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A Structural Equation Analysis of Cognitive, Occupational Status and Network Mechanisms

Abstract

Previous studies have distinguished cognitive, occupational status and network mechanisms in the relation between education and ethnocentrism. Hypotheses on these mediating mechanisms are derived from socialization theory, realistic group threat and contact theory. In the current study we use structural equation modeling to investigate the explanatory power of these three mechanisms simultaneously. The analysis is based on a representative population survey from the Netherlands (NELLS 2009, n=1,910). The results show that more than half of the initial association between education and ethnocentrism can be attributed to cognitive ability and occupational status mechanisms. The remaining part of the overall association, however, still has to be modeled as a direct relationship between education and ethnocentrism. This direct association can be attributed either to social desirability or to a direct liberalizing effect of education on social and political attitudes. Our analysis tentatively suggests that the rise of average education levels in Western societies might lead to less ethnocentric attitudes via the cognitive sophistication mechanism.

Keywords: Ethnocentrism, education, cognitive ability, realistic group threat theory, network diversity, structural equation modeling, The Netherlands

Highlights

- Education is both directly and indirectly related to ethnocentrism
- Cognitive ability is a significant mediator in order to explain the relation between education and ethnocentrism
- In this study on the Netherlands, there was no significant relation between education level and network diversity

1. Introduction

A frequently recurring finding in research on ethnocentrism and anti-immigrant sentiments is that education level is an important covariate of this attitude: higher education levels are associated with lower levels of ethnocentrism (Bobo & Licari, 1989; Case, Greeley, & Fuchs, 1989; Hello, Scheepers, & Slegers, 2006; Nie, Junn, & Stehlik-Barry, 1996). In fact, a frequently voiced critique on the classic work on ethnocentrism by Adorno, Frenkel-Brunswik, Levinson, and Sanford (1950) is that they underestimated the strength of the negative association between education and ethnocentrism (Napier & Jost, 2008, p. 598). There is less research, however, on the question what elements mediate this relationship between education and ethnocentrism (Nie et al., 1996, p. 3; Schaefer, 1996, p. 4).

There are three main streams in the research on the association between education and ethnocentrism. A first body of literature explains the association by invoking socialization theory and applying it to the relation with cognitive sophistication. This theory states that the education system is related to the level of cognitive sophistication of individuals, which, in turn, is associated with lower levels of ethnocentrism (Bobo & Licari, 1989). Second, the realistic group threat theory assumes that lower educated individuals are in direct competition over scarce resources and values with minority groups and that therefore they are more inclined to express ethnocentric attitudes toward these groups (Quillian, 1995; Riek, Mania, & Gaertner, 2006). Third, intergroup contact theory assumes that higher educated individuals will have larger and more diverse personal networks, and this is associated with lower levels of ethnocentrism (Pettigrew & Tropp, 2011).

The aim of the current paper is to disentangle the three mediating mechanisms suggested by these lines of literature: cognitive ability, ethnic competition, and intergroup contact. The inclusion of these mediators in a structural equation model allows us to investigate the effect of the different mechanisms that could help us to explain the relation between education and ethnocentrism. Before we present the data, methods and results, we first review the literature on the relation between education and ethnocentrism. We close with some suggestions on how to investigate the still unexplained direct relation between education and ethnocentrism.

2. Literature

The main variable of interest in this paper is ethnocentrism. In their seminal study on the authoritarian personality, Adorno et al. (1950) made a clear distinction between ‘prejudice’ on the one hand and ‘ethnocentrism’ on the other hand. Prejudice is directed toward a specific outgroup, while ethnocentrism is a feeling of dislike against outgroups in general. In this article, we follow the definition of Hooghe (2008, p. 11): ‘Ethnocentrism is a basic attitude expressing the belief that one’s own ethnic group or one’s own culture is superior to other ethnic groups or cultures, and that one’s cultural standards can be applied in a universal manner’. Because in the European context ethnocentric feelings are often directed toward immigration and diversity, the concept will be operationalized accordingly and in line with the standard approach in social sciences (see 3.2) (Davidov, Meuleman, Billiet, & Schmidt, 2008). Moreover, by using this definition, we are in line with the measurement used in the five waves of the European Social Survey, and since then widely used in the social sciences in Europe.

A prevailing hypothesis in social science literature is that highly educated individuals will have lower levels of ethnocentrism than lowly educated individuals (Bobo & Licari, 1989; Case et al., 1989; Hello et al., 2006). Education is not only related to ethnocentrism, but also associated with attitudes like support for conservative gender roles, homophobia, and authoritarianism (Adorno et al., 1950; Hooghe, 2011; Schaefer, 1996). Research has found education to be a significant covariate of ethnocentrism (Hello, Scheepers, Vermulst, & Gerris, 2004; Nie et al., 1996; Quillan, 1995; Semyonov, Raijman, & Gorodzeisky, 2006; Wagner & Zick, 1995). The negative relation between education and ethnocentrism is found in different countries in Europe and in the US. Moreover, it has to be noted that in countries with a longstanding democratic tradition and religious heterogeneity, the effect of education is found to be even stronger (Hello, Scheepers, & Gijssberts, 2002). Therefore, our first basic hypothesis is:

H1. Educational attainment is negatively associated with ethnocentrism.

Nevertheless, an often voiced critique is that explanations of *how* and *why* education is related to social attitudes are lacking (Nie et al., 1996, p. 3; Schaefer, 1996, p. 4). A first explanation for the relationship between education and ethnocentrism can be found in the socialization

theory (Coenders & Scheepers, 2003; Hello et al., 2004). In this view, the education system is seen as the most important socializing agent influencing the value pattern of individuals. It is a place where adolescents and young adults learn to interact with others and to abandon prejudice and ethnocentrism (Hello, 2003). So, the longer and the more intense one has been exposed to these value patterns, the lower one's level of ethnocentrism should be. In most countries, school is also the place where students learn about diversity and other cultures (Case et al., 1989; Jenssen & Engesbak, 1994). In this sense, education aims to prevent simplification and stereotyping of the outgroup. More and better knowledge about the outgroup, in turn, is associated with higher levels of tolerance (Kenworthy, Turner, Hewstone, & Voci, 2005).

