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Personality and personal network type

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ABSTRACT

The association between personality and personal relationships is mostly studied within dyadic relationships. We examined these variables within the context of personal network types. We used Latent Class Analysis to identify groups of students with similar role relationships with three focal figures. We performed Latent Class Logistic Regression to explore the relationships of the latent classes with the Big Five personality factors. Personality was assessed with the Five Factor Personality Inventory. We found three personal network types: a primarily family oriented network, a primarily peer oriented network, and a mixed family/peer oriented network. We found significant associations between personality and personal network type. Extraverted students were more likely to have a primarily peer oriented network relative to a primarily family oriented network. Autonomous students were more likely to have a primarily family oriented network relative to a primarily peer oriented network. Autonomous students were also more likely to have a mixed family/peer oriented network relative to a primarily peer oriented network. Conscientious students were more likely to have a primarily family oriented network relative to a mixed family/peer oriented network.

1. Introduction

For students enrolled in higher education, many changes may occur in their social environment. They might loosen their bonds with parents and high school friends, meet new people and thereby form new personal networks. The way students experience and cope with these changes and succeed to integrate is possibly related to their personality. For instance, extraverted individuals might find it easier to make new friends than introverted individuals. The social networks of students and the support that is provided by the network members possibly determine part of students' academic success or failure.

Even though the association between personality and social relations has been studied frequently, much information is still missing. Most studies have been focused on dyadic relationships, for instance romantic relationships (e.g., Donnellan, Conger, & Bryant, 2004), or at a narrow range of network ties, for instance peers or family (e.g., Asendorpf, 2002; Scholte, Van Aken, & Van Lieshout, 1997). It is not yet clear if and how personality affects the composition of personal networks in terms of role relationships. Therefore, the present study aimed at exploring the association between personality and personal network types.

1.1. Personal network types

Personal networks are defined as the set of ties surrounding individuals (Marsden, 1990). They have proven to be relevant for the amount of social support a person receives (Stanton-Salazar & Urso Spinoza, 2005; Wenger, 1991; Wenger & Tucker, 2002) and also for well-being and physical and mental health (Berkman, 1984; Faber & Wasserman, 2002; Pescosolido & Levy, 2002). However, it appears that most studies on personal networks addressed isolated aspects of personal networks, for instance network size (e.g., Roberts, Wilson, Fedurek, & Dunbar, 2008), or specific characteristics of relationships, for instance amount of conflict (e.g., Knee, Lonsbary, Canevello, & Patrick, 2005), or specific role relationships, for instance romantic partners (e.g., Knee, Patrick, Vietor, Nanayakkara, & Neighbors, 2002). Relatively little is known concerning different types of personal networks. A network typology offers the possibility to represent different variables concerning social relations in a condensed way (Agneessens, Waege, & Lievens, 2006; Fiori, Antonucci, & Cortina, 2006).

Wenger (1991, 1997) and Wenger and Tucker (2002) identified five network types among elderly people, based on the proximity of kin, the proportion of family, friends, and neighbors, and the le-

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vel of interaction. Takahashi (2005) based his typology on focal figures. These focal figures were categorized into two groups: family and non-family. A third group consisted of individuals not much interested in others: the 'lone wolf type'. These and other studies (Fiori et al., 2006; Litwin & Landau, 2000; McLanahan, Wedemeyer, & Adelberg, 1981) illustrate that the role relationship, and more specifically family roles and friendship roles, are often the central element on which network typologies are based. However, since network typologies have not frequently been empirically determined, it is not yet clear how many and which types can be considered sufficient in describing personal networks. In the present study, we empirically determined the number of network types.

1.2. Personality and social relations

Most of our knowledge on the association between personality and social relations concerns the Big Five personality factors (e.g., Digman, 1990). Below, we briefly discuss what is known for Extraversion, Agreeableness, Conscientiousness, Emotional Stability (or, conversely, Neuroticism) and Autonomy, which is the Dutch fifth factor and relevant for the present study. Autonomy refers to critical thinking and independent decision making (see Hendriks, 1997; Hendriks, Hofstee, & De Raad, 1999a, 2002).

