacy was measured by the 26-item WSES described in Study 1.

In-role job performance was measured by four items of the scale developed by Williams and Anderson (1991). Participants were asked to indicate how often (from 1 = *never* to 5 = *very often*) they engaged in behaviours that are recognized by a formal reward system, for example 'adequately completing assigned duties'. The Cronbach's alpha in the current study was .90.

Extra-role Behaviours was measured by five items of the scale developed by Williams and Anderson (1991). Participants were asked to indicate on a 5-point scale how often (from 1 = *never* to 5 = *very often*) they engaged in each extra-role behaviour, for example 'helping others who have heavy workloads'. The Cronbach's alpha coefficient in this study was .80.

Counterproductive work behaviours were measured by 11 items of the Counterproductive Work Behavior Checklist (Spector et al., 2006), which measures two CWB dimensions: one including behaviours towards the organisation as a whole (CWB-O, 6 items, sample items: daydreamed rather than did your work; stolen something belonging to your employer) and the other including behaviours towards people within the organisation (CWB-P, 5 items, sample items: insulted

someone at work; hit or pushed someone at work). Participants were asked to indicate on a 5-point scale how often (from 1 = *never* to 5 = *every day*) they act out each of the listed behaviours in their present job. The Cronbach's alpha coefficients in this study were .85 and .75 for CWB-P and for CWB-O respectively.

Negative emotions were measured by 8 items of the Job-Related Affective Well-Being Scale (Van Katwyk, Fox, Spector & Kelloway, 2000). Participants were asked to indicate in relation to their job how frequently in the last 30 days they experienced each of the listed negative emotions, for example anger and anxiety. Response options were presented in a 5-point format (from 1 = *almost never* to 5 = *extremely often or always*). The Cronbach's alpha coefficient in the current study was .86.

Health related symptoms were measured by eight items of the scale developed by Spector and Jex (1998). Each item measures how often respondents have experienced the specific symptom (i.e. headache, an upset stomach or nausea, tiredness or fatigue, shortness of breath, backache, trouble sleeping, hearth pounding when not exercising, and loss of appetite) during the last six months on a 5-point response scale (from 1 = *never/almost never*, to 5 = *very often/always*). The Cronbach's alpha coefficient in this study was .90.

Data analysis

First, we investigated the replicability of the W-SE scale factor solution by examining the B-ESEM solution on the new sample. After, we examined the dimensionality of the other measures used in the study and the absence of mono-method bias. Specifically, a model was tested where a B-ESEM was posited on the 26-item W-SE scale, and a six-factor ICM-CFA was posited on the items related to the six criteria defined above (we hypothesise that the correlations among the different criteria are fully captured by factor correlation). All cross loadings of the four SEs on the six criteria were fixed at zero; similarly, all cross-loadings of the six criteria on the SE factors were fixed at zero. This complies with von Wright's (1971) pre-condition of predictive models that assumes the conceptual independence of independent and dependent variables. We allowed two extra-role items

residuals to correlate due to their wording (i.e. '*Helps others who have been absent', 'Helps others who have heavy work loads'*). This solution was then compared, using the chi-square difference test, with a factor solution where all items load on a single factor.

Finally, in order to test the criterion validity, six sets of 2-step hierarchical regression models were performed considering in-role*,* extra-role and counterproductive work behaviours, negative emotions and health-related symptoms as dependent variables*,* and the five SE factors from the B-ESEM as independent variables, along with gender and job tenure as control variables. In all these regressions, factor scores derived from the B-ESEM/ESEM analysis described above were used. Control variables were entered as Step 1. Then, following Cohen et al. (2003), SE global and specific factors were entered as a set of independent variables The increment in R-square was considered as a measure of the added value of the variable(s) entered in the second step, and thus of its lack of redundancy with respect to what is explained in the first step (see in this regard Cohen et al., 2003).

As noted previously, following Morin, Boudrias, Marsh, and colleagues (2017), we test an LPA using the results of the previous B-ESEM. This strategy is particularly efficient in identifying groups that differ in shape. The analyses were conducted using Mplus 8.0, with MLR estimator. Models with one to eight latent profiles were estimated with the indicators' (W-SE scale factor scores) intercepts and residuals freely estimated in all profiles (Morin et al., 2017). To decide how many profiles to retain, we considered the following statistical indices: (a) The Akaike Information Criterion (AIC); (b) the Bayesian Information Criterion (BIC); and (c) the sample-size Adjusted BIC (ABIC). Since these indices are heavily influenced by sample size, it is very likely that with an adequate sample size, they suggest the addition of new groups/profiles without reaching a minimum. Thus, a graphical representation of these indices (i.e. 'elbow plot') is generally beneficial. The optimal number of groups is suggested by the point after which the slope flattens. A set of ANOVAs was conducted to analyse the characteristics of the final solution on both the five SE dimensions and the six criteria used in the regression analyses discussed above as well as on job

tenure. Post hoc analyses were conducted using the Duncan test. In addition, a chi-square test was implemented to examine gender differences. To control for capitalisation on chance due to multiple comparisons, a more conservative level of alpha was used to interpret the significance of all the statistical tests per the Bonferroni correction.

Results

Preliminary Items Statistics

As a preliminary analysis, a check of missing data was performed on all items (see online Additional Materials). While 84.4% of the sample have no missing data, 12% have only one item missing, and 3% between two and 11 items missing. A further exploration of the non-response provides support for the adoption of Full Information Maximum Likelihood (Little's test $\chi^2(471) = 520.19$, p=.06). Regarding the normality check, skewness and kurtosis have an average absolute value of 1.06 (SD = 1.22) and 3.05 (SD = 8.53) respectively. The source of non-normality is located in CWB items. To account for this, we use the same MLR estimators as in Study 1.

Replicability of the WSES Factorial Structure

Findings fully support the replicability of the B-ESEM model (see Table 4) as attested by the goodness of fit indices, $\chi^2(205) = 550.98$, p<.001; RMSEA = 0.049 (0.044 - 0.054) p(RMSEA <= .05) =0.584; CFI= 0.952; TLI = 0.923; SRMR = 0.024. Omega reliability coefficients are generally good or adequate, with the exception of empathic SE, whose omega is marginally adequate.

----------------Table 4 -------------

Criterion Validity of the Scales

The results of the preliminary B-ESEM/CFA, including all the W-SE and criteria items show an adequate fit indices: $\chi^2(1,688, N = 700) = 3,293$, p<.001, RMSEA = .037 (90% CI = .035, - .039), p(RMSEA <.05)= 1, CFI = .91, TLI =.90, SRMR = .042. The one-factor solution resulted in poor fit indices: $\chi^2(1,829, N = 700) = 12,249$, p<.001, RMSEA = .09 (90% CI = .089, .092), p(RMSEA <.05)<.001, CFI = .41, TLI =.39, SRMR = .114. The difference between the chi-square of the

models is highly significant, $\Delta\chi^2(141)=8,956$, p<.001. Thus, these results provide further evidence for the distinctiveness of the 11 factors and for the absence of a substantial common-method bias.

Table 5 summarises the descriptive statistics and correlations among the study variables. In relation to the W-SE dimensions, considering p=.0006 as significance level, in-role behaviour is positively correlated with task and global SE; extra-role behaviour is positively correlated with empathic and global SE; negative emotions and health-related symptoms are negatively correlated with negative emotional and global SEs; CWB-P is negatively correlated with task and global SEs; and CWB-O is negatively correlated with task and global SEs and positively correlated with assertive SE. In addition, negative emotional SE was found to be higher in men.

----------------Table 5-------------

Table 6 presents the results of regression analyses. Considering p=.0011 as significance level, the global SE factor is significantly associated with all six criteria considered. In addition, the four specific SE factors are differently associated with the six criteria considered, above and beyond what is explained by the global factor. Specifically, as hypothesised, task SE is positively associated with in-role behaviour and negatively associated with both CWB-O and CWB-P; negative emotional SE is negatively associated with both negative emotions and health-related symptoms; and empathic SE is positively associated with extra-role behaviour. Contrary to our expectations, assertive SE is positively associated with CWB-O. Finally, regarding the control variables, while gender is associated with health-related symptoms (with females showing higher scores), job tenure is associated with CWB-O (with late-career employees showing lower scores).

----------------Table 6-------------

Latent Profile Analyses

As shown in Figure 1, the BIC suggests retaining three clusters, the ABIC suggests a four-cluster solution, and the AIC points to a solution with a higher number of clusters as preferable. Since the solutions with from five to eight clusters have non-identification problems and show a lack of statistical adequacy, we examined the hypothesised four-cluster solution.