The assumption is that education is associated with higher levels of cognitive sophistication (Bobo & Licari, 1989; McClosky & Brill, 1983). Despite the fact that there is an ongoing debate about whether cognitive abilities should be seen as the result of education or rather as a prerequisite for a successful school career, for the present purpose it is sufficient to say that education and cognitive abilities are related. Individuals with more cognitive sophistication are better able to understand and support the basic norms of equality and tolerance underlying the democratic culture taught at school. Moreover, because higher educated people organize information more efficiently they are more successful in generalizing these principles of tolerance and equality to different minority groups. Nie et al. (1996) assume that especially linguistic abilities are extremely important in this regard (1996, p. 64-65): "Thus, the main explanatory pathway from education to tolerance should prove to be through the impact of formal education on verbal cognitive proficiency."

A longitudinal analysis by Hodson and Busseri (2012) indeed confirmed the strong relationship between cognitive ability and ethnocentrism, controlling for all theoretically relevant covariates. Bobo and Licari (1989) too found cognitive sophistication to be a strong mediator of the association between education and racial prejudice. In their research, up to 33 percent of the total relation between racial prejudice and education could be explained by cognitive mechanisms. Controlling for other explanations of education, Jenssen and Engesbak (1994) and Hello et al. (2006), on the contrary, did not find significant mediating effects of cognitive sophistication and intellectual flexibility. Nevertheless we follow the original research line in the literature, and we formulate our second hypothesis in line with the results of Hodson and Busseri and Bobo and Licari:

H2. The relation between education and ethnocentrism is partially mediated by cognitive ability.

A second mechanism can be found in the realistic group conflict and ethnic competition theory which opposes the ingroup to the outgroup, because of intergroup competition over scarce resources. In this line of reasoning, education is mainly related to the perceived threat of ethnic minority groups (Dixon, 2006; Quillian, 1995; Riek et al., 2006; Schaefer, 1996). Members of the majority group with high educational credentials have on average also higher levels of occupational prestige. They are less likely to face increased competition over scarce resources (e.g. housing, income, jobs) by ethnic minorities. Following the conflict and competition theory, this means that the highly educated have less to fear from the real or perceived competition by ethnic minority groups. These theories therefore emphasize the relative impact of education: “Relative education is not the absolute number of years attained but the amount of education attained compared to those against whom the citizen competes” (Nie et al., 1996, p. 6). To a large extent, this can be considered as an application of the sorting model: education systems ‘sort’ pupils in order to assign them future roles in society (Campbell, 2009). A high level of education implies that actors are sorted into privileged positions with high occupational prestige, so they are less likely to be exposed to the competition posed by ethnic minorities.

The meta-analysis performed by Riek et al. (2006) strongly confirms the relation between perceived threat and outgroup attitudes. They found the effect of competition to be even stronger when it concerned low status minority groups instead of high status minority groups. Other analyses on the effect of perceived threat provide mixed results: Wagner and Zick (1995) found significant indirect effects of individual deprivation. Jenssen and Engesbak (1994) too found strong mediating effects of occupational prestige, but only moderate mediating effects of relative deprivation, controlling for other covariates of education. They conclude that the sorting mechanism is the main reason why the highly educated express less ethnocentrism. Hello et al. (2006) tested the sorting model using a scale of perceived threat as mediator between education and ethnic distance. Their analysis indicated that up to 56 percent of the education effect could be explained by perceived threat. A problem with this operationalization, however, is that the authors use an attitude, i.e. perceived threat, to explain another attitude, i.e. ethnic distance. Both attitudes are very closely related and therefore the strong effect of perceived threat is not surprising. Case et al. (1989) and Hainmueller and Hiscox (2007), on the other hand, only found little support for the mediating effect of

occupational status and prestige. The authors found the cognitive mechanism to be a better explanation of the relation between education and ethnocentrism than the ethnic competition mechanism. We can summarize this discussion therefore in our third hypothesis:

H3. The relation between education and ethnocentrism is partially mediated by occupational status.

Education is not only related to a person's cognitive ability and placement in society, but also to the diversity of his or her network: "Education broadens the perspectives of the more educated beyond those of local communities and groups" (Case et al., 1989, p. 472). Higher educated individuals have larger and more diverse social networks, i.e. a larger amount and intensity of interactions with a wide variety of people (Hello et al., 2006). Thanks to this heterogeneity of social networks, more resources within these networks are available (Huang, Maassen van den Brink, & Groot, 2009). As a consequence, contact with ethnic minority groups is more likely for individuals with higher educational credentials than for their counterparts with lower education levels (Pettigrew, Tropp, Wagner, & Christ, 2011; Savelkoul, Tolsma, & Hagendoorn, 2011). The contact hypothesis suggests that intergroup contact is related to lower levels of prejudice toward the outgroup (Dixon, 2006). However, Pettigrew (1998) argues that in order for intergroup contact to have a positive effect on tolerance, the contact situation must have 'friendship potential'. Authors even found positive effects of extended friendship ties: having friends with intergroup friends significantly reduces prejudice (Dejaeghere, Hooghe, & Claes, 2012; Paolini, Hewstone, Cairns, & Voci, 2004). Friendship diversity is not routinely included in analyses explaining the relationship between education and prejudice (e.g. Hello et al., 2006; Jenssen & Engesbak, 1994). Wagner and Zick (1995) did include a measure of intergroup contact into their analysis: controlling for social psychological background variables, they found the acceptance of contact with foreigners to be a successful mediator of the effect of education.

Although authors regularly found that higher educated have more diverse social networks, it can also be argued that lower educated tend to reside more often in ethnically diverse neighborhoods which provides them with more inter-ethnic contact opportunities (Hello et al., 2006). A study conducted by Vanhoutte and Hooghe (2012) indeed suggests a positive relationship between neighborhood diversity and friendship networks: the higher the ethnic diversity in the neighborhood, the higher the number of intercultural friendship ties. This finding implies that neighborhood diversity only has a positive effect when there is personal

interaction between the different ethnic groups. As such, neighborhood diversity in itself does not contribute to the reduction of ethnocentrism. Applying this theory to the Dutch context, Lancee and Dronkers (2011) and Tolsma, van der Meer, and Gesthuizen (2009) confirmed the positive association between ethnic diversity in the community and inter-ethnic trust. On the other hand, as discussed previously, neighborhood diversity might also reinforce perceived threat as lower educated inhabitants of these neighborhoods will be more often in direct competition over scarce resources and values. The literature, therefore, is clearly divided over the question whether highly educated or lowly educated actors will be exposed more often to ethnic diversity, and whether this has the potential to reduce ethnocentrism. However, in line with most of the literature on this topic, our fourth hypothesis is:

H4. The relation between education and ethnocentrism is partially mediated by network diversity.

