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A network analysis of relationships between the Trait Emotional Intelligence Questionnaire Short Form (TEIQue-SF) and the Big Five personality traits in Italian workers

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ABSTRACT

This study investigated the relationship between the Trait Emotional Intelligence Questionnaire Short Form (TEIQue-SF) and the ten facets of the Big Five Questionnaire (BFQ) via network analysis. The TEIQue-SF and the BFQ were administered to 751 Italian workers. Both centrality indexes (Expected Influence and Node Predictability) and bridge dimensions were calculated. Stability and accuracy were also checked to ensure the reliability of the findings. The BFQ facets of Perseverance (Consciousness) had the highest centrality while Emotion control (Emotion stability, the opposite of Neuroticism) showed high centrality. Among TEIQue-SF dimensions, Sociability followed by Emotionality and Self-Control had high centrality. TEIQue-SF Emotionality and Sociability had a bridge function. Both TEIQue-SF Emotionality and Sociability and both BFQ Perseverance and Emotion control are relevant in linking emotional intelligence and personality traits. Although further studies are needed, the network analysis represents a promising approach in providing a more detailed analysis of the relationships between dimensions of emotional intelligence and facets of personality traits in workers.

1. Introduction

During the last three decades, emotional intelligence (EI) has renewed the landscape of human emotion study (Pérez-González et al., 2020; Siegling et al., 2015). EI is the ability to perceive, recognise, regulate, and express emotions at both interpersonal and individual levels (Salovey & Mayer, 1990). High EI persons are more prone to establish satisfying relationships and obtain favourable individual outcomes (Parker et al., 2020; Zeidner et al., 2004) including improving work performance, facilitating altruistic behaviours, and creating positive relational environments in the workplace (Di Fabio & Saklofske, 2019a, 2019b, 2021; Miao et al., 2017).

Two main approaches to describing EI have emerged (e.g., Stough et al., 2009). Ability EI focuses on cognitive capabilities to comprehend and manage emotion (Mayer & Salovey, 1997) whereas trait EI refers to how individuals understand, experience, and express emotions (Bar-On, 1997). The trait EI model (Petrides & Furnham, 2001) is one of the most comprehensive models encompassing 15 correlated facets comprising four principal domains: well-being, emotionality, sociability, and self-control (Petrides, 2009). Well-being results from linking emotions across time-based on individual attainments, self-esteem, and expectations. Emotionality implies the capacity to understand, communicate, and relate to one's and other's emotions. Sociability refers to being assertive in social situations and capable of managing others' emotions. Self-control deals with managing emotions, impulsive behaviour, and stress. Thus, trait EI represents a "constellation" of traits related to emotional self-efficacy (Vernon et al., 2008).

The Trait Emotional Intelligence Questionnaire (TEIQue) assesses global EI and its dimensions in both long (TEIQue-LF; Petrides & Furnham, 2004) and short (TEIQue-SF; Petrides, 2009) forms. The TEIQue-SF was designed to assess global EI and the four dimensions. Translated versions of both forms exist in 27 languages (Dåderman & Kajonius, 2022) and cited in over 2000 studies (Sambol et al., 2022).

Trait EI has gained attention in I-O Psychology for its value application to the workplace (Furnham, 2009; Zeidner et al., 2004) including job performance (Joseph et al., 2015), job satisfaction, organizational

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commitment, and organizational citizenship behaviour (Miao et al., 2017). Furthermore, trait EI has been identified as an antecedent of positive psychological variables associated with flourishing in working environments, including resilience (Di Fabio & Saklofske, 2014b, 2018), optimism and hope (Di Fabio et al., 2018), intrapreneurial self-capital (Di Fabio & Saklofske, 2019b), positive relational management (Di Fabio & Saklofske, 2019a), compassion and self-compassion (Di Fabio & Saklofske, 2021). Trait EI can be developed and enhanced with specific training (Di Fabio & Kenny, 2011; Vesely et al., 2014) in contrast to more stable personality traits. This places EI as a promising strength-based factor in organizations (Di Fabio & Saklofske, 2021) focusing on developing strategic actions for fostering workers' psychological resources (Di Fabio et al., 2022; Di Fabio & Kenny, 2019; Di Fabio & Saklofske, 2014a, 2014b), to manage the ever-present challenges of the 21st century (Blustein et al., 2019; Cartwright & Cooper, 2014).

Trait EI has been studied together with the well-established five factor personality model (FFM, aka "Big Five"): extraversion, agreeableness, conscientiousness, neuroticism, openness to experience (Costa & McCrae, 1992). Some studies have shown an overlap between EI and major personality dimensions (Joseph & Newman, 2010) while others indicate they share relatively little common variance. Trait EI is reported to be strongly and negatively related to neuroticism (Hjalmarsson & Dåderman, 2022). A study of twins confirmed this negative association between EI and neuroticism while revealing a pattern of positive relationships between Extraversion and Conscientiousness (Vernon et al., 2008). Studies have contrasted the distinction between the FFM and trait EI (Andrei et al., 2016; Petrides et al., 2007). Exploratory factor analysis showed that trait EI emerged as a separate factor from the FFM (Petrides et al., 2007). Andrei et al. (2016) demonstrated the incremental validity of the TEIQue for an array of emotional and behavioral constructs after controlling for the FFM. Siegling et al. (2015) suggested trait EI may represent a higher-order personality construct not fully explained by the FFM. Recent studies recognise the need to further explore the association of the FFM beyond global trait scores (Andrei et al., 2016). Previous research has applied the latent factor theory (e.g., Petrides, 2009), where structural covariation of data is explained by an array of latent variables (Costantini et al., 2015b). As an alternative to the factor model, the network approach to personality analyses has attracted increasing attention (Costantini et al., 2015b; Epskamp & Fried, 2018) and applied to studies of the FFM traits (Christensen et al., 2019) and other personality descriptions (e.g., Di Fabio et al., 2022; Trahair et al., 2020).

Following the network approach, the structural covariance of personality is not constrained in an a priori factor structure but arises from the reciprocal interactions between traits. As a result, the network of personality traits is an "ecosystem" in which some traits with their characteristics and behaviours work to stimulate or to inhibit each other (Costantini et al., 2015b). Accordingly, Trait EI and personality dimensions are represented by nodes, and the linkages between them by edges (Epskamp & Fried, 2018). The guidelines on network analysis (Burger et al., 2022) make it possible to identify the most central nodes in a network via Expected Influence (Robinaugh et al., 2016), and to highlight the more robust edges that connect nodes (Epskamp & Fried, 2018). Lastly, the network approach offers the possibility of detecting the bridge nodes that specifically connect the EI and personality constructs that compose a network (Jones et al., 2021). By highlighting these bridges, network analysis may clarify the main relationships between EI traits and Big Five personality facets, thus providing new insights on the co-occurrence of these elements at the lower levels of personality hierarchies. Therefore, the present study employed network analyses to examine relationships between trait EI assessed by TEIQue-SF and the Big Five personality facets. The network approach was selected to identify the most central and bridge nodes in the network to better understand the relationships between trait EI and Big Five Personality facets in workers.

