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Does intergroup contact affect personality?

A longitudinal study on the bidirectional relationship between intergroup contact and personality traits

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Does intergroup contact predict personality?
A longitudinal study on the bidirectional relationship between intergroup contact and personality traits

Abstract

We conducted a longitudinal study to test whether, in addition to being predicted by personality, intergroup contact is longitudinally associated with personality traits. Participants were 388 majority (Italian) and 109 minority (immigrant) first-year high-school students. Results revealed a bidirectional relationship between contact and personality: quality of contact was longitudinally associated with greater agreeableness and openness to experience, while agreeableness and openness to experience were longitudinal predictors of contact quality. An unexpected negative longitudinal association also emerged between quantity of contact and agreeableness. These effects were not moderated by group of belonging (majority vs. minority). Our findings highlight the importance of integrating research on intergroup contact with research on personality.

Keywords: intergroup contact, personality, Big Five, prejudice, intergroup relations, longitudinal.

Decades of research have convincingly demonstrated that the contact hypothesis is one of the most effective situational approaches for reducing prejudice (Allport, 1954; Hodson & Hewstone, 2013; Pettigrew & Tropp, 2006; Vezzali & Stathi, 2017). However, despite the established role of personality factors in influencing prejudice (e.g., Sibley & Duckitt, 2008), much less attention has been placed on the interplay between intergroup contact as a situational variable and personality factors. Following the call by Hodson (2009; see also Hodson & Dhont, 2015; Hodson, Turner, & Choma, 2017), who argued for the importance of considering both situational and individual difference variables in prejudice research, Turner, Dhont, Hewstone, Prestwich, and Vonofakou (2014) provided cross-sectional evidence that personality variables as identified by the five-factor model of personality (FFM; e.g., McCrae & Costa, 1999) are important antecedents of intergroup contact and outgroup attitudes.

Our primary aim was to go beyond results by Turner et al. (2014) by examining whether intergroup contact can be longitudinally associated with personality. A second aim was to replicate and extend Turner et al.'s findings with longitudinal analyses, by showing that personality has a longitudinal effect on intergroup contact. In order to test our hypotheses, we adopted a longitudinal design by considering ethnic majority and minority members enrolled in the first year of high-school. To our knowledge, this is the first study to examine the longitudinal relationship between contact and personality variables and to test the hypothesis that contact is associated with personality over time.

The contact hypothesis

There is now substantial evidence showing that intergroup contact is an effective tool for reducing prejudice (Hodson & Hewstone, 2013). The meta-analysis by Pettigrew and Tropp (2006), taking into account 515 studies and more than 250,000

participants, demonstrated that contact is negatively associated with prejudice, and this effect is more pronounced when Allport's (1954) contact conditions (equal status, cooperation, common goals, and institutional support) are present. Moreover, contact effects are not limited to the outgroup members encountered; instead, they generalise beyond the contact situation to the whole outgroup category and to outgroups uninvolved in the contact situation (secondary transfer effect; Pettigrew, 2009; Tausch et al., 2010).

One limit of the contact hypothesis is that most of the research conducted is correlational (cf. Christ & Wagner, 2013). For instance, 71% of samples included in Pettigrew and Tropp's (2006) meta-analysis were obtained with cross-sectional designs. To the extent that experimental methods generally focus on short time periods and often lack external validity, a partial solution would be to conduct longitudinal research which, although not suited to test causal relations, nonetheless can provide information on the association between constructs over time. There is now evidence that contact has longitudinal effects on improved outgroup attitudes (e.g., Binder et al., 2009; Swart, Hewstone, Christ, & Voci, 2011), also when tapped at an implicit level (Vezzali, Lolliot, Trifiletti, Capozza, & Hewstone, 2017). However, this evidence only concerns the relationship between intergroup contact and outgroup attitudes.

We are aware of only three studies examining the causal or longitudinal relationship from intergroup contact to one individual difference variable deeply rooted in personality and strongly associated with prejudice, social dominance orientation (SDO; Sidanius & Pratto, 1999). Dhont, Van Hiel, and Hewstone (2014) found in one experimental intervention and one longitudinal study that positive contact was associated with a reduction in SDO. Shook, Hopkins, and Koech's (2016) results

revealed that college students' level of SDO decreased over time as a function of assignment to interracial vs. same-race rooms. However, the authors did not test the relationship between contact and more comprehensive facets of personality, such as the dimensions identified by the FFM (McCrae & Costa, 1999). Moreover, since the SDO scale (and also the right-wing authoritarianism scale; Altemeyer, 1998) is thought to reflect social attitudes and values rather than generalised behavioural dispositions (cf. Sibley & Duckitt, 2008), it is questionable that SDO represents a personality trait in the strict sense. Therefore, additional studies are needed to show that contact can affect personality. As an additional limitation, Dhont et al. (2014) only focused on the majority group; it is important to test whether the relationship between contact experiences and personality operate regardless of group status. To address this point, in this study we will examine the bidirectional relationship between contact and personality among majority and minority group members.

Intergroup contact and personality

The five-factor model of personality (McCrae & Costa, 1999), one widely accepted approach for investigating personality traits that has helped systematise personality measurement, identifies five broad major personality traits that define the individuals' personality. Individuals high in agreeableness are warm, characterised by the tendency to avoid conflicts and to cooperate with others. People with high levels of openness to experience enjoy engaging in new experiences in several domains, are imaginative and nonconformist. Extraverts are sociable, have more friends, and seek out and enjoy social interactions. Individuals high in conscientiousness have high task orientation and are characterised by goal pursuit. Neurotic people are often worried, insecure and experience negative affect.

Although some authors (e.g., Hodson, 2009; Hodson & Dhont, 2015; J. W. Jackson & Poulsen, 2005) have advocated the need to integrate research on prejudice with research on personality, research linking intergroup contact and personality is surprisingly scarce (for an exception, see Boccato, Capozza, Trifiletti, & Di Bernardo, 2015, who tested cross-sectionally secure attachment, an individual difference variable, as an antecedent of intergroup contact). Some work in this direction has concerned SDO (Sidanius & Pratto, 1999) and right-wing authoritarianism (RWA; Altemeyer, 1998), two variables strongly associated with prejudice (Sibley & Duckitt, 2008). For instance, various studies have demonstrated that SDO and RWA can moderate contact effects, such that effects of contact are stronger for those high in SDO or RWA (Dhont & Van Hiel, 2009; Hodson, 2011; Hodson et al., 2017). In other words, contact has stronger effects among individuals who need it, those who are more prejudiced. Moreover, Dhont et al. (2014) and Shook et al. (2016) revealed that contact had causal effects on reduced SDO. However, as noted above, SDO and RWA may be assimilated to social attitudes and values rather than personality traits (Sibley & Duckitt, 2008).