To summarize, the goal of the current paper is to explain the relation between educational attainment and ethnocentrism. Three mediators will be tested simultaneously: cognitive ability, occupational status, and network diversity. It falls outside the scope of the current article to investigate in detail, e.g., the dominant causal direction in the link between education and cognitive ability, or the interrelations between cognitive ability, occupational status, and network diversity. For the purpose of the current article it is sufficient, however, to include these factors simultaneously as possible mediators of the relation between education and ethnocentrism, which is the focus of our study.

3. Data and Methods

3.1 Data

Our study was conducted in the Netherlands in which there is a large and historically dominant native majority. Some 50 years ago sizeable groups of immigrants started to come to this country and most of them are originally from Turkey, Morocco, Surinam, or the Dutch Antilles (Nicolaas, Wobma, & Ooijselaar, 2010). Currently, around 1,250,000 people of Turkish, Moroccan, Surinamese, or Antillean origin live in the Netherlands, which is around 7.5 percent of the population (Nicolaas, Wobma, & Ooijselaar, 2010).

We use data from the first wave of the Netherlands Longitudinal Lifecourse Study (NELLS), which was conducted in 2009 and included a sample of more than 2,000 native majority members in the Netherlands (De Graaf, Kalmijn, Kraaykamp, & Monden 2010a). In this survey, native majority members were defined as those respondents of whom both parents are born in the Netherlands (De Graaf et al., 2010a).¹ Because it is not evident that the relation between education and ethnocentrism is the same across countries, some caution is required regarding the generalizability to other settings (Hello et al., 2002). Nevertheless, previous research indicates that the Netherlands is not an exceptional case with regard to ethnocentrism, compared to other European countries (Semyonov et al., 2006). Despite the fact that in the recent past some highly vocal political entrepreneurs have expressed concern about the impact of ethnic, religious, and cultural diversity, figures on both population attitudes and pursued government policy do not suggest that the Netherlands would deviate from standard practice in Western Europe (Sniderman & Hagendoorn, 2007).

In collecting the data, a random sample of 35 municipalities was selected, stratified by region and degree of urbanization. The four largest cities in the Netherlands were also included because of the large proportion of ethnic minorities in these cities. Respondents were then randomly selected from the population registry, based on age (range 14 to 45 years), country of birth and parents' country of birth. Both a face-to-face interview and a self-administered drop-off questionnaire were used. The response rate was 56 percent, which is average for this type of survey in the Netherlands (De Graaf et al., 2010b). The response rate is calculated by dividing the number of (complete plus partial) interviews by a relevant base sample that excludes ineligible cases and cases for which the name and address provided by the municipality were incorrect (about 7 percent of the initial sample).

The sample originally includes 2,556 native Dutch respondents. We only focus on the native Dutch respondents, because measuring ethnocentrism among ethnic minorities requires different measurement instruments that were not included in the present study (Meuleman, Davidov, & Billiet, 2009). Because our study partly focuses on the relation between education level and occupational prestige, we exclude respondents who are younger than 18 and respondents who are still following higher education, reducing the sample size to 2,038. Furthermore, 66 respondents did not fill out the self-completion part of the survey, containing several key items for our study, and another 62 respondents had missing values on one or more of the measures used. Because the number of respondents with missing values is rather

limited (about 6 percent), and because for the respondents who did not fill out the self-completion questionnaire too much information is missing to impute values properly, we use listwise deletion of cases with missing values. All in all, the present study includes 1,910 respondents.

3.2 Measurements

Ethnocentrism. In a European context the most common method to measure ethnocentrism in surveys is the use of a scale of items that measure anti-immigrant attitudes, as these are the most ‘visible’ ethnic minorities in most societies in Western Europe (Davidov et al., 2008; Pettigrew & Meertens, 1995). In line with most European research (e.g. Dejaeghere et al., 2012), ethnocentrism was therefore measured using a scale of three items: ‘It is better for a country when all citizens share the same customs and traditions’, ‘It is better for a country when citizens hold diverse religious beliefs’, and ‘When a country wants to reduce tensions, it must put a hold on immigration.’ The scale is a shortened version of the ethnocentrism scale routinely used in the European Social Survey. Experimental research has shown that higher scores on this scale are indeed associated with a behavioral tendency to avoid contact with members of ethnic minorities (Dejaeghere & Hooghe, 2012). Respondents were required to reply on a five-point scale ranging from ‘absolutely agree’ to ‘absolutely disagree’. The items were formulated in different directions to avoid acquiescence bias (Knudsen, 1995). Taking into account we only use three items to measure ‘ethnocentrism’, the analysis showed that the items form a reliable scale (Cronbach’s $\alpha = .68$) (Schmitt, 1996). We have reversed the first and third item so that a higher score represents a higher level of ethnocentrism.²

Educational attainment. Level of education was measured by asking respondents about their highest level of education completed. Following the standard classification of Dutch education levels, there were nine categories, ranging from no education, through primary education, lower vocational education (*lbo*), lower general education (*mavo*), medium vocational education (*mbo*), medium general education (*havo*), higher general education (*vwo*), higher vocational education (*hbo*), to university education (De Graaf, De Graaf, & Kraaykamp, 2000). We entered education in the analysis as a continuous variable.

Cognitive ability. Following earlier research on the effect of cognitive sophistication, the survey included a vocabulary and mathematical test (Krosnick & Alwin, 1987). Bobo and Licari (1989, p. 292) strongly advocate the use of this kind of linguistic tests: “Vocabulary is generally considered to be the best single measure of intelligence and is included in most

assessments of intellectual functioning (...) A rich vocabulary indicates a sensitivity to new information and an ability to reorganize ideas in more complex ways.” Language skills were measured with nine items on which respondents were required to identify the synonym of a given word. Analysis showed that the items form a reliable scale (Cronbach’s alpha = .69). Mathematical skills were measured with five items on which respondents were required to logically complete a sequence of numbers. Analysis showed that these items also form a reliable scale (Cronbach’s alpha = .71). The Pearson correlation between the two scales is .40. Following Spearman’s (1904) principle of ‘indifference of the indicators’ of intelligence, the two scales can be seen as measures of the underlying construct general intelligence (‘g’), or generalized cognitive ability (Hodson & Busseri, 2012), as is routinely done in this kind of research on cognitive ability (Hooghe, Marien, & de Vroome, 2012; Schoon, Cheng, Gale, Batty, & Deary, 2010).

