Generalization of Positive and Negative Attitudes Toward Individuals to Outgroup Attitudes

Personality and Social Psychology Bulletin
39(5) 608–622

DOI: 10.1177/0146167213480890
pspb.sagepub.com

Tobias H. Stark[1,2], Andreas Flache[3], and René Veenstra[3]

Abstract

The generalization of attitudes toward individual outgroup members into attitudes toward the outgroup as a whole can affect intergroup relations. However, little is known about the relative strengths of the generalization of negative and positive interpersonal attitudes into attitudes about the outgroup. The unique contribution of negative (disliking) interpersonal attitudes to intergroup attitudes was examined and its strength was compared with the effect of positive (liking) interpersonal attitudes, using cross-sectional (Study 1; *N* = 733, age 10-12) and longitudinal data (Study 2; *N* = 960, age 12-13). Disliking uniquely contributed to respondents' outgroup attitudes. The generalization of interpersonal liking and disliking was about equally strong in both studies. This underpins the importance of examining the effects of both positive and negative intergroup contact experiences on the formation of outgroup attitudes.

Keywords

intergroup attitudes, negative contact, ethnicity, liking, attitude generalization

Received May 20, 2011; revision accepted December 12, 2012

Research on stereotype change has shown that people adjust their perception of groups to their personal experiences with individual members of those groups (Garcia-Marques & Mackie, 1999; Johnston & Hewstone, 1992; Kunda & Oleson, 1997; Weber & Crocker, 1983). Previous research mainly focused on the effect of stereotype-disconfirming information or positive evaluations of individual outgroup members on the reduction of negative outgroup attitudes (e.g., Ensari & Miller, 2002; Kunda & Oleson, 1997). However, everyday interactions between members of different groups can also lead to negative experiences that confirm negative stereotypes or provide negative information about outgroup members (Pettigrew, 2008; Pettigrew & Tropp, 2006). Relatively little is known so far on whether negative evaluations of individual outgroup members (hereafter interpersonal attitudes) affect group stereotypes just as a negative mirror image of positive evaluations, or whether there is a qualitative difference in such effects.

Building on self-categorization theory (Turner, 1985), Paolini, Harwood, and Rubin (2010) recently proposed a positive-negative asymmetry; arguing that negative interpersonal attitudes should more readily be generalized into outgroup attitudes than positive interpersonal attitudes. These researchers found that negative encounters with outgroup members increased the awareness of group memberships. According to established theories of attitude generalization (Brown & Hewstone, 2005; Hewstone & Brown, 1986), the generalization of interpersonal attitudes is facilitated by the salience of group categories. Accordingly, it was proposed that negative interpersonal attitudes may have more impact on general outgroup attitudes than positive interpersonal attitudes (Paolini et al., 2010). However, a direct test of this proposition is still missing.

In contrast, some earlier studies have attributed the correlation between negative attitudes toward individual outgroup members and the attitudes toward the outgroup in general to a reversed causal process (Stephan & Stephan, 1985). According to this view, negative perceptions of the outgroup increase anxiety about intergroup encounters (Allen, 1996; Stephan et al., 2002). This in turn may poison the perception of individual outgroup members. So far, these two competing causal processes have also not been empirically compared.

[1]Utrecht University, Netherlands
[2]Stanford University, CA, USA
[3]University of Groningen, Netherlands

Corresponding Author:
Tobias H. Stark, 300N McClatchy Hall, 450 Serra Mall, Stanford University, Stanford, CA 94305, USA.
Email: tstark@stanford.edu

The present research advances the literature on attitude generalization in two ways. First, we compare the relative strength of the generalization of negative and positive interpersonal attitudes and, second, we identify the causal direction this generalization mainly takes, from members to groups or from groups to members. It was first tested whether disliking of individual outgroup members uniquely contributed to outgroup attitudes, controlling for the effect of positive interpersonal attitudes. In a subsequent step, we tested whether negative interpersonal attitudes were more strongly related to attitudes toward the outgroup in general than were positive interpersonal attitudes. The latter was done in a cross-sectional and in a three-wave longitudinal study.

Generalization of Interpersonal Attitudes Toward Groups

According to Hewstone and Brown's (1986) mutual intergroup differentiation model, attitudes toward individual outgroup members are most often *not* generalized to the entire outgroup. Instead of adjusting the attitudes toward the outgroup to the positive perception of the group member, the person is seen as an exception, a subtype of the outgroup (Johnston & Hewstone, 1992; Weber & Crocker, 1983). Consequently, only the attitude toward the individual improves and the group perception remains unchanged (Brown & Hewstone, 2005).