We are aware of only four studies examining the relationship between the personality traits identified by the FFM (McCrae & Costa, 1999) and intergroup contact. J. W. Jackson and Poulsen (2005) found in two studies that agreeableness and openness to experience were associated with improved outgroup attitudes, and these relationships were mediated by the quality of contact experiences. Turner et al. (2014) conducted two studies also considering extraversion. In the first study, both agreeableness and openness to experience were positively associated with outgroup attitudes, whereas the relationship between extraversion and improved outgroup attitudes was mediated by a higher number of cross-group friendships. These results

were replicated in the second study, where intergroup anxiety was added as a further mediator between cross-group friendships and outgroup attitudes, and mediated the effects of the three personality variables on improved outgroup attitudes.

The studies by J. W. Jackson and Poulsen (2005) and by Turner et al. (2014) demonstrate that intergroup contact and personality are related constructs that should be considered together in the examination of prejudice. However, they were correlational, and either focused on the majority group (Turner et al., 2014) or, when including minority group members, did not examine their relationship with the majority group (J. W. Jackson & Poulsen, 2005). In the present study, we will test personality traits (agreeableness, openness to experience, extraversion) as both antecedents and consequences of contact with a longitudinal design by including participants from both majority and minority. By considering both majority and minority members, we will also be able to test whether the longitudinal association between personality and contact differs depending on one's group.

Is the relationship between intergroup contact and personality bidirectional?

While previous research has focused only on personality as a predictor of intergroup contact, in this paper we argue that contact and personality may have a *bidirectional* longitudinal relationship. That is, we expect FFM traits of agreeableness, openness to experience and extraversion to predict experience of intergroup contact over time, but in addition, we also propose that those intergroup contact experiences may predict participants' levels of agreeableness, openness to experience, and extraversion over time. Below we outline the rationale for these predictions.

The expected role of FFM traits as a predictor of contact draws on the concepts of situational evocation and selection (see Buss, 1989; J. W. Jackson and Poulsen, 2005;

Turner et al., 2014). The concept of *situational evocation* postulates that, because of their personalities, people change the social situations they are in through their presence, while *situational selection* refers to the notion that personality characteristics affect which situations people seek out (Ickes, Snyder, & Garcia, 1997). J. W. Jackson and Poulsen proposed that people high on openness (who like experiencing new and different things) and agreeableness (who are positively predisposed to other people in general) will be more likely to seek out favourable intergroup contact experiences (situational selection) and be more likely to act in a way that facilitates favourable interactions (situational evocation). Turner et al. (2014) made a similar argument for extraversion. The typical extravert is characterised as someone who has many friends, is good at interacting with others, and may therefore be especially adept at ensuring that social interactions are smooth and successful. (e.g., Eddy & Sinnett, 1973; Jensen-Campbell & Graziano, 2001). It therefore follows that they may be especially successful at engaging in contact with outgroup members. The findings of J. W. Jackson and Poulsen and Turner et al. (2014) support this argument; demonstrating that FFM traits predict positive contact experiences over time will provide stronger evidence.

Another reason why openness to experience, in particular, might predict later contact experiences, is that – as a trait associated with multicultural success (Boccato et al., 2015; Leung & Chiu, 2008) – it might improve intergroup expectancies (which are often negative; Vorauer, 2006). Whilst negative norms and expectancies about intergroup contact (e.g., perceiving both ingroup and outgroup members to be reluctant to engage with one another) are associated with greater avoidance of contact and a reduced preference for cross-group friendships (e.g., Jugert, Noack, & Rutland, 2011;

Plant & Devine, 2003), by promoting positive expectancies, openness to experience should promote positive intergroup contact.

Our hypotheses regarding the expected predictive value of intergroup contact on FFM traits over time are perhaps somewhat controversial, as traditionally personality traits have been seen as stable, with children endowed with a particular temperament from birth, and any changes over time being attributable to either intrinsic maturation processes brought about by genetics, or measurement error (e.g., Costa and McCrae, 2006). However, there is now a growing body of evidence to suggest that personality is in fact influenced by life events, for example alterations in marital status (Specht, Egloff, & Schmukle, 2011), relationship quality (Neyer & Lehnart, 2007), and workplace experiences (Roberts, Caspi, & Moffitt, 2003).

Perhaps more importantly for the current research, recent theory and research suggest that personality changes may be especially likely between adolescence and young adulthood (e.g., Bleidorn et al., 2013; Roberts, Walton, & Viechtbauer, 2006). According to social investment theory (Roberts, Wood, & Smith, 2005), the transition from adolescence to adulthood is characterised by various new social roles, regarding work, family, and community, each of which are accompanied by expectations concerning responsibility, loyalty and dependability. How young people behave in these roles may lead to reward (e.g., admiration from others, pride in oneself) or punishment (disrespect from others, shame in oneself), which in turn may drive changes in personality (e.g., Bleidorn, 2015; Hennecke, Bleidorn, Denissen, & Wood, 2014; Roberts & Jackson, 2008). Put simply, as a consequence of taking on new roles that require novel behaviours, and observing themselves alongside the reactions of others in those new situations, individuals may come to see themselves in a different light (J. J.

Jackson, Hill, Payne, Roberts, & Stine-Morrow, 2012; J. J. Jackson, Thoemmes, Jonkmann, Lüdke, & Trautwein, 2012; Roberts, Wood, & Caspi, 2008). Supporting this argument, studies among adolescents and young adults show that engaging in a high intensity educational programme (Dahmann & Anger, 2014), taking part in vocational training (Lüdke, Roberts, Trautwein, & Nagy, 2011), engaging in a romantic relationship (Neyer & Lehnhart, 2007), and experiencing chronic ill health (Elkins, Kassenboehmer, & Schurer, 2016), all predict changes in personality over time.

The social investment theory approach shares similarities with self-perception theory (Bem, 1967), the idea that people observe their own behaviour and accordingly make inferences about themselves. Together, these theories form the basis of our predictions regarding the role of intergroup contact as a predictor of FFM traits. With respect to the trait of agreeableness, it follows that if an individual observes themselves making a particular effort to engage in positive contact with other people regardless of their background, they may well infer that they are an agreeable person. Indeed, increased agreeableness seems to be a necessary disposition in order to maintain positive cross-group relations given the challenges involved when compared to intragroup relations (Towles-Schwen & Fazio, 2006).

