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SPECIAL ISSUE ARTICLE

The association between actual and perceived ethnic diversity: The moderating role of authoritarianism and implications for outgroup threat, anxiety, and mistrust

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Abstract

The present study investigated the role of authoritarianism in the association between the actual proportion of ethnic minorities (objective diversity) within a neighborhood and majority members' subjective perception thereof (perceived diversity). Additionally, we tested how authoritarianism affects the direct and indirect relationships between objective diversity and outgroup threat, anxiety, and mistrust. Analyses in a nationally stratified sample of Dutch citizens ($N=848$) without migration background from 706 different neighborhoods showed that higher levels of authoritarianism have a dual effect on the relationship between objective diversity and negativity towards outgroups. In particular, authoritarianism (i) boosts the indirect relationship between objective diversity and greater outgroup negativity through perceived diversity, and (ii) curbs the direct association of objective diversity with reduced outgroup negativity. These findings shed light on how majority members with different levels of authoritarianism differentially perceive diversity in their neighborhood, and how this relates to their responses to ethnic minorities.

Due to incoming migration, Western European societies are becoming more and more ethnically and culturally diverse. This rise in diversity has received ample media coverage, and has moved to the forefront of scholarly debate (Hewstone, 2015). As a result, a growing body of research has investigated the associations between diversity and several relevant intergroup outcomes, focusing on variables such as trust (e.g., Putnam, 2007; Schmid, Al Ramiah, & Hewstone, 2014; Uslaner, 2012; van der Meer & Tolsma, 2014), social capital (e.g., Lawrence, 2011; Letki, 2008), and prejudice (e.g., Pettigrew, Wagner, & Christ, 2010; Quillian, 1995; Van Assche, Roets, Dhont, & Van Hiel, 2014).

Despite this recent scholarly attention to diversity, studies have remained largely silent about the association between the actual proportion of ethnic minorities within a specific area and residents' subjective perception of this diversity. Yet, the perception of diversity likely plays a crucial role in the relationships between actual diversity and people's responses to outgroups. Indeed, several studies (e.g., Hooghe & De Vroome, 2013; Semyonov, Rajzman, Tov, & Schmidt, 2004) reported stronger effects of perceived diversity compared to objective diversity on intergroup attitudes. Moreover, the perception of diversity is likely to depend not only on the actual proportion of immigrants but also on the characteristics of the perceiver.

Recent studies have demonstrated a moderating role of authoritarianism in the relationship between (objective and perceived) diversity and outgroup attitudes (e.g., Kauff, Asbrock, Thörner, & Wagner, 2013; Van Assche et al., 2014). In the present study, we investigate whether people relatively high versus low in authoritarianism systematically differ in their perceptions of neighborhood diversity, and whether these perceptions correspond with the actual diversity in their neighborhood to different degrees. If this were the case, these differential relations between objective and perceived diversity may, in turn, result in a different impact of diversity on feelings of outgroup threat, anxiety, and mistrust for those high versus low in authoritarianism.

Diversity: Conflict and Contact Theories

Several theoretical models have been proposed concerning how diversity may affect intergroup attitudes. A first important framework can be referred to as conflict theories, which encompasses ethnic competition theory (Blumer, 1958; Bobo & Hutchings, 1996) and group threat theory (Quillian, 1995). These theories propose that higher proportions of ethnic minorities in a community are associated with heightened feelings of outgroup threat (Semyonov & Glikman, 2009), and

more negative feelings towards minorities (e.g., Scheepers, Gijsberts, & Coenders, 2002; Schneider, 2008). In this respect, scholars have suggested that diversity “erodes” social capital and outgroup trust (e.g., Alesina & La Ferrara, 2002; Laurence, 2011; Putnam, 2007). Furthermore, Koopmans and Veit (2014) found that experimental primes of neighborhood ethnic diversity caused lower levels of trust in neighbors among majority group members.

However, a second perspective, grounded in intergroup contact theory (Allport, 1954; Brown & Hewstone, 2005; Pettigrew, 1998; Pettigrew & Tropp, 2006), offers a more optimistic outlook, arguing that diverse neighborhoods may provide more opportunities for positive contact with individuals from other social groups. Diversity therefore has the potential to reduce outgroup anxiety and threat, and to boost empathy and positive outgroup attitudes (see, Wagner, Christ, Pettigrew, Stellmacher, & Wolf, 2006; Wagner, Van Dick, Pettigrew, & Christ, 2003). In line with this perspective, Kunovich and Hodson (2002) showed that higher diversity was related to decreased prejudice levels in former Yugoslavia, and Oliver and Wong (2003) found a similar positive association between diversity and positive outgroup perceptions in U.S. neighborhoods.

