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Perceived Social Support and Big Five Personality Traits in Middle Adulthood: a 4-Year Cross-Lagged Path Analysis

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Abstract

Previous studies have shown that the Big Five personality traits are significantly associated with perceived social support and these associations are positively associated with agreeableness, extraversion, and emotional stability. However, it is not yet clear whether these associations hold longitudinally or how these variables may predict each other over time. To investigate the co-development of personality traits and perceived social support, a cross-lagged path model design was used on a sample of adults (N = 1309) measured on two occasions 4 years apart. The results indicated that while emotional stability predicted perceived social support 4 years later, perceived social support also predicted emotional stability, extraversion, agreeableness, openness, and conscientiousness 4 years later. Our findings suggest that perceived social support may be a resource that has an impact on the development of personality traits known to be associated with social skills as well as the quality and frequency of social interactions in middle adulthood.

Keywords Personality traits · Big five · Perceived social support · Middle adulthood

Even if the social structures of our contemporary societies have evolved, social support remains an undeniable resource for health, well-being, and subjective quality of life (e.g., Lee et al. 2017; Pocnet et al. 2016; Thoits 2011). This is particularly the case during middle adulthood, when adults have to take on different social roles that require managing multiple relationships at the same time (Lachman 2001). Therefore,

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receiving and perceiving support from these significant others could help individuals to more easily accomplish tasks associated with midlife, cope with stress, and thus promote health and well-being (Chang et al. 2009). Similar to social support, personality traits are important predictors of the social competences needed to achieve social challenges met during middle adulthood (Caspi et al. 2005). For example, agreeableness, considered as a prosocial personality trait (Habashi et al. 2016), could help to maintain harmonious interpersonal relationships by cooperation with others (Graziano and Tobin 2009). In the same way, extraversion, which includes sociability and social interest, was also found to be related to positive interpersonal relationships (DeYoung et al. 2013). Prosocial personality traits associated with an individual's interpersonal style (extraversion and agreeableness) but also emotional stability or conscientiousness are important predictors of well-being and subjective quality of life (e.g., DeNeve and Cooper 1998; Gutierrez et al. 2005; Pocnet et al. 2016), and these relationships are moderated by primary social roles (Aldridge and Gore 2016). Some positive aspects of personality traits have been found to be associated with character strengths that are considered the ingredients to a fulfilling life (Peterson and Seligman 2004). Extraversion, for example, is strongly related to zest, which is a way of approaching life with excitement and energy and allows individuals to overcome negative emotions such as fear. Conscientiousness is strongly associated with perseverance, which is the strength that enables you to pursue goal-directed actions even if you meet difficulties and discouragement. These two strengths among others have been found to have a major role in life satisfaction (Peterson et al. 2007; Martínez Martí and Ruch 2014).

Previous studies have shown that perceived social support was significantly associated with personality traits, particularly extraversion, agreeableness, or emotional stability. These associations are well established across the lifespan (Pierce et al. 1997; Swickert 2009). Indeed, since childhood to old age, relationships that individuals maintain with others are related to individual differences in personality traits (Caspi et al. 2005). Personality traits that define interaction styles can predict social interactions, available social support and its perception. However, a supportive social context might also predict personality traits by giving individuals the opportunity to develop social skills, maintain social contacts and thus also foster prosocial behavior. This latter possible relationship has been minimally studied in the literature for two reasons: the lack of longitudinal studies on the relationship between personality traits and perceived social support, and a lack of consideration of the contextual perspectives of personality development. Furthermore, personality develops quite slowly during adulthood (e.g. Terracciano et al. 2005); this co-development should be studied over a relatively long period.

The present cross-lagged longitudinal study aimed at investigating the reciprocal relationship between personality traits and perceived social support over a 4-year period. Personality traits and perceived social support were thus considered as both predictors and outcomes. For this purpose, we used a cross-lagged path model design that allows us to estimate directional influences between the variables measured at two time points.

Personality Traits and Perceived Social Support

Many cross-sectional studies have investigated the relationships between personality traits and perceived social support during adulthood. Halamandaris and Power (1997)

conducted a study with university students and noted that extraversion was significantly related to perceived social support; extraversion was the only variable that predicted perceived social support beyond neuroticism (emotional stability). Indeed, the positive link between emotional stability and social support is very well documented, and emotional stability is supposed to contribute to smoother interpersonal relationships that foster social support. In 2002, Swickert, Rosentreter, Hittner, and Mushrush confirmed that extraversion and perceived social support were positively related in a similar sample. In a study conducted with male police officers in Singapore, Tong et al. (2004) found that agreeableness, extraversion, and openness contributed independently to a number of aspects of social support in three ethnic groups, namely, Chinese, Indians, and Malaysians. Finally, Branje et al. (2005) conducted a study on the relationship between agreeableness and perceived social support in family relationships with a sample of Dutch two-parent families with two adolescents. They found that family members who are more agreeable are also more supportive, both across relationships and within relationships. More recently, Swickert et al. (2010) observed that the interaction between extraversion, neuroticism, and openness predicted perceived social support in a sample of college students. This study provided evidence that to understand perceived social support, it is necessary to go beyond the examination of simple bivariate correlations between personality traits and perceived social support. In sum, all of these cross-sectional studies confirmed that the personality traits defining the interpersonal style as well as other traits, such as emotional stability, are quite strongly associated with perceived social support.