Occupational status and financial problems. To measure occupational status, we use the ‘standard international socioeconomic index of occupational status’ (ISEI), ranging from 22 to 88 (Ganzeboom, De Graaf, & Treiman, 1992). We use a control variable indicating whether respondents are employed, and unemployed respondents were given the mean score of the employed respondents on the variable for occupational status.³ A high occupational status is routinely associated with high income levels. Given the high level of item non-response on the income question, we therefore included a more subjective proxy-variable for the financial position of the respondent. The survey included a question on experiencing financial difficulties by asking: ‘Have you, over the course of the last three months, had to deal with the following: (a) not being able to replace broken equipment, (b) having to borrow money for essential expenses, (c) falling behind on regular expenses, (d) being visited by a bailiff, (e) having difficulty making ends meet’, to which respondents could answer ‘yes’ or ‘no’. As we do not have access to any real-life information about the financial situation and occupational status of the respondent, it has to be noted that these are self-reported measurements.

Network diversity (Intergroup friendship and Intergroup contact). Respondents’ social network diversity was firstly measured by asking respondents whether they have friends belonging to four distinct ethnic outgroups (Paolini et al., 2004; Pettigrew & Tropp, 2011). Thus respondents were asked ‘Do you have one or more friends of < (a) Turkish, (b) Moroccan, (c) Surinamese/Antillean, (d) other non-Western > origin?’, to which respondents could answer ‘yes’ or ‘no’. A meta-analysis by Davies, Tropp, Aron, Pettigrew, and Wright (2011) indicated that this kind of straightforward measure is a reliable operationalization of

intergroup friendship. Secondly, respondents were asked: ‘How do often do you have personal contact with someone in your neighbourhood who is of < (a) Turkish, (b) Moroccan, (c) Surinamese/Antillean, (d) other non-Western > origin?’ Responses were given on a seven-point scale ranging from ‘never’ to ‘daily’.⁴ These measurements too are purely self-reported. Moreover, we take into account the percentage of non-Western immigrants in respondents’ residential neighborhoods, because it is possible that higher educated have fewer contact opportunities because they live in less ethnically diverse neighborhoods. We thus take into account the associations between neighborhood diversity and both forms of inter-ethnic contact, and the direct association between neighborhood diversity and ethnocentrism (Lancee & Dronkers, 2011).

Finally, we include gender, age, and employment status as control variables.

3.3 Methods

After preliminary analyses in SPSS 19, MPLUS 6 was used to analyze the data. Because we include a characteristic of the respondents’ neighborhood in our model (the percentage of non-Western immigrants), in addition to individual characteristics, we apply hierarchical structural equation modeling. In this way, we take into account that respondents are nested within neighborhoods (N=235). Due to the complexity of the model, our two-level design was too computationally demanding and as a consequence not able to converge. Previous studies experienced similar difficulties even with less complex models (Savelkoul et al., 2011, Wagner et al., 2006). We therefore use the alternative Complex method to analyze our models in MPLUS, which does take non-independence of observations in clustered data correctly into account (Muthén & Muthén, 2010; Muthén & Satorra, 1995). All models were fitted using a robust weighted least squares estimator (WLSMV). Because the associated robust WLSMV chi-square cannot be compared directly across models, the Difftest option of MPLUS was used for chi-square difference testing of competing models (Beauducel & Herzberg, 2006; Muthén & Muthén, 2010). Probit regressions are estimated for the categorical dependent variables (i.e. factor indicators), and linear regressions are estimated for the continuous dependent variables (Múthen & Múthen, 2010).

As suggested by Kline (2010), we use a two-step approach for our structural equation models meaning that we first build and test the measurement model before testing models that include

the hypothesized relations. The fit of the measurement model proved to be adequate ($\chi^2=826.2$, $df=393$, $p<.001$; CFI=.955; TLI=.950; RMSEA=.024). Though the model chi-square is significant, this does not indicate a worrisome lack of fit because we have quite a large sample. In fact, the relatively low ratio between model chi-square and degrees of freedom (2.11) does suggest acceptable model fit (Kline, 2010). All items load significantly on their respective latent construct. It should be noted that inspection of the regression weights and r-squares indicated that one of the items measuring linguistic ability did not load very strongly on its latent factor ($\beta=.361$; $r^2=.130$). Because the loading is significant, however, and because we do not have a substantive reason to remove the item, it was left in place.

We use cognitive ability as a second-order factor which is measured by the indicators linguistic ability and mathematical ability, which are itself first-order latent factors (Schoon et al., 2010). It should be noted that the linguistic ability factor loads more strongly on general intelligence ($\beta=.920$ in the measurement model) than does the mathematical ability factor ($\beta=.646$ in the measurement model). Please refer to Appendix A for a graphical representation of the measurement model.

After having established a satisfactory measurement model, we added the observed predictors (i.e. education level and occupational status, and the control variables) and hypothesized relations. The fit of our initial structural model was not yet satisfactory ($\chi^2=1107.7$, $df=570$, $p<.001$; CFI=.882; TLI=.872; RMSEA=.022). We used the modification indices provided by MPLUS, to determine which model parameters should be specified to improve the fit of the structural model. By far the highest modification index suggested including age as a predictor of linguistic ability. Adding this relation significantly improved model fit ($\Delta\chi^2=180.8$, $df=1$, $p<.001$). The resulting final model has satisfactory model fit ($\chi^2=968.7$, $df=569$, $p<.001$; CFI=.913; TLI=.905; RMSEA=.019). We distinguish between the measurement and structural parts of the model in the tables of the SEM analysis.

4. Results

Before we proceed with the actual analysis, it might be useful to present the reader with an overview of the distribution of the variables (Table 1). For most variables, the mean values

are as could be expected. The mean level of ethnocentrism in our sample is just below the midpoint of the scale. It has to be noted that most of the respondents in the sample are employed (more than 90 percent). Moreover, a little more than half of the final sample is female, and average education is at about the level of medium general education. It is also noteworthy that respondents on average report few financial problems, and that also intergroup friendship and intergroup contact are on average at the low end of the scale. We have also checked for multicollinearity by inspecting the bivariate correlations (available in the online appendix on the journal website). Multicollinearity does not appear to be a problem, as the bivariate correlations are not larger than .450, which is the correlation between education and occupational status.