Obviously, conflict and contact theories differ in their predictions concerning diversity, with the former framework stressing the negative consequences, whereas the latter theory emphasizes the positive outcomes (cf. the “population ratio paradox”, Pettigrew *et al.*, 2010). Recently, various scholars integrated both theoretical frameworks (e.g., Savelkoul, Scheepers, Tolsma, & Hagendoorn, 2011; Schlueter & Scheepers, 2010; Schlueter & Wagner, 2008; Schmid *et al.*, 2014). For example, Schmid *et al.* (2014) tested the diversity-trust association in the United Kingdom and demonstrated that diversity as such had no substantial overall effects on outgroup trust and outgroup attitudes, because the positive effect of higher intergroup contact and the negative effect of higher threat canceled each other out. These opposing processes may thus explain why many studies reported non-significant overall effects of diversity on societal outcomes, such as social cohesion (Gijsberts, van der Meer, & Dagevos, 2012; Tolsma, van der Meer, & Gesthuizen, 2009), ethnic polarization (Evans & Need, 2002), outgroup trust (van der Meer & Tolsma, 2014), anti-immigrant attitudes (Green, Fasel, & Sarrasin, 2010; Hjern, 2007; Savelkoul *et al.*, 2011; Schlueter & Scheepers, 2010; Schlueter & Wagner, 2008), and even specific expressions of prejudice, such as opposition to antiracism laws (Sarrasin *et al.*, 2012).

The Potential Role of Individual Differences in Authoritarianism

Diversity not only instills distinct processes related to threat and contact, but its effects also seem to depend on the characteristics of the perceiver. In this regard, Van Assche *et al.* (2014) (see also Kauff *et al.*, 2013) proposed a key role for Right-Wing Authoritarianism

(RWA, Altemeyer, 1981, 1988), which is defined as the covariation of the following: (i) strict adherence to conventional norms and values (conventionalism); (ii) uncritical subjection to authority (authoritarian submission); and (iii) feelings of aggression towards norm violators (authoritarian aggression). Ever since Adorno, Frenkel-Brunswick, Levinson, and Sanford’s (1950) seminal work, authoritarianism has been considered as an important predictor of outgroup attitudes, and recent studies have shown that it also shapes diversity beliefs (Asbrock & Kauff, 2015) and reactions to multicultural policies (Kauff *et al.*, 2013). Moreover, Van Assche *et al.* (2014) demonstrated that authoritarianism moderates the relationship between diversity and majority members’ attitudes towards ethnic minorities. Specifically, while neither perceived nor objective diversity had an overall, direct effect on outgroup attitudes, they both were associated with less positive attitudes towards immigrants among high authoritarian majority members, but with more positive attitudes among low authoritarian individuals. Other studies used constructs that are closely related to authoritarianism and found similar moderation effects. In particular, individuals living in diverse environments who also endorse dangerous worldviews (Sibley *et al.*, 2013) or conformity values (Fasel, Green, & Sarrasin, 2013) typically hold more negative attitudes towards minorities (or minority symbols) than those who do not hold such worldviews or values.

Towards a Mediated Moderation Model

In addition to the observation that different people react differently to diversity, previous research has also shown that there is meaningful variation in people’s estimates of diversity in their environment. Although some studies revealed moderate to strong correlations between actual diversity and rating scales tapping into perceived diversity (Pettigrew *et al.*, 2010; Van Assche *et al.*, 2014), other studies showed weak to moderate correlations between actual figures and perceived estimates of diversity (e.g., Hooghe & De Vroome, 2013; Semyonov *et al.*, 2004). People’s accuracy in making such estimates thus seems less than perfect and there is also meaningful individual variation in the sensitivity to detect diversity (Stolle, Soroka, & Johnston, 2008). Such sensitivity differences may arise because some individuals are more vigilant of minority group members. Deviant or threatening stimuli are known to elicit attention (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001; Rozin & Royzman, 2001; Trawalter, Todd, Baird, & Richeson, 2008) and especially people high in authoritarianism tend to perceive ethnic minorities as different, deviant in terms of norms and values, and therefore threatening (e.g., Ford, 2011; Green *et al.*, 2010; Kauff *et al.*, 2013). Hence, we hypothesize that an individual’s level of authoritarianism will affect the association between the actual proportion of ethnic minorities in the neighborhood and the perception of this diversity.