Regarding openness to experience, experiencing ethnic diversity in a positive way, via high quality of contact, may be a motivating factor, fuelling the desire for new experiences. Van Dick and colleagues (2004; see also Turner, Hewstone, & Voci, 2007), for example, found that experiencing high-quality contact is associated with a greater perception that such contact is personally important, valuable in helping those involved achieve certain goals, for example allowing people to develop skills in interacting with members of other groups and to benefit from new experiences. By

spending time with outgroup members and learning new things from them, people might perceive contact to be personally important, and infer that they must be the kind of person who likes to learn from new and varied experiences (Bem, 1967). Finally, if people engage in intergroup contact, despite the fact that intergroup encounters are typically less comfortable and more anxiety provoking than intragroup encounters (e.g., Trawalter, Richeson, & Shelton, 2009), they might infer that they are the sort of person willing to throw themselves into a variety of social situations, and thus must be quite extrovert in nature.

It is important to acknowledge that most studies that have examined the impact of environmental factors on young people look at change over several years, whereas the time period examined in the current study is less than one year. However, neither social investment theory nor self-perception theory suggest that the time period required for self-perceptions to change needs to be extensive. We argue that given that young people typically spent a significant proportion of the day, five days a week, in the school environment, and may experience intergroup contact over several months, they will have sufficient opportunity to observe their own behaviour, and the reactions of peers and authority figures, and to change their self-perceptions accordingly. Indeed, there is already some evidence that external events can influence personality over a relatively short time span. J. J. Jackson, Hill, et al. (2012), for example, found that high-school students who later experienced military service showed lower levels of agreeableness two years later compared to students who did not take part in military service, even when taking into account expected normative changes in agreeableness around the time of leaving high-school. Moreover, J. J. Jackson, Thoemmes, et al. (2012) found that older adults who regularly engaged in sudoku and crossword puzzles

as part of a 16-week intervention showed increases in openness to experience 30 weeks later compared to a control group.

In sum, in the present study we examined the effects of intergroup contact experiences among students starting their first year in high-school. We expect that on the one hand, students who are agreeable, open to experience and extroverted will experience more positive contact. On the other hand, we also expect to find that as students have the opportunity to engage in positive contact experiences with children from different backgrounds to themselves, they will come to perceive themselves as relatively extraverted, agreeable individuals who are open to new experiences.

It is worth noting that, although contact effects are generally stronger for majorities compared with minorities (Tropp & Pettigrew, 2005), we did not expect differences based on group of belonging. While there are several factors that can inhibit the effects of contact on outgroup attitudes among minority members (e.g., expectations of being the target of prejudice, previous negative experiences, etc.; see Shelton, Richeson, & Vorauer, 2006), our focus here is on personality rather than outgroup attitudes. We argue instead that intergroup contact may represent a significant life experience for both majority and minority members. In any case, considering both majority and minority members will provide us with the opportunity to explore whether effects of contact on personality (and vice versa) differ between majority and minority individuals.

The present research

We conducted a longitudinal study with the aim of testing the bidirectional relationship between intergroup contact and personality traits. Participants were Italian (majority) and immigrant (minority) students enrolled in the first high-school year.

They were asked to complete two questionnaires, one a short time after the beginning of the school year (T1) and one approximately one month before the end of the school year (T2).

Based on the literature reviewed above, we make the following predictions:

H1: quantity and/or quality of contact at T1 should be longitudinally associated with greater agreeableness, openness to experience and extraversion at T2.

H2: greater agreeableness, openness to experience and extraversion at T1 should be longitudinally associated with higher contact quantity at T2 and with more positive contact quality at T2.

To the extent that effects of quality of contact are generally stronger compared to effects of quantity of contact (e.g., Dhont et al., 2014), the above predicted effects are especially expected for contact quality.[1]

Method

Participants and procedure

Data for this study were collected in mixed classes of eight high-schools located in a Northern Italian city. Data were collected in two waves: at the beginning (T1, November 2014) and at the end (T2, May 2015) of the first school year. The research was presented as a study on social attitudes. The distinction between Italian and immigrant participants was made on the basis of the schools' indications, taking into account the family background of children.

The initial sample (T1) consisted of 567 participants. Of these, 5 participants were deleted because of excessive number of missing data (>25%); moreover, 65 participants did not take part at wave 2 and were therefore not included in subsequent analyses. Therefore, the final sample consists of 497 participants (388 Italians and 109

immigrants; 265 males, 232 females; mean age at T1 = 14.15 years, *SD* = 0.66). In the section of Preliminary analyses, in order to check for selective attrition, we will refer to the distinction between matched participants (that is, participants that we were able to match across the two waves because they completed both assessments; *N* = 497) and unmatched participants (participants that we were not able to match across the two waves because they only completed the first assessment; *N* = 65).

Participants in each wave were asked to complete an identical questionnaire during class time. The questionnaire was equivalent for majority and minority members, except for the target group (Italians were asked about immigrants, and vice versa).

Measures

Contact quantity. The frequency of contact was assessed with four items, adapted from previous studies on intergroup contact (see Lolliot et al., 2015), asking participants about the amount of contact with the outgroup in general, at home, at school, during free time. For all items, a 5-point scale was used, ranging from *none* (1) to *very much* (5). Items were combined in a single index of contact quantity (alphas = .83 and .84 at T1 and T2, respectively).

Contact quality. Quality of contact with outgroup members was assessed with four bipolar scales (e.g., competitive/cooperative; hostile/friendly; e.g., Capozza, Trifiletti, Vezzali, & Favara, 2013). On the 5-point scale, 1 denoted the negative and 5 the positive pole; 3 was the neutral point. Items were averaged (alphas = .77 and .79 at T1 and T2, respectively), with higher scores reflecting higher quality of intergroup contact.

Personality factors. In line with Turner et al. (2014), we measured agreeableness, openness to experience and extraversion with the Big-Five Inventory

(BFI; John, Donahue, & Kentle, 1991; see also Benet-Martinez & John, 1998; John, Naumann, & Soto, 2008). The instrument included 9 items for agreeableness, 10 items for openness to experience, 8 items for extraversion. For each item, participants indicated whether the characteristic could be applied to them by using a 5-point scale ranging from 1 (s*trongly disagree*) to 5 (*strongly agree*); 3 was the neutral point (*neither agree nor disagree*). Items were averaged in three composite scores, one for each personality trait, with higher scores indicating higher agreeableness (alphas = .63 and .68 at T1 and T2, respectively), openness to experience (alphas = .71 and .72 atT1 and T2, respectively), and extraversion (alphas = .71 and .70 at T1 and T2, respectively).