2. Methods

2.1. Participants

Participants were 751 adults employed in public and private work organizations in central-southern Italy (Male: $n = 505$; Female: $n = 246$; mean age = 47.10 years; SD = 11.0; range: 22–68 years; 14.7 %: 22–32 years; 19.3 %: 33–43 years; 36 %: 44–55 years; 30 %: 56–68 years; 58.1 % had at least a high school education). Confidentiality was guaranteed, and participation was voluntary. Each participant signed a privacy protection disclaimer in accordance with Italian law's standard criteria for ethics in research (Law Decree DL-196/2003) and European Union General Data Protection Regulation (EU 2016/679).

2.2. Measures

2.2.1. TEIQue-SF Italian version

The 30 item Italian version (Di Fabio & Palazzeschi, 2011) of the Trait Emotional Intelligence Questionnaire Short Form assesses well-being (6 items), self-control (6 items), emotionality (8 items), and sociability (6 items), rated on a 1 (completely disagree) to 7 (completely agree) Likert scale.

2.2.2. Big Five Questionnaire

The 132 item Italian version of the Big Five Questionnaire (BFQ, Caprara et al., 1993) assess five personality traits and their facets: Extraversion (*Dynamism*: expansiveness and enthusiasm; *Dominance*: assertiveness and confidence), Agreeableness (*Cooperativeness*: concern and sensitiveness toward others; *Politeness*: kindness, civility, docility, and trust), Conscientiousness (*Scrupulousness*: accuracy, organization, and precision; *Perseverance*: capacity to accomplish one's own tasks and duties), Emotional Stability (*Emotion Control*: the capacity to cope adequately with one's own anxiety and emotionality; *Impulse Control*: capability of controlling anger, discontent, and irritation), and Openness (*Openness to Culture*: broadness of one's own cultural interests; *Openness to Experiences*: openness to novelty, tolerance of different values, and interest in other people, habits and ways of life). Items are rated on a 5-point Likert scale (1, absolutely false; 5, absolutely true). Regarding relationships between the five dimensions of BFQ and those of NEO-PI (Caprara et al., 1993), BFQ Extraversion was strongly and positively correlated with its corresponding dimension in the NEO-PI model, namely NEO-PI Extraversion ($r = 0.71$); the same was true for BFQ Agreeableness ($r = 0.66$ with NEO-PI Agreeableness), BFQ Conscientiousness ($r = 0.63$ with NEO-PI Consciousness), and BFQ Openness ($r = 0.66$ with NEO-PI Openness to Experience); in contrast, Emotional Stability was strongly and negatively correlated with NEO-PI Neuroticism ($r = -0.80$), following the BFQ framework that conceived it as the inverse of Neuroticism.

2.3. Statistical analysis

Table 1 presents mean, standard deviation, kurtosis and skewness of all measures. Subsequently, we estimated a network structure, encompassing the four TEIQue-SF dimensions and ten BFQ facets via two phases and following Burger et al.'s guidelines (2022). First, we estimated zero-order correlations. Second, the network model (out of 100) with the lowest lambda (tuning = 0.001) was calculated. Our network model comprised fourteen nodes (four reflecting the dimension of the TEIQue-SF and ten mirroring the BFQ facets) and edges representing the regularized partial correlation (i.e., controlled by all the other ones) between two nodes. Blue edges displayed positive associations whereas red edges the negative ones. The thickness of edges represented their magnitude (the thicker the node, the stronger the association) (Epskamp & Fried, 2018). The R packages *bootnet* 1.5, and *qgraph* 1.9 were used.

Local network properties were assessed via the Expected Influence index (Robinaugh et al., 2016) and node predictability. The Expected

Table 1
Study variables: means, standard deviations, skewness, and kurtosis, Cronbach's alpha, mean item-total correlation ($n = 751$).

Study variables	M	SD	Min	Max	Sk	Kr	α	Mean item-total correlation
BFQ Dynamism	39.82	5.43	21	58	0.15	0.26	0.71	0.17
BFQ Dominance	34.26	5.24	17	53	0.13	0.68	0.70	0.16
BFQ Cooperativeness	41.72	5.13	22	58	−0.05	−0.06	0.75	0.20
BFQ Politeness	38.27	5.69	19	60	−0.03	0.47	0.75	0.20
BFQ Scrupulousness	39.43	6.32	16	59	−0.11	0.32	0.71	0.17
BFQ Perseverance	42.35	5.97	21	60	0.07	0.18	0.74	0.19
BFQ Emotion Control	36.26	7.20	16	59	−0.08	0.12	0.79	0.24
BFQ Impulse Control	35.73	6.40	12	58	−0.19	0.72	0.74	0.19
BFQ Openness to Culture	40.74	5.86	21	56	0.04	−0.30	0.70	0.16
BFQ Openness to Experiences	40.23	5.55	20	55	0.08	0.10	0.76	0.22
TEIQue-SF Well-being	31.01	5.62	10	42	−0.35	−0.12	0.73	0.32
TEIQue-SF Self control	26.87	5.42	11	42	0.11	0.03	0.77	0.35
TEIQue-SF Emotionality	40.33	7.19	20	56	−0.04	−0.56	0.71	0.28
TEIQue-SF Sociability	26.96	5.33	8	51	0.38	0.57	0.76	0.34

BFQ: Big Five Questionnaire; TEIQue-SF: Trait Emotional Intelligence Questionnaire; α: Cronbach's alpha.