Extraversion has been found to be beneficial for social relations, because extraverted individuals are socially skilled and have a preference for interaction (e.g., Asendorpf & Wilpers, 1998; Jensen-Campbell et al., 2002; Ozer & Benet-Martinez, 2006; White, Hendrick, & Hendrick, 2004). Agreeableness has been found to positively affect social relations as well; agreeable individuals are motivated to maintain social relations and elicit fewer conflicts in their social environment (e.g., Carlo, Okun, Knight, & de Guzman, 2005; Donnellan et al., 2004; Graziano, Hair, & Finch, 1997; Jensen-Campbell et al., 2002). Conscientiousness benefits social relations because conscientious individuals have a high level of self-control, are responsible, predictable, and inclined to make a success of their relationships (Asendorpf & Wilpers, 1998; Bouchard, Lussier, & Sabourin, 1999; Donnellan et al., 2004; Robins, Caspi, & Moffitt, 2000; Watson, Hubbard, & Wiese, 2000). Neuroticism is not beneficial for social relations. Neurotic individuals are inclined to see events and situations in a negative light and experience and express negative feelings towards others (Anderson, John, Keltner, & Kring, 2001; Asendorpf, 2002; Barelds, 2005; Donnellan et al., 2004; Donnellan, Larsen-Rife, & Conger, 2005; Neyer & Voigt, 2004; Robins, Caspi, & Moffitt, 2002). Lastly, Autonomy is beneficial for social relations, because autonomous individuals are more committed, understanding and persistent in relationships and less defensive in the presence of conflict (Knee et al., 2002, 2005; La Guardia, Ryan, Couchman, & Deci, 2000).

1.3. Sex differences

Men and women differ in their personal relations. For instance, women have more, and more divers, family ties than men (Fischer & Oliker, 1983; Marsden, 1987; Moore, 1990). Men and women also differ in their mean-level scores on personality traits (Budaev, 1999; Costa, Terracciano, & McCrae, 2001; Feingold, 1994; Hendriks, Hofstee, & De Raad, 1999b; Lynn & Martin, 1997). Women tend to score higher on Agreeableness and Extraversion, whereas men tend to score higher on Autonomy and Emotional Stability.

So, the present study focused on the relationship between personality and personal network types. In contrast to most previous studies on personality and personal relations, the number and content of the personal network types were empirically determined. Because sex appears to be related to both personality and personal relations, we included sex as a covariate.

2. Methods

2.1. Sample and procedure

The sample consisted of 1835 students of all universities and various disciplines across The Netherlands. The average age of the students was 23.8 years (SD = 0.68 years). There were 1269 women in our sample and 682 men. Our study was performed within the context of a larger cohort study in the Netherlands, aimed at exploring social psychological determinants of educational outcomes. This cohort study started in 1993 with about 20,000 students who had entered the first grade of secondary education (US grade 7, age about 12 years old). The students were monitored with achievement tests and questionnaires during the six (or seven in the case of grade repetition) years while they were in secondary school. In a follow-up in 2004, we approached those 7039 (response rate 26%) students within the cohort who had transferred to higher education after completing secondary education. We sent a questionnaire to their home address with a return envelope enclosed. In an accompanying letter, the students were assured that the information in the questionnaire would be kept confidential. No reminders were sent afterwards.

The questionnaire included questions concerning students' sex, age, educational career (for instance diploma date and degree), students' study behavior (for instance learning style and motivation), social comparison processes (for instance upward or downward comparison), personality, and finally questions concerning personal network characteristics. For this study, none of the variables available from previous measuring moments have been used; we only used the personality and personal network data available from the 2004 questionnaire.

2.2. Measures

2.2.1. Personal network types

The students were asked to write down maximally five focal figures, which were defined as persons with whom the respondents discussed important matters during the last/preceding year of their study. The respondents indicated the role each person has in their relationship: partner, parent, sibling, other relative, housemate, colleague, former classmate, co-student, neighbor, friend, club mate or teammate, or other. The most mentioned roles in the 'other' category were teacher/mentor/tutor and other academic related roles, and ex-partner. Of all respondents, 92 respondents indicated an 'other' role relationship for one or more of the five focal figures, of which 22 respondents indicated 2 'other' roles and 5 respondents indicated 3 'other' roles. Multiple roles were possible for each focal figure, for instance sibling and friend or housemate and co-student.

