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Positive and Negative Intergroup Contact and Newcomer Immigrants' Psychological Adjustment

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Data are not publicly accessible. They can be made available, upon reasonable request to the corresponding author.

Abstract

Objectives: The present research investigates the associations between immigrants' positive and negative contact with the majority group and their psychological well-being, as indicators of their psychosocial adjustment to the host society. Perceived personal discrimination and relative deprivation in comparison to the majority group are assessed as mediators of the associations between intergroup contact and psychological well-being.

Methods: We conducted a three-wave longitudinal study with newcomer African immigrants living in Italy (N=240; 61.7% men) with age ranging from 18 to 40 years old.

Results: Evidence showed that, across three waves, immigrants' negative contact with Italian natives was longitudinally associated with lower well-being and positive intergroup contact. In turn, well-being was related to immigrants' lower perceptions of relative deprivation across waves. Positive contact with Italian natives was not significantly associated with immigrants' well-being, but it was associated with higher perceived relative deprivation, which was associated with lower well-being.

Conclusions: Overall, the results provide insight into the links between differently valenced contact and the psychological well-being of newcomer immigrants. Furthermore, the findings address assumptions about the primacy of negative contact in undermining social attitudes and the important role of positive contact in promoting awareness of the disadvantaged group's situation.

Keywords: immigration**,** intergroup contact, intergroup discrimination, relative deprivation, well-being

Word count: 196

Public significance statements

Newcomer immigrants with repeated negative experiences with host country natives reveal high awareness of intergroup inequalities and high psychological stress that hinders their adjustment to the host society. Those who share positive intergroup experiences become aware of social inequalities faced by their group, encouraging them to challenge the status quo. Social inclusion policies should monitor the nature of intergroup contact between host country natives and immigrants, by identifying which settings are associated with optimal encounters, and develop interventions to promote mutually-positive contact.

Immigration into many western countries has grown rapidly since the 1990s and has become one of the most crucial issues affecting contemporary societies, highlighting the need to understand factors and processes involved in positive co-existence between different ethnic groups (Pew Research Center, 2019). Immigrants have to adapt to a new environment which involves relocating physically to another geographical area, adjusting socially and psychologically to the local cultural needs, and becoming a part of the local system (Berry, 1997). During this process, intergroup contact with host country natives plays a fundamental role in immigrants' adaptation (Eller et al., 2016; Tip et al., 2019). Research has shown that having positive contact with members of the majority group, or native people, reduces ethnic minority members' prejudice towards them and vice versa (Pettigrew & Tropp, 2006), facilitating social integration. However, research is still needed to investigate the impact of intergroup contact valence on newcomer immigrants' well-being, which represents a central indicator of immigrants' successful adaptation (Liebkind, 2001). Furthermore, immigrants may not only experience positive, but also negative intergroup contact (e.g., Barlow et al., 2012). Indeed, especially in the case of immigrants, who are often confronted with discrimination by members of the host society (Hayward et al., 2017), negative intergroup contact can be both frequent and pernicious (Graf et al., 2014). In this vein, work on how experiences of intergroup discrimination may contribute to the deterioration of physical and psychological well-being (e.g., Carter et al., 2017) suggests that experiences of negative contact may have damaging health implications. In the present study, we examined longitudinally the association between positive and negative contact with Italian natives experienced by newcomer African immigrants living in Italy and their psychological well-being, and the potential mediating role of perceived discrimination and relative deprivation.

Positive and Negative Intergroup Contact

A large body of research since Allport (1954) theorizing about the relation between contact and reduced prejudice has confirmed that intergroup contact theory is among the most effective social-psychological approaches for improving interethnic relations (Brown & Hewstone, 2005). The

meta-analytic findings of Pettigrew and Tropp (2006) provided strong evidence that intergroup contact typically improves intergroup attitudes. Other reviews show that intergroup contact also reduces anxiety and threat perceptions, and results in more intergroup empathy, knowledge about the outgroup, and perceived outgroup variability (e.g., (Brown & Hewstone, 2005). However, Pettigrew and Tropp (2006) pointed out that intergroup contact research up to that time was characterized by a severe "positivity bias," that is, an emphasis on positive and the exclusion of negative contact experiences from most research designs. This bias or oversight has limited investigation of the complete real-world experience of intergroup contact. In this regard, scholars have turned belatedly to examine both types of contact, as in daily settings people often have to deal simultaneously with positive and negative contact (Graf et al., 2014; Paolini et al., 2014).

Not surprisingly, negative and positive forms of contact typically exert opposing effects on prejudice and discrimination (e.g., Hayward et al., 2017). Positive intergroup contact can enhance the process of social integration (Clément et al., 2001; Voci & Hewstone, 2003), such that those majority members who have had positive contact experiences with members of recently immigrated groups are likely to be more accepting of newcomers and to report greater numbers of positive encounters in the future (Kotzur & Wagner, 2021). Negative contact, however, may enhance ethnic prejudice and tensions between majority and minority members (Schäfer et al., 2021). Negative effects of contact are especially likely to occur when intergroup encounters are associated with feelings of intergroup anxiety and threat (Pettigrew & Tropp, 2008). Furthermore, research has shown that negative contact experiences may have greater impact on intergroup attitudes than positive ones (e.g., Paolini et al., 2010). In most intergroup stigmatizing contexts (i.e., contexts with prevailing negative views of an outgroup), negative contact has greater impact on social categorization (e.g., the tendency to see an outgroup member as typical of their group) than positive contact, and, as a result, greater impact on generalized changes in outgroup evaluations after contact (Paolini et al., 2010). However, positive contact experiences also tend to be more common than

negative ones (Barlow et al., 2012). This trend was confirmed in recent evidence showing that members of the receiving society in both the United States and Germany typically report that positive encounters with immigrants are more frequent than negative encounters (Kotzur et al., 2018). Overall, research has shown the importance of considering both positive and negative forms of contact as negative intergroup contact might countervail the encouraging effects of positive contact among majority group members. Further research is still needed, however, to understand their joint impact in shaping intergroup relations and adjustment from the perspective of minority members.

Intergroup Contact: The Perspective of Minority Groups

Research has found that the effects of contact are not of the same magnitude for majority and minority group members (Tropp & Pettigrew, 2005). Although the association of positive contact with lower prejudice is reliable for both groups, the association is generally weaker for minority compared to majority members (Barlow et al., 2013; Binder et al., 2009; Pettigrew & Tropp, 2006). Moreover, minorities often experience discrimination, or they may feel isolated and rejected more often than majority group members in their everyday life (Barlow et al., 2012). Thus, negative compared to positive intergroup contact might be more frequent for minority members, who, given their numerical minority, also typically engage in more cross-group contact than majority group members, and often without choice (Tropp & Bianchi, 2006). Studies on minority groups' perspective showed that negative contact in terms of exposure to prejudice and discrimination (Swim et al., 2003) was associated with minority group members' anxiety about future intergroup contact (Tropp, 2003), shaping minority groups' attitudes towards the majority. In this vein, intergroup contact valence (i.e., whether it is positive or negative) seems likely to play a pivotal role in immigrants' adaptation.