Putting together these different pieces of the literature, we argue that, for a more complete

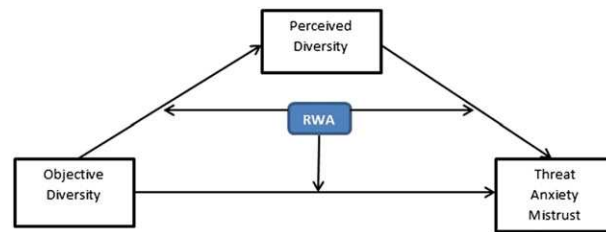


Fig. 1: Conceptual model of the associations between diversity, authoritarianism and outgroup negativity

understanding of the association between diversity and outgroup negativity, it is important to investigate actual minority size as well as perceived ethnic diversity and to take into account the relationship between actual and perceived diversity. Moreover, one should acknowledge that characteristics of the individual, in particular differences in authoritarianism, can influence this relationship between actual and perceived diversity, as well as the relationship between diversity and outgroup negativity. A better understanding of how (i.e., mediating processes) and for whom (i.e., individual differences moderators) diversity is harmful or beneficial for these intergroup outcomes, has recently been identified as one of the core future avenues for social psychological research on intergroup relations (Hodson & Dhont, 2015).

We thus hypothesize that authoritarianism plays a moderating role in (i) the association of actual diversity with outgroup negativity, and (ii) the association of perceived diversity with outgroup negativity (see Van Assche et al., 2014), but also in (iii) the relationship between objective and perceived diversity itself. This perspective yields the conceptual model depicted in Figure 1 in which the relation between objective minority proportion and outgroup negativity (i.e., feelings of threat, anxiety, and mistrust in the present study) is mediated by perceptions of diversity, with the strength of each of these relationships potentially moderated by right-wing authoritarianism.

Method

Participants

We used a nationally stratified sample of citizens ($N=848$, response rate 71.62%) without migration background from 706 different neighborhoods across the Netherlands. This dataset was collected online in 2010 through an independent survey company as a part of a larger multi-wave panel study. All respondents completed all relevant questionnaire items, yielding no missing data. At least one person from every zip code region¹

¹A zip code region in the Netherlands is comprised of all zip codes that share the first two digits (for example: zip code region one consists of all zip codes between 1000 and 1099, zip code region two consists of all zip codes between 1100 and 1199, ..., zip code region 90 consists of all zip codes between 9900 and 9999). A zip code region covers about 82 square kilometers.

in the Netherlands was recruited. The mean age of the sample was 49 years ($SD=15.12$), and 51% were men. Thirty-seven per cent of the participants had completed primary school, 38% had completed high school and 25% had a college or university degree. Annual gross household income showed a fairly normal distribution, with 6% earning less than €11 000, 14% between €11 000 and €23 000, 25% between €23 000 and €34 000, 22% between €34 000 and €56 000, and 11% earned more than €56 000. Twenty-two per cent of the respondents chose the option "I do not want to disclose this information".

Measures

Objective diversity. We assessed the percentage of non-Western minority members within a specific neighborhood (i.e., zip code) as an objective indicator of diversity within the year of data collection (see also Van Assche et al., 2014). We used the available data from the Dutch Central Bureau of Statistics (CBS, 2010), indicating the number of individuals per zip code of non-Western origin² and calculated the percentage as a function of the total number of registered inhabitants per zip code to get a measure of relative objective diversity ($M=11.01\%$, $SD=11.28$, $MIN=0.00\%$, $MAX=72.74\%$).

Perceived diversity. We used two items to assess subjectively perceived diversity in one's direct environment (see also Semyonov et al., 2004). These items read "How many people from immigrant origin live in your municipality/city?" and "How many people from immigrant origin live in your street?" Respondents answered using 7-point rating scales ranging from 1 (*none*) to 7 (*a lot*). Both items were strongly positively related ($r=.58$, $p<.001$), yielding a scale with $M=3.44$ ($SD=1.49$).

²Non-Western ethnic minorities are defined as immigrants whose ethnic background (or that of at least one parent) is in Africa, South America or Asia (excluding Indonesia or Japan). Most non-Western minorities are Turks (23.2%), Moroccans (21.1%), and Surinamese (20.7%; CBS, 2010). Note that in the Dutch context, the category "non-Western minorities" is generally referred to as "ethnic minorities" (Guiraudon, Phalet, & Ter Wal, 2005). For that reason, we use both terms interchangeably.

Right-wing authoritarianism. The 12-item RWA3D-scale of Funke (2005) was administered on 7-point Likert scales anchored by 1 (*totally disagree*) and 7 (*totally agree*). A sample item is "Obedience and respect for authority are the most important virtues children should learn." Cronbach's alpha was .70, with $M=3.93$ ($SD=0.79$).