Results

Introductory analyses

To check for selective attrition, participants who completed both waves (matched participants, constituting the final sample $N = 497$) and those who only completed the first wave (unmatched participants, $N = 65$) (see Participants and procedure section) were compared by means of a multivariate analysis of variance (MANOVA) on the following variables: age, contact quantity, contact quality, agreeableness, extraversion, openness to experience.

Results showed a multivariate difference between matched and unmatched participants, $F(6,555) = 3.36$, $p < .01$, $\eta^2_p = .04$. The univariate statistics showed that, compared with unmatched participants, matched participants: were significantly younger, mean age = 14.15, $SD = 0.66$, vs. mean age = 14.43, $SD = 0.97$, $F(1,560) = 9.32$, $p < .01$, $\eta^2_p = .02$; reported lower quantity of contact, $M = 2.79$, $SD = 0.99$, vs. $M = 3.18$, $SD = 1.02$, $F(1,560) = 8.72$, $p < .01$, $\eta^2_p = .02$. The distribution of males and

females did not differ between matched and unmatched participants, $\chi^2(1) = 0.02$, $p = .878$. Although these results suggest the presence of an attrition bias, differences in mean scores were not large, as suggested by effect size values.

Means and standard deviations for the study variables at T1 and T2 are reported in Table 1; correlations are shown in Table 2.

To inspect differences between majority and minority members, we performed a series of 2 (Group: majority vs. minority) × 2 (Time: T1 vs. T2) mixed-model ANOVAs, with repeated measures on the Time factor. Replicating prior research conducted in the same context, the main effect of Group was significant for contact quantity and contact quality, Fs(1,495) ≥ 33.41, ps < .001, η^2_ps ≥ .06. As can be noted in Table 1, compared to Italians, immigrants reported greater contact frequency and higher quality of contact. Moreover, the main effect of Group was significant for openness to experience, $F(1,495) = 7.21$, $p = .008$, $\eta^2_p = .01$, with immigrants declaring of being more open to new experiences than Italians.

The main effect of Time was significant for agreeableness, $F(1,495) = 8.78$, $p = .003$, $\eta^2_p = .02$, which decreased from T1 to T2.[2]

Main analyses

The hypothesised longitudinal relationships were tested using structural equation modeling with latent variables using LISREL (Jöreskog & Sorbom, 2006). For quantity and quality of contact, each subset of items (four for each construct) served as the manifest indicators for the respective latent construct (see Swart et al., 2011). For each personality factors the manifest indicators were averaged into three parcels (Little, Cunningham, Shahar, & Widaman, 2002). Item parceling allows to maintain an adequate ratio of cases to parameters and to reduce measurement error associated with

individual items. The goodness-of-fit of the tested models was evaluated using the chi-square statistic (χ^2), the χ^2/df ratio, the comparative fit index (CFI), the root-mean-square error of approximation (RMSEA), and the standardised root-mean-square residual (SRMR). The fit of a model is satisfactory with a χ^2/df ratio smaller than 3 (Kline, 2010), a CFI value equal or greater than .95, an RMSEA value close to or lower than .06, an SRMR close to or lower than .08 (Hu & Bentler, 1999).

Longitudinal measurement model

To investigate whether the measurement model could be considered invariant over time, we first tested a longitudinal confirmatory factorial analysis (CFA) including latent variables from the two time points with freely estimated parameters. This unrestricted model was then compared to a second model in which factor loadings within constructs across the two time points were constrained to be equal. The corrected chi-square difference test (Satorra & Bentler, 2001) was used to compare the two models. Partial measurement invariance is considered as a sufficient criterion for comparing latent models (Byrne, Shavelson, & Muthén, 1989; see also Dhont et al., 2014; Swart et al., 2011). The fit of the unrestricted model was satisfactory: $\chi^2(482) = 1279.18$, $p \cong .00$, $\chi^2/df = 2.65$, CFI = .94, RMSEA = .059, SRMR = .055, supporting the factorial validity and construct independence of the latent factors at the two time points (Dhont et al., 2014; Swart et al., 2011). The more restricted model showed a good fit: $\chi^2(494) = 1288.30$, $p \cong .00$, $\chi^2/df = 2.61$, CFI = .94, RMSEA = .058, SRMR =.056. The corrected chi-square difference test showed that the restrictions imposed in this second model did not result in a significantly worse fit compared to the unrestricted model $\Delta\chi^2(12) = 9.12$, $p = .692$, thus confirming partial measurement invariance of the model.

Longitudinal model

To test the temporal relationship between personality factors, contact quantity, and contact quality, we tested a cross-lagged model (see Figure 1) including: a) the autoregressive paths (within constructs relationships over time), b) the paths from personality factors at T1 to contact quantity and contact quality at T2; c) the paths from contact quantity and contact quality at T1 to personality factors at T2. At T2, contact quantity and quality were allowed to correlate, as well as the three personality factors. This model showed an acceptable fit: $\chi^2(496) = 1305.70$, $p \cong .00$, $\chi^2/df = 2.63$, CFI = .94, RMSEA = .058, SRMR = .057.

As can be seen in Figure 2 (see also Table 3), supporting H1, contact quality at T1 was longitudinally associated with agreeableness and openness to experience at T2. Unexpectedly, contact quantity at T1 was negatively associated with agreeableness at T2. Neither the longitudinal relationship between contact quality at T1 and extraversion at T2, nor the relationship between contact quantity at T1 and extraversion and openness to experience at T2 were significant. As to the effects of personality factors, in line with H2, agreeableness and openness to experience at T1 were longitudinally associated with contact quality at T2; the longitudinal relationships between personality factors at T1 and contact quantity at T2, as well as the longitudinal association between extraversion at T1 and contact quality at T2, were instead nonsignificant.[3]

Testing the model separately for majority and minority subsamples

Although not the main focus of the present article, and despite we did not hypothesise differences in the bidirectional relationship between contact and personality for majority compared with minority members, we tested with exploratory purposes whether group of belonging moderated the tested longitudinal relationships.

A multigroup analysis with observed variables was applied. Number of cases in the immigrant subsample was not sufficiently large to perform SEM with latent constructs (the number of cases is only slightly larger than the number of parameters to estimate). We compared a model in which parameters were allowed to be freely estimated across the two groups with a model in which path coefficients were constrained to be equal. The two models showed an acceptable fit: $\chi^2(28) = 53.50$, $p = .003$, $\chi^2/df = 1.91$, CFI = .98, RMSEA = .059, SRMR =.052 (unrestricted model); $\chi^2(45) = 71.12$, $p = .008$, $\chi^2/df = 1.58$, CFI = .98, RMSEA = .047, SRMR =.070 (model with the equality constraint). The corrected chi-square difference test indicates that the restriction did not result in a significant drop of the model fit: $\Delta\chi^2(17) = 17.62$, $p = .413$, suggesting that path coefficients were not moderated by group of belonging.