Several strategies have been proposed to reduce subtyping and promote the generalization of interpersonal attitudes to outgroup attitudes. Generalization is, for example, more likely if an individual is held accountable and has to justify his or her judgments of the outgroup (Paolini, Crisp, & McIntyre, 2009), if the information is dispersed across multiple outgroup members (Weber & Crocker, 1983), and, most importantly, if the outgroup member's membership in a distinct group category is salient (Brown & Hewstone, 2005; Johnston & Hewstone, 1992; Kunda & Oleson, 1997). For instance, Ensari and Miller (2002) found that positive effects of personalized perceptions of outgroup members only generalized to the outgroup as a whole if salience of categories was maintained.

Negative Interpersonal Attitudes and Category Salience

Category salience may not only promote more positive outgroup attitudes but may actually cause negative interpersonal evaluations to be generalized more readily into outgroup attitudes than positive interpersonal evaluations. A number of theories suggest that category salience is higher when a person is evaluated negatively than when the evaluation is positive. Paolini and colleagues (2010) argued that according to self-categorization theory, negative intergroup contact increases the salience of group memberships because negative contact is more consistent with the expectations people have about negatively perceived outgroups (Oakes, Haslam, & Turner, 1994; Reynolds, Turner, & Haslam, 2000). Negative interpersonal evaluations that follow from negative contact may subsequently be generalized to more negative outgroup attitudes whereas positive interpersonal evaluations may have less impact (Paolini et al., 2010).

In line with this idea, Dolderer, Mummendey, and Rothermund (2009) found that information about outgroup members that was consistent with a negative group stereotype but even more extreme (i.e., less socially oriented and less helpful) was generalized to more negative views of the group stereotype. In contrast, stereotype-inconsistent information (i.e., more socially oriented and more helpful) did not affect the group stereotype. Stereotype-confirming outgroup members may have been seen as typical representatives and hence informative about the outgroup. Typicality increases the salience of group categories and may thus have facilitated the attitude generalization (Brown & Hewstone, 2005). The more positive, stereotype-disconfirming exemplars may have instead been seen as exceptions, which led to subtyping instead of generalization.

There are additional reasons to expect stronger generalization of negative rather than positive interpersonal attitudes. According to similarity-attraction theory (Byrne, 1971, 1997), positive interpersonal attitudes often develop on the basis of perceived similarities between two persons. However, perceived similarity of a member of a negatively evaluated outgroup reduces the probability that this person is also perceived as a typical representative of the outgroup (Pettigrew, 1998). Hence, liked outgroup members do not trigger the mental representation of their distinct group category. Accordingly, evaluations of liked outgroup members may be less likely generalized to the outgroup as a whole. In contrast, the dissimilarity-repulsion principle suggests that negative evaluations of individuals can result from perceived dissimilarities (Chen & Kenrick, 2002; Rosenbaum, 1986). A person who is perceived to be dissimilar to oneself and thus to one's ingroup may be considered more typical for the outgroup. This suggests that negative interpersonal attitudes are generalized more readily to attitudes toward the entire outgroup than positive interpersonal attitudes are.

In line with this reasoning, Ratliff and Nosek (2011) found that the negative behavior of an unknown outgroup member influenced implicit evaluations of another person from the same group more strongly than did positive behavior. However, whether negative evaluations of individual outgroup members are indeed generalized more strongly into attitudes toward the outgroup as a whole than positive interpersonal attitudes has never been tested.

Underlying Causal Process

Some research on intergroup anxiety (Stephan & Stephan, 1985) has attributed the correlation between negative interpersonal attitudes and negative outgroup attitudes in general

to a reversed causal process. Although most of the earlier studies have focused on intergroup anxiety's effect on outgroup attitudes, there is evidence showing that negative perceptions of an outgroup can cause intergroup anxiety (Allen, 1996; Stephan et al., 2002). These negative expectations about anticipated intergroup encounters lead to feelings of unease and biased perceptions during the actual encounter of outgroup members (Stephan & Stephan, 1985). This may poison or limit interactions with the outgroup (Swart, Hewstone, Christ, & Voci, 2011). Thus, negative evaluations of individual outgroup members may follow from preexisting negative attitudes toward the outgroup as a whole.