Only a few longitudinal studies have been conducted to analyze the relationship between personality traits and perceived social support. For example, Asendorpf and Wilpers (1998) conducted an 18-month longitudinal study with students in which the reciprocal relationship between Big Five personality traits and social relationships was analyzed. They found that extraversion, agreeableness and conscientiousness predicted social relationships after controlling for the initial correlations between personality traits and social relationship, but not vice versa. More recently, Allemand et al. (2015) examined the long-term correlated change between Big Five personality traits and perceived social support with middle-aged adults and found that the association between all five personality traits and perceived social support also held longitudinally over an 8-year period. More specifically, individual change in one personality trait was accompanied by individual changes in perceived social support. This study highlighted the fact that individuals who increased in personality traits such as agreeableness and extraversion and decreased in neuroticism also tended to increase in perceived social support. These two studies suggest that personality traits, and in particular the traits that defines interpersonal styles, promote change in social support perceptions.

In most studies, only the impact of personality traits on perceived social support was investigated and not vice versa. The authors considered personality traits as stable and having an impact on perceiving and receiving social support, while the selected social environments are considered as dynamic realities. Thus, they used personality traits as a predictor of perceived social support, an antecedent of the latter. However, more contextualized conceptions of personality trait development have appeared the last few years, challenging the idea of complete stability of personality traits during adulthood and leaving space to consider perceived social support as a potential contextual factor predicting personality trait development.

Contextual Perspectives of Personality Development

Models of personality traits such as the Five Factor Theory (FFT; McCrae and Costa 1999) emphasize the endogenous contribution of genetic maturation on personality trait development, which remain relatively stable during middle adulthood (Terracciano et al. 2010), even if some slow but systematic developments have been observed such as a decline in extraversion and an increase in agreeableness (Terracciano et al. 2005). Several recent theories of personality development that emphasize a lifespan developmental perspective studied how this development could be influenced by environmental factors or life events, thus indicating the plasticity of this development during middle adulthood (e.g., Bleidorn et al. 2016).

Social investment theory states that investing in normative social roles (e.g., work, family, community) during young adulthood can influence personality trait change (Roberts et al. 2005). This theory of personality development emphasizes the role of experiences in universal social roles in adulthood. The social investment theory explains that the increase in agreeableness, conscientiousness and neuroticism is the result of endorsed social roles. This would explain why individuals tend to become more socially adapted during adulthood. Bleidorn et al. (2013) conducted a cross-cultural study with adults and showed that in cultures adopting earlier adult roles, earlier personality maturation was found regardless of age. Hudson and Roberts (2016) revealed that changes in social investment at work were simultaneously related to changes in conscientiousness and agreeableness, and age did not moderate the link between them. This relationship underlines the influence of job experiences on personality development across the lifespan.

The personality-relationship transactions theory (Neyer et al. 2014) is one of the theories that highlight the possible reciprocal influence existing between personality traits and social environments. This paradigm puts forward the idea of a reciprocal transaction between personality and social relationships: individuals, based on their personality, create, maintain, and change their social environment, which in turn influences their personality as the individuals adapt to social role expectations. Moreover, according to this theory, relationships impact personality development in the context of normative life transitions that are highly regulated by social expectations. Based on this theory, Lehnart et al. 2010 investigated the effect of entering into the first long-term romantic relationship on personality trait development over eight years across young adulthood. They found that entering into a romantic relationship was related to a decrease in neuroticism.

If personal experiences, social roles and relationships can influence personality trait development, then perceived social support, which is not only a proxy of the quality of social relationships but also of a resource that can help to meet social challenges during middle adulthood, could predict personality traits by adapting to social role expectations and developing social skills. Therefore, the relationship between personality traits and perceived social support could be not only unidirectional but also reciprocal. One study already supports this perspective and has shown that perceived social support increased conscientiousness seven months later, and not vice versa, in a sample of elderly persons (Hill et al. 2014). The authors highlighted the benefits of perceived social support in old age on the conscientiousness dimension, which is linked to positive outcomes such as better health and higher well-being.

The Present Study

This study tested the reciprocal relationship that might exist between perceived social support and personality traits in a middle-aged adult sample, based on the personality-relationship transactions theory. Although Asendorpf and Wilpers (1998) have already conducted a longitudinal study on this relationship, our study is different from theirs for several reasons. First, these authors specifically tested the association between social relationship and personality traits and not directly the association between perceived social support and personality traits. Thus, they used a relationship questionnaire in which participants had to list all of the persons that were important to them at that moment and rate the quality of their relationship with each of them. Perceived social support was then used as an indicator of the quality of the relationship and was assessed by a 1-item scale. Unlike Asendorpf and Wilpers, in our study, we focused only on the relationship between perceived social support and personality traits using self-reported scales. They also used slightly different statistical methods and analyses than we did to test these relationships. Indeed, they used a series of multiple regressions, while we used a cross-lagged path analysis. Finally, the samples and time-lags are also different between their study and ours: Asendorpf and Wilpers conducted their study with first year university students, a completely different population than ours, which is composed of employed or unemployed middle-aged adults. We also tested a 4-year time-lag model with 2 measurement points, while they tested a shorter time-lag model (18 months) with more measurement points.