Outgroup threat. Outgroup threat was measured with three items (Stephan et al., 2002; see also Dhont & Van Hiel, 2011) tapping into perceived realistic threat posed by immigrants for the Dutch economy and the employment of native Dutch people. These items read "In our country, people from immigrant origin have more economic power than they deserve," "People from immigrant origin make it harder for Dutch natives to find a good job," and "The presence of people from immigrant origin in our country has a negative impact on the Dutch economy." Respondents answered using 7-point Likert scales ranging from 1 (*totally disagree*) to 7 (*totally agree*). Cronbach's alpha of this scale was .85, with $M=3.73$ ($SD=1.48$).

Intergroup anxiety. We used a four-item abridged version (Dhont, Roets, & Van Hiel, 2011) of Stephan and Stephan's (1985) 11-item intergroup anxiety scale (see also Turner, Hewstone, Voci, & Vonofakou, 2008; Turner, Dhont, Hewstone, Prestwich, & Vonofakou, 2014). Participants were asked to think about a situation where they would interact with people from immigrant origin. Next, they were asked to what extent they would feel "anxious," "insecure," "afraid," and "scared." Respondents answered using 7-point scales ranging from 1 (*certainly not*) to 7 (*certainly*). Cronbach's alpha of this scale was .94, with $M=2.57$ ($SD=1.44$).

Outgroup mistrust. The measure for mistrust consisted of eight items (see also Dhont & Van Hiel, 2011). An example item reads "If there are people from immigrant origin around me, I usually do not trust them." Respondents answered using 7-point Likert scales ranging from 1 (*totally disagree*) to 7 (*totally agree*). Cronbach's alpha of this scale was .90, with $M=3.67$ ($SD=1.12$).

Results

Preliminary Analyses

Our data were theoretically nested (i.e., individuals were nested within zip codes), although 78% of the respondents in our sample had a unique zip code ($N=661$). Therefore, we first investigated whether multilevel analyses were warranted for all or some of our variables. We estimated empty (intercept-only) models, which provide insight into the variances in our outcomes at the individual and contextual levels. We also

assessed the intraclass correlations (ICCs) to explore if there was substantial between-level variance in the scores of our outcome variables, which would warrant the use of multilevel modeling. Taking into account the higher-level structure for threat, anxiety, and mistrust did not significantly improve the goodness-of-fit statistics of each model (i.e., changes in $-2 * \log$ -likelihood were $\chi^2_{(1)}=1.17$, $p=.28$ for threat; $\chi^2_{(1)}=0.00$, $p=.99$ for anxiety; and $\chi^2_{(1)}=1.48$, $p=.22$ for mistrust). Additionally, all ICC's were very small (ranging from .00 to .07). However, taking into account the higher-level structure for perceived diversity (i.e., the mediator) significantly improved the goodness-of-fit (i.e., the change in $-2 * \log$ -likelihood was $\chi^2_{(1)}=28.20$, $p<.001$). Also, the ICC of .41 indicated that there was substantial between-level variance in perceived diversity. Therefore, for specific analyses with perceived diversity as the outcome variable, we used multilevel analyses.³

Next, the bivariate correlations among all study variables were calculated (see Table 1). Objective and subjective diversity were highly positively interrelated. Objective diversity was weakly negatively related to RWA but not to the outcome variables, while perceived diversity was positively related to all three outcome variables. Also, moderate to high positive correlations were found between authoritarianism and all outgroup outcomes. Finally, all outgroup outcomes were positively interrelated.

Main Analyses

First, we conducted several hierarchical linear regression analyses to test the moderating role of authoritarianism in the relationships between each of the variables of interest: the predictor (objective diversity), the mediator (perceived diversity), and the outcomes (outgroup threat, anxiety, and mistrust). All predictors were centered before running the analyses (Aiken & West, 1991). Table 2 summarizes the results of these analyses. In line with our expectations, each of the three interaction effects were significant. Simple slope analyses revealed (i) a stronger positive association between actual and perceived diversity among people high ($\beta=.72$, $p<.001$) vs. low ($\beta=.55$, $p<.001$) in authoritarianism,⁴ (ii) positive associations between objective diversity and feelings of threat, anxiety, and mistrust among people high in authoritarianism

³According to Maas and Hox (2005) and Gelman and Hill (2007), multilevel analyses can legitimately be performed with a low number of respondents per contextual unit, providing that (i) the model fit increases significantly when taking into account the nested structure in the data, and (ii) the ICC is sufficiently large. When considering perceived diversity as an outcome, these two conditions were met.