The four-cluster solution presents clearer shape differences (Figure 2). As hypothesised, Cluster 4 (N=133, 19%), labelled as 'High self-efficacious', shows higher level of both global and specific SE dimensions, with the exception of task SE, which has the second highest level; Cluster 3 (N=63, 9%), labelled as 'Low with empathic SE', shows lower levels of both global and specific SEs, with the exception of empathic SE, which is as high as in the 'High self-efficacious' cluster; Cluster 2 (N=182, 26%), labelled as 'Intermediate with task SE', shows intermediate levels of global SE, with the highest levels of task SE and lower levels of the others; finally, Cluster 1 (N=322, 46%), labelled as 'Intermediate self efficacious', shows intermediate levels of, global SE, equivalent to Cluster 2, with low levels of empathic and assertive SE as Cluster 2 but intermediate levels of negative emotional SE and low levels of task SE. Overall, results of the ANOVAs confirm the differences among clusters for the SE dimensions (p<.0001; the eta squared measure of effect size ranges from 3% for assertive SE to 40% for task SE).

Results shown in Figure 3 attest to the different associations between clusters and criteria (p<.0001 for all the ANOVAs; the effect size ranges from 3.6% for extra-role to 15.6% for in-role behaviour). Results of the post hoc (considering p<.0014 per the Bonferroni correction) highlight that the 'High self-efficacious' cluster has the most adjusted profile, with the highest level of in-role and extra-role behaviours, and the lowest level for CWB, negative emotions and health-related symptoms. On the contrary, the 'Low with empathic SE' cluster has the least adjusted profile, with not only the lowest level for in-role behaviour but also the lowest for extra-role behaviours and the highest level for CWB. In addition, it also shows the lowest levels of both negative emotions and health-related symptoms. The 'Intermediate with task SE' cluster shows high levels of in-role behaviour but low levels of extra-role. In addition, it also shows lower levels of CWB, negative emotions and health-related symptoms. Finally, the 'Intermediate self-efficacious' cluster shows lower levels of all the criteria considered. The results also show that there are no significant differences in relation to job tenure (p=.435) or gender (p=.507).

Discussion

Overall, the results of this study further support the validity and the good psychometric properties of the W-SE scale. First of all, the Bi-ESEM model was replicated, with both the global and the four specific SE factors properly assessed by the intended items (including Items 1, 7 and 26 which were problematic regarding the factor loadings on the specific factor in the first random sample in Study 1). Furthermore, the correlation and regression analyses, along with the LPA, provide support for the importance of adopting a multidimensional approach that combines an overarching global W-SE factor with specific W-SE dimensions in relation to a set of self-regulatory capabilities relevant for employees' working life. In addition, the results also highlight the significant benefit of integrating two different analytical perspectives, namely the variable- and person-centred approaches, to understand how SEs operate together.

When considering the regression analysis, it is evident that the global W-SE factor is associated with all the criteria in the expected direction. In addition, the specific W-SE dimensions provide a further contribution, above and beyond the global factor, supporting their incremental validity. In particular: (a) task SE, in line with the hypotheses, is associated with performance in terms of in-role behaviour (positively) and counter-performance (negatively) but not extra-role behaviour. The more employees perceive themselves as able to manage their tasks and effectively fulfil their goals, the better they work and the less they counter-perform. (b) Negative emotional SE, in line with the hypotheses, is negatively associated, mainly with well-being, in terms of negative emotions and even more of health-related symptoms. In particular, the more employees perceive themselves as able to manage their negative emotions in stressful and conflict situations, the less they report physical symptoms and the less they experience negative emotions in relation to their job. (c) Empathic SE, in line with our hypotheses, is positively associated with extra-role behaviour but, contrary to our expectations, is not associated with well-being. In particular, the more employees perceive themselves as able to understand their colleagues' moods and states, the more they go the extra mile in their working lives. Finally, (d) our hypotheses on assertive SE are completely

unsupported, with results highlighting not only no relationship with well-being but also a positive association with CWB-O. In particular, the more employees perceive themselves as capable of speaking up for their rights and ideas, the more they engage in counterproductive work behaviour targeting the organisation as a whole. Hence, considering this result, it seems that assertive SE should be considered a risk factor.

However, when integrating these results with a person-centred analytical approach, the extent to which exploring reality by reducing it to separate elements may obscure individuals' complexity and the shared mechanisms and processes among SE dimensions emerge. For instance, when considering the results from LPA, Cluster 4, characterised by the highest level of assertive SE, did not show higher CWB as it should have according to the results of the regression but rather had the most adjusted profile in the included criteria. This result can be explained because this cluster also showed the highest levels of both global W-SE and the specific W-SEs (with the only exception of task SE, which is the second highest). Thus, in line with Pruitt and Rubin (1986) assertive SE's association with other individual interpersonal resources is an important factor for individual adjustment.

Cluster 3 also provides further evidence of the advantages of integrating variable- and person-centred approaches. This cluster is characterised by a high level of empathic SE, and following the regressions results, it is expected to be associated with high extra-role behaviour. However, as high empathic SE is associated with the lowest levels of global W-SE as well as all the other specific W-SE dimensions, Cluster 3 is not adjusted or prosocial. Indeed, this is the most problematic configuration, with the lowest in-role and extra-role behaviours and the highest CWB, both targeting the organisation and other people, negative emotions and symptoms.

Cluster 2 is characterised by an intermediate level of global W-SE and a low level of specific W-SEs; the only exception is the highest level of task SE which is even higher than the most adjusted configuration (Cluster 4). Notwithstanding this, these two clusters do not actually differ in terms of in-role behaviour. In addition, Cluster 2 has a lower level of empathic SE than Cluster 3; however,

they do not actually differ in term of extra-role behaviour. Finally, comparing the two clusters characterised by equivalent intermediate levels of global W-SE, Cluster 1 has a higher level of negative emotional SE than Cluster 2, but they do not differ in terms of negative emotions and health-related symptoms.

In sum, these results provide support for the criterion validity of the W-SE scale, as well as the incremental validity of the specific W-SE dimensions against the global W-SE. Results also evidence that a global W-SE dimension may be highly informative but should be considered along with specific W-SE dimensions to gain a more comprehensive understanding of employees' self-regulatory capabilities. These global and specific dimensions should not be examined independently from one another, instead, their interactions should be investigated in consideration that the relationship between SE dimensions and criteria may not be linear.

General Discussion

In this research, we present results from two independent studies that converge to providing evidence for the validity of the W-SE scale, a multidimensional measure assessing employee's beliefs in relation to different self-regulatory capabilities relevant for managing challenging and stressful situations at work. To develop the W-SE scale, we followed Bandura's approach (1997) which suggests the relevance of considering a variety of self-regulatory capabilities within a specific domain of life. Indeed, almost no one works in a vacuum, and employees must not only accomplish tasks but also manage their negative emotions as well as interpersonal relationships at work. However, from an analysis of the organisational literature, it emerges that although SE in relation to tasks has been largely studied, other types of SE have been generally overlooked. As suggested by Bandura (1997), and consistent with literature on competence and intelligence (Boyatzis, 2008; Goleman, 1995; 2006) focusing on the cognitive domain is not sufficient. It is, indeed pivotal to consider also emotional and interpersonal domains to get a more in-depth understanding of how the human self-regulatory system operates and impacts employees' adjustment. The W-SE scale presented in this manuscript provides a contribution in this direction,

highlighting the relevance of adopting a multidimensional approach for the assessment of SE at work.

Overall, the investigation of four alternative factorial models within a cross-validation approach, and analysis of measurement invariance provided clear support for a bi-factorial ESEM structure, with global W-SE and four specific W-SE dimensions. As noted by Sánchez-Oliva et al. 'a key strength of the Bi-ESEM framework is that it allows for the examination of the outcomes [items] simultaneously associated with global and specific constructs' (2017, p. 184). In more detail, the results suggest that the W-SE scale is a valid measure that can be used for practical purposes to assess an overarching global W-SE dimension related to employees' beliefs about their perceived capabilities in the working context and four specific W-SE dimensions related to the perceived capabilities to: a) manage work activities (task SE); b) regulate negative emotions in stressful situations (negative emotional SE); c) understand others' needs and states (empathic SE); and d) express and defend their own ideas and rights in challenging and demanding situations (assertive SE).

In addition, the factorial structure of the W-SE scale resulted invariant across gender and career stages, reaching the far more stringent criterion of strict measurement invariance. This form of invariance is seldom reached in psychological research, but is essential for the correct use of the observed scores, as in applied psychological testing. Hence, the findings provide evidence for the applicability of the W-SE scale, independently from employees' working experiences accumulated over the years and from gender differences.