One prerequisite for newcomers' successful adaptation into their host society is the development of social networks that include host culture contacts in central positions, as these

contacts provide access to critically important social and informational resources (Damstra & Tillie, 2016). New acquaintances can provide immigrants with access to vital cultural knowledge and resources (Strang & Quinn, 2014), which can assist and support their socioeconomic advancement (Suter & Magnusson, 2015) and psychological well-being (Putnam, 2000). Indeed, research on the acculturation process suggests two main outcomes of adaptation to consider: psychological and sociocultural adjustment. Psychological adjustment is associated with a stress and coping framework and is indicated by immigrants' wellbeing, whereas sociocultural adjustment is based on a social learning perspective and indicated by the ability to "fit in" or negotiate interactive aspects of the host culture (Searle & Ward, 1990). Given the importance of social networks for acculturation, it is surprising that very few studies have examined how intergroup contact relates to the psychological adjustment of immigrants in the host society. Eller et al. (2016), studying indigenous minority groups in Chile and Mexico, rather than immigrants, reported positive associations between the physical and psychological health of members of these groups and the amount of direct and extended (or indirect) contact they had with the majority. Although these results are encouraging, the cross-sectional design cannot yield insight into the direction of these effects. Tip et al. (2019) provided further evidence by focusing on language knowledge as a tool of social adaptation of refugees. They showed that proficiency in the majority language was positively associated with greater contact with majority members one year later; more contact with the majority was itself associated with higher well-being of minority members one year later. Tip et al. also found that English language proficiency was positively linked to well-being two years later via an increase in positive contact with the British majority. Even though these studies underlined the potential of contact in influencing immigrants' psychological adjustment, the role of the valence of this contact has not yet been established.

The Role of Perceived Discrimination and Relative Deprivation Experienced by Minority Groups

Intergroup contact is associated with subsequent attitudes and evaluations towards specific outgroup members and, in turn, generalized attitudes to the outgroup in general. In this vein, effects of immigrants' intergroup contact experiences on their adaptation to the host country might be explained by how immigrants perceive that they are treated in the host society, including their perceived discrimination by, and relative deprivation with respect to, the host majority. Specifically, differently-valenced contact experiences with one or more individuals from the majority group generalize to expectations about the treatment of immigrants. Thus, positive intergroup experiences should have the potential to attenuate perceived discrimination towards immigrants and feelings of relative deprivation compared to the majority group, whereas negative intergroup experiences are more likely to increase them.

Several studies have addressed the relation between discrimination and adaptation-related variables (e.g., Berry et al., 2006; Verkuyten & Thijs, 2002; Ward et al., 2010). Specifically, individuals who experience discrimination are likely to reject close involvement in the national society, leading to weaker integration (Berry et al., 2006). In a meta-analysis, Schmitt et al. (2014) also showed that discrimination was negatively related to psychological well-being across a wide range of well-being measures. Given that discrimination experienced by minority groups is negatively linked not only to adaptation but also to closeness and contact with the majority group (Tropp, 2007), we may expect that negative effects of intergroup contact experiences on well-being would be explained, in part, by discrimination.

Similarly, fraternal relative deprivation (Crosby, 1976; Gurr, 1970) – the feeling that one's group is unfairly deprived of some desirable thing, such as status, relative to other social groups and one's own group in the past – might explain the relationship between intergroup contact and well-being. According to relative deprivation theory, members of a group are inclined to engage in continuous social comparisons to evaluate their group status. In this regard, disadvantaged groups as immigrants might experience relative deprivation when they see themselves as lacking something

they sought and feel that they deserve, based on comparisons with majority group members (Crosby, 1976). The majority of research focused on collective relative deprivation, which involves ingroup and outgroup comparisons (Walker & Pettigrew, 1984), with some exceptions such as the comparisons with the ingroup's past experiences (Albert & Sabini, 1974; Brown & Middendorf, 1996) and previous expectations (Smith et al., 2012). Feelings of relative deprivation might impact not just negative intergroup attitudes (Dambrun & Guimond, 2001; Pettigrew & Meertens, 1995) and intergroup discrimination (Moscatelli et al., 2014), but also psychological well-being (e.g., Zagefka & Brown, 2005). Research has shown that the entire trajectory of collective relative deprivation (which represents how an individual perceives the evolution of their group's history across time) predicted psychological well-being (De la Sablonniére et al., 2010). From this line of reasoning, relative deprivation of immigrants might play a role both in assessing their well-being and in the relationship between intergroup contact and well-being.

The context and the Target of the Study

In the last two decades (Colucci, 2018), Italy has been the primary route into Europe for hundreds of thousands of African asylum seekers and immigrants, and Libya's west coast has been one of the main departure points for those hoping to reach Europe, including the southern coasts of Italy. This has highlighted structural and organizational issues related to immigration policies and social integration in the Italian context that are still fuelling political debate. In this context, we examined the relationship between intergroup contact and well-being in a sample of African people who recently emigrated to the North-East part of Italy (and had been living in Italy for no more than five years). In Italy, people with an immigration background represent 8.4% of the population (Istat, 2021). Of the 5.2 million immigrants residing in Italy, 21.7% hold citizenship of an African country, representing about 1,140, 000 people. Among the immigrants from Africa who reside in Italy, Moroccans and Nigerians are the most populous. The geographical distribution of foreign-born population is uneven: 83.1% of immigrant people live in the Centre-North of Italy, where this

study took place. Recent immigration regulations in Italy made the integration of immigrants who live, or arrived recently, in the country more difficult (Paparusso et al., 2017), increasing anti-immigrant prejudicial attitudes, especially toward African and Muslim immigrants (Perrone, 2018). Although intergroup contact is one of the most effective strategies to reduce intergroup discrimination and promote social integration from the majority group perspective (Pettigrew & Tropp, 2006), scarce research has considered the effects of intergroup contact valence for newcomer immigrants' adaptation to the host country (Voci & Hewstone, 2003). Specifically, for newcomers in these first-arrival countries such as Italy, we still do not know the long-term impact of positive and negative intergroup contact on their psychological health.

