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Birds of a Feather Work Together: The Role of Emotional Intelligence and Cognitive Ability in Workplace Interaction and Advice Networks.

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Abstract

The study investigated whether cognitive ability or trait emotional intelligence impacted the formation of task-contingent communication and advice seeking in the workplace. Contrary to the theory driven hypothesis, an employee's level of EI has no impact on their position within both interaction and advice networks. As predicted, those with higher levels of fluid intelligence represented 'knowledge hubs' and were sought out more by their colleagues. Those perceived to be capable of solving novel problems quickly and accurately had greater indegree centrality for both interaction and advice networks. Additionally, employees with similar levels of cognitive and emotional intelligence were more likely to have interaction and advice ties. This study suggests that employees do use affective judgements when evaluating the perceived utility of a relationship, but this is primarily influenced by how similar that person is to the evaluator and not the disposition of the evaluated.

Introduction

There is a growing interest in the application of network analysis to applied social psychology (Borgatti, Mehra, Brass, & Labianca, 2009), investigating how dispositional and social factors drive the formation and evolution of social structures in the workplace. There are attempts to gain psychological insight into these patterns by looking at both the characteristics of the network itself (e.g. the presence and absence of different forms of network ties) as well as how these impact behaviour and attitude formation (Hawe, Webster, & Shiell, 2004). Social network analysis (SNA) – or organizational network analysis (ONA) – has been applied to industrial and organizational psychology to understand the impact of social dynamics in predicting workplace outcomes.

This study will focus on two types of communication networks that can occur within an organization: interaction and advice. These networks, whilst showing overlap within organizational contexts, have been found to have distinct contributions to workplace outcomes (Ibarra, 1992). Interaction networks depict work-contingent communications or ties within an organization, where employees interact as a function of their role. Advice networks, by contrast, depict communication patterns within an organization that more closely resemble power networks (e.g. Brass, 1992; Ibarra & Andrews, 1993; Morrison, 2002), with employees exchanging work-related knowledge, influencing knowledge of tasks and processes, as well as organizational politics. Employees in advice networks tend to seek input on work-related issues, whereas employees in interaction networks instead seek out task-contingent support (Fischer, 1982).

Researchers have questioned how individual differences influence the formation of social networks and what network positions employees occupy, partly as a means to create a more comprehensive approach to understanding employee performance (e.g. Kilduff & Tsai, 2003). There exists a large amount of research on self-monitoring (SM) and network position; high SM employees use social cues to regulate how they present themselves in response to the specific social situation they are in, with low SM employees generating their behaviour from internal states and attitudes (e.g. Snyder,

1979). Research with SNA shows that high SM individuals are the recipients of more incoming friendship ties (Sasovova et al., 2010), whilst high SM managers are sought more for advice by their team (Toegel et al., 2007). High SM employees have also been found to occupy brokerage positions within a network (Burt et al., 1998), with SM theory suggesting that high SM employees prefer to maintain the power-position they create by segregating their network, whilst low SM employees bring them together (Oh & Kilduff, 2008).

Recent developments in social network theory have emphasised the importance of affective evaluation and emotion in forming social network ties. Affective primacy theory has been applied to the SNA literature (e.g. Cascairo & Lobo, 2014), arguing that employees use the affective value of a relationship (i.e. whether the employee experiences positive emotions from interacting with another member of their network) to determine the instrumental value of the relationship tie (i.e. subjectively evaluating whether that relationship will meaningfully contribute to completing a task). Emotions are argued to be play a key role in social interactions as they provide a means of conveying information on our thoughts, feelings, and intentions in social encounters (Keltner & Haidt, 2001). Studies have shown that positive and negative emotionality impact sociability, with negative emotions putting others off interacting with that individual (Furr & Funder, 1998). Furthermore, studies have found that higher emotional intelligence was associated with perceptually higher quality interactions with others (e.g. Lopes et al., 2004).