Such a reversed causal path of the generalization process has also been the focus of research on stereotyping (Macrae & Bodenhausen, 2000; Oakes et al., 1994). This line of research has shown that people base their expectations about unknown members of outgroups on the perceptions they have about that group in general until more knowledge about the individual person becomes available (Blair, 2002). A correlation between interpersonal and outgroup attitudes may thus result from a reversed causal process and this effect may be stronger for negative attitudes.

The Current Research

The present research focused on the (cross-lagged) relations between evaluations of individual outgroup members and attitudes toward the outgroup in general. We hypothesized that negative attitudes toward individual outgroup members would have a unique effect on attitudes toward the ethnic outgroup as a whole, controlling for the effect of positive interpersonal attitudes. Moreover, we expected that the negative effects would be stronger than the positive ones, both cross-sectionally and longitudinally. Finally, we tested whether the data better fitted the causal process of attitude generalization from members to groups or of attitude generalization from groups to members.

Data for the present research were collected in two studies in schools in the city of Arnhem, a midsize city in the Netherlands (Stark & Flache, 2012). In the Dutch school system, students younger than about 15 years of age spend the entire school day with the same group of classmates. This enabled us to assess interpersonal attitudes using individual liking and disliking ratings of a clearly defined set of classmates. Only the classmates' names were mentioned, not their ethnic backgrounds. This was done at the beginning of the questionnaire. Outgroup attitudes were assessed at the end of the questionnaire, which took on average 30 to 35 min to complete. In between the two sets of questions, participants answered questions about their hobbies, personality, family, and attitudes toward school.

In both studies, students' attitudes toward the two largest ethnic minority groups in Arnhem, Turkish and Moroccan people, as well as toward the Dutch majority, were measured. In the cross-sectional Study 1, we investigated whether disliking (negative interpersonal attitudes) of Turkish, Moroccan, or Dutch classmates was more strongly related to students' attitudes toward Turkish, Moroccan, or Dutch people in general than liking (positive interpersonal attitudes) of those classmates. In the three-wave longitudinal Study 2, we tested whether disliking was a stronger predictor in a longitudinal perspective, and whether both liking and disliking of individual classmates were in fact generalized to the ethnic outgroups as a whole.

Study 1

Method

Participants. Data were collected as part of the primary school module of The Arnhem School Study (TASS) among students attending the last 3 years of primary education (age 10-12). All 25 schools were located in or in close proximity to five ethnically diverse neighborhoods in the city of Arnhem, in the Netherlands. Of the 796 students in the 36 classrooms of the sample, 751 (94.4%) participated in the data collection in May 2008. The sample contained 49% boys and 51% girls. There were 537 (72.8%) students of the Dutch ethnic majority; 13 students did not indicate their ethnic background and were excluded from the analyses. There were students from 36 different ethnic minority groups in the sample. The largest groups came from Turkey ($n = 85$) and Morocco ($n = 22$). We were interested in the effects of liking and disliking of classmates of Turkish, Moroccan, or Dutch ethnic background on the attitudes toward these ethnic groups. Therefore, the three samples used for our analysis of the attitudes toward these three groups were restricted to those school classes in which there was at least one student of the particular ethnicity. There were 24 classes with at least one Turkish student, 14 with at least one Moroccan student, and 32 with at least one Dutch student.

Procedure. Parents received an information letter that offered them the opportunity to deny participation of their child. In addition, students were informed that their answers would be treated confidentially and that they were free to discontinue their participation. All students in a class simultaneously completed paper questionnaires in their classroom during school hours.

Measurements and Coding

Ethnicity. Students were asked to indicate their parents' countries of birth. In the first step, a participant was classified as Dutch when both parents were born in the Netherlands. If at least one parent was born outside the Netherlands, the student was assigned the ethnicity of that parent. In the Netherlands, birthplace of parents is the main predictor of ethnicity and ethnic minority group students' self-identification (Verkuyten, 2005). In the second step, we tried reducing misclassification of students with foreign-born parents who

actually identified as being Dutch. Students who indicated feeling more Dutch to the question "Do you feel more Dutch or that you belong more to another ethnic group?" were recoded as Dutch. Class compositions ranged from 1 to 11 Turkish students, 1 to 5 Moroccans, and 1 to 26 Dutch students in classes where there was at least one student from that particular group.