Overview of the Study

The purpose of the present study was to investigate longitudinally the association between valenced intergroup contact of immigrants with Italian natives and the psychological well-being of immigrants, as an indicator of their psychosocial adjustment in the host society. Specifically, we hypothesised (1; see Figure 1) a longitudinal positive association between positive contact of newcomer immigrants with native Italians and their psychological well-being, and, (2) a negative association between negative contact and psychological well-being. Based on claims that contact with majority group members can have a 'sedative' effect on perceptions of ethnic minority group members and their willingness to engage in collective action (Dixon et al., 2010), we also tested the predictions (3) that positive contact would be negatively associated with relative deprivation and personal discrimination, both of which are predictors of collective action (Agostini & Van Zomeren, 2021), whereas (4) negative contact would be associated with higher levels of both (Reimer et al., 2017); we also explored the reverse associations. The study also tested indirect routes that could underpin the impact of both types of intergroup contact experienced by immigrants on their psychological well-being, by considering the role of relative deprivation and personal discrimination (Dambrun & Guimond, 2001; Zagefka & Brown, 2005). Thus, we tested the possible

(5) mediating roles of both perceived relative deprivation and personal discrimination on the longitudinal associations between (positive and negative) intergroup contact and well-being.

Method

Participants

The data of this study were collected in three waves, October-November 2018 (T1), May-June 2019 (T2), and December 2019-January 2020 (T3), with a six-month interval between each wave for individual participants.

The sample was composed of 240 newcomer African immigrants. Of these participants, 179 (74.6%) took part in the second data collection and 162 (67.5%) in the third data collection. In the first wave, respondents' age ranging from 18 to 40 years old (87.8%, missing 1.3%) and most of them were men (N = 148, 61.7%, missing 2.5%). The vast majority of respondents (86%) declared they had been living in Italy for more than a year but less than five years, for a year (9.7%), and for less than a year (4.2%). Respondents came from the following African countries: Cameroon (32.1%), Nigeria (22.9%), Senegal (16.7%), Ivory Coast (13.8%), Morocco (12.1%). The reasons for immigration varied among respondents: Some of them stated that they immigrated for economic reasons (29.1%), for escaping from difficulties (31.2%), for studying abroad (22.6%), for family reasons (10.3%), and a small percentage did not answer (6.8%). The majority of respondents reported that they belonged to a specific religion (i.e., 47% Christian, 41% Muslim, 12% other). Many respondents perceived their economic situation as mediocre (30.9%), as good (26.6%), as poor (26%), as worse than most (12%), and as wealthy or better than most (3.9%) and a very small percentage did not answer (0.6%). The educational background of the sample ranged from newcomer immigrants who had no school degree (5.9%), or elementary school diploma (26.3%), to high school diploma (35.6%), and university degree (26.3%), and some respondents did not answer (5.9%). We conducted a sensitivity analysis on the achieved sample size (using Monte Carlo features available in Mplus; Muthen & Muthen, 2002) to account for the power of our model.

Information about the procedure adopted and results of the simulation studies are reported in Note 1.

Procedure

All respondents were legal newcomer African immigrants who attended ethnic community organizations, recreational associations (Associazione Piccola Carovana), cultural centres dedicated to ethnic minority activities (from dance classes to religious teaching) and workers at CAS (Centro d'Accoglienza Straordinario) in the North-East of Italy. They were contacted and met systematically across the three waves by the first author, who is from Cameroon, who asked them to complete on a voluntary basis a paper-and-pencil questionnaire in French, English or Italian, according to each respondent's choice, based on their linguistic competence. The questionnaire was developed in English and then translated and back-translated from French and Italian. Respondents chose the language they preferred to fill in the questionnaire. English or French are the main languages in all the African countries involved in this study, and the first author answered any questions or doubts raised by respondents. The majority of respondents filled in the questionnaire in French (44.2%) and some of them chose the Italian version (33.3%) and others chose the English version (22.5%).

Before starting to fill out the survey, respondents were first asked to sign a consent form containing the study goals. In order to connect respondents' responses across the three waves while ensuring their confidentiality, each participant generated a unique code with three digits. For the second and third data collection, respondents who agreed to continue the study were re-contacted, and to ensure maximum participation, individual meetings were fixed for each of them at the same associations and centres. The study was previously approved by the University of [BLINDED FOR REVIEW] Ethics Research Committee.

Measures

Positive and negative intergroup contact

Multiple items were used to measure positive and negative contact (intimate, superficial, and extended). Respondents rated when they had talked with Italian people in the last month, how often their experiences were positive (3 items: "positive", "friendly", "polite") and how often their experiences were negative (3 items: "negative", "unfriendly", "rude"; adapted from Hayward et al., 2017). The same items were repeated for intimate contact (i.e., with a close Italian person) and for superficial direct contact (i.e., with an unknown Italian person). For the extended contact measure, respondents were asked, "How many of your [immigrant] close friends and family members have had [positive/negative] experiences when encountering Italian people?". All contact items were rated on a 5-point scale (1 = *never*; 5 = *a lot*). These items formed reliable indices for both positive (ω_{T1} = .85; ω_{T2} = .84; ω_{T3} = .79), and negative (ω_{T1} = .86; ω_{T2} = .87; ω_{T3} = .58) contact.

Perceived Personal Discrimination

Two items measured immigrants' own perceived discrimination due to their group membership ("I happen to be excluded because I am an immigrant," "As an immigrant, I have rarely felt personally discriminated against"). The items were adapted from Yzerbyt et al. (2006). Ratings were expressed on 5-point Likert-type scales from 1 (*disagree strongly*) to 5 (*agree strongly*). One item was reversed such that higher scores indicate higher discrimination. Indices were reliable (r_{T1} = .70, p < .001; r_{T2} = .73, p < .001; r_{T3} = .63, p < .001).

Perceived Relative Deprivation

Two items were used to measure relative deprivation of immigrants with regard to the improvement of life conditions: "My life conditions in Italy are better than I expected", "Italian people in general are more supportive of immigrants' rights than I expected". Ratings were expressed on 5-point Likert-type scales from 1 (*disagree strongly*) to 5 (*agree strongly*). The items were reversed such that higher scores indicated higher relative deprivation. Indices were reliable (r_{T1} = .39, p < .001; r_{T2} = .48, p < .001; r_{T3} = .44, p < .001; see Note 2).

Psychological Well-being

The psychological well-being subscale of the Mental Health Continuum–Short Form (MHC–SF; Keyes 2005; Italian validation by Petrillo et al., 2015) consisted of eleven items (e.g., "How often in the last month," followed by: "did you feel happy?," "were you interested in life?," "did you feel satisfied with your life?"). Ratings were expressed on 6-point Likert-type scales from 1 (*never*) to 6 (*daily*). Indices were reliable ω_{T1}= .79; ω_{T2}= .78; ω_{T3}= .88.

We also tested the reliability of each measure separately for each of the three languages respondents chose to answer the questionnaire (see Note 3).