What is missing, however, is an understanding as to how the capabilities of an individual to adaptively display emotion in social encounters influence the social networks that they are able to build in the workplace. These characteristics can be linked to the concept of emotional intelligence (EI; Dulewicz et al., 2003). The concept of EI is founded in the works of Thorndike (1920) and Gardner (2000) who expanded the notion of intelligence beyond cognitive abilities to include concepts of social and interpersonal intelligence (i.e. understanding and managing the emotions of others). There are currently two theoretical conceptualizations of EI: “Trait EI,” representing behavioural dispositions (measured through self-reports) (Petrides and Furnham, 2007); and “Ability EI,” reflecting cognitive abilities (assessed via maximum-performance tests) (Salovey and Mayer,

1990). Researchers have highlighted the use of ability EI as problematic due to the methodologies in their associated measures, as scores rely on 'consensus', 'expert' and 'target' scoring systems, meaning that individual levels cannot be easily or consistently interpreted (e.g. Brody, 2004; Freudenthaler & Neubauer, 2007; O'Sullivan & Ekman, 2005; Petrides et al., 2007). Additionally, studies looking at ability and trait EI simultaneously have found that ability EI measures to be strongly correlated with cognitive ability in predicting performance outcomes (e.g. O'Connor & Little, 2003; Qualter et al., 2012). In response to how individuals cope with stress, ability EI has been shown to predict the *selection* of emotion used, whilst trait EI has been shown to predict how *effective* that individual is at portraying the emotion (David & Humphrey, 2012). As this study is concerned with looking at EI as a function of an individual's efficacy in presenting emotion, as well as concerns with the significant overlap (and potential covariance) with cognitive ability, this paper will focus on trait EI.

Trait EI is described as a constellation of emotional perceptions assessed through questionnaires and rating scales (Petrides, Pita, & Kokkinaki, 2007). It depicts a set of self-perceived abilities or perceptions concerning the way individuals identify, make use of, deal with, and process emotions (Andrei et al., 2016). One taxonomy of EI is the Trait Emotional Intelligence model, comprising of 15 traits over four factors (see Table 2 for trait descriptions).

Insert Table 1 Here

If emotionality is important in social interactions, employees that are higher in emotional intelligence should experience a greater number of social interactions compared to colleagues who are lower on emotional intelligence. There are two hypothesized reasons for this: firstly, higher emotionally intelligent employees use their emotional capabilities to support and enhance their interactions, particularly being able to rely on being able to present a positive self to interact more effectively (Lopes et al., 2004); secondly, it could be that highly emotional intelligence people are viewed

positively by others and are therefore sought out more for different types of interaction. Additionally, it is unclear how emotional intelligence influences different types of social network. Affective primacy theory has been applied to explaining variations in advice networks, where ties are based more on trust. Cascairo and Lobo (2008) found that, when employees seek out support or advice with complex projects, they tend to seek out other employees that they like or get on well with rather than those who they see as competent in the role. It is therefore hypothesized that emotional intelligence will be positively associated with both interaction and advice network centrality.

Hypothesis 1: Emotional Intelligence will be positively correlated with higher centrality for interaction and advise network.

Beyond emotional intelligence, there is only a small amount of research indicating that cognitive intelligence could have a role in the formation of social networks. Very early research by Almack (1922) found that children associate with and befriend classmates more when they have similar levels of intelligence. Theorists argue that the consequential attitudes, values, and aspirations that are associated with levels of intelligence are what cause homogenous groups to coalesce and interact with greater frequency in social situations (McPherson et al., 2001). However, no study has yet directly examined the impact, if any, of cognitive intelligence on social networks. Fluid intelligence is predictive of both the ability to interpret and process new information as well as building task-contingent knowledge, it is hypothesized that employees who have higher levels of intelligence will be seen as knowledge hubs or capable of providing support to their colleagues. Consequently, it is likely that these employees will be sought out more often. Supporting this, previous research has found that other-rated intelligence is significantly associated with the measured intelligence of that individual (Borkenau & Liebler, 1993), indicating that others are capable of evaluating another's level of intelligence from social interactions. By contrast, highly intelligence people are by definition very capable at dealing with problems and performing to a high standard. As such, it is possible that these

employees will be less likely to actively collaborate or seek support from others. Based on these, it is hypothesized that fluid intelligence will be related to indegree, but not outdegree, network centrality for both interaction and advice networks.

Hypothesis 2: Fluid Intelligence will be positively correlated with higher centrality for the interaction and advice network.