Positive and negative attitudes toward individuals. Students were asked to evaluate each of their classmates on a 5-point scale printed next to the names of the classmates on the questionnaire (1 = *I don't like the classmate at all; 2 = I don't like the classmate; 3 = neutral; 4 = I like the classmate;* 5 = *I like the classmate very much*). The ethnicity of the nominated classmates was not shown on the name list, and was later derived as described above. Pretests in four classes with students of the same age group who did not participate in the current study revealed that the scale was understood as ranging from a very negative evaluation over a neutral midpoint to a very positive evaluation.

To investigate the effects of liking and disliking separately, answers to the evaluation scale were split into two indicators. First, the scale was recoded to a value range from −2 to 2 so that negative values indicated disliking and positive values represented liking of classmates. Liking was then measured by summing up all positive nominations of classmates of a particular ethnic group (Turkish, Moroccan, or Dutch students) and then dividing this value by the total number of classmates of this ethnic group. The same was done for the negative part of the evaluation scale to measure disliking. Both subscales were divided by the total number of classmates from the particular ethnic group, and not by the number of classmates nominated on either the positive or negative side of the scale, so that each nomination received the same weight. The Liking Scales for Turkish, Moroccan, and Dutch classmates ranged from 0 to 2, and the Disliking Scales from −2 to 0, so that higher values indicated more positive attitudes on both types of scale. Because positive and negative nominations were kept separate, students who indicated liking some and disliking others of their classmates from a particular ethnic group could score on both the Liking and the Disliking Scales. Students who reported only neutral relationships received the value 0 on both scales and served as a baseline in the analyses.

Although the Liking and Disliking subscales were derived from a single measure of interpersonal evaluation, they were not mere mirror images of one another. Descriptive correlations between liking and disliking were relatively modest and varied between $r = .34$ and $r = .47$. In the rare case that students had only one classmate of a particular outgroup, they could score on one scale and receive a score of zero on the other. It might have been preferable to have two independent measurements of liking and disliking, but pretests showed that students did not understand how to rate classmates both on a Liking and on a Disliking Scale. The measurement used nevertheless enabled us to test whether the effects of the positive side of the scale differed from the effects of the negative side.

Outgroup attitudes. Students' outgroup attitudes were measured using three items with respect to the ethnic minority groups of Turkish and Moroccan people, and the Dutch majority. Participants were asked on 5-point scales how many outgroup members in general were (a) honest, (b) friendly, and (c) smart (1 = *[almost] nobody*; 5 = *[almost] everybody*) (cf. Feddes, Noack, & Rutland, 2009). A higher score indicated more positive attitudes toward the particular ethnic group. Only positive traits were included because developmental research indicates that children older than 7 years are less willing to discriminate between social groups in terms of negative dimensions, whereas they will do so in terms of positive traits. This has been attributed to older children's better understanding of social norms of the unacceptability of social discrimination involving negative outcomes (Rutland et al., 2007). The items of our scales showed high internal consistencies for attitudes toward Turkish ($\alpha = .88$), Moroccan ($\alpha = .83$), and Dutch people ($\alpha = .82$).

Analysis. The central analyses were conducted using structural equation modeling, with the latent dependent variable "attitudes toward other ethnic group" being constituted by the three attitude items. The other indicators—interpersonal liking and disliking—were presumed to be each perfectly measured with a single indicator because these variables were determined through evaluations of a different number of students of a particular ethnic group in each school class. To control for the nestedness of the students in school classes, the Mplus option for complex sample designs was utilized, using maximum likelihood estimation with robust standard errors (MLR; L. K. Muthén & Muthén, 1998-2010). Because there were no variables or hypotheses on the class level, we did not apply multilevel modeling but rather controlled for clustering in the data using the "complex" option that yields adjusted standard errors and goodness-of-fit statistics for hierarchically ordered data (B. O. Muthén & Satorra, 1995). Root mean square errors of approximation (RMSEA) smaller than .06, comparative fit indices (CFI) greater than .95, and standardized root mean square residuals (SRMR) of less than .08 indicate acceptable fit of the models to the data (Hu & Bentler, 1999).

The analyses were conducted for three partially overlapping samples. The analyses of students' attitudes toward Turkish and Moroccan people in general were not nested within or between ethnic groups, because there were only 166 non-Turkish and non-Moroccan students who had at least one Turkish and one Moroccan classmate. Instead, the sample for the analysis of attitudes toward a group of students consisted of their classmates from all other ethnic groups. Students with missing values on one of the variables were removed from the sample (we removed 21 non-Turkish students, 6 non-Moroccan students, and 5 non-Dutch students). In the final analyses, attitudes toward Turks were

Table 1. Means, Standard Deviations, and Correlations Between All Variables in Study 1 Separately for Attitudes Toward Turkish, Moroccan, and Dutch People.