Discussion

We conducted a longitudinal study with majority and minority group members enrolled in the first year of high-school in order to examine the bidirectional relationship between intergroup contact and personality traits. As stated by Specht et al. (2011; see also Luhmann, Orth, Specht, Kandler, & Lucas, 2014), longitudinal data are required if the aim is to examine variations in personality. Results generally supported predictions, by revealing a bidirectional relationship between contact quality and personality traits (agreeableness, openness to experience).

We note that analyses revealed evidence of attrition effects, such that participants who completed the study, compared with participants who only took part to the first wave, were younger and had lower contact quantity. Differences between means for these variables however were small (see Table 1) and were likely to be

mainly due to the rather large sample size, as indicated by the small effect sizes. Below we discuss the theoretical implications of findings.

Bidirectional relationship between contact and personality traits

Previous correlational research (J. W. Jackson & Poulsen, 2005; Turner et al., 2014) tested personality traits as antecedents of intergroup contact. Our study supports these findings by adopting a longitudinal methodology and by considering both majority and minority perspectives. Specifically, in line with research showing that people shape their environment based on their personality dispositions (e.g., Wrzus, Wagner, & Riediger, 2016), we found that personality traits (agreeableness and openness to experience) were longitudinally related with the positivity of contact experiences. In line with the principles of situational selection and evocation (Buss, 1989; J. W. Jackson and Poulsen, 2005) it appears that students who were higher in agreeableness and openness to experience at the start of their first year of high school were more likely to seek out outgroup members for social interactions, and were more likely to behave in positive ways during those interactions, resulting in them reporting higher quality of contact at the end of their first year of high school. This may reflect more positive expectancies on the part of these individuals. That is, agreeable individuals tend to see the best in others generally, and open individuals are more likely to be positively oriented to unknown situations and therefore may have more positive intergroup expectancies. Individuals high in both of these traits are therefore more likely to assume that members of both the ingroup and outgroup are positively predisposed towards contact, resulting in a positive orientation towards intergroup contact (e.g., Jugert et al., 2011; Plant & Devine, 2003). We are not aware of other studies demonstrating longitudinal associations of personality variables on subsequent contact.

Mirroring J. W. Jackson and Poulsen's (2005) findings, we found reciprocal relationships between contact variables and personality traits only with respect to contact quality, not contact quantity. This result adds to the existing literature showing that contact quality is more relevant than contact quantity (Hodson & Hewstone, 2013). This observation is reinforced by the unexpected negative longitudinal association between contact quantity and agreeableness. In fact, mere quantity of contact may reflect negative in addition to positive contact experiences, which have been shown to produce detrimental effects on intergroup relations (e.g., Barlow et al., 2012; Graf & Paolini, 2017; Paolini, Harwood, & Rubin, 2010). This finding suggests that contact may also have detrimental associations with personality and it is important that individuals experience high-quality contact.

Supporting our hypotheses regarding contact as a predictor of FFM traits over time, we found that quality of contact was longitudinally associated with greater agreeableness and openness to experience. Students who had experienced higher quality intergroup contact at the start of their first year of high school tended to report being more agreeable, and more open to experiences, at the end of their first year of high school. This is the first time that intergroup contact has been shown to be an antecedent of personality. Moreover, these results support the growing body of research which suggests that, in contrast to the traditional perspective that personality traits are stable (Costa & McCrae, 2006), changes in the environment can in fact predict changes in personality over time, even over relatively short time frames, particularly among young people (e.g., J. J. Jackson, Hill, et al., 2012; J. J. Jackson, Thoemmes, et al., 2012; Specht et al., 2011).

The relationship that emerged between intergroup contact and personality over time supports social investment theory (Roberts et al., 2005) which proposes that as young people experience new social roles – in this case, interacting with people from different social backgrounds to themselves – they experience changes in both how they perceive themselves (for example, as a kind, inclusive person, who is confident in engaging with diversity) and how they observe themselves being perceived by others (for example, experiencing approval from teachers and peers). In turn, these observations may lead them to perceive themselves as more agreeable and open (Bem, 1967).

In the case of the observed relationship between quality of contact and agreeableness, given that relations between members of different ethnic groups tend to be more difficult to maintain (e.g., Towles-Schwen & Fazio, 2006), positive experiences with an outgroup member should result in additional efforts by individuals to make them work, behaviour that could be characterised as agreeable. In the case of the observed relationship between quality of contact and openness to experience, positive intergroup contact experiences may remind an individual that contact is valuable, aiding the development of social kills and broadening one's social horizons (Van Dick et al., 2004). In realising that they are motivated to engage in contact, they may well infer that they must be the sort of person who is open to new experiences.

The current study showed changes in personality traits as a result of intergroup contact within one school year, in contrast to most other studies examining the impact of environmental factors on personality in young people, which consider changes over several years (e.g., Elkins et al., 2016). We argue that students in this study who experienced sustained cooperative intergroup contact at school will have had repeated

opportunities to observe their own behaviour, and the reactions of those around them to that behaviour. It is therefore not surprising that changes in self-perceptions, and therefore personality traits, will have occurred within this time frame. Indeed, there is evidence of changes in personality over an even shorter time scale in other research (e.g., J. J. Jackson, Thoemmes, et al., 2012). Nonetheless, we acknowledge that a stronger test of the longitudinal effect of quality of intergroup contact on personality traits would examine changes over several years, from early adolescence to young adulthood. Demonstrating long term and indeed long-lasting effects of experiencing diversity on personality traits would be an exciting extension to the current research, strengthening the argument made by developmental and social psychologists that the school years are the optimal time to introduce contact interventions (e.g., Turner & Cameron, 2016).

Although the longitudinal effects of contact on personality suggest that positive contact experiences affected personality, one may argue that the longitudinal association between contact and personality is the result of selection effects, whereby contact experiences (which influenced personality) stem from personality itself. In other words, individuals may have self-selected themselves, based on their personality, in contact situations, which in turn are associated with personality (and we only captured the relation from contact from personality, without assessing previous effects of personality on contact). However, we argue that self-selection effects, which are often found in personality research (e.g., Specht et al., 2011), would not undermine the significance of our findings: the fact that individuals, based on their personality, decide to engage in contact situations and experience them positively is not in contrast with the fact that contact, once initiated, contributes to shaping personality.