Homophily in Networks

The homophily principle of social networks argues that that similarity between two individuals increases the likelihood of connections or network ties existing between them (McPherson, Smith-Lovin, & Cook, 2001). Combining the homophily principle with the work on the affective primacy theory, this study also hypothesises that network structure will be influenced by the similarity (or dissimilarity) of fluid and emotional intelligence of colleagues. As mentioned previously, there is some research suggesting that homophily on intelligence is a predictor of network ties (Almack, 1992). Additionally, there is research indicating that employees will seek out and cluster with other employees who are similar to them on well-being (e.g. job satisfaction) as a function of need, satisfaction and mutual attraction (Chancellor, Layous, Margolis, & Lyubomirsky, 2017). As of yet, no studies have looked to examine the role of homophily in the structure for interaction and advice networks. This study will look to investigate the role of homophily and network structure, hypothesising that homophily in both fluid and emotional intelligence will be associated with the presence of network ties.

Hypothesis 3: Fluid Intelligence homophily will correlate with the presence of a tie on interaction and advice networks.

Hypothesis 4: Emotional Intelligence homophily will correlate with the presence of a tie on interaction and advice networks.

Method

Participants and Procedure

Data for this study was gathered as a part of an organisational development project, with an emphasis on understanding team dynamics and cross-organisational collaboration to improve employee engagement and effectiveness. The organisation operated internationally, with offices in Europe, South Africa, Australia, and Malaysia. Prior to data collection, briefings were held with heads of department, where the purpose and deliverable outcomes of the project (i.e. insight into team dynamics), methodology for data collection, and assurance around anonymity of results were discussed.

All employees were invited to participate in the study. 132 of 165 surveyed employees (80%) responded to the network questions had full assessment data, with 66 male and 66 female employees. Average tenure of participants was 4 years, ranging from one month to 27 years. They were nearly all white, English-speaking adults, most with a university education. Participant emotional intelligence and cognitive ability data was gathered prior to the study as a part of recruitment and personal development processes within the organisation. Participant network data was gathered through an electronic questionnaire sent to employee's work email address so responses could be coupled with emotional intelligence and cognitive ability data for analysis. Participants were told that the survey was optional, that their data would be kept anonymous, that their data would be aggregated and reported on to the organization at a top-level and without individual data, and that they could withdraw from the study at any time.

Research procedures were reviewed by a committee to review ethical implications of the study. Committee members consisted of internal institution employees that were not included in the study, as well as external experts in the personality/organisational psychology fields. Committee members reviewed the extent to which researchers displayed transparency around the study, participants' option

to provide written informed consent, psychometric measures that had been established on peer-reviewed materials, that participants were provided with feedback on their results (both electronically and in person), and that participants had the right to withdraw from (and their data) at any point. As all points were satisfied, approval was granted.

Participant network data was gathered at the beginning of an organization-wide restructure, whereas emotional intelligence and cognitive ability data was gathered as a part of the participant's recruitment process. Participants were told that the survey was optional, that their data would be kept anonymous, that their data would be aggregated and reported on to the organization at a top-level and without individual data, and that they could withdraw from the study at any time. Ethical approval was sought and received.

Measures

Trait Emotional Intelligence Questionnaire (TEIQue; Petrides, 2009): The TEIQue is a 153-item questionnaire that assesses 15 facets of trait emotional intelligence (see Table 2 for description of facets). The TEIQue represents a constellation of emotional perceptions assessed through questionnaires and rating scales (Petrides, Pita, & Kokkinaki, 2007); a set of self-perceived abilities or perceptions concerning the way individuals identify, make use of, deal with, and process emotions (Andrei et al., 2016). Participants are presented statements to which they rate the extent to which they perceive the statement to represent themselves, ranging from 1 (strongly disagree) to 7 (strongly agree). The TEIQue has a strong theoretical and psychometric basis; previous meta-analyses have revealed incremental validity of the TEIQue over and above higher order personality dimensions and other emotion-related variables (Andrei et al., 2016). Previous research also commented on the overall internal reliability of the TEIQue measure using Cronbach's alpha, finding high internal consistency ($\alpha = 0.89$; Petrides, 2009). The items of the TEIQue fall under 4 factors including wellbeing, self-control, emotionality and sociability with two independent facets (i.e., *Adaptability* and *Self-*

Motivation; Petrides, 2009). The four-factor structure also holds in several other languages (e.g., Andrei et al., 2016, Italian adaptation; Freudenthaler et al., 2008, German adaptation; Martskvishvili et al., 2013, Georgian adaptation; Mikolajczak et al., 2007, French adaptation).