To test the direction of the effects in our study, we modeled longitudinal relationships using an autoregressive, 4-year cross-lagged path model design taking into account all Big Five personality traits (Fig. 1). The analyses were conducted controlling for a number of background variables (such as age, gender, life events, and household type) that were found to relate to both the development of personality traits and perceived social support (e.g., Bleidorn et al. 2016; Galdiolo and Roskam 2014; Lin et al. 1985; Prezza and Pacilli 2002). Indeed, a life event was identified as a potential predictor of personality trait development and as a stressor that can be buffered by perceived social support. Being in a relationship or having a child was found to have an impact on the development of personality traits and moderated the level of perceived social support.

The present model allowed for simultaneous examination of the longitudinal impact of one construct on another, while also controlling for concurrent associations and the stability of each construct over time. Three hypotheses were tested regarding the direction of the effects between personality traits and perceived social support.

Hypothesis 1: personality traits at T1 will be related to perceived social support at T1: neuroticism will be negatively associated with perceived social support, while the four other traits will be positively associated with perceived social support.
Hypothesis 2: personality traits at T1 will predict social support at T2: neuroticism at T1 will negatively predict perceived social support at T2, while extraversion, openness, agreeableness, and conscientiousness at T1 will positively predict perceived social support at T2.

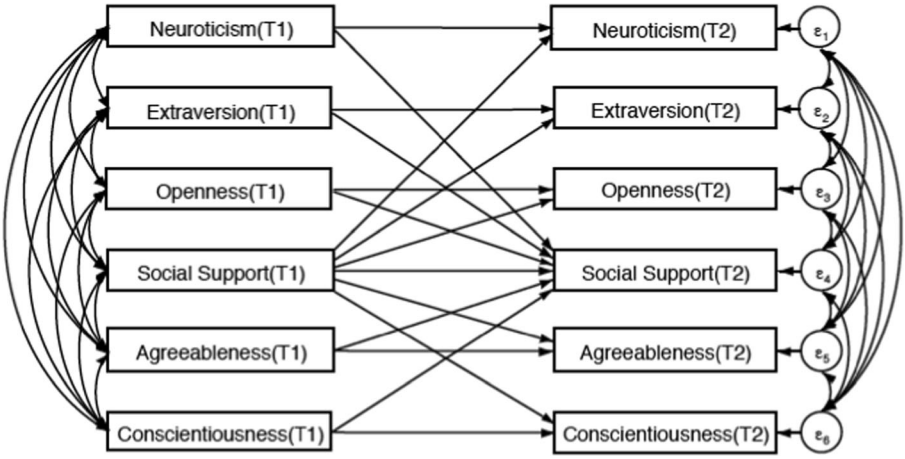

Fig. 1 An autoregressive, 4-year cross-lagged path model design testing the reciprocal relationship between perceived social support and the Big Five personality traits in a middle-aged adult sample ($N = 1305$), and controlling for a number of background variables. For ease of presentation, control variables are not represented in the model

Hypothesis 3: perceived social support at T1 will negatively predict neuroticism and positively predict extraversion, openness, agreeableness, and conscientiousness at T2.

Method

Sample

The analyses conducted in this paper were based on a middle-aged adult sample ($N = 1305$) between 26 and 56 years at T1 (51.9% female; mean age at T1 = 42.74, $SD = 8.37$). The data were drawn from the first wave (2012) and the forth wave (2015) of a 7-year longitudinal study on professional paths conducted at the Swiss National Center of Competence in Research—Overcoming Vulnerabilities: Life Course Perspectives (LIVES). Measurement occasions were separated by a one-year lag each. A representative sample of employed and unemployed adults living in Switzerland was drawn based on a random sample from the Swiss Federal Statistics Office and the State Secretariat for Economic Affairs. Sampling was targeted at the two largest linguistic regions, the German- and French-speaking regions and was representative in terms of age, gender, linguistic region, professional situation, and nationality. Altogether, 2469 persons completed the whole questionnaire at baseline (T1). A total of 1397 of them took part in the follow-up four years later and fully completed the questionnaire (T2; 56.6%).

The dropout analysis revealed no gender differences between the original and the dropout sample. However, some differences were found in age, life events, and household type. Specifically, the dropout sample was slightly younger and reported less significant life events during the past twelve months than did the original sample at T1. Families with children and single-parent families were less represented in the dropout sample. The mean level of perceived social support as measured at T1 was

slightly lower among the dropouts. For the personality traits, the mean level of conscientiousness was the same in both samples, while the mean level of neuroticism was slightly higher in the dropout sample, and the mean levels of extraversion, openness to experience and agreeableness were slightly lower in the dropout sample.

Procedure

Before each measurement occasion, individuals received a letter to present the study inviting them to complete the questionnaire. The survey consisted of two steps. The participants completed the first part by a computer-assisted telephone interview or as an online questionnaire. The main aim of this part was to determine the professional situation of the participant and remained the same each year. The second part was completed via a paper-pencil method or as an online questionnaire and assessed primarily work-related aspects and personal resources and was different year to year.

Participation in this study was voluntary. All data were collected anonymously with a 6-digit code identifying each participant. The entire process complied with the ethical standards of the Swiss Society for Psychology. At the end of the survey, participants could choose the receive compensation in the form of a 20 CHF gift card or a donation to a non-profit organization.