Some unexpected non-significant findings emerged in the research. First, contrary to our predictions, contact quality was not associated longitudinally with extraversion and vice versa. This may reflect the fact that extraversion is related to contact with others, and not specifically to contact with outgroup members (Jensen-Campbell & Graziano, 2001). An extraverted person is thus more likely to have more ingroup as well as outgroup close contacts; assessing only contact with the outgroup, as we did in this study, may have obscured the relationship between extraversion and relationships with others in general. Similarly, positive contact with a specific outgroup may not be predictive of extraversion because it represents a too limited measure of a person's circle of acquaintances; possibly, considering the number of acquaintances *in general* may be more predictive of extraversion over time.

Second, we also acknowledge that we did not find longitudinal associations of personality with quantity of contact, but only with quality of contact. Thus, rather than engaging in *more* contact because of their personality traits, consistent with a person-environment perspective (Roberts et al., 2008), possibly individuals have changed the way they behave during intergroup interactions to better fit their personality tendencies. Engaging in contact in a more positive way may in turn have influenced their outgroup interaction partner who, perceiving a friendlier reception, could also have experienced more positive contact during these interactions and behaved more positively in return. These are however speculations that need to be tested. Moreover, the bidirectional relationship between (quality of) contact and personality is consistent with the idea that individuals have an active role in shaping their personality (McAdams & Olson, 2010) by engaging in positive contact, which in turn contributes to shape their personality.

It is worth acknowledging one alternative explanation for the observed relationship between personality and quality of contact, that people who are more agreeable and open to experiences may be more likely to *perceive* and self-report contact to be of high quality, rather than actually engaging in contact more successfully. This is difficult to disentangle in the current study as we rely on participants' self-reported quality of contact. However future research could examine this issue by observing how participants actually behave during intergroup contact (e.g., West & Turner, 2014; West, Turner, & Levita, 2015), and whether people who are high in agreeableness or openness to experience do, in fact, behave more friendly and positively during such interactions.

Finally, we note that, as predicted, analyses revealed that being in a majority vs. minority did not moderate the longitudinal relationships we tested. Although effects of contact are generally stronger for majority than minority members (Tropp & Pettigrew, 2005), an effect also found in longitudinal studies with respect to quality of contact (Vezzali, Giovannini, & Capozza, 2010), evidence is limited to effects on reduced prejudice. In the case of attitudes, several factors can inhibit contact effects, such as different perspectives between majorities and minorities and negative expectations, therefore preventing the improvement of outgroup attitudes (Shelton et al., 2006). This inhibition effect however is less likely when the outcome is not represented by attitudes towards the person one has contact with, which may in fact be poisoned by negative expectations and previous experiences. In the case of our study, where we examined relationships between contact and personality, we argue that contact can say something about oneself and specifically that having diverse and positive experiences defines one as an agreeable and open person.

Limitations and future directions

A limitation of this study is that we did not examine trait expressions across situations. There is evidence that, although personality traits are fairly stable over time, their expression across time and contexts may vary considerably (Fleeson, 2001). Therefore, it is possible that people express agreeableness and openness to experience in contact situations differently across time and contexts, depending for instance on psychological needs in distinct contexts. In our study we asked individuals to report average levels of quantity and quality of contact with the outgroup. To the extent that both stability and variability in trait expression may contribute to explain behaviour (La Guardia & Ryan, 2007), future studies should examine more closely quantity and quality of contact in specific situations, and consider both stability and variability in trait expressions in contact situations as predictors of actual intergroup behaviour.

Second, we only considered two time points. Ideally, studies on personality variations would require the examination of more time points, including an assessment before the life event triggering personality change happened (Luhmann et al., 2014). However, this would have been complicated since we relied on classic measures of contact, not assessing contact in a specific moment. Rather, we assessed participants' contact at the beginning of the first high-school year. Future studies may consider assessing contact in a specific moment and examine its interplay with personality traits.

Third, since we did not have a control group, it is difficult to disentangle effects obtained for personality from those due to intrinsic maturation. However, it should be noted that participants were of similar age, and that paths emerged as significant did not change when considering age and sex as covariates. In any case, future studies should adopt an *experimental* longitudinal design. For instance, researchers may conduct an

experimental prejudice-reduction intervention based on intergroup contact (considering a control group who does not take part in the intervention) and then assess whether and how personality varies over time.

Fourth, the time span considered does not allow the examination of the stability of personality variation. In fact, variations in personality determined by intergroup contact may not be stable over time. In other words, personality variations in response to life events may be reversible (see Luhmann et al., 2014). This may be especially true when the event triggering personality change is intergroup contact. Especially in multicultural contexts such as that examined in the present study, individuals are likely to be often exposed to members of the outgroup, which can be incorporated into their social network. However, intergroup contact may also be negative, and there is evidence that the effects of negative contact are stronger than those of positive contact (Graf & Paolini, 2017). Future research should look more closely at the stability of personality traits following intergroup contact and examine the effects of negative contact on personality.

As a further idea for future research, consider that recent evidence reveals a strong association between personality traits and prejudice. For example, extraverts display more positive behavioural intentions towards the outgroup (Stürmer et al., 2013), whilst agreeable and open individuals display lower prejudice (Ekehammar & Akrami, 2003) and are more sensitive to stereotype-disconfirming information (Flynn, 2005). Sibley and Duckitt's (2008) meta-analysis, including 71 studies and more than 22,000 participants, confirmed that prejudice and personality are interrelated, revealing that generalised prejudice was significantly predicted by agreeableness and openness to experience. Based on this evidence, future research should replicate the longitudinal

association between contact and personality and in addition test whether personality, in turn, mediates contact effects on reduced prejudice.

Conclusion

By demonstrating the reciprocal interplay between contact and personality traits, our study shows for the first time that the experience of positive intergroup contact has the potential to be longitudinally associated with our personality. Boyce, Wood, Daly, and Sedikides (2015) argued that there is an advantage to changing our personality as a result of the environment, to maximise our 'person-environment fit' (Lewin, 1951; Magnusson & Endler, 1977). When living in an increasingly multicultural world, for example, being open to experience and agreeable will undoubtedly make it easier for a person to navigate intercultural experiences and gain the most benefit from them. Having the personality traits, and associated competencies, to interact positively with others in a diverse world will – as our findings show – result in further positive intergroup contact, generating a cascade of benefits for intergroup relations (Turner & Cameron, 2016). Overall, these findings therefore point to the importance of considering personality in the study of intergroup contact and intergroup relations. By predicting personality over time, the contribution of intergroup contact goes beyond that of "simply" reducing prejudice, and opens the door to future research examining its broader effects on individuals and their interaction with the environment.