The validity of the W-SE scale and the relevance of adopting a multidimensional perspective is further supported by the findings of a set of analyses integrating two different approaches - variable-centred (correlations and regression analyses) and person-centred (LPA) - and considering relevant criteria related to performance (in terms of in-role, extra-role and counterproductive behaviour) and well-being (in terms of health-related symptoms and negative emotions experienced in relation to work). The regression results provide evidenced of a clear association of the global W-

SE factor with all the six criteria considered: in particular, while revealing a positive association with in-role and extra-role behaviours, it reveals a negatively association with the remaining four criteria. However, the presence of these significant effects due to the global factor did not impede the emergence of a well-differentiated pattern of effects of the specific W-SE factors on the six criteria. It should be noticed that the variance attributable to the specific factors is above and beyond that explained by the global factor. In fact, these factors are modelled as orthogonal, even though a very small degree of non-orthogonality may be present in the estimated factor scores due to sampling error (as attested by the correlations presented in Table 5). Thus, as expected, task SE is positively associated with in-role behaviour and negatively associated with both CWBs. This is in line with theoretical models emphasising the role of self-regulatory processes in the execution and modulation of behaviour oriented towards the achievement of positive goals (Bandura, 1997; Carver & Scheier, 1981). Employees who are higher in task SE not only put greater effort into their work activities and achieve better results, but also engage less frequently in misconduct that may put their own work and the organisation's productivity at risk. The results also show that negative emotional SE is instead particularly associated with well-being in terms of both negative emotions and health-related symptoms. These findings attest, in line with the literature (Grandey, 2000), to the pivotal role of emotional self-regulatory competences in protecting individuals from stress-related consequences. Indeed, belief in their ability to manage their own negative emotional experiences in difficult situations possibly allows people to adopt coping strategies that are useful to overcoming tension while preserving their well-being. For instance, it is possible that employees higher in negative emotional SE may adopt strategies that allow them to elaborate on these emotions rather than suppress them. These beliefs would allow employees to get a hold of their emotional states and elaborate on negative emotions, such as anxiety and anger, avoiding the potential negative consequences of frequent experience of negative emotional activation.

In addition, empathic SE is positively associated with extra-role behaviour. This is in line with literature emphasising the role of empathic competences in promoting and sustain prosocial

behaviour (Eisenberg & Fabes, 1999). Employees who are higher in this SE dimension engage more frequently in other-oriented conduct at work. Finally, assertive SE was unexpectedly found to be positively associated with CWB-O. Although this result can be interpreted by referring to literature that suggests an association between assertiveness and both workplace aggression and a lack of prosocial behaviour (Griffin & Lopez, 2005), when considering the results derived from the person-oriented approach, a more complex picture emerges. Indeed, findings of the LPA, described in the Study 2 discussion, highlight that the relationship between SEs and the criteria are not necessarily linear and that different SE dimensions may interact. This is consistent with Bandura's theorisation, according to which SE beliefs operate in concert and can thus be combined in a variety of configurations differently associated with different criteria.

Overall, in line with the literature, we believe that the person-centred approach complements the variable-centred approach for validating the W-SE scale, since they both provide different pictures of the same reality (Morin et al., 2017). Indeed, while level differences are substantially better represented by the variable-centred approach, shape or configuration differences are better represented by the person-centred approach (Morin et al., 2017). By this integration, it has thus been possible to better understand the *meaning* of a score in an SE dimension. Indeed, an equivalent level/score in one SE dimension may have a different sense in terms of individual functioning across two individuals, depending on their levels/scores also in the global dimension and in the remainder of specific W-SE dimensions.

LPA can provide additional insights into criterion-based validity of the multidimensional W-SE scale than those provided by the more 'classical' variable-centred approaches to criterion validity such as regression. This additional insight comes from the fact that LPA, giving rise to typologies or classifications, aims at categorising persons into qualitatively and quantitatively different groups according to their profiles. This definitely makes the emergence of complex interactions among the multiple indicators used (i.e., the global SE factor, and the 4 specific SE factors) much more possible than when using 'linear' methods such as regressions, analysis of variance and SEM.

Indeed, the four SE clusters identified in Study 2 show different SE configurations and suggest that the relationship among SE and the criteria – that were not used for generating the LPA solution – is complex. In particular, when considering the two 'extreme' clusters, which comprise almost 30% of the sample, it can be noted that global W-SE clearly differentiates members of these two groups. However, the specific W-SEs do not necessarily 'move' consistently with the global W-SE. Indeed, the High self-efficacious cluster (Cluster 4), which comprises 19% of employees, is characterised by a very high level of global W-SE along with a positive trend in all the specific W-SEs and is the most adjusted profile both in terms of performance and well-being. On the contrary, in the Low with empathic SE cluster (Cluster 3), which comprises 9% of employees, the very low level of global W-SE 'does not tune' with low levels of all the specific W-SEs, with rather high level of empathic W-SE. However, the high level of empathic SE, which may represent an individual resource, at least in relation to prosocial conduct (as suggested by the regressions results), is not associated with higher engagement in extra-role behaviour. On the contrary, this cluster shows more CWB, as well as higher negative emotions and health-related problems. In sum, this profile suggests that when empathic W-SE is associated with low levels of global W-SE and the remainder of W-SEs, its protective role fails.

When considering the intermediate clusters, which comprise le majority of the employees (72%), it is evident that the specific W-SEs may combine with each other quite differently, despite being associated with equivalent intermediate levels of global W-SE. Further, even though employees may perceive some difficulty in relation to a specific sphere of functioning, this is not necessarily associated with a problem in terms of performance or well-being. In other words specific W-SEs may 'compensate' for each other. In particular, in the Intermediate with task W-SE cluster (Cluster 2), which comprises 26% of the sample, an intermediate level of global W-SE is associated with a high level of task W-SE, but low levels of the remaining specific W-SEs This configuration suggests potential problems in relation to well-being but not in relation to performance. On the contrary, the extremely high level of performance in terms of in-role behaviour, is associated with

levels of CWB, negative emotions and health-related symptoms that are not significantly different from the High self-efficacious cluster. Indeed, the level of extra-role behaviour is lower than that observed in the most adjusted cluster, but is still not problematic and in line with the majority of the employees. Furthermore, in the Intermediate self-efficacious cluster (Cluster 1), which comprises almost half of the sample (46%), the intermediate level of global W-SE, is associated with a low level of task W-SE, intermediate levels of interpersonal SEs, and intermediate-high levels of emotional W-SE. In this case, while this configuration is associated with lower in-role performance, consistent with task W-SE, it does not show a more adjusted profile in terms of health-related symptoms and negative emotions at work, as would be expected considering emotional W-SE. In sum, while in the Intermediate with task W-SE cluster (Cluster 2) the low level of emotional W-SE is compensated for by a high level of task W-SE, in the Intermediate self-efficacious cluster (Cluster 1) the intermediate-high level of emotional W-SE does not make a difference in terms of employees' well-being.

Thus, while the variable-centred method approaches criterion validity by examining the single relation of the 'test' with the 'criterion', the person-centred method approaches criterion validity by more a flexible examination of the configuration/pattern of the criteria within groups, which are defined by a complex combination of scores on the 'test' (i.e., the W-SE factors in our study). This reasoning is consistent with the claim made by Messick (1995) that validity is considered not only a function of the items comprising a test but also of the persons responding to the test.

Overall, the results show that the W-SE scale provides information at two-levels, which are mutually relevant and inter-related. Specifically, the global factor, as an overarching dimension, seems to be a particularly helpful indicator on its own to differentiate among employees characterised by 'extreme' configurations. Indeed, the most and least adjusted clusters are mainly characterised by the highest and the lowest levels of global W-SE respectively. In addition, the possibility of also identifying the four specific W-SE dimensions, above and beyond the global factor, results in a greater capability to discriminate different profiles. Indeed, the two clusters

comprising the vast majority of the sample are characterised by equivalent levels of global W-SE but can be clearly differentiated in relation to specific W-SEs (in particular task and emotional W-SEs). In sum, the specific 'SE architecture' of each cluster, by concurrently taking into account the informative contribution of both global and the specific factors, can help to better understand associations with the criteria and to orient the design of tailored interventions to bolster employees' beliefs in their self-regulatory capabilities at work.

Limitations and Future Studies

Some limitations of the present research need to be mentioned. Specifically, the data from the two studies are cross-sectional, hence it is not possible to neither provide information about predictive validity nor make any clear inferences about the causality of the paths. Future longitudinal studies could better investigate the impact of global and specific W-SEs on several outcomes, as well as further investigating the reciprocal influence among them.

A further limitation that future studies should overcome is the absence of objective indicators. In this regard, it would be relevant to investigate the role of the W-SE dimensions in relation to performance assessed through an objective measure, as well as in relation to short and long term sickness leave, errors and complaints among others. Although the specific W-SEs include four key dimensions, it does not cover all the self-regulatory capabilities potentially relevant in the workplace. Hence, future studies should rely on this multidimensional approach and explore the relevance and need of including additional dimensions related to self-regulatory capabilities in further domains such as, for example, morality and expression of positive emotions. In addition, studies in specific contexts or focusing on specific job roles should consider integrating additional dimensions such as SE in managing teamwork, cross-cultural issues, or learning and development. Another limitation is related to not having examined the discriminant and incremental validity of the W-SE scale against other work and/or occupational SEs. This particular aspect should be addressed in future studies. Finally, the two studies have only been conducted in one national context and this could have affected the generalisability of the results. Although the factor structure

of the W-SE and its invariance have been cross-validated, future studies should further investigate the psychometric properties of the W-SE in different national contexts.

Practical Implications

Overall, the findings from the two studies suggest the potential practical implication of the W-SE scale. Its multidimensionality is consistent with a view of the work context that is not limited to a focus on performance, but also takes into account other capabilities equally relevant for a positive adjustment. Indeed, by providing information about a global W-SE and four specific W-SEs related to different self-regulatory capabilities, the W-SE scale may be helpful monitoring employees' strengths and weaknesses. This represents a major asset over any measure of work related SE that cannot capture a similarly rich and nuanced picture.