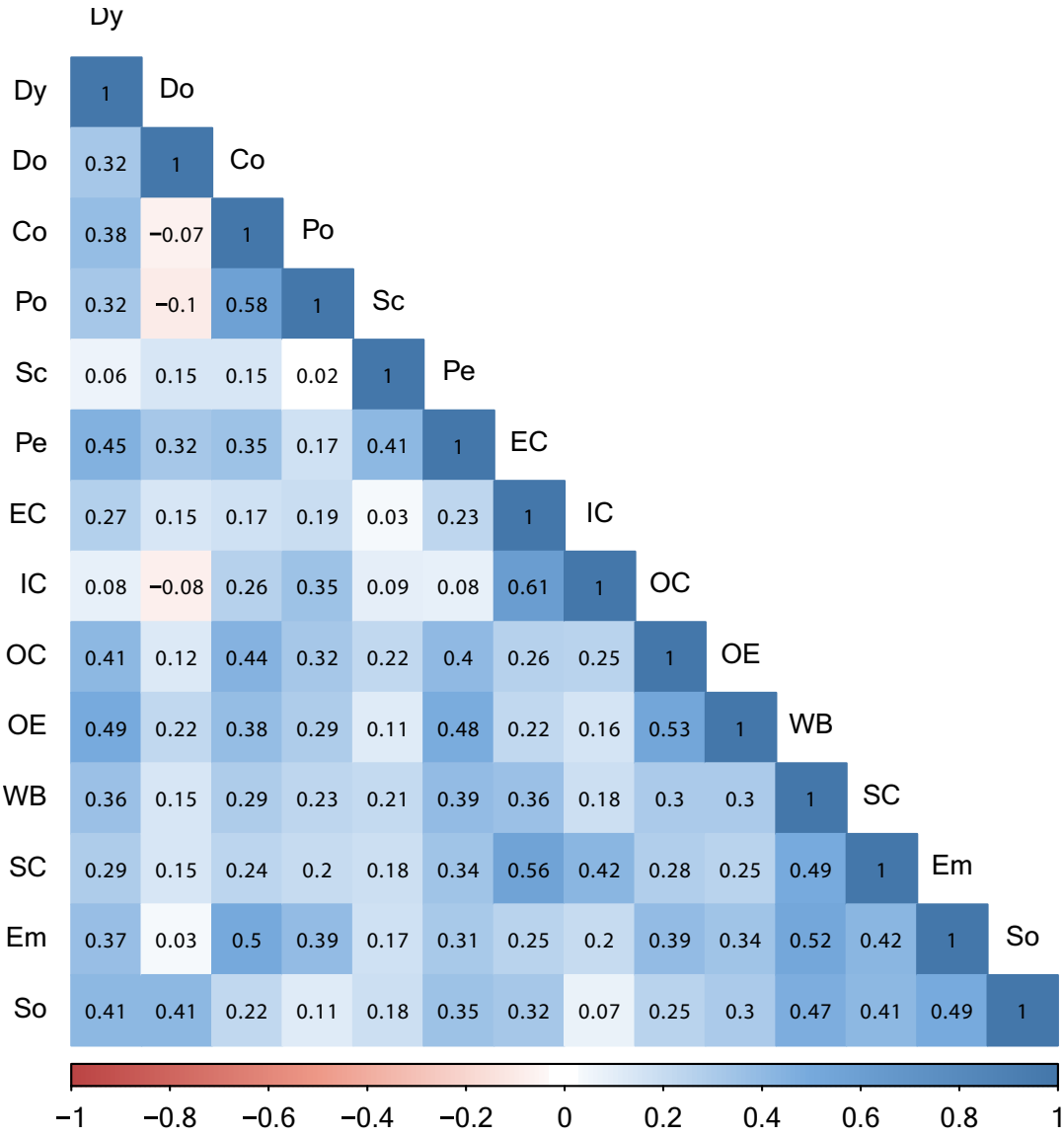

Fig. 1. Zero order Pearson correlations ($n = 751$).
Big Five Questionnaire ten facets - Dy: Dynamism; Do: Dominance; Co: Cooperativeness; Po: Politeness; Sc: Scrupulousness; Pe: Perseverance; EC: Emotion Control; IC: Impulse Control; OC: Openness to Culture; OE: Openness to Experiences. Trait Emotional Intelligence Questionnaire Short Form - WB: Well-being; SC: Self-control; Em: Emotionality; So: Sociability.

Influence index is a superior centrality index that calculates each node's overall connections (Robinaugh et al., 2016). Centrality refers to the importance of nodes in a network. It is assessed via indexes labelled centrality indices of the network structure (e.g., strength, closeness, betweenness, expected influence) in relation to centrality. Among them, Expected Influence is defined as the sum of all edges extending from a given node toward all surrounding nodes (Robinaugh et al., 2016). Node predictability (ranging from 0 to 1) evaluated how a particular node is predicted by all surrounding nodes and represents the percentage of variance shared by a specific node with all neighbouring nodes (Epskamp et al., 2018). The correlation stability (CS) coefficient assessed network stability; a CS coefficient > 0.50 suggests a stable Expected Influence (Epskamp et al., 2018). The bootstrap test of edge weight accuracy examined network accuracy in which a plotted curve with larger confidence intervals (CIs) indicates poorer precision while smaller CIs indicate greater precision (Epskamp et al., 2018). The nonparametric bootstrapped difference test for Expected Influence was used to determine statistically significant differences among EI facets. The nonparametric bootstrapped difference test for edge weight was applied to examine statistically significant differences between edges (Epskamp et al., 2018). We used the R packages *igraph* 1.2.9 and *bootnet* 1.5. Finally, bridge nodes representing dimensions that connect TEIQue-SF and BFQ were calculated using the bridge Expected Influence. Bridge nodes are nodes that are important in communication between two different communities of nodes (Jones et al., 2021). In our network model, one community of nodes was represented by the BFQ facets, and the other one pertained to the TEIQUE-SF dimensions. In the network approach, bridge centrality indexes (e.g., strength, closeness, betweenness, expected influence) in relation to bridge function were used to identify bridge nodes. According to Jones et al., 2021 we implemented Bridge Expected Influence to detect bridge nodes. Following Jones et al. (2021), we provided a graphical LASSO model based on choosing as bridge nodes those with bridge Expected Influence in the top 80th percentile. We used the R packages *networktools* 1.2.3 and *qgraph* 1.9. The following R packages were also used: *dplyr* 1.0.7, *bnlearn* 4.7, *reshape2* 1.4.4, *ggplot2* 3.3.5, and *Hmisc* 3.3.5. All the analyses were conducted using the R Studio Version 2022.07.0 Build 548 for Windows.

3. Results

Table 1 shows descriptive statistics of all study variables and Fig. 1 shows zero-order Pearson correlations. Fig. 2 presents the Network model of Trait Emotional Intelligence and BFQ Personality Traits and

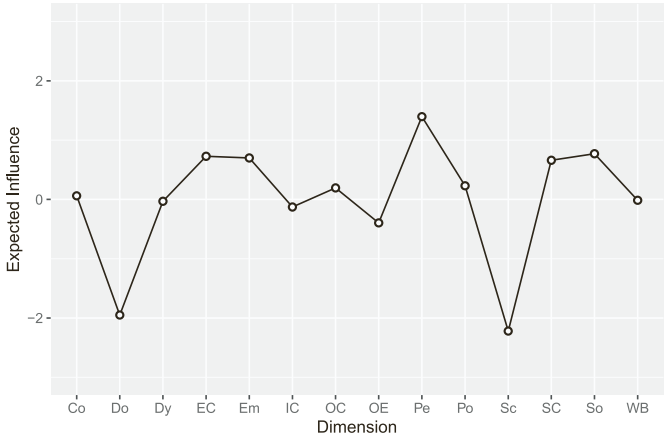

Fig. 3. Expected influence centrality estimates for the network of Trait Emotional Intelligence dimensions and Big Five Personality Facets ($n = 751$).
Note: *X*-axis represents the Trait Emotional Intelligence Questionnaire Short Form dimensions and Big Five Questionnaire personality traits *Y*-axis represents standardized Expected Influence z-scores. The Expected Influence of a node in a network is the sum of all edges extending from a given node toward all surrounding nodes..
Big Five Questionnaire ten facets - Dy: Dynamism; Do: Dominance; Co: Cooperativeness; Po: Politeness; Sc: Scrupulousness; Pe: Perseverance; EC: Emotion Control; IC: Impulse Control; OC: Openness to Culture; OE: Openness to Experiences. Trait Emotional Intelligence Questionnaire Short Form - WB: Well-being; SC: Self-control; Em: Emotionality; So: Sociability.