Demographic measures were also collected, such as respondents' gender, age, socio-economic condition (scale ranging from 1 = poor to 6 = wealthy), education (scale ranging from 1 = no school qualification to 4 = university degree), and their self-reported Italian language proficiency (scale ranging from 1 = unable to speak to 6 = very good). The survey included other measures that were not considered in the present study.

Results

Preliminary Analyses

We conducted logistic regression analyses to assess how demographic (i.e., age, gender, status, education, reason for migration and language proficiency) and main variables (i.e., positive and negative intergroup contact, personal discrimination, relative deprivation, psychological well-being) from the baseline predicted respondents' drop-out at one and two time points later. Results showed that respondents who dropped out reported less relative deprivation and personal discrimination than those who completed the third wave (see Appendix A). The results of Little's (1988) Missing Completely at Random (MCAR) test conducted on the study variables yielded a significant result, $\chi2$ (63) = 102.226, p = .001. However, the normed Chi-square ($\chi2$), which can be used to correct for the sensitivity of the $\chi2$ to sample size (Bollen, 1989), was lower than 3 ($\chi2$/df=1.67), indicating

that data were likely missing at random. Therefore, all respondents were included in the analyses, and missing data patterns on one or more variables were handled with the Full Information Maximum Likelihood procedure (FIML). Means, standard deviations, and correlations among variables of the study are presented in Table 1. Positive contact correlated positively with psychological well-being, and well-being was negatively associated with negative contact. Positive contact was negatively correlated with personal discrimination and relative deprivation, which were, in turn, positively correlated with positive contact across all waves except for wave 3. Additionally, data of the current study is available at the following link: https://osf.io/5qvwn/.

Cross Lagged Analyses

To achieve the goal of examining the longitudinal associations between negative contact, positive contact, psychological well-being, personal discrimination, and relative deprivation we conducted cross-lagged analyses in Mplus 7 (Muthen & Muthen, 2017) with FIML. Cross lagged panel models test the effect of individual differences in a construct measured at a specific time point on the relative changes in individual differences in another construct measured at a different time (i.e., effect of A measured at T1 on B, measured at T2, and the effect of B measured at T1 on A measured at T2), controlling for the autoregressive effects in the constructs (i.e., effect of A at T1 on A at T2, and effect of B at T1 on B at T2). To keep a proper balance between the sample size and the number of parameters in the model (Bentler & Chou, 1987; Kelloway, 2014), we tested the model using observed variables. Specifically, we estimated cross-lagged paths in which all variables were both predictors and dependent variables, controlling for (a) stability paths (T1→ T2, T2→T3); (b) within-time correlations among all variables at T1, and correlated disturbances at T2 and T3; and (c) the effects of the following covariates: respondents' gender, age, socio-economic situation, education, reason for migrating and language proficiency. Specifically, we controlled for respondents' age and reason for migrating based on results of preliminary analyses. We also considered respondents' gender, education, socio-economic situation and language proficiency because they may have a direct impact on intergroup contact and its association with ethnic

minorities' quality of life (e.g., El Khoury, 2019; Hawthone et al., 2006; Kudo & Simkin, 2003; Patricio, 2014; Tip et al., 2019; Ying & Han, 2006). Moreover, a multivariate analysis of variance showed a significant effect of all these demographic variables (i.e., age, gender, education level, socio-economic status, reason for migrating and language proficiency) on the study variables, and therefore they were included as covariates in the analysis.

To evaluate the model fit, we used: (1) the comparative fit index (CFI), with values higher than .95 suggesting a sufficient fit; (2) the root mean square error of approximation (RMSEA), with values below .08 indicative of an acceptable fit (Byrne, 2012); and (3) the 90% CI of the RMSEA: when the upper bound of this confidence interval is ≤ .10 the model fit can be considered acceptable (Chen et al., 2008). To model the longitudinal associations as parsimoniously as possible, we tested for time-invariance of (a) stability paths (T1→ T2, T2→T3) and (b) cross-lagged effects (T1→T2, T2→T3). Time invariance analysis is conducted to ensure that constructs are measured with reliable and consistent tools, that is, the same construct is assessed across time and on the same metric (equality of measurement across time and between participants). This minimises and controls the probability that convergence issues in the model, as well as estimates and changes in parameters, result from measurement issues (e.g., Orth et al., 2020). To compare nested models corresponding to different hierarchical levels of invariance, we considered both the chi-square difference test and changes in fit indices (e.g., Cheung & Rensvold, 2002). Differences between models were established when at least two of the following three criteria were met: (1) $\Delta XSB2$ significant at $p <$ .05 (Satorra & Bentler, 2001), (2) ΔCFI ≥ .010; and (3) ΔRMSEA ≥ .015 (Chen, 2007).

The results (see Table 2) confirmed that time-invariance could be established for stability paths (except for stability of well-being) and cross-lagged effects (except the relative deprivation → well-being path, and the well-being → personal discrimination path). Thus, the more parsimonious model (M3a), including all time invariance constraints, could be retained as the final one. The fit of the model was acceptable (Table 2). The significant cross-lagged effects are reported in Figure 2, and complete model results are available in Table 3. As can be seen, negative contact was

associated with lower positive contact and lower psychological well-being, and over time (T1→T2, and T2→T3). Positive contact was associated with higher relative deprivation over time (T1→T2, and T2→T3). Well-being was associated with lower relative deprivation over time (T1→T2, and T2→T3) and with lower personal discrimination, but only from T1 to T2. Personal discrimination was not significantly associated with any other variables (T1→T2, or T2→T3). Finally, relative deprivation was associated with higher negative contact over time (T1→T2, and T2→T3), and with lower well-being from T2 to T3. Measurement invariance of study variables and standardized results of the cross lagged model without covariates were also established. Results are reported in Appendix B.

Mediational Analyses

We tested indirect effects to examine mediational mechanisms by means of the indirect command procedure in Mplus 7 (Muthen & Muthen, 1998–2012). In this way, it is possible to test whether a predictor measured at T1 influences an outcome measured at T3 via a mediator measured at T2. Findings indicated that the association between positive contact with Italians at T1 and immigrants' psychological well-being at T3 was mediated by the relative deprivation of immigrants at T2. Specifically, findings suggested that positive contact was associated with greater perceived relative deprivation, which, in turn, was associated with lower well-being (standardized indirect effect: b = -.066 [-.152, -.011], p= .023). The effect of negative contact with Italians at T1 on relative deprivation at T3 was mediated by immigrants' well-being at T2. Specifically, negative contact was associated with lower well-being, which, in turn, was associated with higher relative deprivation (standardized indirect effect: b= 0.034 [.005, .082], p = .029). Alternative indirect effects were not significant (see Note 4).