Footnotes

1. Paralleling Turner et al. (2014), in the current study we did not focus on neuroticism nor on consciousness, since neither of them are powerful predictors or contact and/or prejudice.
2. An interaction Group × Time also emerged with respect to contact quantity, $F(1,495) = 6.19$, $p = .013$, $\eta^2_p = .01$. Simple effect analyses revealed however only marginal effects, and specifically that over time contact quantity tended to decrease among immigrants, $F(1,495) = 3.48$, $p = .063$, $\eta^2_p = .01$, and tended to increase among Italians, $F(1,495) = 3.22$, $p = .074$, $\eta^2_p = .01$.
3. When including age and gender as covariates, the paths emerged in the longitudinal regression model remained significant.

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Table 1. Means and standard deviations (in parentheses) for the study variables. $N = 497$.

		Measure				
		Contact quantity *M* (*SD*)	Contact quality *M* (*SD*)	Agreeableness *M* (*SD*)	Openness to experience *M* (*SD*)	Extraversion *M* (*SD*)
	Whole sample	2.79 (0.99)	3.67 (0.78)	3.70 (0.56)	3.23 (0.64)	3.54 (0.67)
T1	Italians	2.46 (0.77)	3.57 (0.79)	3.70 (0.60)	3.20 (0.66)	3.52 (0.69)
	Immigrants	3.99 (0.74)	4.04 (0.63)	3.71 (0.42)	3.37 (0.56)	3.60 (0.60)
	Whole sample	2.82 (0.95)	3.65 (0.76)	3.61 (0.60)	3.23 (0.63)	3.50 (0.65)
T2	Italians	2.53 (0.78)	3.58 (0.74)	3.61 (0.60)	3.20 (0.63)	3.48 (0.68)
	Immigrants	3.85 (0.79)	3.90 (0.76)	3.62 (0.59)	3.35 (0.60)	3.53 (0.55)
	Whole sample	2.80 (0.90)	3.66 (0.65)	3.66 (0.51)	3.23 (0.57)	3.52 (0.60)
T1-T2	Italians	2.49 (0.68)	3.58 (0.66)	3.66 (0.53)	3.19 (0.58)	3.50 (0.62)
	Immigrants	3.92 (0.66)	3.97 (0.56)	3.67 (0.43)	3.36 (0.51)	3.57 (0.50)

Table 2. Correlations between the study variables, $N = 497$.

	1	2	3	4	5	6	7	8	9	10
1. Contact quantity (T1)	-									
2. Contact quality (T1)	.39***	-								
3. Agreeableness (T1)	.02	.24***	-							
4. Openness to experience (T1)	.04	.13**	.23***	-						
5. Extraversion (T1)	.13**	.02	.18***	.13**	-					
6. Contact quantity (T2)	.69***	.36***	.00	.04	.08	-				
7. Contact quality (T2)	.22***	.41***	.22***	.17***	.03	.38***	-			
8. Agreeableness (T2)	-.01	.23***	.55***	.11*	.05	-.01	.28***	-		
9. Openness to experience (T2)	.04	.17***	.20***	.61***	.08	.07	.21***	.26***	-	
10. Extraversion (T2)	.10*	.06	.13**	.09*	.64***	.09†	.08†	.18***	.12**	-

*$p < .05$; **$p < .01$; ***$p \leq .001$.

Table 3. Paths (γ standardized coefficients) in the longitudinal regression model, $N = 497$.

	Variables at T2				
Variables at T1	Contact quantity	Contact quality	Agreeableness	Openness to experience	Extraversion
Contact quantity	.77***-		-.15*	-.06	-.04
Contact quality	-	.45***	.17*	.13*	.09
Agreeableness	-.02	.16**	.79***	-	-
Openness to experience	.03	.11*	-	.78***	-
Extraversion	-.03	.00	-	-	.87***

*$p < .05$; **$p < .01$; ***$p \leq .001$

Figure Captions

Figure 1. Cross-lagged model of the longitudinal relationships between contact quantity, contact quality, and personality factors.

Figure 2. Path analysis with latent variables on the longitudinal relationships between contact quantity, contact quality, and personality factors. Significant correlations between exogenous latent variables (T1), not reported in the Figure: $\phi = .53$, $p < .001$ (contact quantity-contact quality),$\phi = .15$, $p < .01$ (contact quantity-extraversion), $\phi = .34$, $p < .001$ (contact quality-agreeableness), $\phi = .16$, $p < .01$ (contact quality-openness to experience), $\phi = .28$, $p < .001$ (agreeableness-openness to experience), $\phi = .21$, $p < .001$ (agreeableness-extraversion), $\phi = .18$, $p < .01$ (openness to experience-extraversion).