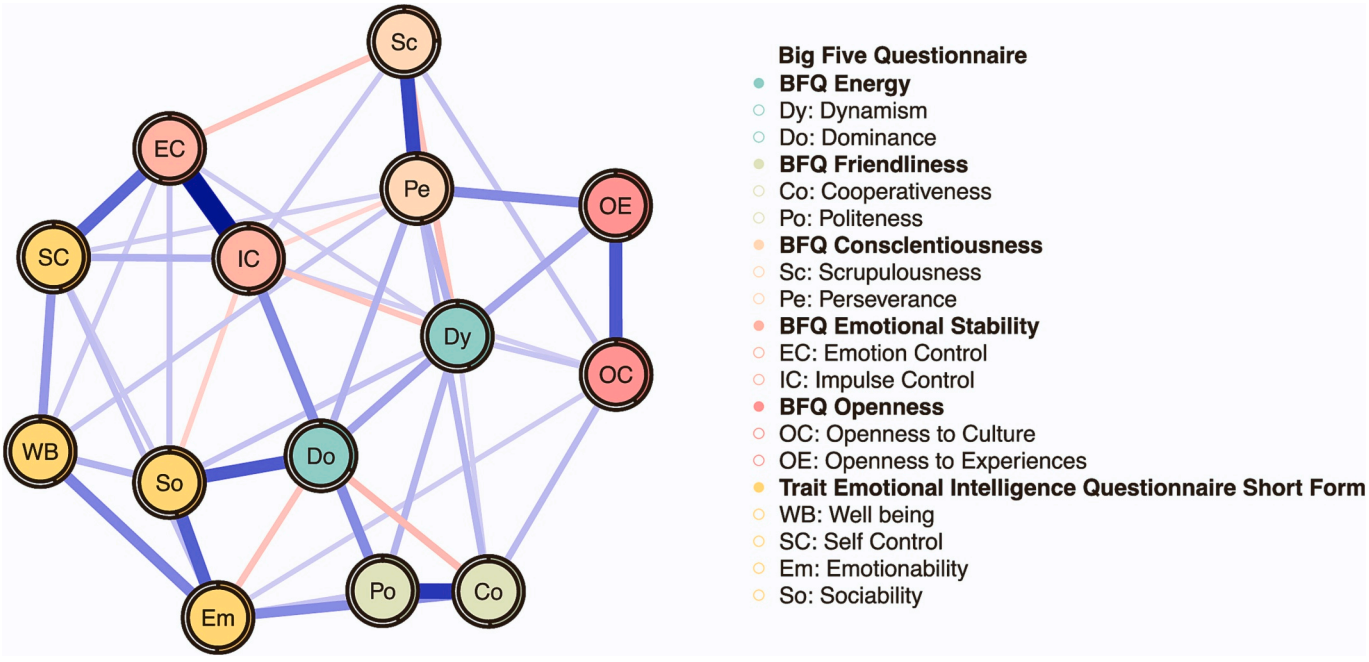

Fig. 2. Graphical representation of the Network model for Trait Emotional Intelligence and Big Five Personality Facets ($n = 751$).
Each node represents TEIQue-SF dimensions and BFQ ten facets. Blue edges display positive connections and red edges represent display connections; the thicker the connection the stronger it is. The pie chart surrounding the node represents node predictability (percentage of shared variance with surrounding nodes). TEIQue-SF = Trait Emotional Intelligence Questionnaire Short Form; BFQ = Big Five Questionnaire.

Fig. 3 shows the Expected Influence for each node in the network. Concerning the Expected influence (i.e., centrality index) associated with each node, BFQ Perseverance showed a significantly higher centrality (Expected Influence = 1.20) than all other nodes (Fig. 4). Four nodes showed high centrality with Expected Influence ranging from 1.00 to 0.99 (Figs. 3, 4): TEIQue-SF Sociability, BFQ Emotion Control, TEIQue-SF Emotionality and Self-control. Seven nodes showed medium centrality with EI ranging from 0.88 to 0.80, namely BFQ Politeness, BFQ Openness to Culture, BFQ Cooperativeness; TEIQue-SF Well-being; BFQ Dynamism and BFQ Impulse Control (Figs. 3, 4). Lastly, two nodes (BFQ Dominance and BFQ Scrupulousness) showed very low centrality (Expected Influence 0.36 and 0.30, respectively) (Figs. 3, 4). Mean node predictability was 0.61; thus 61 % of each node variance could potentially be accounted for by its surrounding nodes and ranged from 0.67 (BFQ Emotion control) to 0.32 (BFQ Scrupulousness).

Fig. 5 shows the statistically significant higher edges. The largest edges were between dimensions of the same construct, except for the edges between TEIQue-SF Sociability and BFQ Dominance, TEIQue-SF Self-control and BFQ Emotion Control, and TEIQue-SF Emotionality with BFQ Cooperativeness. Concerning the trustworthiness of the network, the CS stability coefficient was high (0.66). The bootstrap tests of the edge weight accuracy yielded a reasonable precision for the 13 nodes of the network (Fig. 6). The correlation between Expected Influence and predictability was also high (0.89). Figs. 7 and 8 illustrate the results of the Bridge Expected Influence for the network of BFQ and BTPS-SF. Analyses revealed that the network had two bridge nodes:

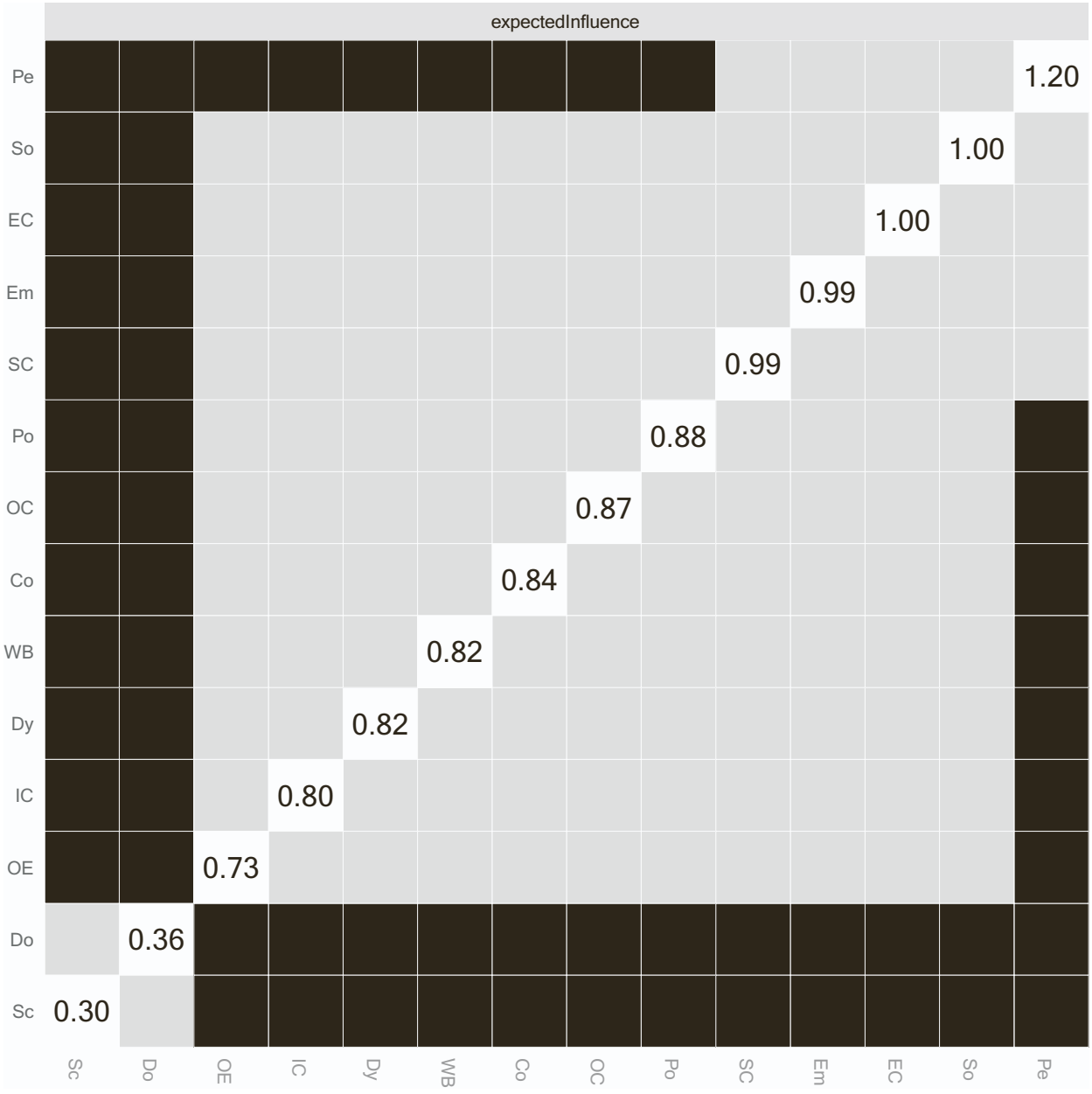

Fig. 4. Nonparametric bootstrapped difference test for Expected Influence of network of Trait Emotional Intelligence dimensions and Big Five Personality Facets (n = 751).

Note: *X* and *Y axis* represent, from lowest to highest value, all expected influence centrality estimates for the Trait Emotional Intelligence Questionnaire Short Form dimensions and Big Five Questionnaire Big Five personality facets. Big Five Questionnaire ten facets - Dy: Dynamism; Do: Dominance; Co: Cooperativeness; Po: Politeness; Sc: Scrupulousness; Pe: Perseverance; EC: Emotion Control; IC: Impulse Control; OC: Openness to Culture; OE: Openness to Experiences. Trait Emotional Intelligence Questionnaire Short Form - WB: Well-being; SC: Self-control; Em: Emotionality; So: Sociability.

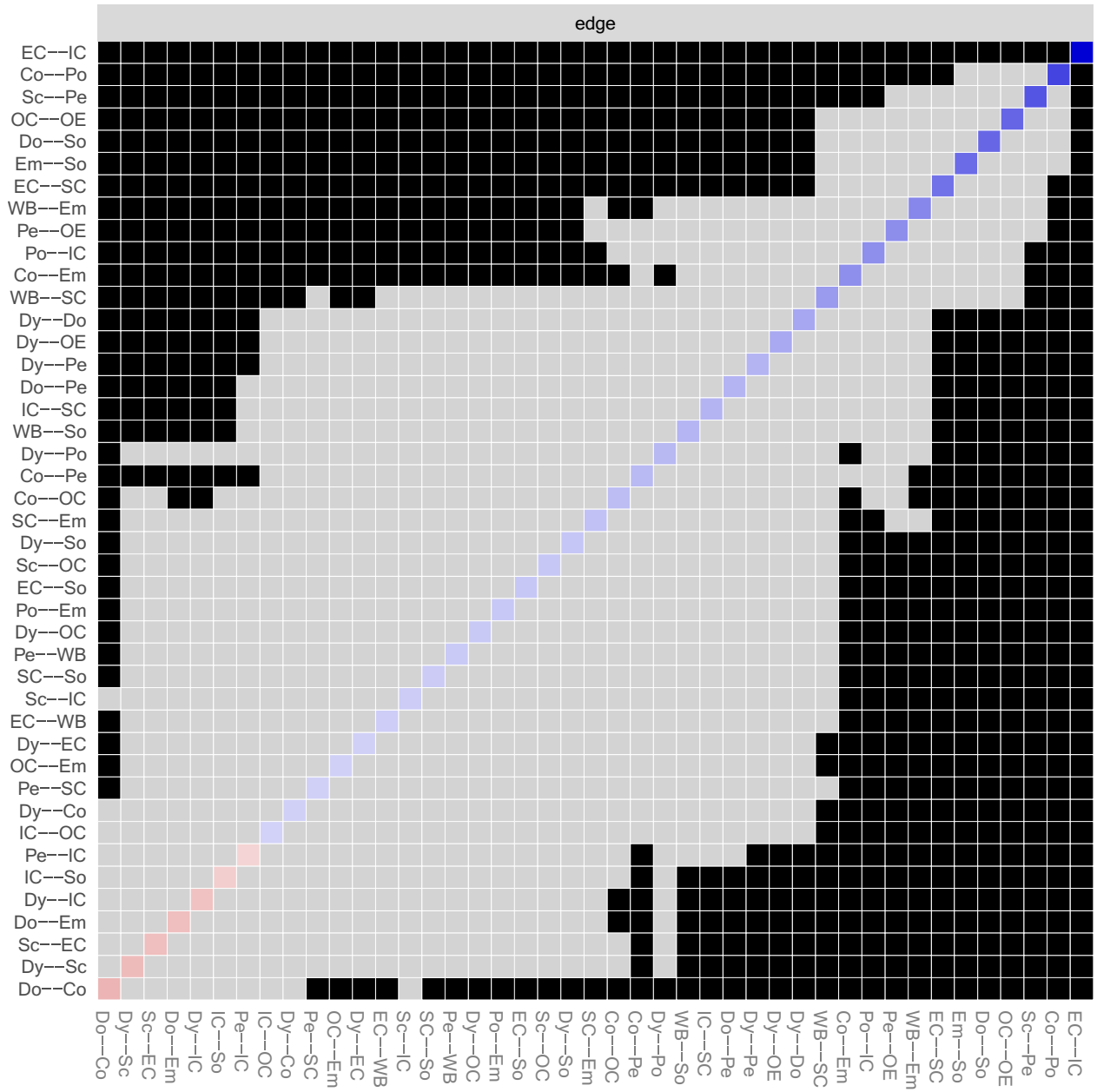

Fig. 5. Nonparametric bootstrapped difference test for the edge of network of Trait Emotional Intelligence dimensions and Big Five Personality Facets ($n = 751$). Note: *X* and *Y* axis represent, from lowest to highest value, all non-zero edges in the network. Statistical difference between two edge weights is represented with a black box; non-statistical difference is indicated with a grey box. Central boxes on the diagonal of the figure represent each node's magnitude and direction. Blue boxes illustrate positive edges. Red boxes illustrate negative edges. The intensity of the color represents the thickness of the edges—the more intense the color, the thicker the edge. Labels of the two nodes connected by one edge are displayed at the side of each box. Big Five Questionnaire ten facets - Dy: Dynamism; Do: Dominance; Co: Cooperativeness; Po: Politeness; Sc: Scrupulousness; Pe: Perseverance; EC: Emotion Control; IC: Impulse Control; OC: Openness to Culture; OE: Openness to Experiences. Trait Emotional Intelligence Questionnaire Short Form - WB: Well-being; SC: Self-control; Em: Emotionality; So: Sociability.