Discussion

The present study advances understanding of the longitudinal associations of positive and negative contact with immigrants' psychological adaptation in their host society. The reported findings yield

evidence on minority-majority interethnic relationships in an understudied context, that of African immigrants living in Italy, a country with a relatively recent history of continued and extensive immigration accompanied by an increase of anti-immigrant sentiment (Pellegrini et al., 2021). Results partially supported our hypotheses, showing that (1) African immigrants' positive contact with Italian natives was not associated with their psychological well-being over time, whereas (2) negative contact was associated with lower psychological well-being and also lower positive intergroup contact across three waves. Moreover, (3) immigrants' positive intergroup contact was associated with high perceived relative deprivation, which may act as an antecedent of social change by increasing immigrants' awareness of personal discrimination directed at, and inequality faced by, their group (Cakal et al., 2011). Thus, these results failed to support the contention that positive intergroup contact has a 'sedative' or 'ironic' effect, inhibiting awareness of the ingroup's disadvantages in comparison with higher status outgroups and weakening the willingness to engage in social change, at least in a context characterized by increased social inequalities and discrimination against immigrants (Perrone, 2018). This lack of support is consistent with the results of a meta-analysis, which rejected such a sedative or ironic effect of contact (Reimer & Sengupta, 2023). Our findings also showed that (4) perceiving one's ethnic group to be relatively deprived was longitudinally associated with higher negative contact with native Italians over time. Though their relations were not consistent across the three waves, findings indicated that from T1 to T2, immigrants' well-being was related to perceiving less personal discrimination from Italians, and from T2 to T3 perceived relative deprivation was related to immigrants' lower well-being. This study also highlighted the mediators, over time, of the associations between both positive and negative intergroup contact effects and the other factors. Specifically, (5) positive intergroup contact was longitudinally associated with high perceived relative deprivation that, in turn, was associated with immigrants' low well-being across waves. Negative intergroup contact was longitudinally associated with low well-being, that, in turn, was associated with high perceived relative deprivation across waves.

Overall, the study provides information on the distinct roles of differently valenced forms of intergroup contact for immigrants' psychological adaptation in the host country, highlighting how the nuanced social experiences of this group of people provide them with essential information to understand the new context in which they live and how to fit in there. We extended contact theory's assumptions on the primacy of negative contact in undermining the association between positive contact and high well-being among immigrants (Barlow et al., 2012). However, we also revealed the beneficial effect of positive contact in increasing respondents' awareness of their minority group's situation that may eventually encourage their efforts to demand social change in the form of intergroup equality (Agostini & Van Zomeren, 2021). Therefore, the evidence highlighted in this study further underlined the importance of considering both negative and positive intergroup experiences separately when examining the effects of contact on immigrants' social adaptation, in order to understand better the complexity of the phenomenon.

Theoretical and Practical Implications

In multicultural societies, the need to integrate new members, to promote social cohesion, implies as a crucial step their psychological adjustment to the new situation to avoid further negative outcomes for themselves and the host society (Liebkind, 2001). We provided evidence that intergroup contact crucially related to changes that might occur, for better or for worse, in immigrants' psychological adjustment to the host society, especially in the first phase of their adaptation. In the Italian context, characterized by increasing anti-immigrant sentiment and intense political debate about immigration, results suggest that negative intergroup contact effects on newcomers' lives might be more robust over time than originally anticipated. Findings extended previous research focused only on the impact of positive intergroup contact on immigrants' well-being (Eller et al., 2016; Tip et al., 2019), by showing that newcomer immigrants' negative experiences with host Italians in such an unwelcoming context were strongly associated over time with both lower psychological well-being and lower frequency of positive intergroup contact. Well-being and positive contact can be considered distinct indexes of overall immigrant adaptation, by

involving their personal adjustment and social support in the host society respectively, and highlighting the deleterious effects of negative intergroup experiences (Searle & Ward, 1990). The lower psychological well-being could be explained by the pervasive effect that negative contact has on individuals (Barlow et al., 2012), but also by the fact that, over time, negative contact is associated with lower positive contact (which might be understood as lower social support), which might be an implicit cause of the detrimental effect of negative contact on well-being. In this sense, it might be that the negative association between negative contact and positive contact accentuates the detrimental effect of negative contact on well-being. Moreover, individual relative deprivation was longitudinally negatively associated with intergroup contact of respondents, thus it seems that newcomer immigrants who perceived themselves to be relatively deprived were more likely to face negative contact over time, leading to a detrimental cascade of events on their adaptation.

Positive contact, however, was positively related to perceived relative deprivation over time. This finding is theoretically relevant as it suggests that positive contact with host country natives provides immigrants with an opportunity to perceive inequalities between them and the majority. Thus, contrary to the assumption that positive intergroup contact inhibits minority group members' desire for equality and their perception of discrimination (Dixon et al. 2005), our evidence suggests that positive contact with natives contributes to revealing intergroup differences, which may be a building block in challenging intergroup inequality. In this vein, Pettigrew (2010) argued that intergroup contact increased group relative deprivation because contact of minority groups with majority groups improves minority groups' awareness of the majority's privileges. Thus, overall, intergroup contact seems to be a crucial tool for promoting social integration not only from the majority group perspective, but also from that of the minority group, in terms of increasing their awareness of intergroup inequalities that need to be changed.

However, this same process does come with a cost in terms of immigrants' adaptation. We found that relative deprivation stemming from the comparison of immigrants' lives with host country natives', elicited by higher positive intergroup contact, was associated with a reduction in

newcomer immigrants' psychological well-being over time. Thus, it seems that the process of adapting to the host country, even when positive intergroup contact supports it, ends up with lower levels of immigrant adjustment because of the interethnic inequalities that they perceive through contact. On the one hand, positive intergroup contact can encourage members of an ethnic minority group to challenge the status quo, in order to reduce interethnic inequalities and thus enhance adaptation. On the other hand, it seems that until negative intergroup contact is reduced, intergroup relationships involve a persistent difficulty for newcomer immigrants to adapt psychologically to their new society, which has potentially detrimental consequences not just at the social but also at the individual level. Our findings imply that, especially at an early stage of immigrants' adaptation to the host society, positive contact with the majority group may enhance their psychological stress by highlighting their social and economic differences from the majority group. In this vein, further research is needed to understand whether this detrimental effect of positive intergroup contact on psychological well-being may change during the process of immigrants' integration in the host society, leading positive intergroup encounters to be a crucial tool for promoting minority group members' health. In a similar vein, we found that negative intergroup contact with host country natives was associated with newcomer immigrants' lower psychological well-being, which was, in turn, associated with relative deprivation.