General Intelligence Assessment (GIA): The GIA assesses individuals' cognitive abilities, by measuring their speed and accuracy across five relevant to: *Reasoning, Perceptual Speed, Number Speed, Word Meaning,* and *Spatial Visualization.* These are detailed in Table 1 (Dann, 2015; Furnham & Treglown, 2018). Its aim is to primarily measure mental speed of processing (i.e., fluid intelligence and procedural knowledge), rather than depth (i.e., crystallised intelligence and declarative knowledge). The GIA represents a computer-based cognitive ability assessment that was derived from a battery of tests (see Collis et al., 1995; Irvine, Dann, & Anderson, 1994). The GIA utilises computer-based item-generation: tests are constructed in "real time" by rules supplied to the testing system, allowing the automatic production of an extremely large number of different yet equivalent forms of the same test (Irvine et al., 1990). The GIA has previously been shown to have high internal validity (test-retest correlations ranging from 0.75 to 0.86) and construct validity (correlations with Raven's progressive matrices; r = 0.74; Dann, 2015).

Individual scores for the five subtests are calculated as adjusted scores; overall scores that take into account guessing. These scores are calculated using the following equation:

$$N_{correct} - (\frac{N_{incorrect}}{K-1})$$

Where *N* represents the number of correct or incorrect items (denoted by subscript), and *K* represents the number of potential alternative answers for the particular question (e.g. *Verbal Reasoning* questions have two potential answers).

Insert Table 2 here

Network Centrality Measures: The network surveys listed the name of all employees in the participating organization. Two network questions were asked, focusing on interaction and advice. Interaction ties were assessed by asking: "to get your job done, who must you interact/communicate with?". Following the protocol set out by previous researchers (e.g. Sparrowe et al., 2001; Ibarra, 1993), advice ties were assessed by asking the following question: "if you have questions or problems related to your specific job, who would you ask for help or advice?". Participants were presented with a list of all other employees in their organization and were asked to select the employees that they perceived to be answers to the network question, which were recoded as 1 (to indicate the presence of a strong tie) and all other responses were coded as 0 to create a binary, directed network matrix for the two network questions. Participant network position was defined via the number of indegree (e.g. who sought the participant out) and outdegree (e.g. who the participant sought out) ties for both interaction and advice networks.

Results

Network Position

Pearson Product Moment Correlation analyses were run in order to examine the relationship between GIA, TEIQue, and network position. The results can be seen in Table 3 and 4. The results indicated that there were no significant correlations between either GIA or TEIQue with centrality metrics for both the interaction and advice networks. For emotional intelligence, the only significant correlated was between *Emotion Management* and interaction outdegree centrality ($r = .19$, $p < .05$), showing partial support for hypothesis 1. However, at a factor level, results indicated that indegree centrality for both interaction and advice networks were positively correlated with employee *Reasoning* scores ($r = .19$; $p < .05$ for both), and *Perceptual Speed* was significantly positively correlated with interaction indegree centrality ($r = .18$; $p < .05$). These results provide partial support for 2.

Insert Table 3 here

Insert Table 4 here

Homophily Correlations

Symmetric matrices were created to represent the absolute difference between individual nodes on fluid and emotional intelligence. These matrices were then correlated using quadratic assignment procedure (QAP) correlations in UCINET to assess whether similarity in cognitive ability or emotional intelligence was related to the presence or absence of a strong network tie. QAP correlations randomly assign columns and rows in matrices to differing positions to assess how often a relationship is noted to determine statistical significance. Positive correlations would indicate that the greater the dissimilarity between employees on emotional or cognitive intelligence, the greater the likelihood of a strong tie being present. Negative correlations would indicate that employees with greater similarity in emotional or cognitive intelligence experience a greater likelihood of having a strong network tie.

Table 5 and 6 show the results of the QAP correlations between the presence of Interaction and Advice network ties with GIA and TEIQue similarity. The results indicated that employees who have similar GIA scores were more likely to seek each other out for interaction (r = -.03; p < .05) and advice (r = -.03; p < .05). Additionally, similarity on *Number Speed* was associated with interaction (r = -.03; p < .05) and advice ties (r = -.03; p < .05), whilst *Word Meaning* similarity was correlated with advice ties (r = -.03; p < .05). For the TEIQue, it was found that similarity on overall TEIQue score was correlated with ties for both interaction (r = -.03; p < .05) and advice (r = -.03; p < .05). At the trait level, similarity on *Emotion Management* and *Assertiveness* was correlated with interaction ties (r = -.03, p < .05 for both) and advice ties (r = -.03; p < .05 for *Assertiveness;* r = -.02; p < .05 for *Emotion Management*). The results indicate that homophily in both cognitive and emotional intelligence was associated with task-related collaboration and extra-role communication, supporting both hypothesis 3 and 4.