Personal network types were assessed via Latent Class Analysis (LCA; Nylund, Asparouhov, & Muthén, 2007). LCA aims at finding a latent categorical variable, based on similar response patterns on a number of categorical manifest indicators. We used the role relationships (friend, parent, etcetera) of respondents as indicator variables for the LCA, and excluded the 'other' category from the LCA. Per respondent we aggregated the data across the first three focal figures, because of the large number of missing values on the fourth and fifth focal figures. We estimated and tested models with increasing numbers of T classes against a model with $T-1$ classes. We used the maximum likelihood estimator with robust standard errors to determine the latent classes, and we used random start values to prevent solutions based on a local maximum. We preferred the model with the lowest Bayesian Information Criterion (BIC) (Nylund et al., 2007). Furthermore, the Lo-Mendell-Rubin adjusted likelihood ratio test (LRT) of model fit (Lo, Mendell, & Rubin,

2001) of each model had to show a significant improvement in the model fit compared to the $T-1$ model (Nylund et al., 2007).

2.2.2. Personality

Personality was assessed with the Five Factor Personality Inventory (FFPI); (Hendriks et al.,1999a, 1999b). The FFPI consists of 100 statements in the third person singular, assessing Extraversion, Agreeableness, Conscientiousness, Emotional Stability, and Autonomy. Example items are *starts conversations* (Extraversion, stratified alpha: .86), *accepts people as they are* (Agreeableness, stratified alpha: .81), *loves order and regularity* (Conscientiousness, stratified alpha: .85), *readily overcomes setbacks* (Emotional Stability, stratified alpha: .84), and *takes the initiative* (Autonomy, stratified alpha: .76). The students rated themselves on a five point scale with scale anchors defined as: 1 = *not at all applicable* to 5 = *entirely applicable*. FFPI factor scores were computed using the FFPI software (Hendriks et al., 1999a, 1999b). The factors in our sample are identical to the factors in the Dutch norm sample in terms of interpretation; the congruence coefficient Tucker's phi (Tucker, 1951) was .98 for Extraversion, Agreeableness, and Conscientiousness and .97 for Emotional Stability and Autonomy (see Lorenzo-Seva & Ten Berge, 2006).

3. Results

3.1. Establishing personal network types

We fitted models with one through six latent classes. Based on the lowest *BIC* value and theoretical considerations we chose the three-class model solution (2-class BIC = 27318.65, 3-class BIC = 27035.30, 4-class BIC = 27065.37, 5-class BIC = 27152.221, 6-class BIC = 27295.167; 3-class LRT = 539.74, $p = 0.04$). In this model, 384 respondents (22%) were assigned to Class 1, 568 respondents (32%) were assigned to Class 2, and 827 (46%) respondents were assigned to Class 3. Table 1 shows the probabilities of each role for each class. The roles of partner, parent, former classmates, co-students, and friends were found to be the most relevant to distinguish the classes.

Class 1 is characterized by the highest probability of mentioning a partner, one or two parents, and no friends or one friend as focal figures. Since Class 1 also has the highest probability of mentioning a sibling and two or three family members as focal figures, this class was interpreted as having a primarily family oriented network.

Class 2 is characterized by the highest probability of mentioning no partner and no parent(s) as focal figures. Furthermore, Class 2 has the highest probability of mentioning three friends, three co-students and two or three former classmates as focal figures. Therefore, Class 2 was interpreted as having a primarily peer oriented network.

Lastly, Class 3 is characterized by a high probability of mentioning a partner, and the highest probabilities of mentioning one or two co-students and two friends as focal figures. In addition, Class 3 has a higher probability than Class 2 of mentioning a parent, sibling, and other family members as focal figures. Therefore, Class 3 was interpreted as having a mixed family/peer oriented network.