⁴Standardized estimates for regression analyses on perceived diversity were calculated on the basis of multilevel unstandardized estimates. These were $b=9.54$ ($SE=0.54$), $p<.001$ for individuals high in authoritarianism, and $b=7.26$ ($SE=0.47$), $p<.001$ for those low in authoritarianism.

Table 1. Correlations among study variables

Measure	1	2	3	4	5	6
1. Objective diversity	-					
2. Perceived diversity	.62***	-				
3. Right-wing authoritarianism	-.08*	.02	-			
4. Outgroup threat	-.04	.09*	.51***	-		
5. Intergroup anxiety	.02	.14***	.18***	.31***	-	
6. Outgroup mistrust	-.04	.08*	.48***	.69***	.44***	-

*: $p < .05$;
 **: $p < .01$;
 ***: $p < .001$

Table 2. Standardized estimates (β s) of hierarchical regression analyses on perceived diversity (multilevel), outgroup threat, intergroup anxiety, and outgroup mistrust

	Perceived diversity	Outgroup threat	Intergroup anxiety	Outgroup mistrust
Objective diversity (OD)	.64*** ^a	.02 ^a	.04 ^b	.02
Right-wing authoritarianism (RWA)	.07** ^a	.51***	.18***	.48***
OD x RWA	.09** ^a	.08*	.09*	.08**
R^2	.43*** ^b	.27***	.04***	.24***
Perceived diversity (PD)		.07*	.13***	.07*
Right-wing authoritarianism (RWA)		.51***	.18***	.48***
PD x RWA		.06*	.10**	.06*
R^2		.27***	.06***	.24***

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

^aStandardized estimates for regression analyses on perceived diversity were calculated on the basis of multilevel unstandardized estimates. These were $b = 8.40$ ($SE = 0.36$), $p < .001$ for objective diversity (OD), $b = .13$ ($SE = 0.05$), $p = .009$ for authoritarianism (RWA), and $b = 1.44$ ($SE = 0.45$), $p = .002$ for the OD x RWA interaction term.

^bThe explained variance at Level 1 (Individual) was 7.58%, the explained variance at Level 2 (zip code) was 94.13%. Total explained variance = $7.58 \times 0.59 + 94.13 \times 0.41$. The explained slope variance in the relationship objective – perceived diversity by RWA was 23.87%.

($\beta = .09$, $p = .04$; $\beta = .12$, $p = .01$; $\beta = .09$, $p = .04$; for threat anxiety, and mistrust, respectively) versus no significant associations among people low in authoritarianism ($\beta = -.06$, $p = .15$; $\beta = -.04$, $p = .40$; $\beta = -.06$, $p = .09$; for threat anxiety, and mistrust, respectively), and c) positive associations between perceived diversity and feelings of threat, anxiety, and mistrust among individuals high in authoritarianism ($\beta = .13$, $p = .001$; $\beta = .22$, $p < .001$; $\beta = .13$, $p = .002$; for threat anxiety, and mistrust, respectively) versus no significant associations among people low in authoritarianism ($\beta = .01$, $p = .87$; $\beta = .04$, $p = .43$; $\beta = .01$, $p = .85$; for threat anxiety, and mistrust, respectively).

Second, we tested whether perceived diversity accounts for the interactions between objective diversity and authoritarianism on outgroup negativity using the regression-based method of Muller, Judd, and Yzerbyt (2005) (see Table 3). To test the hypothesized mediated moderation, three regression steps needed to be examined. Step 1 was already reported in Table 2 and included the predictor (objective diversity), the moderator (authoritarianism) and their interaction predicting each outcome. In Step 2, we added the mediator (perceived diversity) to the model,

and in Step 3, the interaction between the mediator (perceived diversity) and the moderator (authoritarianism) was added. For all outcomes, the addition of perceived diversity in Step 2 significantly improved the model, while, at the same time, the interaction between objective diversity and authoritarianism remained significant. Interestingly, for all outcomes, adding the interaction between perceived diversity and authoritarianism in Step 3 did not produce additional explained variance, but the interaction between objective diversity and authoritarianism was no longer significant (see Table 3).