TEIQue-SF Emotionality and TEIQue-SF Sociability.

4. Discussion

The present study is the first to apply network analysis to extending the understanding of the relationships between trait emotional intelligence and personality facets in adult workers. The first finding relates to the degree of centrality observed in the network. The second finding describes the higher and statistically significant edges that link the TEIQue-SF dimensions with BFQ facets. The third finding concerns the bridge nodes that connect the two scales (TEIQue-SF and BFQ).

Network theory posits that personality is an ecosystem of nodes interacting with each other (Costantini et al., 2015a). In this framework, the higher the centrality, the greater the influence in activating or inhibiting the network. Following a cascading effect (i.e., a chain of relations that potentially affect a system), reciprocal interactions between the nodes proceed from nodes with the highest to the lowest centrality, and edges represent the paths of this interactions (Costantini et al., 2015a; Epskamp & Fried, 2018). Here, BFQ Perseverance had the highest centrality. Thus, it could be hypothesized that BFQ Perseverance is the node that functions as a trigger to activate the network of TEIQue-SF trait EI dimensions and BFQ Personality Facets. Thus, the highest centrality of BFQ Perseverance in the personality ecosystem of the relationship between TEIQue-SF and BFQ measures could reflect the

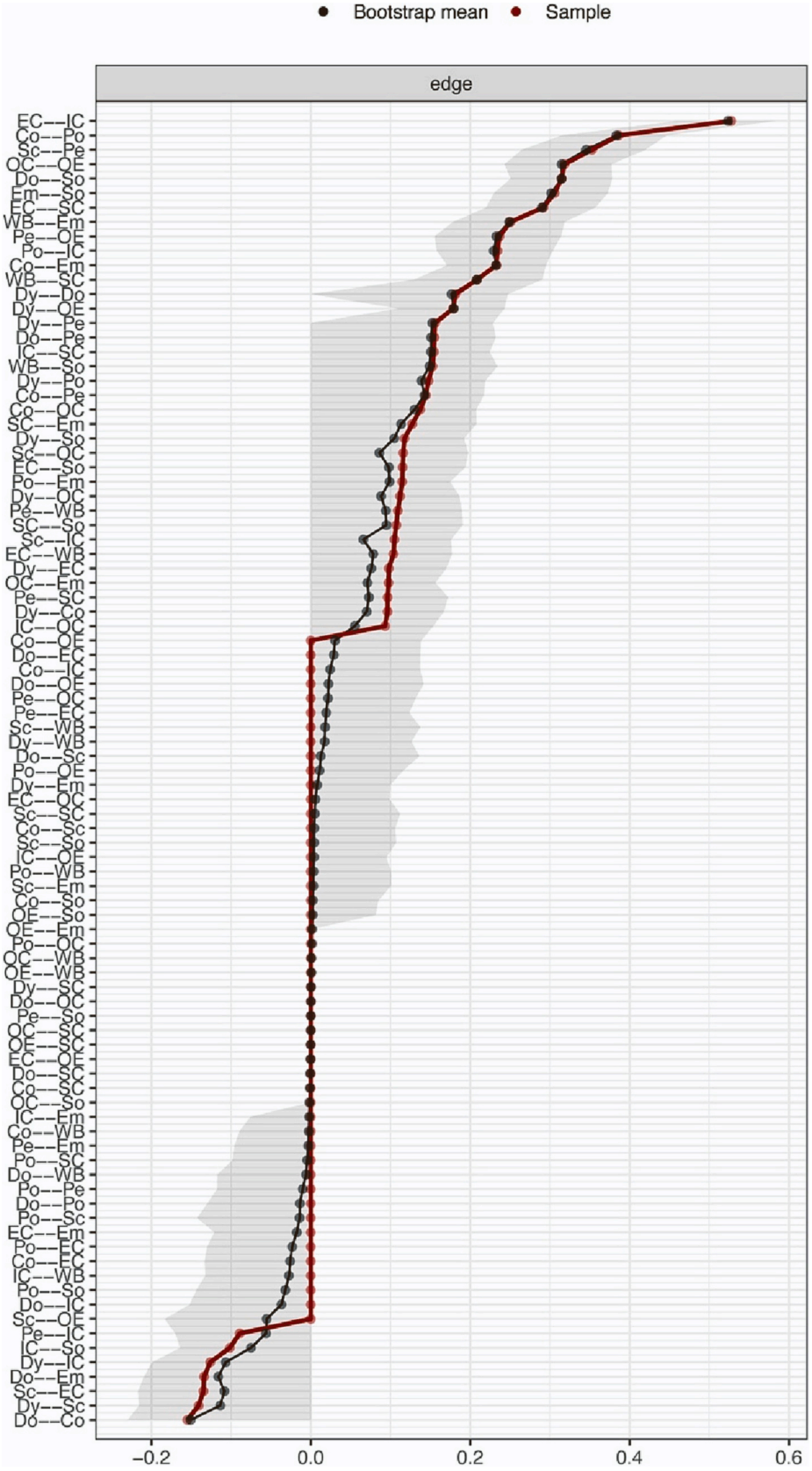

Fig. 6. Bootstrap tests of the edge weight accuracy [95 % confidence intervals] for network of Trait Emotional Intelligence dimensions and Big Five Personality Facets (n = 751).

Note: The grey area represents the bootstrapped CIs, and the red line represents the values observed in current study. Each horizontal line represents one edge, from the highest to the lowest edge weight. Big Five Questionnaire ten facets - Dy: Dynamism; Do: Dominance; Co: Cooperativeness; Po: Politeness; Sc: Scrupulousness; Pe: Perseverance; EC: Emotion Control; IC: Impulse Control; OC: Openness to Culture; OE: Openness to Experiences; Trait Emotional Intelligence Questionnaire Short Form - WB: Well-being; SC: Self-control; Em: Emotionality; So: Sociability.