Overall, these findings pose multiple challenges to contemporary multi-ethnic societies. First, national and local governments of democratic societies should underline the necessity of establishing positive supportive contacts with immigrants to help them to their new destination countries, a goal that has both social and economic advantages for all. Second, it is very important that institutional policies implement more equal treatment of minority groups. Third, the present evidence highlights the need for further research on intergroup contact to better understand whether specific forms of positive intimate contact may lead immigrants to feel supported in their fight for more equal treatment and respect of their rights. Of course, these are political issues not directly

under the control of us as scientists, but nevertheless our discipline can contribute to more tolerant and integrated societies that hold out advantages for all.

Limitations and Future Research

Notwithstanding its unique longitudinal analysis of the roles of both positive and negative contact on psychological well-being and associated variables in an immigrant minority group, some limitations to this research should be acknowledged. First, the sensitivity analysis revealed that the study has low power to detect expected effect sizes, so our results should be considered as preliminary and explorative evidence that require further investigations. Second, although there was sample attrition over the three waves, this was to be expected given that the target respondents, newcomer African immigrants in Italy, are both "hard-to-reach" and somewhat transient. Third, the heterogeneity of the sample in terms of reasons for migration or country of origin could affect respondents' well-being. However, our sample did not include highly vulnerable categories such as asylum seekers or refugees, attenuating the potential influence of previous traumatic experiences on some respondents' well-being compared to others. Fourth, two measures (perceived personal discrimination and perceived relative deprivation) included only two items (which might pose a threat to reliability), thus pointing to the need for further studies to build on this preliminary evidence. Fifth, further investigation of the impact of negative contact, still especially scarce among minority groups, and how it may undermine the beneficial effects of positive contact, is needed, especially comparing different situations, characterized by more or less threat and conflict and including samples of both the frequently-used majority and the more rarely studied minority within the same setting. In this regard, future research should involve not only measures of quantity of contact but also measures of the intensity of positive and negative contact (see Schäfer et al., 2022) to understand the impact of distinct types of intergroup contact on well-being and adaptation in multicultural societies.

Conclusion

This study makes a novel contribution to the intergroup contact literature by providing evidence on the role of minority groups members' positive and negative contact experiences on their adaptation to the host society. In many societies facing substantial migratory flows, immigration is sometimes seen as a "clash of cultures", even of civilisations, and often leads to angry public debate on the "integration crisis". Part of the challenge of integration is for individuals from different majority and minority, host and migrant, groups to redefine social interactions and norms that are adaptive for all groups. In this vein, this work highlighted how the type of contact, particularly negatively valenced interactions with members of the host group, could represent an obstacle to the health and well-being of newcomer immigrants (which has economic as well as social costs). Furthermore, this result highlights that intergroup contact is fundamental in explaining why difficulties persist for immigrants to integrate into society (because positive contact may not be sufficiently frequent or intense, or because negative contact, even if it is typically less frequent, may be intense). This may lead to the maintenance, or exacerbation, of group segregation, potentially fuelling the avoidance of intergroup contact or, worse, increased anxiety, threat and conflict between groups. Therefore, it is important that social inclusion policies monitor the nature of intergroup contact (its frequency and intensity) between natives and immigrants, identify which settings are associated with optimal and suboptimal encounters, and develop interventions to promote mutually-positive contact.

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Notes

1. To assess the minimum size of effect that can be reliably detected with the given sample size (N = 240), we conducted a sensitivity analysis using Monte Carlo simulations in Mplus 7.0. We determined the statistical power for different effect sizes the cross-lagged paths since these are the effects of interest. We used the benchmark values proposed by Orth et al. (2022) with 0.3 for small, .07 for medium, and .12 for large effects. For all other parameters, we used values that reflect a medium sized effect and also matched the observed values in our main analysis (i.e., for time 1 correlations, we used .12 and for the stability paths, we used .50. The results of the sensitivity analysis show that the statistical power was well below the conventional level of .80 even for large cross-lagged effects (<.20). We gradually increased the values of the cross-lagged parameters until we reached a result that our sample size yields for power of .80. The results showed that the conventional power of .80 could be reached for values of cross-lagged of .31.
2. We also ran the analyses separately for the two items assessing relative deprivation (due to their low correlation), but we found no significant difference from the results reported in the text where the two items are combined in one variable.
3. Considering respondents who filled in the questionnaire in French, all indexes were reliable: positive (ω_{T1} = .89; ω_{T2} = .85; ω_{T3} = .80), and negative (ω_{T1} = .86; ω_{T2} = .89; ω_{T3} = .62) contact, personal discrimination (r_{T1}= .69, p < .001; r_{T2}= .64, p < .001; r_{T3}= .63, p < .001), perceived relative deprivation (r_{T1}= .42, p < .001; r_{T2}= .50, p < .001; r_{T3}= .54, p < .001) and psychological wellbeing (ω_{T1} = .68; ω_{T2} = .74; ω_{T3} = .82). Considering the respondents who filled in the questionnaire in Italian, almost all indexes were reliable: positive (ω_{T1} = .88; ω_{T2} = .81; ω_{T3} = .87), and negative (ω_{T1} = .90; ω_{T2} = .87; ω_{T3} = .76) contact, personal discrimination (r_{T1}= .78, p < .001; r_{T2}= .91, p < .001; r_{T3}= .15, p = .392), perceived relative deprivation (r_{T1}= .34, p = .016; r_{T2}= .52, p < .001; r_{T3}= .57, p < .001) and psychological wellbeing (ω_{T1} = .85; ω_{T2} = .53; ω_{T3} = .88). Considering the respondents who filled in the

questionnaire in English, almost all indexes were reliable: positive (ω_{T1} = .84; ω_{T2} = .88; ω_{T3} = .72), and negative (ω_{T1} = .85; ω_{T2} = .89; ω_{T3} = .52) contact, personal discrimination (r_{T1}= .65, p < .001; r_{T2}= .74, p < .001; r_{T3}= .73, p < .001), perceived relative deprivation (r_{T1}= .43, p < .001; r_{T2}= .43, p < .001; r_{T3}= .21, p = .118) and psychological wellbeing (ω_{T1} = .78; ω_{T2} = .74; ω_{T3} = .92).

4. Alternative indirect effects (positive contact T1→ well-being T2→ perceived relative deprivation T3; negative contact T1→ perceived relative deprivation T2→ well-being T3).

Table 1

Means (M), Standard Deviations (SD) and Bivariate correlations between study variables (N=240).