Because a significant effect of the mediator on the outcome emerged, and the residual predictor x moderator interaction was reduced to non-significance, the requirements for mediated moderation were fulfilled. In sum, these analyses indicated that authoritarianism particularly acted as a moderator of the effects of objective diversity (the predictor) on both perceived diversity (the mediator) and the outcome variables, rather than moderating the effects of perceived diversity on only the outcome variables. Therefore, to test the conditional indirect effects of objective diversity on the outcome variables via perceived diversity, we

Table 3. Standardized estimates (β s) of the hierarchical regression analyses on outgroup threat, intergroup anxiety, and outgroup mistrust

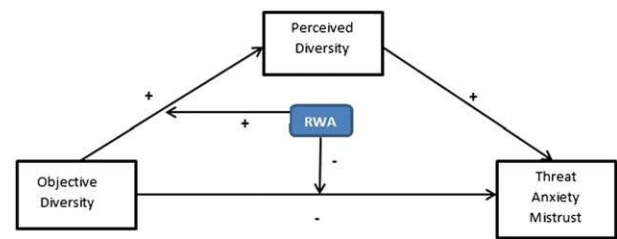
	Step 1	Step 2	Step 3
Outgroup threat			
Objective diversity (OD)	.02	-.05	-.05
Right-wing authoritarianism (RWA)	.51***	.50***	.50***
OD \times RWA	.08*	.07*	.05
Perceived diversity (PD)		.11**	.11**
PD \times RWA			.04
ΔR^2	.27***	.01**	.00
Intergroup anxiety			
Objective diversity (OD)	.04	-.07 ^a	-.08 ^a
Right-wing authoritarianism (RWA)	.18***	.17***	.17***
OD \times RWA	.09*	.07*	.02
Perceived diversity (PD)		.19***	.18***
PD \times RWA			.08 ^a
ΔR^2	.04***	.02***	.01 ^a
Outgroup mistrust			
Objective diversity (OD)	.02	-.05	-.05
Right-wing authoritarianism (RWA)	.48***	.47***	.47***
OD \times RWA	.08**	.07*	.06
Perceived diversity (PD)		.11**	.11**
PD \times RWA			.02
ΔR^2	.24***	.01**	.00

^a $p < .10$;* $p < .05$;** $p < .01$;*** $p < .001$

conducted bootstrap analyses (1000 bootstrap samples) using Hayes' Process macro (2013, default 1000 bootstrap samples) in which the association between the predictor (i.e., objective diversity) and the mediator (i.e., perceived diversity), as well as the associations between the predictor and the outcome variables (i.e., threat, anxiety, and mistrust) were moderated by authoritarianism (i.e., Model 8; Hayes, 2013; see Figure 2).

The model tests revealed that the indirect associations of objective diversity with increased outgroup threat, anxiety and mistrust through perceived diversity were stronger for those higher (vs. lower) in authoritarianism (see Figure 3 and Table 4). Moreover, in line with previous studies (e.g., Pettigrew *et al.*, 2010), objective diversity was directly associated with lower levels of threat, anxiety, and mistrust, but this proved to be the case only for people relatively low in authoritarianism, not among those relatively high in authoritarianism. The total association of objective diversity with all three outcome variables was then positive, but only for high authoritarians. All direct, indirect, and total effects of objective diversity on each outcome are reported in Table 4.

To check that our results were robust, we also conducted a number of alternative analyses, which yielded a similar pattern of results. These analyses either controlled for demographic variables and unemployment rates, used a fractionalization index (see Putnam, 2007) instead of the objective minority proportion as indicator of actual diversity, or tested the model for both