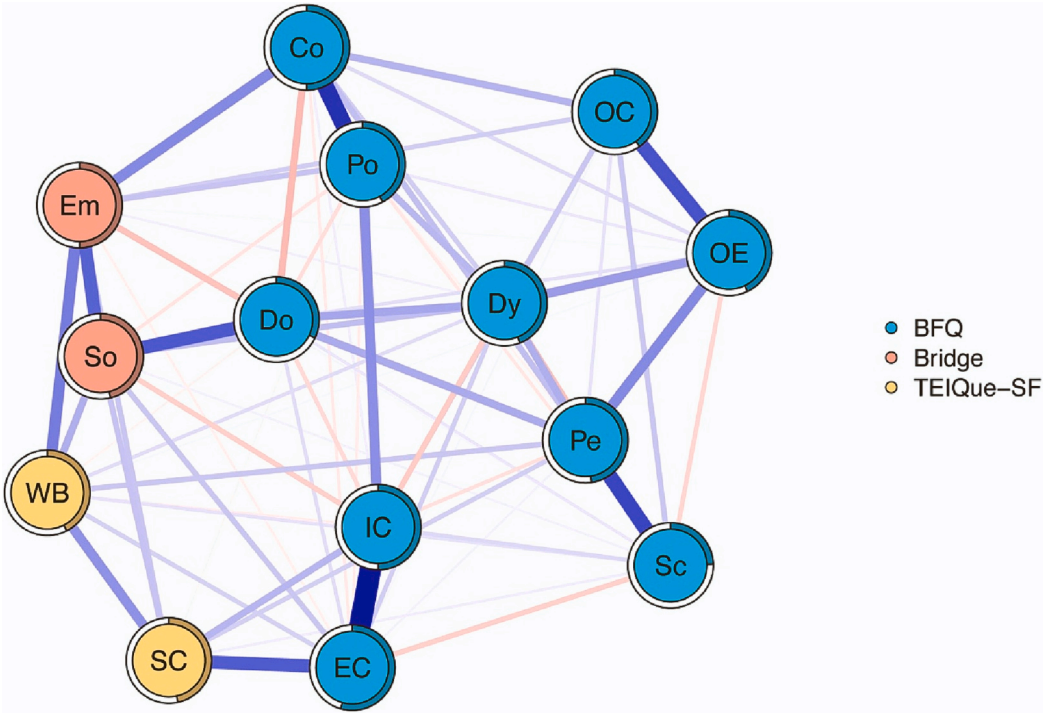

Fig. 7. Graphical representation of the Network model of Trait Emotional Intelligence dimensions and Big Five Personality Facets: Bridge Nodes and Bridge Expected Influence ($n = 751$). BFQ: Big Five Questionnaire; TEIQue-SF: Trait Emotional Intelligence Questionnaire - Short Form; Big Five Questionnaire ten facets - Dy: Dynamism; Do: Dominance; Co: Cooperativeness; Po: Politeness; Sc: Scrupulousness; Pe: Perseverance; EC: Emotion Control; IC: Impulse Control; OC: Openness to Culture; OE: Openness to Experiences. Trait Emotional Intelligence Questionnaire Short Form - WB: Well-being; SC: Self-control; Em: Emotionality; So: Sociability.

individual's orientation toward the job to be done and the contributions that the activation of emotional intelligence can bring about. Of the four nodes with high centrality, three were TEIQue dimensions: Emotionality, Sociability and Self-control. In contrast, only the of emotion control dimension was reflected by the BFQ. On the one hand, it seems that when emotional intelligence is "active" in the workplace, some aspects of trait EI and personality are connected, specifically TEIQue Emotionality and BFQ Emotion Control, which deal with the capacity to manage one's emotions, understanding, sharing, communicating, and relating to one's own and other's emotions. This is consistent with research showing some links between Trait EI and personality traits as well as emotional stability in terms of emotion control (Alegre et al., 2019). On the other hand, network analysis revealed that other relevant and different aspects of trait EI strongly activated the ecosystem of relationships between trait EI and personality as observed with TEIQue Sociability and Self-control, which encompass elements of managing and expressing emotions during social interaction. It is consistent with previous findings that showed a relationship between trait EI and positive relational management (respect, caring, and connectedness to self and others), attesting to the importance of self-management and sharing positive emotions when interacting and forming relationships with other people at work (Di Fabio & Saklofske, 2019a, 2021).

By contrast, well-being was the EI dimension with the lowest centrality along with BFQ Dominance and Scrupulousness facets that showed very low centrality. These three dimensions appear to have a poor role in activating the network of relationships between emotional intelligence and personality.

Regarding the statistically significant and stronger edges, the strongest was between TEIQue-SF Sociability and BFQ Dominance. Trait EI Sociability emphasises social influence, focusing on affecting others' emotions and being good negotiators and networkers (Petrides, 2009). Dominance measures aspects connected with the ability to impose oneself and to assert one's influence on others (Caprara et al., 1993). Thus, it may be hypothesized that when TEIQue sociability and BFQ Dominance are connected, it could facilitate the likelihood that one's influence on others can be exerted trough emotional social influence.

The second statistically significant and stronger edge was between Trait EI Self-control and BFQ Emotion control. This too is in line with research that highlights trait EI as significantly associated with emotional stability (Alegre et al., 2019). Therefore, Self-control and Emotion control could co-occur, facilitating adaptive behaviour including managing emotion, negative affect, impulsive behaviour, and stress. Furthermore, the high centrality of both nodes could highlight a virtuous circle of reciprocal reinforcement processes that could lead to a sharper increase of trait EI. The third statistically significant and stronger edge was between BFQ Politeness (kindness, civility, docility) and TEIQue-SF Emotion Control (managing emotions, impulsive behaviour, and stress). Again, this edge seems to highlight a co-occurrence of nodes particularly related to adaptive strategies in workers.

A bridge function was observed between the EI nodes of Emotion Control and Sociability supporting the viewpoint of the adaptive role of trait EI in the workplace, involving aspects related to positive and cooperative behaviours oriented toward job performances. It is consistent with metaanalyses results highlighting the positive effects of trait EI in work environments (e.g., Andrei et al., 2016; Miao et al., 2017).

The main strength of this study is that links between TEIQue-SF and BFQ facets were examined for the first time by implementing a network approach. Our results expand previous findings, highlighting main paths across dimensions, considering the centrality of nodes, and identifying bridge nodes. In this view, bridge nodes can represent specific dimensions to be analysed and assessed but also the specific aspects to address during interventions to foster EI and, in turn, strengthen the psychological resources of workers (Di Fabio & Saklofske, 2021).

Concerning limitations, our study employed a cross-sectional design, so edges did not indicate whether a particular node causes or is caused by its neighbouring node. To better understand causal relationships, longitudinal methods are needed to study the network of TEIQue-SF and BFQ. Additionally, our study participants were Italian employees so that future research should be broadened to include other countries and cultural contexts. Furthermore, it is to be noted that TEIQue-SF and its cross-cultural adaptations (e.g., Al-Dassean, 2023; Feher et al., 2019; Jacobs et al., 2015; Neri-Uribe & Juárez-Garcia, 2016; Stamatopoulou et al., 2016) reported lower reliability estimates (Cronbach's alphas) for all dimensions, with the exception for TEIQue-SF Well-Being. However, validity and reliability of measures are approached differently from the