[Table 1 around here]

Subsequently, we develop a structural equation model, which allows us to investigate the direct and indirect associations between education and ethnocentrism. Figure 1 presents an overview of our SEM model, including the standardized regression weights for the structural part of the model. In Table 2, we present our main results (the total, direct, total indirect and specific indirect relations between education and ethnocentrism). Additionally, in Appendix B and Appendix C, we provide an overview of the unstandardized and standardized regression weights for all relations, including all factor items and control variables. The r-squares for the final model, the residual variances, and the intercepts and thresholds are available in the online appendix on the journal website.

[Figure 1 around here]

It will not come as a surprise that our first hypothesis receives support as we observe a negative relation between education level and ethnocentrism. Moreover, the results in Figure 1 already suggest a number of mediating mechanisms, but despite the inclusion of these variables, we still observe a quite robust and substantive direct relation between education and ethnocentrism. This implies that while some of the mediators that we discussed in the introduction might capture some of the association with education, there is still a significant part of the relation that is not mediated in this manner.

Equally important, however, is that some of the mechanisms that were suggested in the literature do not turn out to be significant. To start with, in our sample education is not significantly related to intergroup friendship nor to intergroup contact. Second, the financial problems scale is not significantly related to ethnocentrism. We can, however, observe that occupational status is significantly positively associated with ethnocentrism.

Self-evidently, looking at these relations one by one is not a good manner to test the validity of our mediation hypotheses. Therefore, we also included an explicit test of the specific relations between education and ethnocentrism to ascertain the significance of the indirect relations (Table 2). The results of the tests of indirect relations empirically confirm what we might have guessed from inspecting the coefficients in Figure 1. The indirect relations by means of financial problems and intergroup friendship are clearly not significant. On the other hand, the indirect relations running via occupational status and through cognitive ability prove to be significant, so it is clear that at least some of the relationship with education is mediated by these variables.

[Table 2 around here]

When looking at the full model, it is clear that the second hypothesis receives support: education is positively related to cognitive ability, and in turn this ability is significantly associated with lower levels of ethnocentrism ($\beta = -.285$). The idea that education is positively associated with cognitive ability, and that this, in turn, is negatively related to ethnocentrism is therefore clearly supported.

The third hypothesis is equally supported: education level is positively related to occupational status, and, in turn, this is negatively related to ethnocentrism. The guiding idea between this suggested path is that because of their high education level actors gain access to a privileged situation on the labor market and are therefore less likely to develop ethnocentric feelings toward ethnic minorities. This structural path, however, runs fully through occupational status and not via having financial problems.

Finally, the fourth hypothesis was not supported at all, as we did not observe a relation between education level and intergroup friendship or intergroup contact. While intergroup friendship by itself is negatively related to levels of ethnocentrism, as we might expect, there

clearly is no indirect education association occurring here. It should be noted that we also take into account the associations between neighborhood diversity on the one hand and intergroup friendship and intergroup contact on the other. This means that we control for the possibility that higher educated have fewer opportunities for intergroup contact, because they tend to live in less ethnically diverse neighborhoods.

An intriguing finding is that, despite all these mediators and controls, we still observe a considerable direct relation between education level and ethnocentrism. In fact, the standardized direct relation between education and ethnocentrism ($\beta = -.208$) is as large as the standardized indirect relation ($\beta = -.204$) (see Table 2). This implies that roughly half of the total relation between education and ethnocentrism cannot be explained by invoking the cognitive ability and occupational status mediators. The current data do not allow us to investigate the remaining direct relation further.

5. Discussion

It is a recurrent finding in research on ethnocentrism that there is a negative relation between educational attainment and levels of ethnocentrism. By itself, there is nothing new about this observation and it would indeed be hard to find a study that does not show this negative relation. Opinions differ, however, on how to explain this consistent relation, and by combining various mechanisms into one structural equation model, we hope to have provided new insights with regard to this problem.

A recent survey conducted in the Netherlands allows us to investigate cognitive, occupational status and intergroup contact effects of education simultaneously. As could be expected, the survey shows that levels of ethnocentrism are much lower among the highly educated than among the lowly educated. However, to start with a dead end argument: we did not find any indication that those with higher education levels would have more diverse friendships and contacts, and would develop a more positive attitude towards ethnic minorities. This finding might be idiosyncratic for our dataset, as in some earlier research it was found that there is a positive relation between education level and network diversity, but here we did not find any new results. Despite using two different measurements for intergroup contact, and controlling for ethnic diversity at the neighborhood level, we did not find any association.

Other authors (e.g. Bobo and Licari, 1989; Hodson and Busseri, 2012; Nie et al., 1996) have suggested that the relation between education and ethnocentrism to some extent can be explained by invoking cognitive elements: it is assumed that those who have a good education record indeed have more cognitive ability and that because of this ability, they have lower levels of ethnocentrism. This hypothesis was indeed supported by our analysis, and we can therefore support the claim that higher levels of cognitive ability are associated with a lower level of ethnocentrism. We do not wish to emphasize causality too strongly in this regard, since we can also assume that cognitive ability has a facilitating effect on reaching high levels of education. Cognitive ability as such, however, is clearly related to lower levels of ethnocentrism.

The ethnic competition mechanism also proved to be significant, as those who have acquired high occupational status most likely have less reason to feel threatened by the arrival of immigrants. The fact that economic position only has a limited relation with ethnocentrism is theoretically interesting, because the economic effects of education basically amount to a zero-sum game. The number of high prestige jobs in a society will always be limited, and given increasing education levels, new cohorts will need higher educational credentials to get access to the same level of jobs (Nie et al., 1996). If occupational prestige was the main mechanism to explain the relationship between education and ethnocentrism, this would imply that this relation with education probably would dilute over time as education loses some of its market value in a society with very high average education levels. The notion that there also might be a cultural and direct association is much more promising in this regard, since this does not amount to a zero-sum logic. Even if the entire population would be exposed to the cultural effect of higher education, the same effects would still be produced as pupils in this regard are not competitors but share a common culture that is being promoted by the education system (Nussbaum, 2010). The fact that only a limited part of the total education relationship can be explained by competitive variables, therefore allows us to be quite optimistic about the future contribution of education in reducing ethnic prejudice.