**Fig. 2.** Schematic representation of the tested mediated moderation model

items of perceived diversity separately as a form of robustness analysis.⁵

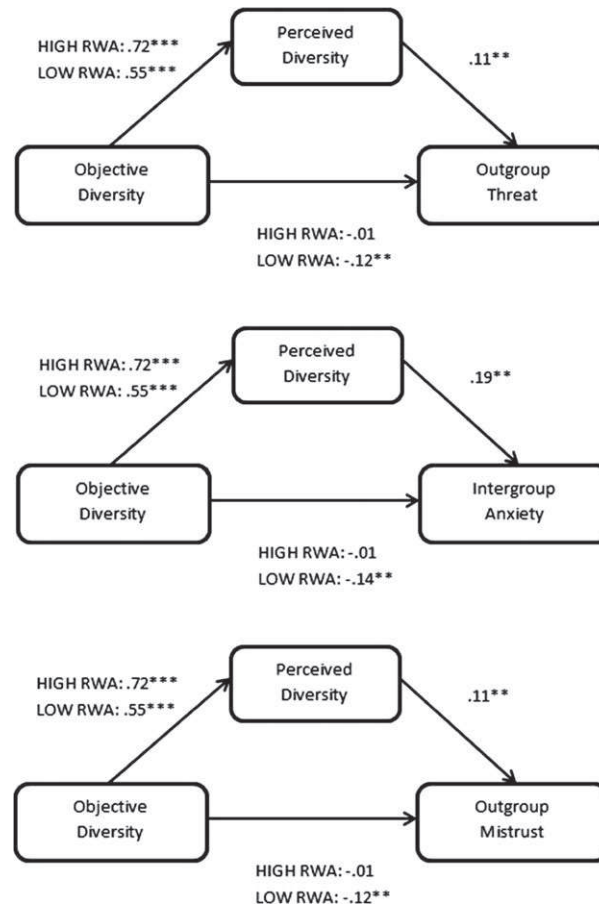
Discussion

Rising immigration and cultural diversity have been an increasingly prominent issue in political and societal debates in Western societies, and as such this topic represents a most relevant field of investigation for social and political psychologists. However, previously reported effects of cultural diversity on majority members' intergroup attitudes seem to be rather inconsistent, suggesting that such effects may depend on both contextual and individual characteristics (see Kauff *et al.*, 2013; Sibley *et al.*, 2013; Van Assche *et al.*, 2014). The present study takes this approach one step further by focusing on the role of context and individual differences in the genesis of subjective perception of diversity. Specifically, we investigated the following: (i) the role of authoritarianism in the relationship between the actual proportion of minorities in a given area and the perception of neighborhood diversity by the majority members living in this area, and (ii) how such differential relations between objective and perceived diversity may, in turn, result in a differential impact on experienced outgroup threat, anxiety, and mistrust for majority members high versus low in authoritarianism.

The Relationship between Actual and Perceived Diversity

The present study shows that individuals' perception of ethnic diversity in their local environment depends upon the actual proportion of minorities living there, with the perceiver's level of authoritarianism playing a moderating role. In particular, the association between the actual proportion of ethnic minorities in the neighborhood and the perception of this diversity was significantly stronger among individuals scoring high on authoritarianism than for those scoring low. This finding may be surprising to scholars who merely expect greater perception bias in high authoritarian individuals, but it is in line with our reasoning that such individuals are more likely to spot the presence of other

⁵Given the largely analogous results, we do not report the full results of these additional analyses, but they are available upon request with the first author.



Note: * $p < .05$; ** $p < .01$; *** $p < .001$

Fig. 3: Results of the models for process model 8 on outgroup threat (upper panel), intergroup anxiety (middle panel), and outgroup mistrust (lower panel)

ethnic and cultural groups because they are more vigilant of these specific groups.

However, a stronger link between actual and perceived diversity among high (vs. low) authoritarian individuals does not preclude the possibility that high authoritarian individuals overestimate diversity. Indeed, correlations and mean level differences are statistically independent. Hence, even though the estimates of high authoritarians are more sensitive to real contextual differences, their estimates may also be exaggerated. Previous research (Alba, Rumbaut, & Marotz, 2005; Sigelman & Niemi, 2001) has reported that majority members tend to have inflated estimations of the proportion of minorities in their community and it seems plausible that this tendency is stronger among individuals high (vs. low) in authoritarianism. Although we obtained a non-significant zero-order correlation between authoritarianism and perceived diversity, additional analyses indicated that this could be due to high authoritarians living in objectively less diverse areas than low authoritarians. Indeed, statistically controlling for this mean difference in living environment revealed that high authoritarians tended to have slightly ($r = .09, p < .01$) higher overall estimates of ethnic diversity. However, the present data do not allow us to determine whether these estimates represent an

overestimation by high authoritarians, an underestimation by low authoritarians, or both. The use of percentage-wise estimates of minority proportions in follow-up studies could provide a more direct test of the “authoritarian overestimation” hypothesis.

The Role of Authoritarianism and its Possible Implications for Interventions

Our results indicated that higher levels of authoritarianism have a dual effect that underlies the global (i.e., total) interaction effect between objective diversity and authoritarianism on outgroup negativity. In particular, authoritarianism boosted the indirect relationship between greater objective diversity and outgroup negativity through greater perceived diversity, while it simultaneously curbed the direct association of objective diversity with reduced threat, anxiety, and mistrust. These findings thus distinguish two paths explaining why objective diversity is associated with more negativity towards minorities among individuals high in authoritarianism. This dissociation in two paths may have relevant practical implications for interventions.