3.2. Personality and personal network type

We performed latent class logistic regression to explore the relationship of the latent classes with personality (and sex). All analyses were performed using the MPlus software (Muthén & Muthén, 1998–2007). Listed in Table 2 are the regression parameters of the three-class solution with personality factors as predictors and sex as covariate. Sex appeared to be related to network

Table 1
Conditional probabilities of responses of each latent class

		Primarily family	Primarily peers	Mixed family/peer
Partner	0	0.401	0.938	0.406
	1	0.596	0.062	0.590
	2	0.003	0.000	0.005
Parents	0	0.005	1.000	0.765
	1	0.529	0.000	0.233
	2	0.466	0.000	0.002
Siblings	0	0.731	0.981	0.819
	1	0.263	0.019	0.168
	2	0.006	0.000	0.011
	3	0.000	0.000	0.001
Other family members	0	0.880	0.983	0.875
	1	0.040	0.017	0.114
	2	0.069	0.000	0.008
	3	0.012	0.000	0.003
Housemates	0	0.861	0.812	0.782
	1	0.119	0.119	0.194
	2	0.017	0.057	0.025
	3	0.003	0.012	0.000
Colleagues	0	0.961	0.880	0.854
	1	0.037	0.072	0.118
	2	0.002	0.033	0.027
	3	0.000	0.014	0.001
Former classmates	0	0.872	0.576	0.653
	1	0.128	0.157	0.252
	2	0.000	0.121	0.095
	3	0.000	0.145	0.001
Co-students	0	0.731	0.313	0.396
	1	0.269	0.136	0.381
	2	0.000	0.183	0.216
	3	0.000	0.368	0.007
Neighbours	0	0.984	0.961	0.955
	1	0.016	0.030	0.039
	2	0.000	0.007	0.005
	3	0.000	0.002	0.001
Friends	0	0.451	0.141	0.083
	1	0.502	0.073	0.222
	2	0.020	0.095	0.496
	3	0.027	0.692	0.198
Acquaintances	0	0.985	0.923	0.960
	1	0.008	0.035	0.024
	2	0.000	0.006	0.012
	3	0.008	0.035	0.004
Team members	0	0.947	0.805	0.855
	1	0.053	0.091	0.101
	2	0.000	0.051	0.039
	3	0.000	0.053	0.005

Table 2
Latent class logistic regression results of personal network type on personality and sex

	Family vs. Peer	Family/peer vs. Peer	Family vs. Family/peer
Intercept	−0.923 (0.434)	0.126 (0.494)	−1.049 (0.282)
Sex	0.643 (0.187)***	0.501 (0.235)*	0.142 (0.267)
Extraversion	−0.274 (0.090)**	−0.139 (0.083)	−0.135 (0.088)
Agreeableness	0.016 (0.094)	0.018 (0.086)	−0.002 (0.090)
Conscientiousness	0.105 (0.096)	−0.140 (0.090)	0.245 (0.077)**
Emotional Stability	−0.038 (0.096)	−0.068 (0.097)	0.031 (0.078)
Autonomy	0.179 (0.091)*	0.206 (0.084)*	−0.026 (0.086)

Note: Sex: 0 = men, 1 = women, *$p < .05$, **$p < .01$, ***$p < .001$.

type; women were more likely to have a primarily family oriented network or a mixed family/peer oriented network, while men were more likely to have a primarily peer oriented network. So, taking into account sex as covariate appeared appropriate.

When contrasting a primarily family oriented network against a primarily peer oriented network, Extraversion showed a significant negative regression coefficient. The odds ratio of Extraversion was ($e^{-0.274}$=) 0.76, which means that extraverted students were less likely than introverted students to have a primarily family oriented network relative to having a primarily peer oriented network. Autonomy showed a significant positive regression coefficient. The odds ratio of Autonomy was 1.2, which means that autonomous students were 1.2 times more likely than less autonomous students to have a primarily family oriented network relative to having a primarily peer oriented network.

When contrasting having a mixed family/peer oriented network against a primarily peer oriented network, again Autonomy showed a significant positive regression coefficient. Autonomous students were 1.2 times more likely than less autonomous students to have a mixed family/peer oriented network relative to a primarily peer oriented network.

Lastly, when contrasting having a primarily family oriented network against having a mixed family/peer oriented network, Conscientiousness showed a significant positive regression coefficient. Conscientious students were 1.3 times more likely to have a primarily family oriented network relative to having a mixed family/peer oriented network than less conscientious students.

4. Discussion

Among students in higher education, we empirically identified three personal network types: a primarily family oriented network, a primarily peer oriented network, and a mixed family/peer oriented network. We found personality to predict these network types, taking into account sex. Sex indeed appeared to be related to network type. This is consistent with the literature and our expectations (Fischer & Oliker, 1983; Marsden, 1987; Moore, 1990).

