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Personality and Individual Differences

The six dimensions of personality (HEXACO) and their associations with network layer size and emotional closeness to network members

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ABSTRACT

Previous work has examined how specific personality dimensions are associated with social network characteristics. However, it is unclear how the full range of personality traits relates to the quantity and quality of relationships at different network layers. This study ($N = 525$) investigates how the six HEXACO personality dimensions relate to the size of support and sympathy groups, and to the level of emotional closeness to network members. Extraversion was positively related to support group size, but did not significantly relate to sympathy group size or emotional closeness. Openness to Experience and Emotionality were positively related to support group size, but not to the size of the sympathy group. Honesty–Humility, but not Agreeableness, was positively related to emotional closeness to members of the sympathy group. Findings suggest that personality effects vary across network layers and highlight the importance of considering both emotional closeness and network size.

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1. Introduction

Personality is important for our understanding of individual patterns of cognition, motivation, emotion, and behavior—what has been described as "*a kind of thematic recurrence within the events of a life*" (Nettle, 2007, pp. 12). Here, we focus on the effects of personality on characteristics of individuals' innermost network layers, that is, on the number and emotional intimacy of close social relationships.

Individuals' social networks are hierarchically structured in successive layers of increasing size and decreasing emotional intimacy (Dunbar, 1998; Hill & Dunbar, 2003; Sutcliffe, Dunbar, Binder, & Arrow, 2012). Recent work has examined the effects of personality on different network layers' size and intimacy, but has been limited to specific dimensions, such as Extraversion and Neuroticism (Pollet, Roberts, & Dunbar, 2011; Roberts, Wilson, Fedurek, & Dunbar, 2008). Other studies, which examined a more exhaustive set of personality dimensions, did not differentiate between network layers, such as support and sympathy groups (Asendorpf & Wilpers, 1998; Selfhout et al., 2010). In this study, we attempt to address these limitations by investigating how the six HEXACO personality dimensions (Ashton & Lee, 2007; Lee & Ashton, 2004) relate both to the size and relationship intensity of individuals' innermost network layers.

1.1. Social network characteristics

It is widely recognized that not all social relationships are of equal strength or emotional intensity (Bernard et al., 1990; Granovetter, 1973; Milardo, 1992; Wellman & Wortley, 1990). Focusing on emotionally close ties, many studies have identified two distinct groupings: a small number of emotionally close ties offering intense emotional support and a larger number of less emotionally close, but still significant, ties that provide more general support (Bernard et al., 1990; Binder, Roberts, & Sutcliffe, 2012; Boase, Horrigan, Wellman, & Rainie, 2006; Milardo, 1992; Wellman & Wortley, 1990).

Consistently, research suggests that social networks are organized in a series of hierarchically inclusive layers (Hill & Dunbar, 2003; Sutcliffe et al., 2012; Zhou, Sornette, Hill, & Dunbar, 2005). The innermost layers, corresponding to the two groupings identified above, have been termed 'support groups' and 'sympathy groups'. Support groups consist of individuals from whom one would seek support in times of severe emotional or financial distress: they have an average size of 5 members (Binder et al., 2012; Dunbar & Spoors, 1995). Sympathy groups consist of individuals whose sudden death would be greatly upsetting (Buys & Larson, 1979): they have an average size of 12–15 members, including support group members (Binder et al., 2012; Dunbar & Spoors, 1995; Stiller & Dunbar, 2007).

Previous work has noted the importance of examining both the quantity and quality of relationships within different network layers (Pollet et al., 2011), as there is evidence of a trade-off between relationship quantity and quality (Roberts, Dunbar, Pollet, & Kuppens, 2009; Binder et al., 2012). As the size of each network layer increases,

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relationship intensity tends to decrease (Dunbar, 1998; Hill & Dunbar, 2003). Arguably, this is due to constraints—related to time and cognitive effort—on the number of relationships one can maintain at a certain level of emotional intensity (Roberts & Dunbar, 2011a; Stiller & Dunbar, 2007; Sutcliffe et al., 2012; Zhou et al., 2005).

While upper bounds seem to exist in different network layers' size, previous work has also documented substantial inter-individual variation in both their size and composition. Such variation can be partly explained by demographic characteristics such as sex, socioeconomic status, age, and relationship status (McPherson, Smith-Lovin & Brashears, 2006; Roberts et al., 2009), but another important factor is personality (Nettle, 2007).

1.2. Personality and social networks

Research has examined how the Big Five or Five-Factor model personality traits (McCrae & Costa, 1999) relate to network characteristics. Among adolescents and young adults, Extraversion relates to larger networks and faster network growth, whereas Agreeableness is associated with higher peer acceptance and less conflict (Asendorpf & Wilpers, 1998; Jensen-Campbell et al., 2002; Selfhout et al., 2010). Although some studies have found no relation between Neuroticism and network size (Asendorpf & Wilpers, 1998; Roberts et al., 2008), higher Neuroticism is linked to less perceived social support and more loneliness (Russell, Booth, Reed, & Laughlin, 1997; Stokes, 1985). Finally, Openness to Experience is linked to a larger number of new network contacts (Zhu, Woo, Porter, & Brzezinski, 2013; cf. Jensen-Campbell et al., 2002).