	M	*SD*	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
1.Positive contact T1	3.61	0.71	-.29**	.31**	-.22**	-.21**	.45**	-.28**	.28**	-.04	-.09	.38**	-.27**	.09	-.06	.01
2.Negative contact T1	2.26	0.72		-.37**	.24**	.23**	-.33**	.41**	-.38**	.02	.11	-.14	.27**	-.09	-.01	-.03
3.Psychological well-being T1	4.39	0.70			-.26**	-.35**	.34**	-.21**	.62**	-.29**	-.34**	.09	-.11	.24**	-.17*	-.06
4.Personal discrimination T1	3.45	1.09				.33**	-.14	.25**	-.19**	.54**	.27**	-.15	-.03	-.11	.19*	.00
5. Relative deprivation T1	2.90	0.95					-.15*	.37**	-.21**	.34**	.67**	-.18*	.07	-.29**	.13	.37**
6.Positive contact T2	3.89	0.55						-.42**	.32**	-.30**	-.31**	.31**	-.08	.13	-.06	.01
7.Negative contact T2	2.12	0.54							-.23**	.25**	.41**	-.19*	.24**	-.26**	.14	.21**
8.Psychological well-being T2	4.48	0.83								-.26**	-.33**	.07	-.09	.18*	-.06	-.18*
9.Personal discrimination T2	3.55	0.94									.35**	-.21*	-.01	-.21*	.19*	.09
10. Relative deprivation T2	2.94	0.85										-.05	.05	-.39**	.26**	.40**

11.Positive contact T3	3.51	0.55								-.45**	.42**	-.15	-.11	
12.Negative contact T3	2.34	0.49									-.24**	.16*	.12	
13.Psychological well-being T3	4.04	0.83										-.22**	-.27**	
14.Personal discrimination T3	3.54	0.93											.16*	
15. Relative deprivation T3	3.10	0.81												

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 2

Measurement invariance.

	Model fit indices				Model comparison					
	χ_{SB^2}	*df*	CFI	RMSEA [90% CI]	Models	$\Delta\chi_{SB^2}$	Δdf	*p*	ΔCFI	ΔRMSEA
M1. Baseline model	88.496	55	.942	052 [.031, .072]						
M2. Model with time invariance of stability paths	118.084	60	.899	.066 [.048, .084]	M2-M1	26.125	5	.000	-.043	.014
M2a. Model with partial time-invariance of stability paths	96.747	59	.935	.054 [.034, .073]	M2a-M1	7.795	4	.099	-.007	.002
M3. Model with time invariance of stability paths and cross-lagged paths	150.423	79	.876	.064 [.048, .079]	M3-M2a	53.080	20	.000	-.059	.010
M3a. Model with time invariance of stability paths and partial cross-lagged paths	115.742	76	.931	.049 [.030, .066]	M3a-M2a	19.366	17	.308	-.004	-.005

Note. N=221. χ_{SB^2} = Satorra–Bentler scaled chi-square; df = degrees of freedom; CFI = comparative fit index; RMSEA [90% CI] = root mean square error of approximation and 90% confidence interval; Δ = change in the parameter. a = In this model, the stability paths of well-being and the cross lagged paths of Relative deprivation → Psychological well-being and Psychological well-being → Personal discrimination were unconstrained.

Table 3

Standardized results of the cross lagged model.

Stability paths	T1 →T2	T2 →T3
Positive contact	.349***	.253**
Negative contact	.372**	.319**
Psychological well-being	.519***	.140
Relative deprivation	.623***	.513***
Personal discrimination	.424***	.371***
Cross lagged paths	**T1 →T2**	**T2→T3**
Positive contact → Negative contact	-.140	.113
Positive contact → Psychological well-being	.039	.027
Positive contact → Relative deprivation	.171*	.121*
Positive contact → Personal discrimination	.043	.032
Negative contact → Positive contact	-.196*	-.147*
Negative contact → Psychological well-being	-.171*	-.125*
Negative contact → Relative deprivation	.041	.030
Negative contact → Personal discrimination	-.126	-.097
Psychological well-being → Positive contact	.072	.081
Psychological well-being → Negative contact	-.023	-.030
Psychological well-being → Relative deprivation	-.182**	-.200**
Psychological well-being → Personal discrimination	-.293**	.073
Relative deprivation → Positive contact	.057	.048
Relative deprivation → Negative contact	.174*	.168*
Relative deprivation → Psychological well-being	.060	-.383***
Relative deprivation →Personal discrimination	.120	.104
Personal discrimination → Positive contact	-.120	-.101
Personal discrimination → Negative contact	.028	.027
Personal discrimination → Psychological well-being	-.061	-.050
Personal discrimination → Relative deprivation	-.029	-.024
Covariates	**T1 →T2**	**T1 →T3**
Language proficiency →Positive contact	.153	-.061
Language proficiency → Negative contact	-.191*	.013

Language proficiency → Psychological well-being	-.029	-.095	
Language proficiency → Personal discrimination	.015	-.136	
Language proficiency → Relative deprivation	-.187*	-.063	
Age →Positive contact	-.072	.021	
Age → Negative contact	-.033	-.048	
Age → Psychological well-being	.116*	-.072	
Age → Personal discrimination	.023	.010	
Age → Relative deprivation	-.069	.085	
Gender →Positive contact	-.023	.023	
Gender → Negative contact	-.027	-.126	
Gender → Psychological well-being	.049	.076	
Gender → Personal discrimination	.039	-.125	
Gender → Relative deprivation	-.049	-.056	
SES →Positive contact	-.039	-.143*	
SES→ Negative contact	-.062	-.050	
SES→ Psychological well-being	-.045	.046	
SES→ Personal discrimination	.029	-.001	
SES→ Relative deprivation	.038	.018	
Education →Positive contact	-.064	-.059	
Education → Negative contact	-.054	.211**	
Education → Psychological well-being	.055	.085	
Education → Personal discrimination	-.015	-.041	
Education → Relative deprivation	.069	-.049	
Reason for migrating →Positive contact	-.112	-.086	
Reason for migrating → Negative contact	.089	.080	
Reason for migrating → Psychological well-being	-.074	-.023	
Reason for migrating → Personal discrimination	.126*	.020	
Reason for migrating → Relative deprivation	.022	-.044	
Correlations	T1	T2	T3
Positive contact ↔ Negative contact	-.342***	-.334***	-.424***
Positive contact ↔ Psychological well-being	.320***	.057	.447***
Positive contact ↔ Relative deprivation	-.221**	-.257**	-.219*
Positive contact ↔ Personal discrimination	-.212*	-.322***	-.117

Negative contact ↔ Psychological well-being	-.396***	-.092	-.168
Negative contact ↔ Relative deprivation	.298***	.294**	.151
Negative contact ↔ Personal discrimination	.267***	.209*	.136
Psychological well-being ↔ Relative deprivation	-.376***	-.293***	-.143
Psychological well-being ↔ Personal discrimination	-.307***	-.226*	-.172
Relative deprivation ↔ Personal discrimination	.347***	.178	.044

Notes. T= Time; SES = Social Economic Situation

N =221; *$p < .05$, ** $p < .01$, *** $p < .001$.

Appendix A.