Measures

Perceived Social Support The French and German versions of the 8-item Duke-UNC Functional Social Support scale (DUFFS; Broadhead et al. 1988) were used to measure individuals' perception of qualitative social support available from others. This scale provides a total score and a score for each of its subscales: confident support (e.g., "I get chances to talk to someone I trust about my personal or family problems") and affective support (e.g., "I have people who care what happens to me"). The item response options were on a 5-point scale ranging from 1, *much less than I would like*, to 5, *as much as I would like*. Higher scores reflect higher perceived social support. The Cronbach's alpha coefficient of the total score was .92 at T1 and T2. For the confident support subscale, it was .90 at both time points, and for the affective support subscale it was .81 at both time points. As the two subscales were highly correlated ($r = .79$), we have considered only the total score for this study.

Personality Traits The French and German versions of the 60-item NEO Five-Factor Inventory–Revised (NEO-FFI-R; McCrae and Costa 2004) were used to measure the five main personality dimensions proposed by the Five Factor Model: neuroticism (N), extraversion (E), openness to experience (O), agreeableness (A), and conscientiousness (C). Each scale was assessed with 12 items, and the response format was a 5-point Likert-type scale (1, *Strongly disagree*, to 5, *Strongly agree*). The Cronbach's alpha coefficients at T1 were .83, .77, .74, .71, and .80, respectively, for N, E, O, A, and C.

Control Variables Age, gender, life events, and household type were used as control variables. Life events were measured with a 1-item binominal scale (yes or no) where individuals were asked to report if they had any significant life events (in their personal or professional life) during the past twelve months. Household type was measured by a

1-item nominal scale where respondents had to choose between different possibilities: lone-person household, couple without children, family with children, single-parent family, and adult living with parents. Dummy variables were created from this variable and included in the final model.

Statistical Analyses

All of the analyses were conducted using Stata 14 (StataCorp 2015). First, descriptive statistics and bivariate correlations were calculated including the means, standard deviations, and Pearson correlation coefficients at T1 and T2. Then, a validation of the measurement models was conducted. And finally, structural equation modeling (SEM) techniques for path analysis with maximum likelihood estimators were used to run the cross-lagged longitudinal path analyses. To compare alternative models, chi-square difference tests were used. The following fit indices were also used: the comparative fit index (CFI), the Tucker-Lewis index (TLI), the standardized root mean residual (SRMR) and the root mean square error of approximation (RMSEA). If the CFI value was .90 or above, the TLI values were above .95, the SRMR value was .08 or less, and the RMSEA value were .08 or less, the model was considered to have an acceptable fit (Cheung and Rensvold 2002; Hu and Bentler 1999). Standardized beta coefficients were used to interpret the results.

The cross-lagged model estimates the association between each of the five personality traits and perceived social support over time controlling for age, gender, life events, and household type. Autoregressive path weights account for the stability of each measure across the two time points, while the concurrent correlations between the variables are also estimated. The cross-lagged paths indicate the extent to which scores on personality traits or perceived social support at T1 predict scores on the other scale at T2, independent of the longitudinal correlations between measures of the same construct and the concurrent correlation between the constructs at each time point.

Four competing path models of the association between perceived social support and personality traits were compared. The first model (*M1-stability model*) is a stability model where only the autoregressive paths are taken into account without the predictive associations from one construct to the other at T2. The second model (*M2-one-way cross-lagged*) proposes that individual differences in personality traits predict perceived social support at T2, whereas early perceived social support does not predict later personality traits. In contrast, the third model (*M3-reversed cross-lagged*) proposes that only individual differences in perceived social support predict later personality traits. The final model (*M4-full model*) is a reciprocal model suggesting that perceived social support and personality traits have bidirectional associations, with personality traits at T1 predicting perceived social support at T2, and perceived social support at T1 predicting personality traits at T2.

Data Availability Statement The datasets analyzed during the current study are available on request from the authors in Forsbase, data access portal in Switzerland: https://forsbase.unil.ch/project/study-public-overview/14369/0/

Results

Descriptive Analyses

The means, standard deviations, and Pearson correlation coefficients for perceived social support and personality traits at T1 and T2, and for control variables at T1 are shown in Table 1. The mean score of perceived social support at T1 was negatively correlated with the mean score of neuroticism and positively correlated with the mean score of extraversion, agreeableness, openness, and conscientiousness both synchronously and over time. These correlations ranged between low to moderate, with the mean score of neuroticism at T1 being the most highly correlated to the mean score of perceived social support at T1. The latter was correlated significantly with gender, lone-person household type, couple without children household type and single-parent family household type. The autocorrelations of perceived social support and all personality traits were rather stable and varied between .59 and .72. Gender was correlated with most of the personality traits at T1 and T2; agreeableness had the highest correlation with gender at T1. Life events were not significantly correlated with perceived social support at T1 or T2. However, life events were correlated with some personality traits, mostly with openness at T1 and at T2. We decided to include all the control variables in the final model since there was a significant difference between the model with and without control variables ($\Delta\chi^2(96) = 528.68$, $p < .001$).