Despite including different pathways to explain the relation, the direct relationship between education and ethnocentrism did not disappear and still amounts to about half of the total relationship. This strong direct association was also found by Wagner and Zick (1995) when they controlled for the mediating effects of economic deprivation, conservatism, national pride, and contact. While the literature tends to focus on cognitive and competitive effects, this approach seems to miss the point to some extent as in reality this explains only part of the

total (direct and indirect) association between education and ethnocentrism. Here we have to acknowledge the limits of the current analysis, as we cannot offer any information on what might explain this direct association: the only thing we do know is that it cannot be attributed to the mediating mechanism of cognitive abilities or occupational status as these were already controlled for.

The literature does not offer all that many suggestions on how we could explain this direct relation. Social desirability is an obvious idea, as we can assume that those who have been successful in their school career indeed will be better acquainted with cultural codes that discourage open assertions of racism and ethnocentrism (Jackman & Muha, 1984). Even if they would have the same basic level of ethnocentrism, higher educated respondents will still have a stronger tendency to refrain from expressing these judgments. Social desirability therefore might be an element in explaining this direct relation. It has to be noted, however, that previous research that included measurements robust to effects of social desirability did not eliminate the difference between the low and highly educated (e.g. Knudsen, 1995; Wagner & Zick, 1995). So, the conclusion has to be that the higher educated are ‘genuinely’ more tolerant than the lower educated (Ostapczuk, Musch, & Moshagen, 2009, p. 928). While we can assume that social desirability is responsible for a part of the direct relation, the results of previous research renders it unlikely that it would be responsible for the bulk of the direct relation.

Second, it has to be noted that education has other mechanisms than the purely cognitive ones that we controlled for. Education also aims at strengthening an academic outlook and role-orientation. Quite some schools in the Netherlands have programs that are explicitly aimed to reduce prejudice and to entice their students to develop more positive contacts with ethnic minority members. Those who have high education levels were exposed for a longer period to these efforts than respondents who dropped out of the school system at an earlier age. The only safe conclusion for the time being, therefore, is that education is most likely related to the value patterns of pupils in numerous ways, that cannot just be reduced to only cognitive and competition effects. Education does have attitudinal effects, and most school systems also aim explicitly to achieve this kind of educational outcomes.

This study has some limitations that need to be mentioned. Our measurements were not always ideal as they were not collected specifically for this purpose. The two ability tests were rather short, but from the pattern we observed it is obvious that there is no reason to assume that, e.g., a longer test would lead to different or more convincing results. The

measurement of intergroup friendship and contact was rather limited, but the fact that we did not observe any effect whatsoever, here too, does not indicate that a more elaborate measurement would lead to different results. Also, in some of the literature it is stated that respondents with higher levels of cognitive ability will more easily generalize the principles of tolerance and equality to minority groups. However, the survey did not allow to include a measure for 'liberal values'. Furthermore, it has to be remembered that these findings are only valid for one specific case, i.e., the Netherlands. Previous research has established that the relation between education level and ethnocentrism is not equivalent across societies (Hello et al., 2002), so it needs to be investigated whether the same relation will be found in other societies as well. If indeed we assume that the culture that is being upheld by the education system to a large extent is responsible for the observed direct relationship, we have every reason to assume that the relationship will not be the same in all countries or education systems. Some education systems might even promote a rather negative vision on ethnic minorities, and this vision can have an effect on the attitudes of pupils. In future research, it should be investigated therefore what kind of explicit and implicit messages schools and teachers send out about ethnic and cultural diversity, and whether these messages are in some way related to the educational outcomes of that school system. The results of the Dutch case, however, allow us to assume that the relationship between the schooling system and ethnocentrism cannot be reduced to the occurrence of just one mediating mechanism. In future research, therefore, it is important not just to expand the current framework to a case outside the Netherlands, but it would also be very meaningful to explore possible causal paths more in depth. More specifically, we had to deal with a rather limited operationalization of the ethnic competition indicators, and neither did we have any information about the kind of specific values that are being promoted by the education system. In future research, these elements should therefore receive more attention.

6. Conclusion

The end conclusion of the current analysis indeed shows a very robust relation between education and ethnocentrism. The total standardized regression parameter (direct and indirect combined) of education on ethnocentrism is $-.412$. The only likely conclusion, therefore, is that education is in various ways, that are not mutually exclusive, related to lower levels of ethnocentrism, not just by stimulating the cognitive ability of pupils, or by providing them

with a better starting position in their professional life, but also by transferring an academic culture to them, and apparently lower levels of ethnocentrism are part of that culture. As we know that the average education level in most Western societies has risen sharply during the past decades, longitudinal analyses should help us to determine whether this aggregate level change indeed can be associated with fluctuations in the average level of ethnocentrism in these societies. This endeavor, however, is obviously a topic for future research as it requires to take into account the occurrence of possible age, cohort and period effects.

Endnotes

¹. Since it would require a differently phrased measurement scale to capture ethnocentrism among members of ethnic minority groups, respondents from these minorities were not included in the current analysis.

². While it has to be noted that this ‘European’ measurement scale of ethnocentrism differs from the scale routinely used in a US context, this scale refers most clearly to the ethnic relations that are salient in Western European societies. While Semyonov et al. (2006) accept the internal and external validity of this scale, they argue that the label should be ‘anti-foreigner sentiment’. In line with the vast majority of research conducted in Europe, however, we will use the label ‘ethnocentrism’ for this scale.

³. Analyses were also conducted without unemployed respondents in order to control for a potential effect of assigning these respondents with an average score. Results of the analysis, however, were identical

⁴. The questions on intergroup contact in this survey asked how often respondents had contact with ‘outgroups’, in their neighbourhood, at work and at social clubs. Because some respondents were not employed (about 9 per cent) and were not a member of any social club (about 30 per cent), we focus on the neighbourhood contacts.

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Figure 1
Standardized direct relations between education, mediators and ethnocentrism

Notes: Entries are standardized regression weights. Dashed lines represent non-significant relations ($p < .05$). Rectangles represent observed predictors, ovals represent latent factors. Not presented in this figure are the factor items and the control variables (included in the analysis). Please refer to appendix Table A for these results. Source: NELLS 2009, $N = 1,910$.