We created dummy variables for waves 2 and 3. Respondents were coded as 0 = those who did not participate in the wave and 1 = those who participated in the wave. We created an additional dummy variable which coded respondents who completed only one wave as 0, and those who completed at least two waves as 1. We then entered the variables in a series of logistic regressions to test which, if any, predicted respondents' drop-out. We adjusted the significance threshold (alpha level 0.01) due to multiple testing of disjunction hypothesis (see Rubin, 2021). Results showed only significant differences on relative deprivation between respondents who dropped out and those who participated in both the second and third wave (see Tables B1-2). Mean comparisons showed that respondents who dropped out reported less relative deprivation than those who completed both the second and third wave. Similarly, respondents who participated at the third wave showed lower discrimination compared to those who dropped out.

Table A1

Logistic regression predicting respondents' drop-out at T2:

Predictor	*B*	*SE*	*p*	*OR*	99% CI
Gender	.17	.38	.652	1.18	[0.44, 3.12]
Age	-.18	.11	.107	.82	[0.61, 1.12]
Education	.23	.21	.269	1.26	[0.73, 2.19]
Economic status	.07	.14	.630	1.07	[0.73, 1.56]
Language proficiency	-.09	.17	.607	.91	[0.57, 1.42]
Reason for migrating	-.14	.15	.320	.86	[0.59, 1.27]
Positive contact	.13	.27	.618	1.14	[0.61, 2.34]
Negative contact	.23	.27	.405	1.26	[0.65, 2.60]
Personal Discrimination	.17	.17	.319	1.19	[0.74, 1.87]
Relative deprivation	.50	.22	.021	1.66	[0.93, 2.89]
Psychological well-being	.19	.29	.521	1.21	[0.56, 2.57]

Table A2

Logistic regression predicting respondents' drop-out at T3:

Predictor	*B*	*SE*	*p*	*OR*	99% CI
Gender	-.06	.37	.863	.93	[0.36, 2.45]
Age	.01	.11	.923	1.01	[0.76, 1.35]
Education	.33	.21	.113	1.39	[0.81, 2.40]
Economic status	.00	.14	.992	1.00	[0.69, 1.45]
Language proficiency	.17	.16	.285	1.19	[0.76, 1.80]
Reason for migrating	-.17	.14	.229	.84	[0.58, 1.22]
Positive contact	.17	.27	.511	1.19	[0.61, 2.35]
Negative contact	.06	.26	.813	1.06	[0.65, 2.43]
Personal discrimination	.37	.17	.035	1.44	[0.90, 2.23]
Relative deprivation	.79	.22	.000	2.21	[1.21, 3.80]
Psychological well-being	-.15	.29	.612	.86	[0.42, 1.90]

Appendix B

Table B1

Measurement invariance of study variables without covariates.

	Model fit indices				Model comparison					
	χ_{SB^2}	*df*	CFI	RMSEA [90% CI]	Models	$\Delta\chi_{SB^2}$	Δdf	*p*	ΔCFI	ΔRMSEA
M1. Baseline model	45.332	25	.961	058 [.030, .085]						
M2. Model with time invariance of stability paths	72.330	30	.919	.077 [.054, .099]	M2-M1	23.270	5	.000	-.042	.019
M2a. Model with partial time-invariance of stability paths	49.599	29	.961	.054 [.027, .080]	M2a-M1	5.041	4	.283	.000	-.004
M3. Model with time invariance of stability paths and cross-lagged paths	106.835	49	.889	.070 [.052, .088]	M3-M2a	48.873	20	,000	-.072	.016
M3a. Model with time invariance of stability paths and partial cross-lagged paths	69.608	45	.953	.048 [.023, .069]	M3a-M2a	20.260	16	.209	-.008	-.006

Note. χ_{SB^2} = Satorra–Bentler scaled chi-square; df = degrees of freedom; CFI = comparative fit index; RMSEA [90% CI] = root mean square error of approximation and 90% confidence interval; Δ = change in the parameter. a = In this model, the stability paths of Well-being and the cross lagged paths of Perceived relative deprivation → Psychological well-being and Psychological well-being → Personal discrimination were unconstrained.

Table B2

Standardized results of the cross lagged model without covariates.

Stability paths	T1 →T2	T2 →T3	
Positive contact	.390***	.341***	
Negative contact	.376**	.335**	
Psychological well-being	.542***	.082	
Relative deprivation	.642***	.547***	
Personal discrimination	.436***	.368***	
Cross lagged paths	**T1 →T2**	**T2→T3**	
Positive contact → Negative contact	-. 092	-. 087	
Positive contact → Psychological well-being	. 053	. 042	
Positive contact → Relative deprivation	. 142*	. 111*	
Positive contact → Personal discrimination	. 032	. 025	
Negative contact → Positive contact	-. 158*	-. 131*	
Negative contact → Psychological well-being	-. 191**	-. 143**	
Negative contact → Relative deprivation	. 028	. 020	
Negative contact → Personal discrimination	-. 087	-. 066	
Psychological well-being → Positive contact	. 234**	. 009	
Psychological well-being → Negative contact	-. 019	-. 025	
Psychological well-being → Relative deprivation	-. 200**	-. 220**	
Psychological well-being → Personal discrimination	-. 270***	. 030	
Relative deprivation → Positive contact	. 083	. 079	
Relative deprivation → Negative contact	. 268***	. 066	
Relative deprivation → Psychological well-being	.064	-. 356***	
Relative deprivation → Personal discrimination	. 136	. 120	
Personal discrimination → Positive contact	-. 076	-. 070	
Personal discrimination → Negative contact	. 010	. 010	
Personal discrimination → Psychological well-being	-. 019	-. 016	
Personal discrimination → Relative deprivation	-. 062	-. 051	
Correlations	**T1**	**T2**	**T3**
Positive contact ↔ Negative contact	-. 289***	-. 308**	-. 406***
Positive contact ↔ Psychological well-being	. 325***	. 149	. 418***

Positive contact ↔ Relative deprivation	-. 209**	-. 325**	-. 176
Positive contact ↔ Personal discrimination	-. 211**	-. 319***	-. 103
Negative contact ↔ Psychological well-being	-. 377***	-. 111	-. 180*
Negative contact ↔ Relative deprivation	. 238***	. 288**	. 091
Negative contact ↔ Personal discrimination	. 241***	. 193	. 141
Psychological well-being ↔ Relative deprivation	-. 351***	-. 349***	-. 113
Psychological well-being ↔ Personal discrimination	-. 263***	-. 227*	-. 117
Relative deprivation ↔ Personal discrimination	. 337***	. 183	. 082

Notes. * $p < .05$, ** $p < .01$, *** $p < .001$. Results that differ from those reported in the manuscript are underlined.