We found Extraversion, Autonomy and Conscientiousness to be significant predictors of personal network types. Extraversion appeared predictive of having a primarily peer oriented network relative to a primarily family oriented network. Extraverted individuals can be characterized as talkative, lively, enthusiastic, and preferring company above being alone (Hendriks et al., 1999a). This allows them to come in contact easily with new people and enjoy the company of peers. This might be beneficial for a rapid adaptation to their new lives. Autonomy on the other hand appeared predictive of having a primarily family oriented or a mixed family/peer oriented network rather than a primarily peer oriented network. Individuals high in Autonomy, as assessed with the FFPI, can be characterized as independent, critical, and wanting to form their own opinions (Hendriks et al., 1999a). They might be inclined to resist (implicit) peer group norms to loosen the bonds with parents and other family members and to spend their time mainly with peers. Conscientiousness appeared predictive of having a primarily family oriented network rather than a mixed family/peer oriented network. Students high in Conscientiousness can be described as punctual, accurate, and reliable (Hendriks et al., 1999a), and, therefore, possibly feel more responsible for maintaining the long-term relationships with family members than investing in forming and maintaining peer relations. The next step would be to investigate the precise relationship between personality, personal network type, and study success.

Our findings are in some aspects consistent with findings from other studies. Extraversion has been found to play an important role in peer relations (Asendorpf & Wilpers, 1998; Jensen-Campbell et al., 2002; Ozer & Benet-Martinez, 2006). Furthermore, Conscientiousness has been found to be beneficial for relationships with parents and other family members (Asendorpf & Wilpers, 1998; Belsky, Jaffee, Caspi, Moffitt, & Silva, 2003; Ozer & Benet-Martinez, 2006). Lastly, Autonomy has been found to be beneficial for satisfaction within diverse types of relations. However, our results are not completely consistent with previous findings. Agreeableness and Emotional Stability have been found to be related to different types of and different aspects of social relations (Anderson et al., 2001; Barelds, 2005; Bouchard et al., 1999; Donnellan et al., 2004; Jensen-Campbell et al., 2002; Ozer & Benet-Martinez, 2006; Scholte et al., 1997; White et al., 2004), but in our study appeared not to be significantly associated with students' personal network types. It is likely that personality plays a different role within personal network types than within dyadic relations; forming and maintaining multiple relationships may require different abilities and appeal to different personality characteristics than dyadic relationships. Further analyses are required to examine in what way associations between personality and dyadic relationships differ from associations between personality and personal network type.

The fact that we determined the personal network types empirically, adds to the ecological validity of the results. However, also limitations can be noted. One limitation is that we employed our study within a sample of university students, which is rather homogeneous with respect to age, educational level and ethnicity. This likely affects the number as well as the types of personal networks that were found. Older individuals, for instance, have had more time to make deliberate choices in the forming and maintaining of their networks. Furthermore, at older ages other kinds of relationships might become more important, of which work-related relationships are most obvious. Finally, in some cultures family plays a much more important role than friends and this will be reflected in the network types. On the other hand, the types of network we found are largely consistent with other network types found in previous studies. For instance, both Wenger (1997) and Takahashi (2005) found the amount of family versus non-family to be reflected in their network types.

A second limitation is that we did not distinguish resident from non-resident students. However, in The Netherlands traveling distances are relatively small compared to, for instance, the US. So, staying at home does not prevent students to fully participate in student life. Moreover, Dutch students rarely live on student campuses but participate in the local community. Therefore, we believe that the differences between resident and non-resident student in terms of their personal network might not be very large. Still, further research is needed with more heterogeneous samples or subgroups of students to provide evidence for the generalizability of our findings.

We aimed to add to the literature on the relationship between personality and social relations, in that we focused on personal network types rather than dyadic relations or groups with a single role relationship. To our knowledge, the association between personality and personal network types has not been studied before. Furthermore, our personal network types were empirically derived and tested within a large sample. A large sample size reduces the amount of sampling error and thereby increases the accuracy of the parameter estimates. Therefore, our study can be considered a valuable first step in extending the literature on dyadic relationships and groups with one role relationship to knowledge concerning personal network types.

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