	M	*SD*	1	2	3
Attitudes toward Turks (*n* = 346)					
1 Mean attitudes[a]	3.28	0.93	1.00		
2 Liking	0.48	0.58	.24****	1.00	
3 Disliking[b]	−0.35	0.55	.21****	.35****	1.00
Attitudes toward Moroccans (*n* = 237)					
1 Mean attitudes[a]	3.19	0.87	1.00		
2 Liking	0.46	0.62	.21****	1.00	
3 Disliking[b]	−0.37	0.59	.27****	.34****	1.00
Attitudes toward the Dutch (*n* = 196)					
1 Mean attitudes[a]	3.30	0.91	1.00		
2 Liking	0.54	0.45	.27****	1.00	
3 Disliking[b]	−0.40	0.45	.24****	.47****	1.00

Note: [a]The three attitudes questions have been collapsed into one additive index (value range 1-5) for a better overview.
[b]Higher values indicate less disliking.
****$p < .001$.

examined among all non-Turkish students who had at least one Turkish classmate (n = 346), and attitudes toward Moroccans were studied among all non-Moroccan students with at least one Moroccan classmate (n = 237).[1] Attitudes toward the Dutch were examined among 196 students from all ethnic minority groups.

Results and Discussion

Table 1 presents the means and standard deviations of interethnic attitudes toward Turks, Moroccans, and the Dutch separately, as well as means and standard deviations for the independent variables and their intercorrelations. The three attitude items were collapsed in this table to provide a better overview, but kept separate in the analyses. The table first shows that students' attitudes toward all ethnic groups were positively correlated with their liking and disliking of classmates from the respective ethnic groups. Moreover, the higher absolute means of liking compared with those of disliking show that students tended to feel more positive than negative about their outgroup classmates, Turks: $t(345) = 2.63$, $p < .01$; Dutch: $t(195) = 2.56$, $p = .01$, although this difference was not significant for attitudes toward Moroccans, $t(236) = 1.37$, $p = .17$.

It is important to remember these slightly higher absolute values of positive attitudes when evaluating the generalization process. The main focus of this research is on the relative strength in which positive and negative interpersonal attitudes are generalized toward outgroup attitudes. Yet, the final outcome of this generalization is also determined by the absolute values of the interpersonal attitudes. That is, the higher absolute means of positive interpersonal attitudes indicate that positive attitudes toward Turkish and Dutch classmates would affect students' outgroup attitudes more strongly even if positive and negative interpersonal attitudes were generalized to the same extent.

Analyses were conducted in three steps. In the first structural equation models, only students' liking of classmates from the particular ethnic group was allowed to predict their attitudes toward Turkish people (Model 1 of Table 2), Moroccan people (Model 3), and Dutch people (Model 5) in general. The path from disliking to attitudes was constrained to be zero in each model so that only the effects of positive interpersonal attitudes could be examined in the first step. This path was set free in the second step. The significance of the disliking predictors as well as change in R^2 of the latent dependent attitude factors were used to determine the unique contribution of disliking. In the third step, it was tested whether the effects of liking and disliking were significantly different from each another.

The results of the structural equation models presented in Table 2 show that interpersonal liking of Turkish ($\beta = .26$, $p < .001$, Model 1), Moroccan ($\beta = .22$, $p < .01$, Model 3), and Dutch ($\beta = .29$, $p < .001$, Model 5) classmates was significantly related to students' attitudes toward the respective ethnic group in general. With the path from disliking to students' attitudes constrained to zero, goodness-of-fit statistics indicated an acceptable but not very good fit to the data for the models of attitudes toward Turks and the Dutch. The RMSEA of .099 in the model of students' attitudes toward Moroccans even showed a poor fit.

Next, the path from disliking to the latent dependent variable was set free. In line with our expectations, disliking of classmates was a significant predictor of students' attitudes toward Turks ($\beta = .15$, $p < .01$, Model 2) and Moroccans ($\beta = .23$, $p = .02$, Model 4) when their liking of classmates was controlled for. All coefficients were positive because higher values reflected *less* disliking. This means that students who indicated less disliking reported more positive outgroup attitudes than students who indicated stronger disliking of outgroup classmates. The change in the explained variance indicated that students' disliking of Turkish classmates explained an additional 2% of the variance, and their disliking of Moroccan classmates explained an extra 5%. This shows that interpersonal disliking makes a unique contribution to outgroup attitudes, in addition to the influence of interpersonal liking. Only in the smaller sample of non-Dutch students did this effect not reach statistical significance, as presented in Model 6 ($\beta = .15$, $p = .18$). Goodness-of-fit statistics improved considerably and indicated a good fit of all models to the data.