In line with Gist (1987), the W-SE scale may be used for different ends and at different stage of an employee's career. In the recruitment process, it may provide relevant information to understand how potential employees may adjust to the work environment, based on an assessment of global W-SE and their specific personal beliefs related to managing tasks, negative emotions and interpersonal relationships. It can also be used in the appraisal system as a self-reflective tool. In addition, given the factorial invariance of the W-SE scale, it can be a valid scale in relation to career development, and for training and vocational counselling. It may inform the design of tailored interventions (through, for example, modelling and mastery experiences) aimed at promoting employees' self-regulatory competences in 'less trained' self-regulatory capabilities.

References

Asparouhov, T., Muthén, B.O., & Morin, A.J.S. (2015). Bayesian structural equation modeling with cross-loadings and residual covariances. *Journal of Management, 41*, 1561–1577.

Bakan, D. (1966). *The duality of human existence: An essay on psychology and religion*. Chicago: Rand McNally

Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman

Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology*, *52*, 1-26.

Bandura, A. (2006). Guide for constructing self-efficacy scales. In T. Urdan & F. Pajares (Eds.). *Self-efficacy beliefs of adolescents*, (Vol. 5., pp. 307-337). Greenwich, CT: Information Age Publishing.

Bandura, A., Caprara, G. V., Barbaranelli, C., Gerbino, M., & Pastorelli, C. (2003). Role of affective self☐regulatory efficacy in diverse spheres of psychosocial functioning. *Child Development*, 74(3), 769-782.

Bergman, L. R., & Wangby, M. (2014). The person-oriented approach: A short theoretical and practical guide. *Estonian Journal of Education, 2(1)*, 29-49.

Bettencourt, B., & Miller, N. (1996). Gender differences in aggression as a function of provocation: a meta-analysis. *Psychological Bulletin, 119(3)*, 422.

Betz, N. E., Hammond, M. S., & Multon, K. D. (2005). Reliability and validity of five-level response continua for the Career Decision Self-Efficacy Scale. *Journal of Career Assessment*, *13*(2), 131-149.

Boyatzis, R. E. (2008). Competencies in the 21st century. *Journal of Management Development*, 27(1), 5-12.

Bussey, K., & Bandura, A. (1999). Social cognitive theory of gender development and differentiation. *Psychological Review, 106*, 676-713.

Caprara, G. V., Di Giunta, L., Eisenberg, N., Gerbino, M., Pastorelli, C., & Tramontano, C. (2008). Assessing regulatory emotional self-efficacy in three countries. *Psychological Assessment*, 20(3), 227.

Caprara, G.V., Gerbino, M., Paciello, M., Di Giunta, L., & Pastorelli, C. (2010). Counteracting depression and delinquency in late adolescence. *European Psychologist*, 15, 34-48

Carroll, A., Houghton, S., Wood, R., Unsworth, K., Hattie, J., Gordon, L., & Bower, J. (2009). Self-efficacy and academic achievement in Australian high school students: The mediating effects of

academic aspirations and delinquency. *Journal of Adolescence*, *32*(4), 797-817. doi: 10.1016/j.adolescence.2008.10.009

Carver, C. S., & Scheier, M. P. (1981). *Attention and self-regulation: A control-theory approach to human behavior*. New York: Springer-Verlag

Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling*, *9*(2), 233-255.

Cinamon, R. G. (2006). Anticipated work☐family conflict: effects of gender, self☐efficacy, and family background. *The Career Development Quarterly*, 54(3), 202-215.

Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences*. Mahwah, NJ: Routledge.

Consedine, N.S. & Moskowitz, J. (2007). The role of discrete emotions in health, A critical review. *Applied and Preventive Psychology*, 12, 59 – 75

Cornick, J. (2015). Factor Structure of the Exercise Self-Efficacy Scale. *Measurement in Physical Education and Exercise Science. 19*. 208-218.

Costa Jr, P., Terracciano, A., & McCrae, R. R. (2001). Gender differences in personality traits across cultures: robust and surprising findings. *Journal of Personality and Social Psychology, 81(2)*, 322-331. doi: 10.1037//0022-3514.81.2.322

Dacre Pool, L., & Qualter, P. (2013). Emotional self-efficacy, graduate employability, and career satisfaction: Testing the associations. *Australian Journal of Psychology*, *65*, 214-223.

Di Giunta, L., Eisenberg, N., Kupfer, A., Steca, P., Tramontano, C., & Caprara, G. V. (2010). Assessing perceived empathic and social self-efficacy across countries. *European Journal of Psychological Assessment*, 26(2), 77–86

Dou, K., Wang, Y. J., Bin, J. L., & Liu, Y. Z. (2016). Core self-evaluation, regulatory emotional self-efficacy, and depressive symptoms: Testing two mediation models. *Social Behavior and Personality: an international journal*, *44*(3), 391-399.

Dunbar, R. L., Dingel, M.J., Dame, L.F., Winchip, J. & Petzold, A.M. (2016): Student social self-efficacy, leadership status, and academic performance in collaborative learning environments, *Studies in Higher Education*, doi:10.1080/03075079.2016.1265496

Eisenberg, N., & Fabes, R. A. (1999). Prosocial development. In W. Damon (Series Ed.) & N. Eisenberg (Vol. Ed.), *Handbook of child psychology, 3. Social, emotional, and personality development* (5th ed., pp. 701–778). New York, NY: Wiley

Erber, R., & Erber, M. W. (2000). The self-regulation of moods: Second thoughts on the importance of happiness in everyday life. *Psychological Inquiry*, *11*(3), 142-148.

Fan, J., Meng, H., Zhao, B., & Patel, T. (2012). Further validation of a US adult social self-efficacy inventory in Chinese populations. *Journal of Career Assessment*, 20(4), 463-478.

Fida, R., Laschinger, H. K. S., & Leiter, M. P. (2016). The protective role of self-efficacy against workplace incivility and burnout in nursing: A time-lagged study. *Health care management review*. doi: 10.1097/HMR.0000000000000126

Fida, R., Paciello, M., Tramontano, C., Barbaranelli, C., & Farnese, M. L. (2015). "Yes, I Can": the protective role of personal self-efficacy in hindering counterproductive work behavior under stressful conditions. *Anxiety, Stress, & Coping*, *28*(5), 479-499.

Fida, R, Paciello M., Tramontano, C, Barbaranelli, C., & Fontaine, RG. (2014). The Role of Irritability in the Relation between Job Stressors, Emotional Reactivity, and Counterproductive Work Behavior. *European Journal of Work and Organizational Psychology, 23*, 31-47

Fitness, J. (2000). Anger in the workplace: an emotion script approach to anger episodes between workers and their superiors, co-workers and subordinates. *Journal of Organizational Behavior*, 21, 147–162.

Galla, B. M., & Wood, J. J. (2012). Emotional self-efficacy moderates anxiety-related impairments in math performance in elementary school-age youth. *Personality and Individual Differences*, 52(2), 118-122.

Gist, M. E. (1987). Self-efficacy: Implications for organizational behavior and human resource management. *Academy of management review*, 12(3), 472-485.

Goleman, D. (2006). *Social Intelligence*, Bantam Books, New York, NY.

Goleman, D. (1995). *Emotional Intelligence*, Bantam Books, New York, NY.

Grandey, A. A. (2000). Emotional regulation in the workplace: A new way to conceptualize emotional labor. *Journal of Occupational Health Psychology*, *5*(1), 95.

Griffin, R., W., & Lopez, Y., P. (2005). "Bad behavior" in organizations: A review and typology for future research. *Journal of Management, 31(6)*, 988-1005.

Griffin, M. A., Neal, A., & Parker, S. K. (2007). A new model of work role performance: Positive behavior in uncertain and interdependent contexts. *Academy of Management Journal*, *50*(2), 327-347. doi: 10.5465/AMJ.2007.24634438

Gross, J. J. (2008). Emotion regulation. *Handbook of Emotions*, 3, 497-513.

Harman, H. H. (1976) *Modern Factor Analysis*. Third Edition. Chicago: University of Chicago Press.

Hayes, J. (2002). *Interpersonal skills at work*. London: Routledge

Hoyle, R. H. (1995). *Structural equation modeling: concepts, issues, and application*. Thousands Oaks, CA: Sage.

Judge, T. A., Jackson, C. L., Shaw, J. C., Scott, B. A., & Rich, B. L. (2007). Self-efficacy and work-related performance: the integral role of individual differences. *Journal of Applied Psychology*, *92*(1), 107-127. doi: 10.1037/0021-9010.92.1.107

Kim, T. Y., Cable, D. M., Kim, S. P., & Wang, J. (2009). Emotional competence and work performance: The mediating effect of proactivity and the moderating effect of job autonomy. *Journal of Organizational Behavior*, *30*(7), 983-1000. doi: 10.1002/job.610

Klassen, R. M., & Chiu, M. M. (2011). The occupational commitment and intention to quit of practicing and pre-service teachers: Influence of self-efficacy, job stress, and teaching context. *Contemporary Educational Psychology*, 36(2), 114-129.