Research explicitly differentiating the hierarchical structure within social networks has focused on Extraversion. However, evidence on its relation with network characteristics is mixed. Specifically, Roberts et al. (2008) showed that Extraversion positively correlates with the support group, but not the sympathy group, size. However, this relation was no longer significant after controlling for participant age. Another study by Pollet et al. (2011) examined the relation of Extraversion with both network quantity and quality: extraverts reported having larger network layers (support group, sympathy group, outer layer), but did not feel emotionally closer to members of any layer.

1.3. HEXACO personality and network characteristics

Recent theoretical and empirical research in personality psychology has supported a six-dimensional framework of personality structure—the HEXACO—as a viable alternative to the Big Five and Five-Factor models. Lexical studies of personality structure in diverse languages consistently demonstrate the emergence of six (rather than five) personality factors (Ashton & Lee, 2007): Honesty–Humility (H), Emotionality (E), Extraversion (X), Agreeableness (A), Conscientiousness (C), and Openness to Experience (O).

An important difference between the HEXACO model and five-factor models is the addition of Honesty–Humility, which is defined by honesty, fairness, sincerity, modesty, and lack of greed. Further, in the HEXACO framework, the Emotionality and Agreeableness factors result from a re-rotation of the Big Five factors of Emotional Stability and Agreeableness. As a result, HEXACO Emotionality excludes the anger facet that defines low Emotional Stability but includes the sentimentality facet that defines Agreeableness. Conversely, HEXACO Agreeableness excludes sentimentality and includes lack of anger.[1]

For our research, the use of the HEXACO has two important advantages. First, it allows us to examine the relations of both Agreeableness—i.e., the tendency to be flexible, forgiving, and tolerant—and Honesty–Humility—i.e., the tendency to approach others

with sincerity and fairness—with emotional closeness toward support and sympathy group members. While we start from the explorative hypothesis that both Honesty–Humility and Agreeableness positively relate to emotional closeness, we also consider the possibility that one characteristic is more important than the other for building and maintaining close social relationships. Second, using the HEXACO could clarify if Emotionality—including sentimentality, but excluding anger content—relates to network layer size (Asendorpf & Wilpers, 1998; Roberts et al., 2008) and, in particular, whether it is indeed associated with less social support (Russell et al., 1997; Stokes, 1985).

The HEXACO Extraversion, Conscientiousness, and Openness to Experience dimensions are largely equivalent to the corresponding traits in the Big Five. However, HEXACO Openness excludes intellect content—i.e., intelligence and mental ability—that is part of some Big Five measures (e.g., Goldberg (1999) IPIP scale).

Based on previous examinations of the relation between Extraversion and network characteristics (Asendorpf & Wilpers, 1998; Pollet et al., 2011), we expect Extraversion to positively relate to the size of both support and sympathy groups, but not to emotional closeness. Given previous inconsistencies regarding the relation between Openness and network size (Jensen-Campbell et al., 2002; Selfhout et al., 2010), and the lack of evidence for a relation between Conscientiousness and network characteristics, we do not make specific predictions for these dimensions.

2. Methods

2.1. Participants

525 participants (63.4% women, $M_{age} = 27$, $SD_{age} = 10.09$, range 18 to 83 years) completed an online survey in English or Dutch. Respondents were recruited via the personal networks of more than 20 international and Dutch students. The majority of respondents had a university degree (68.6%). Among participants, 29.3% reported Dutch as their native language, 20.4% reported English, and 50.3% another language. Finally, 52.8% of participants reported having a partner (*married* or *in a relationship*); 47.2% were *single*, *divorced*, or *widowed*; see also Supplementary materials 1–2).

2.2. Procedure and measures

Participants were first asked to list all people with whom losing contact forever would be upsetting ("*We would like you to think of the people who are most important to you, and to imagine not being able to speak or to see these people ever again*"). Next, they indicated which of these people they would turn to "*in times of severe emotional or financial distress*". We defined the support group as individuals to whom participants would turn in times of severe distress, and the sympathy group as individuals with whom losing contact forever would be upsetting. These measures are commonly used to elicit individuals' inner network layers (e.g. Binder et al., 2012, Buys & Larson, 1979). Participants then reported how emotionally close they felt to each network member on a 0 to 100 scale. Emotional closeness is considered the most reliable indicator of tie strength (Marsden & Campbell, 1984) and is related to the frequency of both mobile phone and face-to-face contact (Roberts & Dunbar, 2011b; Saramäki et al., 2014).

Subsequently, participants completed the 60-item version of the HEXACO personality inventory (Ashton & Lee, 2009), using 5-point Likert scales (1 = *strongly disagree*, 5 = *strongly agree*). The HEXACO-60 consists of items representing a broad range of content from all facets of the six HEXACO dimensions (Ashton & Lee, 2009). Scales for all HEXACO dimensions showed adequate reliability: Honesty–Humility, $a = .70$; Emotionality, $a = .76$; Extraversion, $a = .80$; Agreeableness, $a = .73$; Conscientiousness, $a = .77$; and Openness to Experience, $a = .76$.

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[1] Empirically, Honesty–Humility and Emotionality are less well covered by the five factors of the NEO-FFI than the other HEXACO factors, suggesting that these two traits—and somewhat Agreeableness—include content that is not well-represented in the Big Five (Lee & Ashton, 2013).