Validating the Measurement Models

Confirmatory factor analyses (CFA) were performed using maximum likelihood estimation in order to assess the structural validity of the NEO-FFI-R and DUFFS even though the subsequent analyses were conducted in the non-latent space for the sake of simplicity. Regarding Big Five personality traits, the model with five latent variables showed unsatisfactory fit indices, $\chi^2(1700) = 14{,}580.43$, CFI = .627, TLI = .612, RMSEA = .057, SRMR = .076, with some low factor loadings (6 item with < .30). However, these results were similar to what was found in previous studies (Aluja et al. 2005b; McCrae and Costa 2004). Furthermore, as personality factors are prone to have salient secondary loadings (Church and Burke 1994), a restrictive CFA analysis where each item loads onto a single latent variable is usually associated with poor goodness-of-fit statistics (e.g., Aluja et al. 2005a; Marsh et al. 2010).

Regarding perceived social support scale we compared a unidimensional model with a single latent variable and a hierarchical structure where perceived social support includes two sub-constructs, namely affective and confidence support. Although some fit indices were not good, the unidimensional model showed better fit to data than the hierarchical model, $\chi^2(20) = 1097.10$, CFI = .917, TLI = .884, RMSEA = .149, SRMR = .047. Considering modification indices, we allowed five errors terms to covariate, which improved significantly the fit indices, $\chi^2(15) = 236.08$, CFI = .983, TLI = .968, RMSEA = .078, SRMR = .021. The loadings varied between 0.69 and 0.84.

The results of the pooled CFA that included the unidimensional model with the six covariated error terms of perceived social support and the five factors model of personality traits showed, as expected, unsatisfactory fit indices, $\chi^2(2190) = 15{,}765.12$, CFI = .716, TLI = .704, RMSEA = .052, SRMR = .071, mainly due to the NEO-FFI-R.

Table 1 Means, Standard Deviations, and Pearson Correlations at T1 ($N = 2469$) and at T2 ($N = 1397$)

	Mean (*SD*)	1	2	3	4	5	6	7	8	9	10
1. Neuroticism (T1)	31.11 (7.22)	1									
2. Extraversion (T1)	40.78 (5.96)	−.29**	1								
3. Agreeableness (T1)	43.46 (5.65)	−.07**	.16**	1							
4. Openness (T1)	41.21 (6.17)	.03	.30**	.21**	1						
5. Conscientiousness (T1)	47.16 (5.90)	−.29**	.36**	.25**	.14**	1					
6. Social support (T1)	4.14 (.82)	−.38**	.24**	.11**	.13**	.19**	1				
7. Neuroticism (T2)	30.65 (7.68)	.69**	−.21**	−.08**	.01	−.21**	−.33**	1			
8. Extraversion (T2)	39.75 (5.91)	−.29**	.66**	.06*	.21**	.17**	.23**	−.27**	1		
9. Agreeableness (T2)	43.08 (5.74)	−.07**	.12**	.62**	.18**	.12**	.17**	−.08**	.28**	1	
10. Openness (T2)	40.80 (6.31)	−.03	.22**	.13**	.72**	.00	.11**	.02	.40**	.33**	1
11. Conscientiousness (T2)	45.73 (5.89)	−.26**	.15**	.11**	.00	.59**	.19**	−.25**	.39**	.39**	.21**
12. Social support (T2)	4.09 (.87)	−.35**	.16**	.11**	.05	.13**	.63**	−.45**	.25**	.18**	.10**
13. Age	41.92 (8.64)	−.09**	−.05*	.09**	.07**	.07**	−.04	−.10**	−.07*	.11**	.08**
14. Gender	1.51 (.50)	.12**	.08**	.18**	.14**	.08**	.10**	.17**	.03	.15**	.07**
15. Life events	1.43 (.50)	−.09**	−.08**	−.06*	−.17**	−.03	−.03	−.14**	−.07**	−.05	−.15**
16. Lone-person household	.13 (.34)	.09**	−.07**	−.04*	.03	−.04	−.17**	.06*	−.04	−.04	.05
17. Couple without children	.19 (.39)	−.01	<.00	−.02	.03	.03	.16**	.01	−.04	−.06*	.01
18. Family with children	.38 (.48)	−.08**	.07**	.05*	−.07**	.04	.03	−.08**	.09**	.10**	−.06*
19. Single-parent Family	.05 (.22)	.04*	.01	.04*	.05*	.02	−.07**	.06*	−.03	<.00	.01
20. Adult living with parents	.02 (.14)	.05*	−.04	−.01	.01	−.03	−.03	−.01	−.05*	−.02	−.01

Table 1 (continued)

11	12	13	14	15	16	17	18	19	20
1									
.23**	1								
.04	.02	1							
.03	.07**	−.03	1						
.02	.03	.04	−.10**	1					
−.01	−.08**	−.01	−.05*	<.00	1				
.01	.09**	−.15**	.07**	−.02	−.19**	1			
.03	.04	.21**	−.07**	.06**	−.30**	−.38**	1		
−.02	−.05	.09**	.17**	−.05*	−.09**	−.11**	−.18**	1	
−.01	−.07**	−.17**	−.07**	.03	−.06**	−.07**	−.11**	−.03	1