Kossek, E. E., Ruderman, M. N., Braddy, P. W., & Hannum, K. M. (2012). Work non work boundary management profiles: A person-centered approach. *Journal of Vocational Behavior, 81,* 112-128. doi:10.1016/j.jvb.2012.04.003

Locke, K. D., & Sadler, P. (2007). Self-efficacy, values, and complementarity in dyadic interactions: Integrating interpersonal and social-cognitive theory. *Personality and Social Psychology Bulletin*, *33*(1), 94-109

Lukaszewski, K.M., & Stone, D.L. (2012). Theory and research on social issues in organizations. *Journal of Managerial Psychology, 27(4)*, 324 - 329.

Magnusson, D., & Törestad, B. (1993). A holistic view of personality: A model revisited. *Annual Review of Psychology, 44*, 427-452.

Matsushima, R., & Shiomi, K. (2003). Social self-efficacy and interpersonal stress in adolescence. *Social Behavior and Personality: an international journal*, *31*(4), 323-332.

Maurer, T. J. (2001). Career-relevant learning and development, worker age, and beliefs about self-efficacy for development. *Journal of Management, 27*, 123–140.

McColl-Kennedy, J. R., & Anderson, R. D. (2002). Impact of leadership style and emotions on subordinate performance. *The Leadership Quarterly, 13*(5), 545-559

McDonald, R. P. (1970). The theoretical foundations of principal factor analysis, canonical factor analysis, and alpha factor analysis. *British Journal of Mathematical and Statistical Psychology, 23*(1), 1-21.

Meredith, W. (1993). Measurement invariance, factor analysis and factorial invariance. *Psychometrika*, 58(4), 525-543.

Messick, S. (1995) Validity of Psychological Assessment. Validation of Inferences from Persons' Responses and Performances as Scientific Inquiry into Score Meaning. *American Psychologist*, 5D, 741-749. http://dx.doi.org/10.1037/0003-066X.50.9.741

Meyer, J. P., Morin, A. J. S., & Vandenberghe, C. (2015). Dual commitment to the organization and supervisor: A person centered approach. *Journal of Vocational Behavior, 88*, 56–72.

Moreira, P.A.S., Cloninger, C.R., Dinis,L., Sá,L., Oliveira, J.T., Dias, A.,& Oliveira, J. (2015). Personality and well-being in adolescents. *Frontiers in Psychology, 5*, 1494.

Morin, A. J. S., Arens, A. K., & Marsh, H. W. (2016). A bifactor exploratory structural equation modeling framework for the identification of distinct sources of construct-relevant psychometric multidimensionality. *Structural Equation Modeling, 23*, 116–139.

Morin, A.J.S., Boudrias, J.-S., Marsh,H.W., McInerney, D.M., Dagenais-Desmarais, V., & Madore, I. (2017). Complementary variable- and person-centered approaches to exploring the dimensionality of psychometric constructs: Application to psychological wellbeing at work. *Journal of Business and Psychology*, *32*, 395–419.

Paciello, M., Ghezzi, V., Tramontano, C., Barbaranelli, C., Fida, R. (2016). Self-efficacy configurations and wellbeing in the academic context: A person-centred approach. *Personality and Individual Differences*, *99*, 1-16. doi: 10.1016/j.paid.2016.04.083

Park, J., Sohn, Y.W., & Ha, Y.J. (2016). South Korean salespersons' calling, job performance, and organizational citizenship behavior: The mediating role of occupational self-efficacy. *Journal of Career Assessment*, *24*(3), 415-428.

Parker, S. K. (1998). Enhancing role breadth self-efficacy: The roles of job enrichment and other organizational interventions. *Journal of Applied Psychology*, *83*, 835–852.

Paulhus, D. L., & Trapnell, P. D. (2008). Self-presentation of personality. *Handbook of Personality Psychology*, 19, 492-517.

Pruitt, D.G., & Rubin, J.Z. (1986). *Social conflict*. New York: McGraw-Hill.

Rigotti, T., Schyns, B., & Mohr, G. (2008). A short version of the occupational self-efficacy scale: Structural and construct validity across five countries. *Journal of Career Assessment*, *16*(2), 238-255.

Robins, R. W., & Tracy, J. L. (2003). Setting an agenda for a person-centered approach to personality development. *Monographs of the Society for Research in Child Development, 68*(1), 110-122. http://dx.doi.org/10.1111/1540-5834.00243

Saks, A. M., Zikic, J., & Koen, J. (2015). Job search self-efficacy: Reconceptualizing the construct and its measurement. *Journal of Vocational Behavior*, 86, 104-114.

Sánchez-Oliva, D., Morin, A.J.S., Teixeira, P.J., Carraça, E.V., Palmeira, A.L., & Silva, M.N. (2017). A bifactor exploratory structural equation modeling representation of the structure of the basic psychological needs at work scale. *Journal of Vocational Behavior, 98*, 173-187.

Schwarzer, R., & Renner, B. (2000). Social-cognitive predictors of health behavior: Action self-efficacy and coping self-efficacy, *Health Psychology*, *19*, 487–495.

Smith, H. M., & Betz, N. E. (2000). Development and validation of a scale of perceived social self-efficacy. *Journal of Career Assessment, 8*(3), 283-301.

Spector, P. E., & Jex, S. M. (1998). Development of four self-report measures of job stressors and strain: Interpersonal conflict at work scale, organizational constraints scale, quantitative workload inventory, and physical symptoms inventory. *Journal of Occupational Health Psychology*, *3*(4), 356–367. doi:10.1037/ 1076-8998.3.4.356.

Spector, P. E., Fox, S., Penney, L. M., Bruursema, K., Goh, A., & Kessler, S. (2006). The dimensionality of counterproductivity: Are all counterproductive behaviors created equal? *Journal of Vocational Behavior*, *68*(3), 446–460. doi:10.1016/j.jvb.2005.10.005.

Sullivan, B.A., O'Connor, K.M., & Burris, E.R. (2006). Negotiator confidence: The impact of self-efficacy on tactics and outcomes. *Journal of Experimental Social Psychology*, *42*, 567–581. doi:10.1016/j.jesp.2005.09.006

Tschannen-Moran, M., & Hoy, A. W. (2001). Teacher efficacy: Capturing an elusive construct. *Teaching and teacher education*, *17*(7), 783-805.

Tschannen-Moran, M., & Woolfolk Hoy, A. (2007). The differential antecedents of self-efficacy beliefs of novice and experienced teachers. *Teaching and Teacher Education*, *23*, 944–956.

Tripp, M. K., Diamond, P. M., Vernon, S. W., Swank, P. R., Dolan Mullen, P., & Gritz, E. R. (2013). Measures of parents' self-efficacy and perceived barriers to children's sun protection:

construct validity and reliability in melanoma survivors. *Health Education Research*, *28*(5), 828–842. http://doi.org/10.1093/her/cys114

Van Katwyk, P. T., Fox, S., Spector, P. E., & Kelloway, E. (2000). Using the job-related affective well-being scale (JAWS) to investigate affective responses to work stressors. *Journal of Occupational Health Psychology*, *5*(2), 219–230.

von Wright, G. H. (1971). *Explanation and Understanding*, Ithaca NY: Cornell University Press.

Wang, G., & Netemyer, R. G. (2002). The effects of job autonomy, customer demandingness, and trait competitiveness on salesperson learning, self-efficacy, and performance. *Journal of the Academy of Marketing Science*, 30(3), 217-228.

Watson, D., & Pennebaker, J. W. (1989). Health complaints, stress, and distress: exploring the central role of negative affectivity. *Psychological review, 96*(2), 234.

Wiggins, J. S. (1991). Agency and communion as conceptual coordinates for the understanding and measurement of interpersonal behavior. In W. Grove & D. Cicchetti (Eds.), *Thinking clearly about psychology* (Vol. 2, pp. 89-113). Minneapolis: University of Minnesota Press.

Williams, L. J., & Anderson, S. E. (1991). Job satisfaction and organizational commitment as predictors of organizational citizenship and in-role behaviors. *Journal of Management*, *17*(3), 601-617.

Zelazo, P. D., & Cunningham, W. A. (2007). Executive function: Mechanisms underlying emotion regulation. In J. J. Gross (Ed.), *Handbook of emotion regulation* (pp. 135-158). New York: Guilford Press.

Table 1. Study 1 - Goodness of fit statistics for the estimated models – Random Samples 1 and

2

Random sample 1	χ^2	df	RMSEA	CFI	TLI	SRMR
M1. First-Order ICM-CFA	1443.881	293.000	.059 [.056 - .062][a]	.903	.892	.045
M2. ESEM	1037.101	227.000	.057 [.053 - .060][a]	.932	.902	.028
M3. Hierarchical ESEM	1046.060	229.000	.057 [.053 - .060][a]	.931	.902	.028
M4. Bi-factor-ESEM	842.999	205.000	.053 [.049 - .057][b]	.946	.914	.023
Random sample 2						
M1. First-Order ICM-CFA	1327.127	293.000	.057 [.054.-.060][a]	.912	.903	.044
M2. ESEM	860.870	227.000	.051 [.047.-.055][b]	.946	.923	.024
M3. Hierarchical ESEM	865.047	229.000	.051 [.047.-.054][b]	.946	.923	.024
M4. Bi-factor-ESEM	743.075	205.000	.049 [.046.-.053][b]	.954	.928	.021

Note. All chi-squares are statistically significant (p<.001).
[a] significant test of close fit related to RMSEA(p<.05)
[b] non-significant test of close fit related to RMSEA(p>.05)

Table 2. Study 1 - Factor loadings for the Bi-factor-ESEM solution – Random Samples 1 and 2.