The indirect path of objective diversity to increased feelings of threat, anxiety and mistrust towards ethnic

Table 4. Standardized estimates (β s) of the total, direct, and indirect effects of objective diversity on outgroup threat, intergroup anxiety, and outgroup mistrust at high and low levels of authoritarianism

	Total	Direct	Indirect	<i>b</i> (Boot <i>SE</i>) [<i>CI</i> ₉₅]
	β	β	β	
Outgroup threat				
High RWA (+1SD)	.09*	.01	.08**	1.02 (.38) [.25; 1.73]
Low RWA (- 1SD)	-.06	-.12**	.06**	.78 (.29) [.17; 1.33]
Intergroup anxiety				
High RWA (+1SD)	.12*	-.01	.13*	1.71 (.46) [.78; 2.62]
Low RWA (- 1SD)	-.04	-.14**	.10*	1.30 (.35) [.60; 1.97]
Outgroup mistrust				
High RWA (+1SD)	.09*	-.02	.07*	.76 (.31) [.14; 1.35]
Low RWA (- 1SD)	-.06 ^a	-.12**	.06**	.58 (.24) [.11; 1.04]

^a $p < .10$;* $p < .05$;** $p < .01$;*** $p < .001$

minorities through perceived diversity may offer few opportunities for intervention. Indeed, such interventions would need to involve masking or manipulating people's perception of the presence of minorities, which not only seems impractical, but can also be considered unethical. Moreover, such strategies are likely to be ineffective and possibly even counterproductive if people find out that they have been misled.

A more promising target for interventions would be to bolster the direct path between actual diversity and reduced negativity towards minorities. As we discussed above, diverse neighborhoods provide opportunities for positive contact with individuals from other social groups, and therefore also have the potential to decrease intergroup anxiety and threat, and to increase empathy and positive intergroup attitudes (see; Schmid *et al.*, 2014; Stolle *et al.*, 2008; Wagner *et al.*, 2003, 2006). Such positive interactions may account for the direct effect of objective diversity on reduced feelings of threat, anxiety and mistrust in our model among low authoritarian respondents.

But why would actual diversity have these beneficial effects among low scoring authoritarians, but not among high scoring individuals? The answer to this question is rather straightforward: People who score high on authoritarianism are more likely to avoid intergroup contact (Pettigrew, 2008; Pettigrew, Christ, Wagner, & Stellmacher, 2007). In the present sample, we also found that people scoring high on authoritarianism generally live in neighborhoods with an objectively smaller minority presence (see also Pettigrew *et al.*, 2007; Hodson, 2011). High authoritarian individuals thus seem to have had less opportunity to experience intergroup contact, or they may even actively avoid environments where contact is more likely. Nevertheless, studies have indicated that if positive intergroup contact does occur, its beneficial effects on the reduction of prejudice and outgroup negativity are most pronounced among high authoritarians (e.g., Dhont & Van Hiel, 2009, 2011; Hodson,

2011). Interventions that seek to reduce outgroup negativity may thus most likely benefit from a focus on the promotion of intergroup contact among individuals high in authoritarianism, who otherwise seem to be less likely to interact with outgroup members.

Limitations and Future Directions

The present research provides an extended perspective on how characteristics of the individual may shape the relationship between ethnic diversity in one's neighborhood and one's reactions to ethnic minorities. However, although this study provides new insights into the mediating role of perceived diversity and the moderating role of authoritarianism, it also raises new questions. As such, the present study should be regarded as an initial step and will hopefully encourage future research to further develop this interesting theoretical framework of diversity, authoritarianism and intergroup relations using more specialized designs.

First, in the present study, we chose a broad approach with respondents covering the entire country, which resulted in the majority of respondents in our sample having a unique zip code. Yet, to tackle this limitation and further corroborate the authoritarianism-dependent relationship between objective diversity and perceived diversity (and the consequences thereof), there is a need for clearly nested data with more observations per contextual unit. As such, future studies could focus on a select number of high and low diversity neighborhoods and collect data from several respondents within each of these neighborhoods in order to test our findings in a multilevel model that fully takes into account both individual-level and context-level variation.

Second, the complex relation between authoritarianism and perceived threat deserves further discussion. High authoritarians are likely to perceive more threat in their environment, and the present results show this for the specific case of intergroup threat. An interesting

possibility for future research, however, could be to disentangle the role of general threat sensitivity and that of the social-ideological dimension of authoritarianism as moderator variables in explaining outgroup negativity in the face of diversity.

A final limitation is the cross-sectional nature of our data. The use of longitudinal data could allow scholars to address the issue of reverse causality between diversity perceptions and outgroup negativity. It is likely that individuals with higher outgroup negativity might overestimate ethnic diversity within their local environment. Furthermore, such longitudinal data could also test for “self-selection bias:” Do authoritarians choose to live in less diverse neighborhoods, or do people living in diverse neighborhoods become less authoritarian over time (possibly as a consequence of more positive intergroup experiences)?

Conclusion

The present study demonstrated that people’s perception of diversity is not only a function of where they live, but also of their individual level of authoritarianism, which has implications for people’s feelings of threat, anxiety, and mistrust towards outgroups. This points to the importance of integrating the psychology of individual differences in sociological and social psychological theories of diversity.

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