Table 1

Descriptive statistics of dependent and independent variables, N=1,910

	Min.	Max.	Mean	SD
Ethnocentrism	0	4	1.809	.757
Education	0	8	4.750	2.138
Cognitive ability				
Linguistic ability	0	9	6.717	1.925
Mathematical ability	0	5	3.694	1.436
Occupational status	22	88	49.035	14.308
Financial problems	0	5	.413	.886
Intergroup friendship	0	4	.547	.866
Intergroup contact	0	6	1.053	1.408
Age	18	47	34.673	7.246
Female	0	1	.544	
Currently employed	0	1	.909	
Neighborhood diversity	0	85	9.107	9.370

Source: NELLS 2009, own calculations.

Notes: Mean and standard deviation of latent variables (i.e. ethnocentrism, linguistic ability, mathematical ability, financial problems, intergroup friendship and intergroup contact) approximated by calculating scales (the average of the ethnocentrism and intergroup contact items and, in the case of linguistic ability, mathematical ability, financial problems and intergroup friendship, the sum of the items).

Table 2
Specific relationships between education and ethnocentrism

				B	S.E.	β	P
Ethnocentrism	←	Education	(Total)	-.130	.011	-.412	***
Ethnocentrism	←	Education	(Direct)	-.065	.015	-.208	***
Ethnocentrism	←	Education	(Indirect)	-.064	.014	-.204	***
Ethnocentrism	←	Cognitive ability (g)	← Education	-.057	.011	-.180	***
Ethnocentrism	←	Occupational status	← Education	-.015	.005	-.048	.002
Ethnocentrism	←	Financial problems	← Education	.005	.003	.015	.078
Ethnocentrism	←	Intergroup friendship	← Education	.004	.003	.011	.223
Ethnocentrism	←	Intergroup contact	← Education	-.001	.001	-.003	.479

Source: NELLS 2009, own calculations. N=1,910. *** p < .001.

Notes: Entries are the result of a SEM analysis in MPLUS. Reported are the unstandardized coefficients (B), standard errors (S.E.), standardized coefficients (β) and P-values.

Appendix A

Figure A.1
Measurement model

Notes: Rectangles represent observed predictors, ovals represent latent factors.

Appendix B

Table B.1

Structural part final model of the relation between education and ethnocentrism through mediators

Path		B	S.E.	β	P
Structural part					
Hypothesized relations					
Cognitive ability (g)	← Education	.179	.013	.631	***
Occupational status	← Education	3.402	.131	.510	***
Financial problems	← Education	-.081	.012	-.236	***
Intergroup friendship	← Education	-.014	.011	-.047	.179
Intergroup contact	← Education	-.042	.016	-.077	.008
Ethnocentrism	← Education	-.065	.015	-.208	***
Ethnocentrism	← Cognitive ability (g)	-.316	.059	-.285	***
Ethnocentrism	← Occupational status	-.004	.001	-.094	.002
Ethnocentrism	← Financial problems	-.060	.034	-.065	.073
Ethnocentrism	← Intergroup friendship	-.243	.056	-.236	***
Ethnocentrism	← Intergroup contact	.021	.027	.036	.436
Control variables					
Ethnocentrism	← Age	-.013	.002	-.142	***
Linguistic ability	← Age	.031	.003	.313	***
Ethnocentrism	← Female	-.125	.033	-.093	***
Ethnocentrism	← Employed	-.040	.054	-.017	.459
Ethnocentrism	← Neighborhood diversity	-.003	.002	-.036	.189
Intergroup friendship	← Neighborhood diversity	.017	.003	.247	***
Intergroup contact	← Neighborhood diversity	.030	.004	.245	***
Model fit					
Chi ²		968.7			
DF		569			
CFI		.913			
TLI		.905			
RMSEA		.019			
R ² Ethnocentrism		.321			

Source: NELLS 2009, own calculations. *** p < .001. N = 1,910.

Notes: Entries are the result of a SEM analysis in MPLUS. Reported are the unstandardized regression weights (B), standard errors (S.E.), standardized regression weights (β) and P-values. CFI = Comparative Fit Index, TLI = Tucker Lewis Index, RMSEA = Root Mean Square Error of Approximation. Not presented in the table is the covariance between intergroup friendship and intergroup contact (B=.379, SE=.046, β =.533, P=***), which is also specified in the final model.

Appendix C

Table C.1

Measurement part final model of the relationship between education and ethnocentrism through mediators

		B	S.E.	β	P
Measurement part					
ethnocentrism1	← Ethnocentrism	1.000		.673	
ethnocentrism2	← Ethnocentrism	.747	.047	.569	***
ethnocentrism3	← Ethnocentrism	1.024	.073	.683	***
linguisticability1	← Linguistic ability	1.000		.649	
linguisticability2	← Linguistic ability	1.259	.084	.780	***
linguisticability3	← Linguistic ability	1.160	.076	.732	***
linguisticability4	← Linguistic ability	1.1824	.087	.743	***
linguisticability5	← Linguistic ability	.512	.065	.354	***
linguisticability6	← Linguistic ability	1.155	.083	.730	***
linguisticability7	← Linguistic ability	1.414	.100	.850	***
linguisticability8	← Linguistic ability	.781	.057	.524	***
linguisticability9	← Linguistic ability	1.011	.076	.655	***
mathematicalability1	← Mathematical ability	1.000		.773	
mathematicalability2	← Mathematical ability	.839	.043	.658	***
mathematicalability3	← Mathematical ability	1.195	.049	.903	***
mathematicalability4	← Mathematical ability	.904	.043	.705	***
mathematicalability5	← Mathematical ability	1.026	.055	.791	***
Linguistic ability	← Cognitive ability (g)	1.000		.854	
Mathematical ability	← Cognitive ability (g)	.904	.076	.670	***
financial problems1	← Financial problems	1.000		.721	
financial problems2	← Financial problems	1.088	.066	.782	***
financial problems3	← Financial problems	1.318	.082	.940	***
financial problems4	← Financial problems	1.019	.071	.734	***
financial problems5	← Financial problems	1.212	.085	.867	***
intergroupfriendship1	← Intergroup friendship	1.000		.645	
intergroupfriendship2	← Intergroup friendship	1.169	.102	.751	***
intergroupfriendship3	← Intergroup friendship	1.079	.096	.695	***
intergroupfriendship4	← Intergroup friendship	.929	.088	.600	***
intergroup contact 1	← Intergroup contact	1.000		.651	
intergroup contact 2	← Intergroup contact	1.046	.058	.732	***
intergroup contact 3	← Intergroup contact	1.133	.070	.793	***
intergroup contact 4	← Intergroup contact	1.132	.081	.704	***

Source: NELLS 2009, own calculations. *** p < .001. N = 1,910.