		Random Sample 1						Random Sample 2				
		λ				Error (δ)	λ					Error (δ)
	SE items	G	S-TA	S-AS	S-NE	S-EM		G	S-TA	S-AS	S-NE	S-EM	
SE_18	Always comply with your work agenda and deadlines	**.61**	**.42**	-.10	.00	-.01	.44	**.59**	**.43**	-.03	.03	.00	.47
SE_23	Complete your work at the highest level of accuracy	**.69**	**.40**	-.04	-.01	-.01	.37	**.65**	**.53**	.02	-.01	-.01	.30
SE_20	Organise your work even when unexpected events and urgencies occur	**.63**	**.39**	.03	.13	.11	.42	**.66**	**.36**	-.06	.11	.09	.42
SE_5	Work hard on your activities until you reach the expected goals	**.67**	**.38**	-.05	.00	.03	.41	**.71**	**.26**	-.05	-.08	-.03	.42
SE_13	Maintain your attention at work	**.64**	**.45**	.07	.03	.00	.39	**.70**	**.30**	-.02	.02	-.01	.41
SE_16	Seek additional information when you are unsure about what you already know	**.67**	**.30**	.14	-.09	.06	.43	**.69**	**.23**	.12	-.03	.00	.45
SE_9	Get all the information needed to do your work	**.72**	**.33**	.01	-.06	.01	.37	**.73**	**.21**	.08	-.07	.00	.42
SE_25	Intensify your efforts in hard times at work	**.66**	**.38**	.09	-.01	.07	.41	**.70**	**.39**	.04	-.05	.07	.35
SE_15	Defend your opinions even when they are different from what others think	**.71**	.09	**.49**	-.04	.06	.24	**.68**	.09	**.49**	-.01	.06	.29
SE_10	Defend your rights when you are mistreated	**.68**	.03	**.36**	-.05	-.13	.39	**.66**	.04	**.39**	-.02	-.10	.41
SE_24	Successfully defend your rights when you get attacked unfairly	**.71**	.12	**.33**	-.03	-.10	.37	**.71**	.13	**.38**	.00	.01	.33
SE_12	Express your ideas even when your colleagues do not agree with you	**.69**	-.01	**.48**	.02	.04	.29	**.77**	-.03	**.30**	.02	-.06	.32
SE_3	Express your opinion during work meetings	**.68**	-.13	**.25**	-.06	.07	.45	**.63**	-.13	**.32**	-.03	-.01	.48
SE_7	Convince others of your ideas	**.68**	-.12	**.10**	.05	.11	.50	**.64**	-.12	**.31**	.04	.10	.47
SE_1	Overcome frustration if my superiors and/or my colleagues do not appreciate you as you would like	**.64**	-.26	-.08	**.20**	-.20	.44	**.51**	-.06	.17	**.40**	-.04	.54
SE_22	Overcome the irritation for injustices you suffered at work	**.57**	.00	-.04	**.53**	.07	.39	**.51**	.11	.12	**.60**	.16	.33
SE_19	Avoid to get angry when others are disrespectful to you	**.42**	.08	-.04	**.66**	.17	.36	**.46**	-.01	-.16	**.53**	.14	.46
SE_11	Keep your cool in times of stress and tension at work	**.57**	.09	.09	**.41**	.04	.49	**.69**	-.05	-.24	**.31**	-.09	.37
SE_4	Maintain control of yourself in every circumstances	**.53**	.03	.01	**.44**	.05	.52	**.67**	-.10	-.28	**.35**	-.06	.34
SE_17	Not get disheartened following a heavy criticism at work	**.70**	-.02	.03	**.28**	-.17	.40	**.65**	.04	.18	**.35**	-.05	.42
SE_6	Overcome frustration due to your failures at work	**.71**	-.11	-.12	**.29**	-.16	.36	**.63**	-.01	.14	**.38**	-.11	.42
SE_21	Understand the mood of colleagues or superiors when I am deeply involved in an argument	**.63**	.06	.01	.19	**.42**	.39	**.64**	.05	.02	.20	**.44**	.35
SE_8	Understand when a colleague is irritated with you	**.64**	-.02	-.03	-.13	**.39**	.42	**.64**	-.07	.01	-.10	**.35**	.45
SE_2	Understand the mood of your colleagues	**.62**	-.11	-.12	-.07	**.36**	.46	**.62**	-.11	.01	-.02	**.39**	.45
SE_14	Understand the needs of your colleagues, even if they do not mention them explicitly	**.64**	.10	.06	.09	**.33**	.46	**.67**	.07	.01	.02	**.40**	.39
SE_26	Put yourself in the shoes of a work colleague who is in trouble	**.55**	.27	.09	.08	**.29**	.53	**.60**	.17	-.04	.00	**.35**	.49
omega		**.96**	**.74**	**.64**	**.75**	**.64**		**.96**	**.70**	**.68**	**.77**	**.66**	

Note. λ = Factor loadings; G = Global factor; *S-TA* = Task Self-Efficacy specific factor; *S-AS* = Assertive Self-Efficacy specific factor; *S-NE* = Negative Emotional Self-Efficacy specific factor; *S-EM* = Empathic Self-Efficacy specific factor

Table 3. Study 1 - Results of the measurement invariance

Gender Invariance								
	χ^2	DF	RMSEA	90% C. I.		p	CFI	TLI	SRMR
M1. Configural	1805.925	410	.056	.053	.059	.000	.940	.906	.023
M2. Weak	1945.641	515	.051	.048	.053	.316	.939	.923	.029
M3. Strong	1967.169	536	.050	.047	.052	.582	.939	.926	.029
M4. Strict	2004.816	562	.049	.046	.051	.816	.938	.929	.034

Model Comparison						
	ΔCHI	ΔDF	p		ΔCFI	ΔTLI
M1 VS. M2	162.227	105	.000		-.001	.017
M2 VS. M3	30.423	21	.084		.000	.003
M3 VS. M4	37.647	26	.065		-.001	.003

Job Tenure Invariance								
	χ^2	DF	RMSEA	90% C. I.		p	CFI	TLI	SRMR
M1. Configural	1633.492	615	.066	.062	.070	.000	.925	.881	.026
M2. Weak	1651.424	825	.051	.048	.055	.279	.939	.928	.038
M3. Strong	1713.049	867	.051	.047	.054	.387	.938	.93	.039
M4. Strict	1724.588	877	.05	.047	.054	.431	.938	.931	.043

Model Comparison						
	ΔCHI	ΔDF	p		ΔCFI	ΔTLI
M1 VS. M2	178.950	210	.941		.014	.047
M2 VS. M3	54.677	42	.091		-.001	.002
M3 VS. M4	11.539	10	.317		.000	.001

Table 4. Study 2 - Bi-factor-ESEM solution.

			λ			Error (δ)
	G	**S-TA**	**S-AS**	**S-NE**	**S-EM**	
SELF_18	**.64**	**.44**	-.11	.02	-.09	.38
SELF_23	**.66**	**.49**	-.02	.01	-.11	.31
SELF_20	**.68**	**.39**	-.04	.10	-.05	.37
SELF_5	**.58**	**.31**	.05	.01	.12	.55
SELF_13	**.58**	**.42**	.03	-.01	.05	.48
SELF_16	**.66**	**.20**	.15	-.16	.02	.47
SELF_9	**.64**	**.39**	.14	-.07	.09	.41
SELF_25	**.69**	**.38**	.02	-.06	.03	.38
SELF_15	**.77**	-.10	**.46**	-.10	-.06	.18
SELF_10	**.58**	.09	**.37**	-.01	-.09	.51
SELF_24	**.68**	.11	**.30**	.00	-.17	.41
SELF_12	**.66**	-.01	**.51**	.00	.01	.31
SELF_3	**.50**	.04	**.50**	.11	.19	.46
SELF_7	**.54**	.03	**.41**	.17	.08	.51
SELF_1	**.37**	.06	.29	**.63**	.09	.38
SELF_22	**.60**	-.16	-.14	**.46**	.01	.38
SELF_19	**.51**	-.13	-.30	**.52**	-.01	.36
SELF_11	**.57**	.03	-.04	**.34**	.02	.56
SELF_4	**.48**	.03	-.12	**.31**	.12	.65
SELF_17	**.63**	.09	.15	**.38**	-.07	.42
SELF_6	**.45**	.05	.22	**.48**	-.03	.51
SELF_21	**.63**	-.09	-.10	.09	**.30**	.49
SELF_8	**.53**	.05	.08	-.05	**.48**	.48
SELF_2	**.38**	.03	.13	.11	**.67**	.38
SELF_14	**.65**	-.11	-.14	-.03	**.36**	.41
SELF_26	**.64**	.06	-.09	-.02	**.24**	.53
omega	**.96**	**.73**	**.73**	**.76**	**.67**	