Figure 1

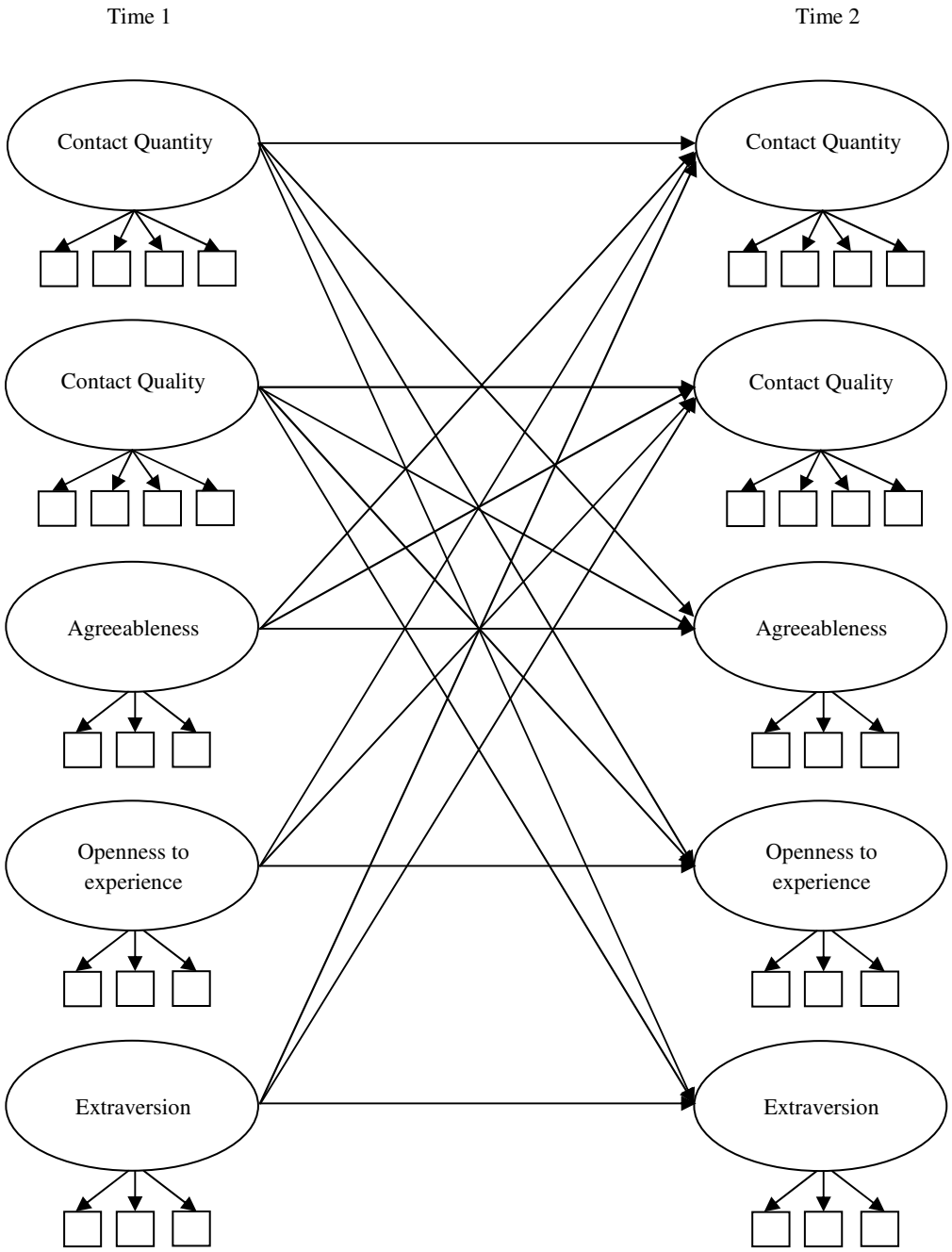
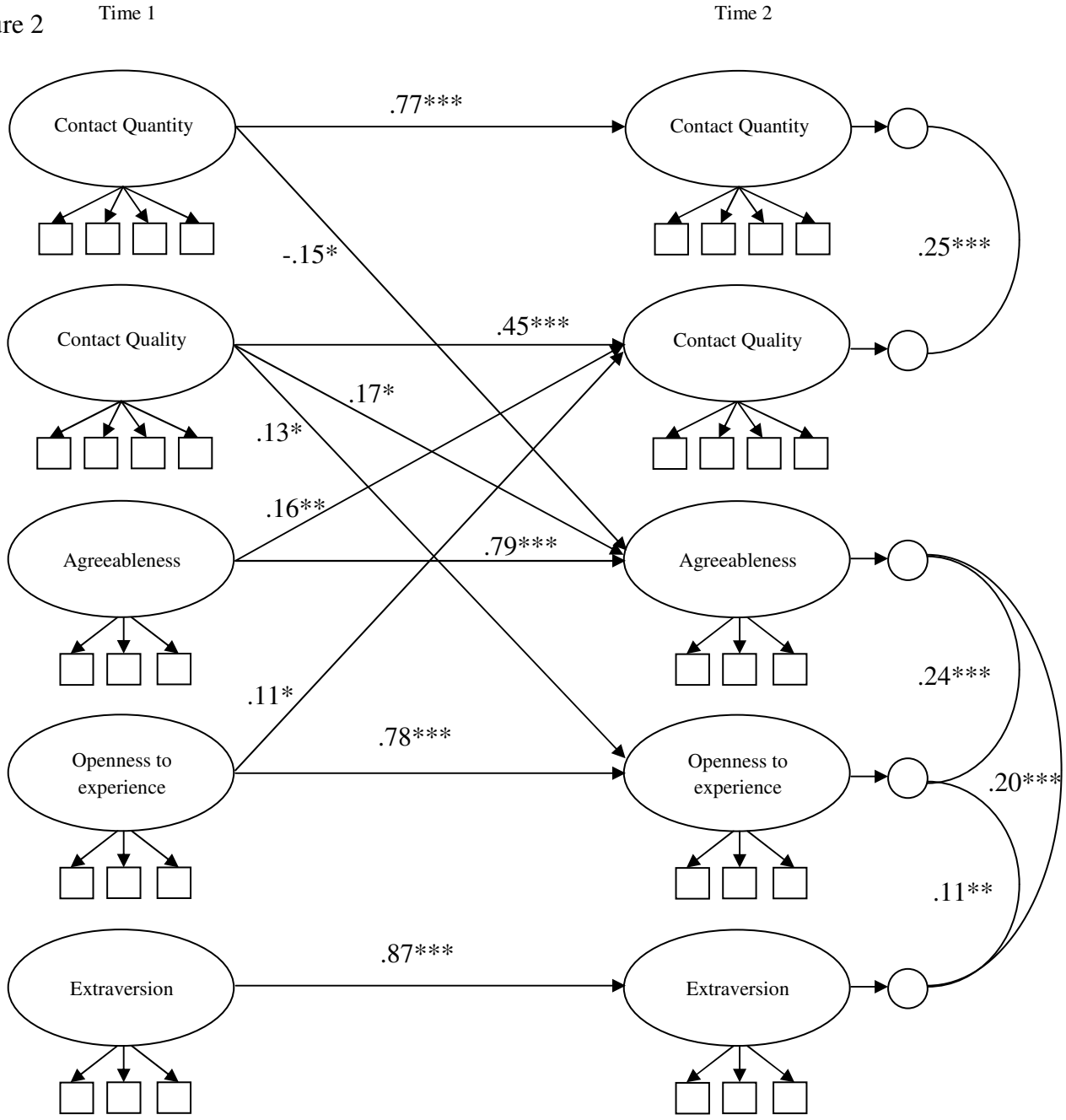

Time 1
Time 2
Contact Quantity
Contact Quality
Agreeableness
Openness to experience
Extraversion
Contact Quantity
Contact Quality
Agreeableness
Openness to experience
Extraversion

Figure 2


Time 1
Time 2
Contact Quantity
Contact Quality
Agreeableness
Openness to experience
Extraversion
Contact Quantity
Contact Quality
Agreeableness
Openness to experience
Extraversion
.77***
-.15*
.45***
.17*
.13*
.16**
.79***
.11*
.78***
.87***
.25***
.24***
.20***
.11**