*$p < .05$, ** $p < .01$

Model Comparisons and Path Weights

The four alternative models were compared to each other and tested with a chi-square difference test. The reciprocal model (*M4-full model*) had the best fit compared to that of the other three models (see Table 2). We then examined the values of the concurrent standardized path coefficients at T1 of the best fitting model. Concurrent paths from perceived social support to each personality trait at T1 were all significant. Perceived social support was negatively correlated with neuroticism ($r = -.40$, $p < .001$), while it was positively correlated with extraversion ($r = .25$, $p < .001$), openness ($r = .12$, $p < .001$, agreeableness ($r = .14$, $p < .001$), and conscientiousness ($r = .20$, $p < .001$). We the examined the values of the autoregressive and cross-lagged path standardized coefficients. Autoregressive paths for perceived social support revealed adequate longitudinal stability four years later when variances attributable to the concurrent and cross-lagged associations were simultaneously accounted for ($\beta_{SS} = .58$, $p < .001$). This longitudinal stability of perceived social support is quite comparable to the longitudinal stability of all of personality traits included in the model ($\beta_N = .63$, $p < .001$; $\beta_E = .65$, $p < .001$; $\beta_O = .70$, $p < .001$; $\beta_A = .59$, $p < .001$; $\beta_C = .60$, $p < .001$) (Table 3).

In addition to the autoregressive effects and controlling for age, gender, life events, and household type, the cross-lagged path weight from neuroticism to perceived social support was significant ($\beta_{N->SS} = -.14$, $p < .001$), while the cross-lagged path weights from the four other personality traits to perceived social support were not significant ($\beta_{E->SS} = -.02$, n.s.; $\beta_{O->SS} = -.03$, n.s.; $\beta_{A->SS} = .02$, n.s.; $\beta_{C->SS} = -.02$, n.s.). On the other hand, the reversed path weights from perceived social support to personality traits were all significant ($\beta_{SS->N} = -.09$, $p < .001$; $\beta_{SS->E} = .08$, $p < .001$; $\beta_{SS->O} = .04$, $p = .045$; $\beta_{SS->A} = .08$, $p < .001$; $\beta_{SS->C} = .07$, $p < .001$).

As the only significant reciprocal effect was between neuroticism and perceived social support, we tested a new model (M_T-Trimmed model) without the cross-lagged paths from all of the personality traits to perceived social support except for neuroticism. We then compared this trimmed model with the full model. The results showed that there was not any difference between these two models ($\Delta\chi^2(4) = 4.67$, $p = .323$) and the path coefficients were almost identical to the full model, meaning that the parsimonious model has the same predictive power as compared to the full model. This result highlights the importance of the effect of neuroticism at T1 on perceived social support at T2.

Table 2 Fit results of the cross-lagged structural equation models

	χ^2	*df*	CFI	TLI	RMSEA	SRMR	Model comparisons	
M4-full model	69.91*	20	.992	.958	.044	.013		$\Delta\chi^2(df)$
M1-stability model	139.40*	30	.982	.939	.053	.024	M1-M4	69.49(*10*) *
M2-one-way cross-lagged	101.60*	25	.987	.949	.048	.019	M2-M4	31.70(*5*) *
M3-reversed cross-lagged	102.71*	25	.987	.948	.049	.016	M3-M4	32.80(*5*) *
M_T-Trimmed model	74.58*	24	.991	.965	.040	.013	M_T-M4	4.67(*4*)

* $p < .001$, *df* degrees of freedom, *CFI* Comparative Fitness Index, *TLI* Tucker-Lewis Index, *RMSEA* Root Mean Square Error of Approximation, *SRMR* Standardized Root Mean square Residual

Table 3 Standardized coefficients of significant paths

	β	*95% CI*	*p*
Autoregressive paths			
Social support T1 ➔ social support T2	.58	[.53, .62]	< .001
Neuroticism T1 ➔ neuroticism T2	.63	[.60, .67]	< .001
Extraversion T1 ➔ extraversion T2	.65	[.62, .68]	< .001
Openness T1 ➔ openness T2	.70	[.67, .73]	< .001
Agreeableness T1 ➔ agreeableness T2	.59	[.56, .63]	< .001
Conscientiousness T1 ➔ conscientiousness T2	.60	[.57, .63]	< .001
Cross-lagged paths			
Neuroticism T1 ➔ social support T2	−.14	[−.18, −.12]	< .001
Social support T1 ➔ neuroticism T2	−.09	[−.13, −.04]	< .001
Social support T1 ➔ extraversion T2	.08	[.03, .12]	< .001
Social support T1 ➔ openness T2	.04	[.00, .08]	.045
Social support T1 ➔ agreeableness T2	.08	[.04, .12]	< .001
Social support T1 ➔ conscientiousness T2	.07	[.02, .11]	< .001
Control variables paths			
Age ➔ agreeableness T2	.06	[.02, .10]	.006
Gender ➔ neuroticism T2	.07	[.03, .11]	< .001
Gender ➔ agreeableness T2	.06	[.01, .10]	.014
Life events ➔ neuroticism T2	−.07	[−.11, −.03]	< .001
Single-parent family ➔ openness T2	−.07	[−.14, −.01]	.032
Single-parent family ➔ agreeableness T2	−.10	[−.18, −.03]	.008
Family with children ➔ openness T2	−.13	[−.25, −.01]	.030
Couple without children ➔openness T2	−.11	[−.21, −.01]	.032
Couple without children ➔ agreeableness T2	−.15	[−.26, −.04]	.006

Concerning the control variables, the path weights from gender to neuroticism at T2 and agreeableness at T2 were significant ($\beta_{G->N} = .07$, $p < .001$; $\beta_{G->A} = .06$, $p = .014$). Age significantly predicted agreeableness at T2 ($\beta_{Age->A} = .06$, $p = .006$). The path weight from life events to neuroticism at T2 was also significant ($\beta_{LE->N} = -.07$, $p < .001$). The single-parent family household type significantly predicted openness and agreeableness at T2 ($\beta_{SP->O} = -.07$, $p = .032$; $\beta_{SP->A} = -.10$, $p = .008$). The family with children household type significantly predicted openness at T2 ($\beta_{FC->O} = -.13$, $p = .030$). The couple without children household type significantly predicted openness and agreeableness at T2 ($\beta_{CnoC->O} = -.11$, $p = .032$; $\beta_{CnoC->A} = -.15$, $p = .006$).