1

Table 5. Study 2 - Correlations among the study variables

	M	SD	2	3	4	5	6	7	8	9	10	11	12	13
1. Job Tenure	11.9	10.6	-.008	-.002	.052	.012	-.038	-.041	.001	.017	-.038	.010	-.002	-.178***
2. Gender (0 = Male)	-	-		.022	.006	-.293***	.083	-.072	-.012	.051	.055	.205***	-.112	-.062
3. Global SE	5.22	0.85			.109	.085	.060	.093	.442***	.373***	-.276***	-.192***	-.266***	-.228***
4. Task SE	5.70	0.96				-.095	-.066	-.067	.355***	.047	-.071	.009	-.258***	-.246***
5. Negative Emotional SE	4.67	1.06					-.015	-.070	.041	.052	-.208***	-.307***	.080	-.070
6. Empathic SE	5.21	0.99						-.047	-.003	.192***	.065	.065	-.100	.039
7. Assertive SE	5.23	1.11							.117	-.070	-.077	.013	.035	.180***
8. In-role behaviour	4.23	0.64								.392***	-.179***	-.133	-.212***	-.204***
9. Extra-role behaviour	3.63	0.75									-.043	.048	-.247***	-.157***
10. Negative Emotions	2.20	0.80										.501**	.193***	.241***
11. Health Symptoms	2.24	0.74											.091	.175***
12. CWB-P[a]	1.16	0.45												.496***
13. CWB-O[a]	1.69	0.63												

Note. SE = Self-Efficacy; CWB-P = Counterproductive Work Behaviour towards people; CWB-O = Counterproductive Work Behaviour towards organisations; ** $p < .001$; *** $p < .0006$ (as per Bonferroni correction). Please note that while means (M) and standard deviations (SD) have been estimated on the variables computed by averaging the corresponding items, the correlations have been estimated on factor scores (M=0; SD=1) derived from B-ESEM/CFA.

[a] Given the non-normality of the factor scores of CWB-P and CWB-O (skewnesses were 5.9 and 1.9 respectively), these were transformed using the reciprocal (the result was then multiplied times -1 to restore the right direction or latitude of the original non-transformed variable) according with Tabachnick and Fidell (2007).

1

2 **Table 6**. Study 2- Results of the hierarchical regression analyses

|	In-role		Extra-role		CWB-O[a]		CWB-P[a]		Negative Emotions		Health Symptoms	
	Step 2 Standardised Beta coefficients											
Gender (0=Male)	-.002		.031		-.072		-.079*		-.008		.132***	
Job Tenure	-.011		.020		-.159***		.006		-.033		.017	
Global SE	.394***		.367***		-.217***		-.242***		-.250***		-.181***	
Task SE	.324***		.014		-.206***		-.229***		-.061		.009	
NegEm SE	.045		.027		-.078*		.057		-.199***		-.249***	
Assertive SE	.104**		-.090*		.172***		.036		-.070		.026	
Empathic SE	.000		.165***		.046		-.091*		.069		.064	
	R^2	Inc R^2	R^2	Inc R^2	R^2	Inc R^2	R^2	Inc R^2	R^2	Inc R^2	R^2	Inc R^2
Step 1	.000		.003		.036**		.010*		.004		.042***	
Step 2	.303***	.303***	.179***	.176***	.171***	.135***	.147***	.135***	.126***	.116***	.143***	.101***

3 *Note.* Step 1 = Gender + Job tenure; Step 2 = Gender and Job tenure + W-SE dimensions; SE= Self-efficacy; * p< .05; ** p< .01; ***p<.0011 (as per Bonferroni
4 correction). Regressions have been estimated on factor scores (M=0; SD=1) derived from B-ESEM/CFA.
5 [a] Given the non-normality of the factor scores of CWB-P and CWB-O (skewnesses were 5.9 and 1.9 respectively), these were transformed using the
6 reciprocal (the result was then multiplied times -1 to restore the right direction or latitude of the original non-transformed variable) according with Tabachnick
7 and Fidell (2007).
8

**Figure 1.** Study 2 -'Elbow plot' of the Latent Profile Analysis statistical indices
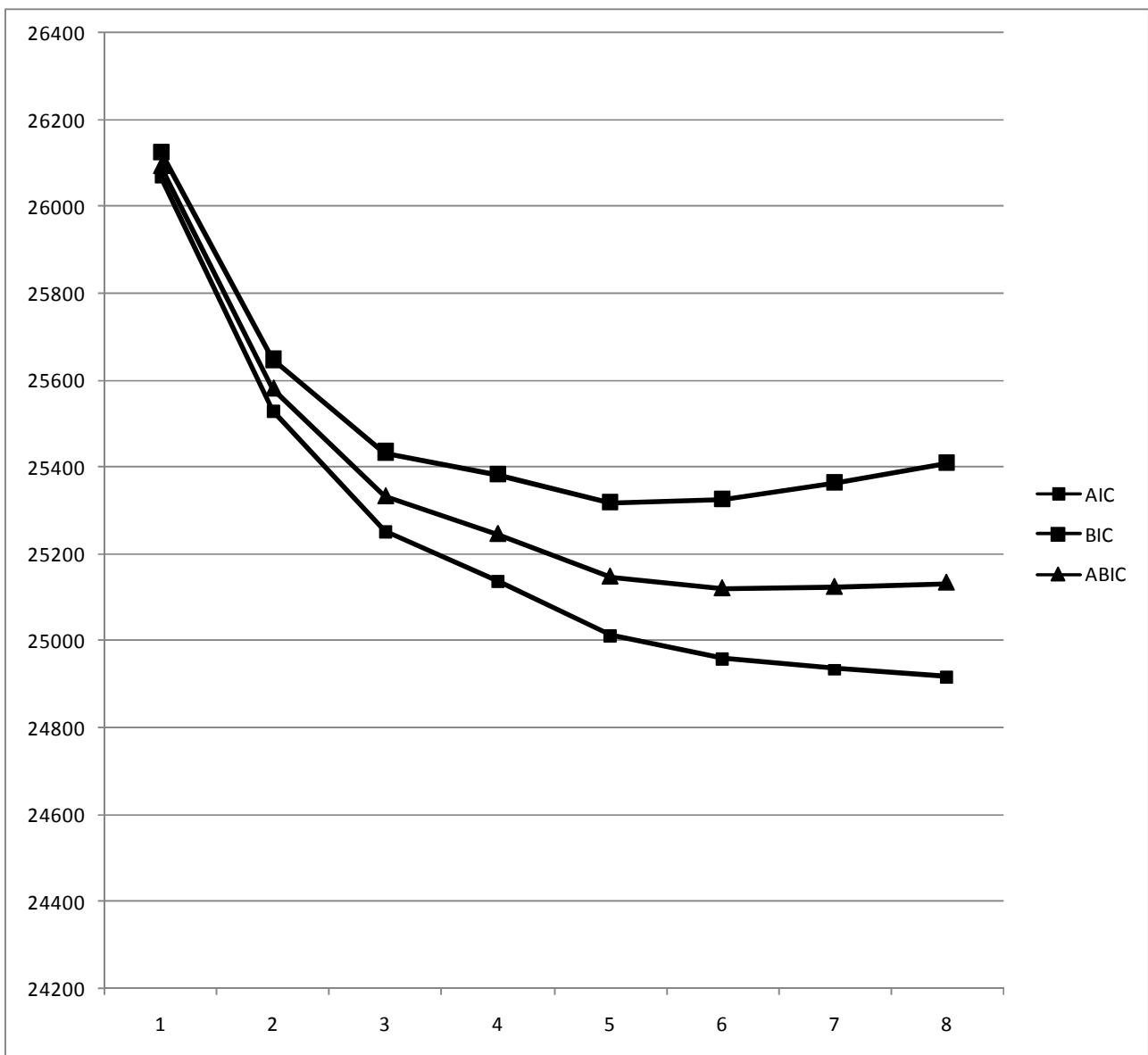
Note. AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion; ABIC = sample-size Adjusted BIC.