Insert Table 5 here

Insert Table 6 here

Discussion

Why do we seek out certain colleagues for work or for advice? Affective primacy theory argues that we appraise others based on emotions, using the quality of our interactions as guides when evaluating our colleagues. The current study looked to explore how emotional and fluid intelligence affect the formation of social networks to gain key insights into collaboration and team dynamics.

What does Emotional Intelligence tell us about SNA?

The expression of emotions, thoughts, and intentions have previously been characterised as important for social encounters (Keltner & Haidt, 2001). Additionally, social interactions with highly emotionally intelligent individuals tend to be rated as higher quality (e.g. Lopes et al., 2004). However, very little research had been conducted to examine whether EI translated into the formation of larger social networks, particularly in the workplace. As such, it was hypothesized that EI would cause employees to be more central to networks for two reasons: firstly, higher EI would be linked to more effective utilisation of emotion to support social interactions; and secondly, following from the first point, the effective use of emotion would result in more positively evaluated interactions.

However, the current study found that an employee's level of EI has no impact on their position within both interaction and advice networks. The only significant relationship between EI and network centrality was that employees who had greater perceived ability to influence others' thoughts and emotions (*Emotion Management*) was related to greater outdegree interaction network ties. Whilst individual employee EI alone does not appear to be enough to offer insight into the formation of social networks,, instead EI homophily appears to provide greater insight. The results indicated that employees with similar levels of EI were more likely to seek each other out in both interaction and advice networks, specifically for overall EI levels, as well as *Assertiveness* and *Emotion Management*. Interestingly, most individual emotional intelligence facets did not display a significant result, indicating a potential bandwidth-fidelity paradox in this relationship.

Cascairo and Lobo (2014) argued that affect preceded the formation of interorganizational network ties. In particular, subjective perceptions of high-activation positive emotions, such as excitement compared to pleasantness, were key foundations of task-related networks. It appears that the affective evaluation of a social relationship is in part due to the similarity between two individuals rather than a dispositional aspect of one member of the dyad. A key theoretical contribution of this finding is that, when individuals are affectively appraising others, this is not done in isolation but instead with reference to how similar the other person is to that individual. Cascairo (2014) suggested that there is a fundamental dimension of human social evaluation, quoting Fiske et al.'s (2006) that "*people everywhere differentiate each other by liking (warmth, friendliness)"* (p. 77). The results of this study provide a caveat or extension; '*liking*' itself appears to be, at least partially, a dynamic process that is dictated by homophily rather than solely a dispositional, fundamental human social evaluation.

What does Fluid Intelligence tell us about SNA?

Employees high on fluid intelligence are able to process, interpret, and apply new information, building task-contingent knowledge both quickly and accurately. As a result, it was hypothesized that fluid intelligence would influence the formation of social networks in two ways: firstly, these employees would be seen as 'knowledge hubs' and would be sought out for their accrued knowledge; secondly, their ability to solve novel problems would mean that others would seek their support and cognitive capability to be applied to problems that they have encountered.

These hypotheses were partially supported by what was seen in the network data. Employees with higher levels of fluid intelligence appeared to represent these 'knowledge hubs' and were sought out more by their colleagues. In particular, employees that are capable of solving novel problems quickly and accurately (higher *Reasoning*) had greater indegree centrality for both interaction and advice networks. Interestingly, it indicates that higher fluid intelligence is associated with behavioural cues beyond in-task knowledge (that could arguably be associated with job specific crystallised intelligence accrued with experience) that are available and detectable to the extent that these

individuals are sought out over others. Previous research has indicated that fluid intelligence is somewhat detectable, with high correlations between psychometrically-assessed and other-rated intelligence (Borkenau & Liebler, 1993).

As with EI, fluid intelligence homophily was predictive of employee interaction. Employees with similar levels of fluid intelligence tend to seek each other out with support for both task-contingent and knowledge-sharing interactions. The question is why this occurs: it could be that people who work in different parts of the organization and more prone to networking in every sense are of different intelligence level.