Discussion

The goal of this study was to clarify the longitudinal associations between personality traits and perceived social support by conducting a 4-year cross-lagged path analysis. Based on the personality-relationship transactions theory, we tested three hypotheses,

namely, the concurrent relationships between each personality traits and perceived social support, the predictive associations from each personality trait at T1 to perceived social support at T2, and the predictive associations from perceived social support at T1 to each personality trait at T2.

Our first hypothesis testing the concurrent relationships between each personality trait and perceived social support was supported. Indeed, all of the personality traits were related to perceived social support at the first time point, confirming the results identified in previous research (e.g., Allemand et al. 2015; Halamandaris and Power 1997; Swickert et al. 2002; Tong et al. 2004): neuroticism was negatively related to perceived social support, while extraversion, openness, agreeableness and conscientiousness were positively related. The relationship between neuroticism and perceived social support was the strongest, while the relationship between openness and perceived social support was the weakest. Individuals who were more emotionally stable and experienced less negative emotional states were the ones who perceived more social support. As perceived social support is also related to extraversion, which is strongly related to positive affect (DeNeve and Cooper 1998), being free from experiencing negative feelings and experiencing positive feelings could be related to the positive perception of the quality of social support received from others. Swickert et al. (2010) noted an interaction model where high extraversion, low neuroticism and low openness predicted high levels of perceived social support, which supports the idea that not only experiencing less negative emotions but also experiencing positive emotions are important to enhance the quality of social support and so, affect could explain the relationship between personality traits and perceived social support.

Regarding the stability of individual differences, the results showed that individual's relative standing in both personality traits and perceived social support changed very little over the 4-year time period. These results are in line with what had already been identified in the literature concerning the rank-order consistency of personality traits. Roberts and DelVecchio (2000) conducted a meta-analysis to test the consistency of personality traits at different periods of life using age categories. Personality traits of the age category that was close to that of our sample showed similar rank-order stability, which supports the idea that traits are quite consistent in middle adulthood (Terracciano et al. 2010), but not consistent enough to infer a complete lack of change in personality traits. Less is known about the rank-order stability of perceived social support. In our study, the autoregressive path coefficient of perceived social support and those of each personality trait were comparable. Allemand and his colleagues (Allemand et al. 2015) found that perceived social support was less stable in terms of rank-order stability than the Big Five personality traits. However, the stability correlation of perceived social support was quite high ($r = .62$) and comparable to what we found in the present study with a shorter time-lag. The type of social support we investigated in this study could explain this stability. Indeed, we focused on functional and qualitative types of social support, particularly on affective and confidant support. Therefore, we evaluated how people perceived the quality of the support received from others in terms of love and affection and the possibility to share their personal experiences, regardless of the more dynamic construct of quantity of social support. The social network of a person can grow or shrink quite easily in a period of time while maintaining the same level of perceived quality of support. A high perception of functional social support could be fulfilled by a single close supportive person as long as their relationship is strong enough to not break and to be maintained over a period of time.

Perceived Social Support as a Predictor of Personality Trait

By comparing the four competing models, the results showed that the best fitting model of the association between perceived social support and personality traits was the reciprocal one. This model included cross-lagged paths suggesting a reciprocal predictive relationship between personality traits and perceived social support, whereby each of them explains variance in the other four years later. Although the reciprocal model showed the best fit indices, a reciprocal relationship was only found in one instance between perceived social support and neuroticism. This means that our second hypothesis is only partially confirmed. Not only did neuroticism negatively predict perceived social support at the subsequent time point, but perceived social support also predicted neuroticism four years later. In other words, adults with a higher level of emotional instability tend to perceive less social support, even when controlling for their previous perception of social support. This relationship also works in reverse; adults who perceive less social support tend to have a higher level of emotional instability, even when controlling for their prior level of emotional instability. Moreover, neuroticism predicted perceived social support more than the inverse 4 years later. A way to test the significance of this relationship was to create a trimmed model with a reciprocal relationship only between neuroticism and perceived social support, keeping only the reversed cross-lagged paths for the rest and comparing it to the reciprocal model. The results showed that this trimmed model had the same predictive power as compared to the fully reciprocal model, highlighting out the importance of neuroticism in perceived social support. Specifically, it highlights the long-term disadvantage of experiencing negative emotional states on the positive perception of social support and, less strongly, on the long-term buffering effect of positive perceptions of social support on experiencing negative emotions.