Figure 2. Study 2 –Results of the Four-Cluster solution
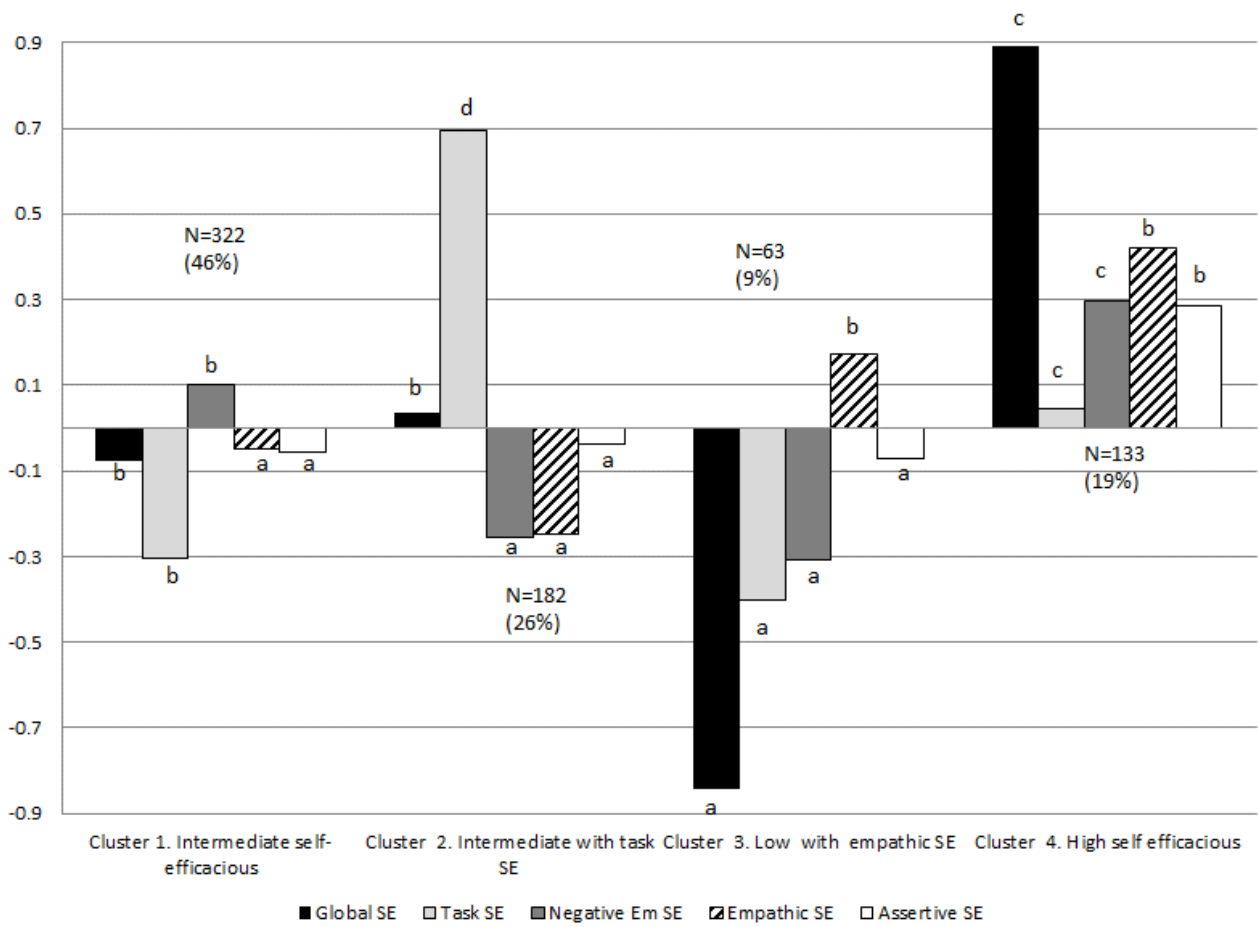
Note. SE = Self-Efficacy. Different letters indicate significant differences among clusters (p<.0017 as per Bonferroni correction)

Figure 3. Study 2 – Clusters profile on the criteria
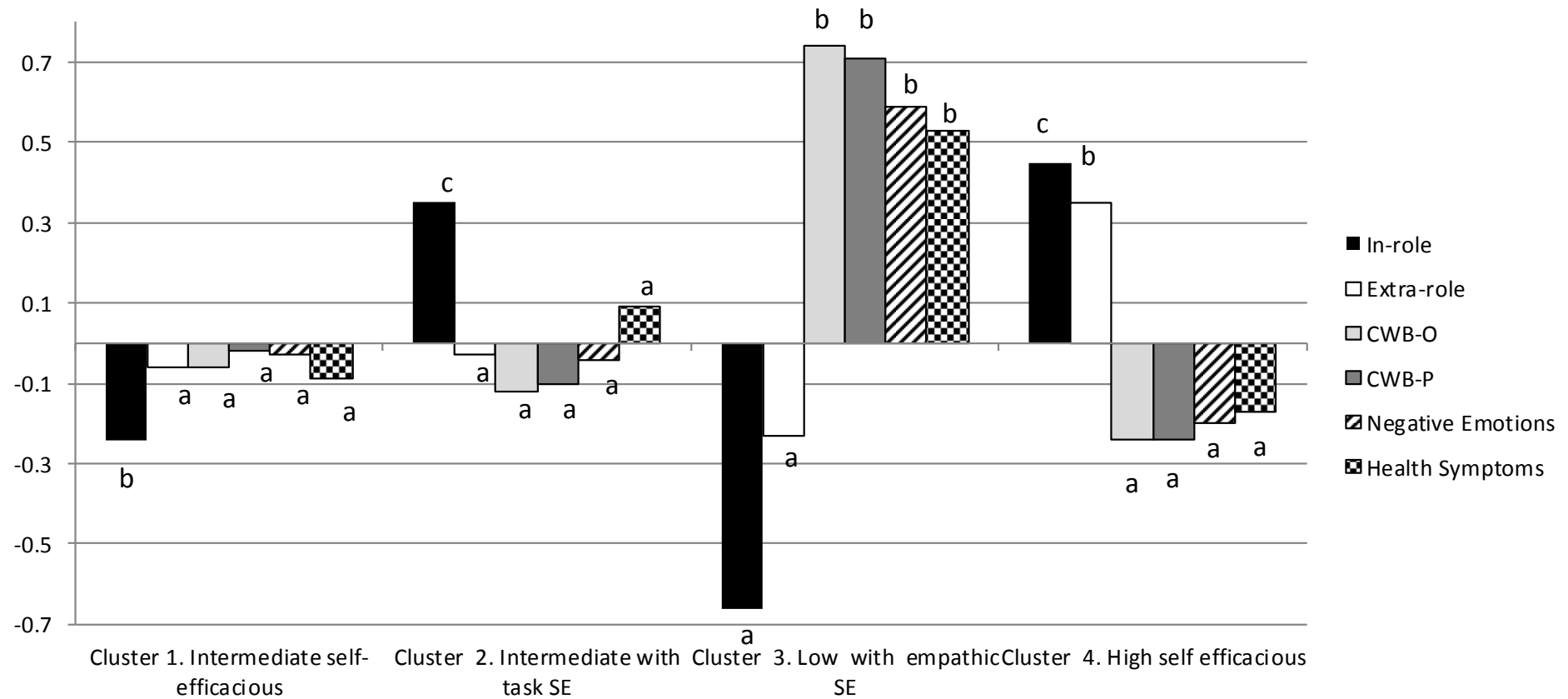
Note. SE = Self-Efficacy; CWB-O = Counterproductive Work Behaviour towards organisations; CWB-P = Counterproductive Work Behaviour towards people. Regressions have been estimated on factor scores (M=0; SD=1) derived from B-ESEM/CFA. Different letters indicate significant differences among clusters(p<.0014 as per Bonferroni correction).

Additional materials

Study 1. Analysis of missingness

As preliminary analysis, a check of missing data was performed on all items. While 95.4% of the sample have no missing data, 4.2% have only 1 item missing, 0.4% from 2 to 11 items missing. By further exploring the non-responses, they were not specific to some items but spread across all of them. In addition, to analyse in much depth the missingness, 26 one-way ANOVAs were performed considering as grouping variable having no missing (N = 2092) vs. having at least one missing value (N = 100), and as dependent variables scores on the 26 items. After correcting the actual level of alpha using the Bonferroni approach, only in one case the p value was lower than the nominal alpha level of p=.05/26 =.0019, and this occurred for item 14. Given these results and based on Rubin's typology (1976), we have no theoretical or methodological reasons to suspect that our data were missing not at random, with a consequent bias introduced by the estimation process due to non-response. Accordingly, the use of Full Information Maximum Likelihood to handle missing data implemented in Mplus assures that parameter estimates of the structural equation model are unbiased.

Study 2. Analysis of missingness

As preliminary analysis, a check of missing data was performed on all items. While 84.4% of the sample have no missing data, 12% have only 1 item missing, 3% from 2 to 11 items missing. By further exploring the non-responses, they were not specific to some items but spread across all of them. In addition, to analyse in much depth the missingness 61 one-way ANOVAs were performed considering as grouping variable having no missing (N = 591) vs. having at least one missing value (N = 109), and as dependent variables scores on the 61items. After correcting the actual level of alpha using the Bonferroni approach, only in one case the p value was lower than the nominal alpha level of p=.05/61 =.0008, and this

occurred for item 2 of SE scale. Given these results and based on Rubin's typology (1976), we have no theoretical or methodological reasons to suspect that our data were missing not at random, with a consequent bias introduced by the estimation process due to non-response. Accordingly, the use of Full Information Maximum Likelihood to handle missing data (FIML; Arbuckle, 1996) implemented in Mplus assures that parameter estimates of the structural equation model are unbiased.