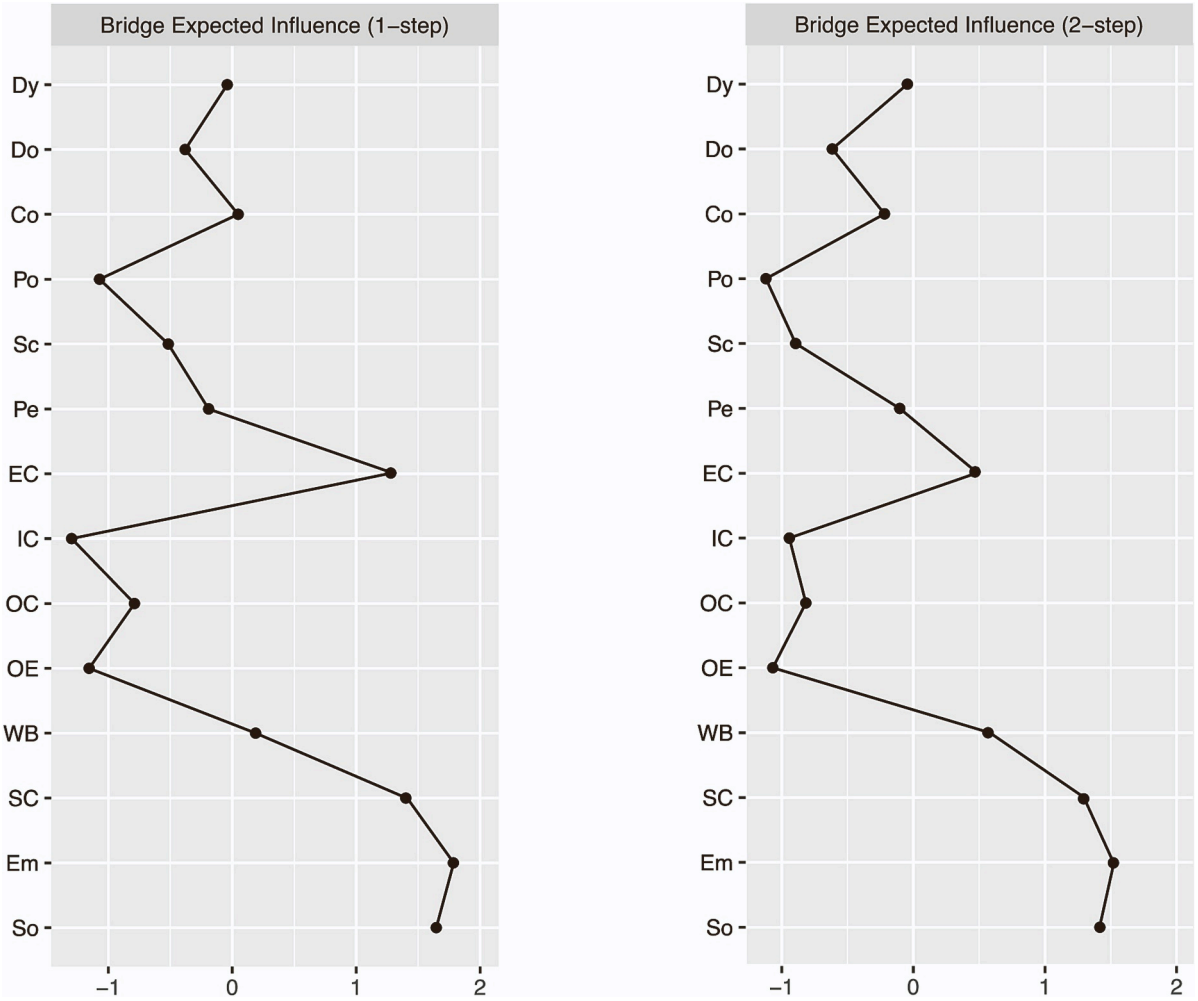

Fig. 8. Bridge Expected Influence for the model for Trait Emotional Intelligence and Big Five Personality Facets: Bridge Nodes and Bridge Expected Influence (n = 751).
Big Five Questionnaire ten facets - Dy: Dynamism; Do: Dominance; Co: Cooperativeness; Po: Politeness; Sc: Scrupulousness; Pe: Perseverance; EC: Emotion Control; IC: Impulse Control; OC: Openness to Culture; OE: Openness to Experiences. Trait Emotional Intelligence Questionnaire Short Form - WB: Well-being; SC: Self-control; Em: Emotionality; So: Sociability.

factorial approach, mainly focusing on the properties that connect an attribute's structure to a measure's response processes (Christensen et al., 2020). Therefore, it could be of interest that future studies investigate cross-cultural adaptations of TEIQue-SF via the network approach. Since our participants comprised a higher percentage of males rather than females and given that trait EI tends to change across genders, this constitutes a limitation of the present study. Future network analyses could compare the relationship between trait Emotional Intelligence and BFQ personality traits across gender. Furthermore, since our participants are mostly aged between 44 and 68 years, their emotional intelligence stability in the workplace could be higher than younger participants. Future network analyses on BFQ personality traits and trait EI in workers could compare younger participants and senior participants. Finally, our participants were workers from both private and public organizations. It is another limitation of the current research since previous studies highlighted that trait EI varied across different categories of workers (e.g., Arora et al., 2011; Dugger et al., 2022; Pérez-Díaz et al., 2021; Petrides et al., 2022). Therefore, future investigations could examine measurement invariance, at least between the two strata (private and public workers), via network analysis (Jamison et al., 2022; Van Borkulo et al., 2022).

In conclusion, the current study offers promising information to expand the framework of trait emotional intelligence, at least as assessed by the TEIQue, and integrating the current results with previous knowledge obtained via the factorial approach. Network structure with three out of four nodes with high centrality pulling from the TEIQue-SF was observed. It suggested that trait EI was linked with BFQ Emotion Control, the other node with high centrality. However, the network of relationship between EI and personality traits also encompasses specific aspects that deal with positive relational management (Di Fabio & Saklofske, 2021). Furthermore, the results showed one main path between the two highly central connected nodes of BFQ Emotion Control and TEIQue-SF Emotionality, suggesting a reciprocal reinforcement process. Thus, Emotionality could be a promising target in strength-based preventive perspective actions (Di Fabio & Saklofske, 2021) aimed to foster individual resources in workers (Di Fabio & Kenny, 2019). Lastly, the two connecting bridge nodes of TEIQue-SF Emotionality and Sociability point to the adaptive role of trait EI in the workplace, encompassing aspects associated with positive and cooperative behaviours that may be further oriented toward work fulfilment. Thus, from a strength-based preventive perspective (Di Fabio & Saklofske, 2021), they could be a suitable target for action aimed at strengthening social and relational positive aspects of working environments.

In summary, the network analysis appears to be a promising approach to identifying the core aspects involved in the relationship between emotional intelligence and personality traits. These core targets

could be the focal points of tailored programs and actions to foster psychological resources for healthy organizations (Di Fabio et al., 2020; Di Fabio & Saklofske, 2019a; Meechan et al., 2022; Robertson & Cooper, 2010).

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Annamaria Di Fabio and Donald H. Saklofske: Conceptualization; Review and Editing; Andrea Svicher: Writing - Original Draft; Data Curation. Andrea Svicher and Alessio Gori: Methodology and Formal analysis.

Declaration of competing interest

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Data availability

Data will be made available on request.

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