Notes: Entries are the result of a SEM analysis in MPLUS. Reported are the unstandardized regression weights (B), standard errors (S.E.), standardized regression weights (β) and P-values.

AVAILABLE UPON REQUEST OR AS ONLINE APPENDIX

Table D.1

Bivariate correlations between dependent and independent variables

	1	2	3	4	5	6	7	8	9	10	11	12
1. Ethnocentrism	1											
2. Education	-.352**	1										
3. Linguistic ability	-.289**	.447**	1									
4. Mathematical ability	-.185**	.344**	.402**	1								
5. Occupational status	-.234**	.495**	.275**	.255**	1							
6. Financial problems	.032	-.176**	-.115**	-.106**	-.101**	1						
7. Intergroup friendship	-.106**	-.008	-.048*	-.022	.049*	.095**	1					
8. Intergroup contact	-.045*	-.049*	-.084**	-.080**	-.026	.101**	.412**	1				
9. Neighborhood diversity	-.103**	.105**	.019	-.021	.111**	.030	.187**	.220**	1			
10. Currently employed	-.072**	.192**	.160**	.130**	.002	-.155**	-.054*	-.018	-.053*	1		
11. Age	-.117**	.011	.275**	.039	.053*	-.041	-.062**	-.129**	-.059**	.038	1	
12. Female	-.082**	.009	-.005	-.099**	-.048*	.008	-.046*	-.023	.010	-.100**	.012	1

Notes: Mean and standard deviation of latent variables (i.e. ethnocentrism, linguistic ability, mathematical ability, financial problems, intergroup friendship and intergroup contact) approximated by calculating scales (the average of the ethnocentrism and intergroup contact items and, in the case of linguistic ability, mathematical ability, financial problems and intergroup friendship, the sum of the items). Correlations between scale items and estimated correlations between latent variables also available upon request from the authors. N=1,910.

Table D.2
R-squares final model

	Estimate
Structural part	
Ethnocentrism	.321
Cognitive ability (g)	.398
Occupational status	.260
Financial problems	.056
	.061
Intergroup contact	.062
Measurement part	
ethnocentrism1	.453
ethnocentrism2	.324
ethnocentrism3	.466
linguisticability1	.421
linguisticability2	.608
linguisticability3	.536
linguisticability4	.552
linguisticability5	.126
linguisticability6	.532
linguisticability7	.723
linguisticability8	.274
linguisticability9	.429
mathematicalability1	.597
mathematicalability2	.434
mathematicalability3	.816
mathematicalability4	.498
mathematicalability5	.625
Linguistic ability	.831
Mathematical ability	.449
financialproblems1	.519
financialproblems2	.612
financialproblems3	.883
financialproblems4	.538
financialproblems5	.752
intergroupfriendship1	.416
intergroupfriendship2	.563
intergroupfriendship3	.482
intergroupfriendship4	.360
intergroup contact 1	.424
intergroup contact 2	.536
intergroup contact 3	.628
intergroup contact 4	.496

Source: NELLS 2009, own calculations.
N=1,910.

Table D.3
Residual variances final model

	Est.	S.E.	P
Structural part			
Ethnocentrism	.308	.033	***
Cognitive ability	.221	.032	***
Occupational status	150.687	5.670	***
Financial problems	.505	.055	***
	.401	.050	***
Intergroup contact	1.256	.168	***
Measurement part			
ethnocentrism1	.546	.031	***
ethnocentrism2	.528	.023	***
ethnocentrism3	.545	.033	***
linguisticability1	.693		
linguisticability2	.514		
linguisticability3	.588		
linguisticability4	.572		
linguisticability5	.920		
linguisticability6	.591		
linguisticability7	.387		
linguisticability8	.813		
linguisticability9	.687		
mathematicalability1	.451		
mathematicalability2	.614		
mathematicalability3	.216		
mathematicalability4	.552		
mathematicalability5	.422		
Linguistic ability	.085	.024	***
Mathematical ability	.368	.038	***
financialproblems1	.495		
financialproblems2	.402		
financialproblems3	.123		
financialproblems4	.476		
financialproblems5	.259		
intergroupfriendship1	.599		
intergroupfriendship2	.452		
intergroupfriendship3	.533		
intergroupfriendship4	.654		
intergroup contact 1	1.816	.106	***
intergroup contact 2	1.266	.070	***
intergroup contact 3	1.017	.065	***
intergroup contact 4	1.747	.090	***

Source: NELLS 2009, own calculations. N=1,910. ***: $p < .001$.

Table D.4
Intercepts and thresholds final model

	Est.	S.E.	P
Intercepts			
ethnocentrism1	2.843	.152	***
ethnocentrism2	2.887	.119	***
ethnocentrism3	3.543	.152	***
Occupational status	33.869	2.401	***
intergroup contact 1	1.985	.230	***
intergroup contact 2	1.563	.226	***
intergroup contact 3	1.506	.229	***
intergroup contact 4	1.922	.282	***
Thresholds			
linguisticability1	1.613	.227	***
linguisticability2	.603	.215	.005
linguisticability3	1.980	.228	***
linguisticability4	-.080	.229	.727
linguisticability5	.518	.211	.014
linguisticability6	1.794	.211	***
linguisticability7	.974	.262	***
linguisticability8	1.292	.183	***
linguisticability9	2.397	.220	***
mathematicalability1	-.018	.203	.928
mathematicalability2	.476	.188	.012
mathematicalability3	.366	.198	.065
mathematicalability4	.324	.194	.095
mathematicalability5	-.266	.232	.253
financialproblems1	.917	.231	***
financialproblems2	.576	.236	.015
financialproblems3	.902	.269	.001
financialproblems4	.166	.368	.652
financialproblems5	-.007	.171	.969
intergroupfriendship1	.758	.231	.001
intergroupfriendship2	.514	.284	.071
intergroupfriendship3	1.160	.215	***
intergroupfriendship4	.654	.215	.002

Source: NELLS 2009, own calculations. N=1,910. ***: $p < .001$.