A central applied question is what does this mean for collaboration if these knowledge hubs are only actively disseminating information within equally highly-educated cliques? Should organizations in some ways encourage more intellectual diversity in working groups, if indeed that is possible.

Implications, Limitations and Conclusions

This work holds significance for both theory and practitioners. The importance of groups in organisations has been a highly researched area; Bass (e.g. 1963; Pryer & Bass, 1959) highlighted the importance of knowledge sharing and interaction in driving group performance. Blustein (2011) also outlined that relationships are inherent to how we work, with decisions, experience, and interactions all being influenced by social connections. Additionally, the psychology of sustainability and sustainable development framework (Di Fabio, 2017) argues that organisations need to develop relationships and positive group dynamics that foster wellbeing in order for employees to be engaged and successful in the workplace. However, our results suggest and theorize that employees are disposed to naturally interact with and seek advice from others who are similar to them, potentially reducing or restricting how interactions form organically within organisations. Practitioners should look to use this information to support the development of multifaceted interactions in the workplace. Managers could use emotional intelligence and cognitive ability to identify limitations in interactions and design processes that facilitate different types of interaction (e.g. ‘whiteboarding’ sessions) to facilitate the formation of stronger workplace ties. Additionally, interaction has been argued to be the primary mechanism for

converting new-starters to integrated members of an organisation (Reichers, 1987), meaning managers could integrate this information into employee onboarding processes.

This study is not without its limitations. Firstly, the data from this study was limited to only one organization. Further research will be needed to examine whether the results are an artefact of the specific organization or industry, or whether they are a consistent and replicable psychological phenomenon. Secondly, the theorisation of fluid intelligence's role on network position was contingent on its relation to performance. However, no performance data was gathered alongside the network data to verify whether this was the case. Future research should aim to investigate this finding; if fluid intelligence does promote network centrality as a function of other-perceived ability, a mediation effect would be seen where other-rated performance explains the relationship between cognitive capability and centrality. Thirdly we did not gather information on physical propinquity which influences interactions. Previous research has suggested that historic physical encounters are a key predictor of social network ties (Chin et al., 2012), indicating that physical proximity could act as a confounding variable in the formation and analysis of social networks.

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Table 1. Description of *TEIQue Factors/Facets*

Factors/Facets	Description
Well-Being	*Overall well-being*
Happiness	Satisfaction and contentment with the present (i.e., one's current life)
Optimism	Confidence and positive outlook towards the future
Self-Esteem	Self-confidence, self-respect, and perception of personal success
Self-Control	*Ability to regulate external pressure, stress, and own impulses*
Emotion Regulation	Ability to control own emotions and stay focused and calm
Impulse Control	Reflectiveness and ability to resist own urges
Stress Management	Capacity to withstand pressure and regulate stress
Emotionality	*Capacity to perceive and express emotions, and use them with others*
Empathy	Ability to take others' perspectives and understand others' viewpoints
Emotion Perception	Clear understanding of own and others' feelings
Emotion Expression	Ability to communicate own feelings to others
Relationships	Capacity to develop and maintain meaningful personal bonds
Sociability	*Capacity to socialise, manage, and communicate with others*
Emotion Management	Ability to influence and manage others' feelings
Assertiveness	Frankness and willingness to stand up for own rights
Social Awareness	Networking and social skills
Independent Facets	
Adaptability	Flexibility and willingness to adapt to new environments/conditions
Self-Motivation	Drive for productivity and resilience to adversity

Referenced from Petrides (2009).