The reversed cross-lagged paths from perceived social support at the first time point to personality traits at the second time point were all significant, which confirm our third hypothesis. Prior levels of perceived social support predicted all later personality trait levels, controlling for the prior personality trait level. These results support the contextual perspectives of personality development, which posit that personality traits could be influenced by some environmental factors, even during middle adulthood. Moreover, our results showed that only perceived social support predicted personality traits, and not vice versa, except for neuroticism. This finding is new and opens spaces for further research considering perceived social support as a potential predictor of personality traits. In many studies, the authors put forwards the idea that individuals select or create social networks and perceive support from others consistent with their personality (Allemand et al. 2015; Asendorpf and Wilpers 1998; Swickert et al. 2002). For example, extroverted people, because of their social-seeking tendencies, would perceive more social support (Swickert et al. 2002). However, according to our findings, only emotionally stable individuals, because of their tendency to experience less negative feelings, would perceive more social support. Otherwise, it is the individuals who perceived more supportive behaviors from others that would mostly be more stable emotionally, more extroverted, and more agreeable after a period of 4 years. Supportive context seems to create an ambience that is favorable for enacting positive personality trait development, especially of the traits that define individuals' interpersonal style and the trait of emotional stability. Perceived social support may thus be a

social resource that influences individual positive resources by reducing the tendency to experience unpleasant emotions and increasing the tendency to experience positive emotions, enhancing social skills and improving social interactions, which, in turn, could help to overcome health issues and increase subjective well-being and quality of life. Pocnet et al. (2016) found that social support and some personality traits (neuroticism, extraversion, and conscientiousness) were significantly related to subjective quality of life. They concluded that both social resources and individual resources could help to address stressors and thus increase the tendency to look on the positive side of life. However, they studied the effect of these resources separately and did not consider either an interaction effect or mediation effect. Our study suggests the possibility of a long-term mediation effect of individual resources on the relationship between social resources and life-related positive outcomes.

In sum, these findings do not support the personality-relationship transactions paradigm in which the personality traits and social environment influence each other over time. Perhaps such reciprocal influence could exist between emotional stability and perceived social support, but more than two time points are needed to confirm that individuals, based on their emotional stability, perceive differently the quality of the social support received from others, which in turn feeds back into emotional stability. Nevertheless, our study suggests that perceived social support may promote positive personality trait development and increase emotional stability and prosocial personality traits, which strengthen individuals' resources and strengths.

Limitations and Future Directions

Some limitations are worth noting as additional directions for future research. First, future studies should collect more than two waves of data to more accurately chart the longitudinal reciprocal effects of perceived social support and personality traits. Even though in our study, a reciprocal effect between neuroticism and perceived social support as well as cross-lagged effects of perceived social support on all personality traits were found, most of the previous research nevertheless suggests a cross-lagged effect of personality traits on perceived social support. Therefore, it is important to have more than two measurement points and test a reciprocal model to clarify the longitudinal relationship between these two constructs.

This study was useful for identifying the reciprocal relationship between personality traits and perceived social support across time. Cross-lagged models are useful for initial research into the effect of one construct on another, but these models do not provide data regarding the mean-level change in a variable over time and intra-individual changes (Selig and Little 2012), and this is a limitation of this study. Furthermore, these models are sensitive to time lags. Having different time points with different time lags could help to clarify the role of the time lag and how it could impact the relationship between personality traits and perceived social support.

Another limitation of this study would be the instrument we used to assess perceived social support. Although it identifies two types of functional perceived social support, namely, affective and confident support, the two were so highly correlated that there were almost no differences in the results when considering these types of support, which explains our choice to have

considered only the global score for this study. However, different types of perceived social support exist (e.g., emotional support, instrumental support, and informative support) and could be differently related to personality traits. Future research should use a scale that takes into account these types of perceived social support and longitudinally analyze their reciprocal relationships with various personality characteristics. For instance, further studies should look at not only the Big Five traits but also, for example, character strengths that are morally valued and positive traits of personality (Peterson and Seligman 2004). Many research studies on character strengths highlight their significant positive role in one's life by buffering against difficulties and improving one's relationships and health, but few have been interested in factors that enhance character strengths and their use. A recent study (Lavy et al. 2017) using a daily diary method noted that social support from a superior at work predicted increased strengths' use the following day. If the use of strengths can be improved in such a short time, we can expect an impact of perceived social support on the development of character strengths over a longer-term period whether at work or in life.

Cross-lagged models allow the possibility to run multi-group analysis and consider the possibility that a third variable may moderate the relationship between personality traits and perceived social support. In our study, we introduced age, gender, life events, and household type as possible confounders that could be driving the association between personality traits and perceived social support. Having made the choice to not introduce them as moderator results from their low associations with the primary variables of interest. However, it is important to consider the possible moderators of these associations such as life period (adolescent, early adulthood, middle adulthood, and old-age) and run multi-group analyses in further research.

Conclusion

The present research extends prior studies on the relationships between the personality traits and perceived social support in middle adulthood by examining their association over 4 years using a cross-lagged path analysis. The research support cross-lagged effects of perceived social support on all personality traits within a 4-year time-lag, while controlling for age, gender, life events, and household type. Emotional stability has also a reversed cross-lagged effect on perceived social support within the same time-lag. These results support the contextual perspective of personality development, which consider social environment as a potential predictor of personality traits. Perceived greater social support may lead to positive personality changes, which may facilitate one to consider the positive side of one's life.

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