Table 2. *Description of GIA Subtests.*

Test	Description	Format	Abilities Tested
Reasoning	Evaluates problem-solving abilities (i.e., capacity to reason, make inferences, draw conclusions), by testing simple deductive verbal reasoning skills.	Problem-solving task: After reading a statement (e.g., Jack is taller than Jill), participants need to answer a related question (e.g., Who is shorter? Jack or Jill).	Fluid and crystallised intelligence
Perceptual Speed	Measures visual checking skills (i.e., ability to identify and report on similarities/differences, details, and errors), by testing semantic perception and encoding.	Letter-matching task: Participants need to identify matching letters between rows of capital and lower case letters (e.g., ADGK/afgm).	Broad cognitive speed
Number Speed and Accuracy	Assesses overall numeracy (i.e., capacity to process numerical information, perform mental calculations, and reason with quantitative concepts).	Number task: Out of three numbers, participants need to identify which number is numerically further from the others (e.g., 2, 9, 5).	Fluid intelligence and memory
Word Meaning	Evaluates vocabulary and word-related knowledge (i.e., ability to comprehend large numbers of words and identify words with similar or opposite meanings).	Semantic word task: Participants are shown three words (e.g., Up, Down, Street) and need to specify which word is not related to the others (e.g., Street).	Fluid and crystallised intelligence
Spatial Visualisation	Tests mental visualisation skills (i.e., ability to visualise concepts and objects, and mentally rotate and manipulate shapes and symbols).	Symbol task: Participants need to identify pairs of identical symbols (when symbols have been rotated and/or presented as a mirror image of each other).	Fluid intelligence and visual perception

Information above represents a synthesis from Furnham & Treglown (2018) and Dann (2015).

Table 3. *Correlations between TEIQue and Network Position (Interaction and Advice)*

	Interaction Network		Advice Network	
	Outdegree	Indegree	Outdegree	Indegree
Trait Emotional Intelligence	0.05	0.02	0.02	0.06
Happiness	0.09	0.12	0.06	0.12
Optimism	0.04	0.05	0.03	0.1
Self Esteem	-0.01	-0.03	0.02	0.03
Emotion Regulation	-0.02	-0.08	-0.04	-0.1
Impulse Control	-0.10	-0.06	-0.09	-0.11
Stress Management	-0.05	-0.05	0.01	-0.10
Empathy	-0.03	0.04	-0.14	0.02
Emotion Perception	0.04	0.07	0.02	0.07
Emotion Expression	-0.02	0.02	0.05	0.11
Relationships	0.03	0.08	0.07	0.06
Emotion Management	**0.19***	0.07	0.10	0.16
Assertiveness	0.11	0.01	0.08	0.06
Social Awareness	0.07	-0.06	0.05	0.03
Adaptability	0.1	0.03	0.00	0.07
Self-Motivation	0.09	0.11	-0.01	0.07

Note: ** = $p < .01$; * = $p < .05$

Table 4. *Correlations between GIA and Network Position (Interaction and Advice)*

	Interaction Network		Advice Network	
	Outdegree	Indegree	Outdegree	Indegree
GIA	0.14	0.15	0.14	0.14
Reasoning	0.15	**0.19***	0.09	**0.19***
Perceptual Speed	0.14	**0.18***	0.12	0.05
Number Speed	0.07	-0.05	0.05	0.16
Word Meaning	0.12	0.00	0.06	0.14
Spatial Visualization	0.12	0.09	0.05	-0.05

Note: ** = $p < .01$; * = $p < .05$

Table 5. *QAP correlations between network matrices and matrices of overall GIA and facet score similarities.*

	Interaction Network	Advice Network
1. Interaction Network	1.00	
2. Advice Network	0.44**	1.00
3. GIA Difference	**-0.03***	**-0.04****
4. Reasoning Differences	0.01	-0.01
5. Perceptual Speed Difference	0.01	-0.01
6. Number Speed Differences	**-0.03***	**-0.03***
7. Word Meaning Differences	-0.02	**-0.03***
8. Spatial Visualization Differences	0.01	0.00

Note: ** = $p < .01$; * = $p < .05$

Table 6. *QAP correlations between network matrices and matrices of overall TEIQue and facet score similarities*

	Interaction Network	Advice Network
1. Interaction Network	1.00	
2. Advice Network	.44	1
3. TEIQue Difference	**-0.03***	**-0.03***
4. Happiness	-0.01	-0.01
5. Optimism	-0.02	-0.02
6. Self Esteem	-0.01	-0.02
7. Emotion Regulation	0.00	0.00
8. Impulse Control	0.00	0.00
9. Stress Management	-0.01	0.01
10. Empathy	0.00	0.00
11. Emotion Perception	0.00	-0.01
12. Emotion Expression	-0.02	-0.02
13. Relationships	-0.01	-0.02
14. Emotion Management	**-0.03****	**-0.02***
15. Assertiveness	**-0.03***	**-0.03***
16. Social Awareness	0.00	-0.01
17. Adaptability	-0.01	-0.01
18. Self-Motivation	-0.02	-0.01

Note: ** = $p < .01$; * = $p < .05$