In the last step, it was tested whether the effects of interpersonal liking and disliking on students' interethnic attitudes were significantly different from each other. Satorra–Bentler scaled chi-square tests (Satorra, 2000) were used to test for differences, because the scaled chi-square of an MLR estimation cannot be used for conventional chi-square difference testing. According to this test, there were no differences in the

Table 2. Structural Equation Models of Attitudes Toward Other Ethnic Groups on Liking and Disliking of All Classmates From These Ethnic Groups for Study 1 (Standardized Parameters).

	Attitudes toward Turks (n = 346)		Attitudes toward Moroccans (n = 237)		Attitudes toward the Dutch (n = 196)	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Liking	.26****	.20***	.22****	.15**	.29****	.22**
Disliking[a]	—	.15***	—	.23**	—	.15
Model fit						
$\chi^2(df)$	10.22* (5)	3.29 (4)	16.72*** (5)	6.97 (4)	7.67 (5)	5.50 (4)
CFI	.992	1.000	.961	.988	.989	.992
RMSEA	.055	.000	.099	.056	.052	.044
SRMR	.045	.011	.070	.022	.043	.021
R^2	.065	.086	.050	.098	.083	.100

Note: CFI = comparative fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual. Correlations included between all exogenous variables. Controlled for clustering in school classes: 24 classes for attitudes toward Turks, 14 classes for attitudes toward Moroccans, and 32 classes for attitudes toward the Dutch.
[a]Higher values indicate less disliking.
*p < .1. **p < .05. ***p < .01. ****p < .001.

effects of liking and disliking on interethnic attitudes toward any ethnic group (Turks: $\Delta\chi^2 = 0.04$; Moroccans: $\Delta\chi^2 = 0.12$; the Dutch: $\Delta\chi^2 = 0.14$, all $\Delta df = 1$, $p > .05$). This result contradicts our hypothesis of stronger effects of negative attitudes. Instead, interpersonal liking and disliking were equally strongly related to interethnic attitudes.

The findings of Study 1 demonstrated that the conceptually equivalent measurements of interpersonal liking and disliking each uniquely contributed to students' attitudes toward ethnic outgroups. In contrast to our hypothesis, both effects were about equally strong. However, this cross-sectional study provided no information about the causal order in the relationship between interpersonal liking and disliking, on one hand, and students' interethnic attitudes, on the other hand. Both generalization from attitudes toward outgroup members and generalization from attitudes toward the entire outgroup could have been the cause of the statistical associations that we found. To avoid the problem of reversed causality, we conducted a new study in which the same variables as in Study 1 were measured in a longitudinal design.

Study 2

For Study 2, we followed students who had participated in Study 1, and had finished primary school and enrolled in a secondary school in the city of Arnhem. All their new classmates were also included in the sample to assess interpersonal attitudes. These data are unique because the class compositions changed completely owing to the school transition, during which interpersonal relationships had to be newly formed. This allowed us to follow the development of interpersonal liking and disliking, and of students' outgroup attitudes in a new social setting. Data were collected at three points in time. The first two waves took place early in the school year, because we expected more change to happen in the first few months in a new classroom. The final data collection was conducted at the end of the school year.

Method

Participants. Data for Study 2 came from the secondary school module of TASS, which comprises 1,350 students attending the 1st year of secondary education (age 12-13). The first wave took place in the second and third weeks after the start of secondary education (September 2008). Wave 2 was conducted about 3 months later (December 2008), and Wave 3 took place about 6 additional months later (June 2009). Sixty-one (88.4%) of all 1st-year classes in secondary schools in the city of Arnhem took part in our study. Of the 1,350 students in these classes, 1,219 participated in the first wave of the study (response rate = 90.3%). Of these respondents, 972 students from 54 classes were included in all three waves (matching rate = 79.7%).[2] Because the focus was on cross-lagged effects, only those respondents were analyzed. Two hundred and twenty (22.6%) of these students were included in Study 1. The final sample contained 520 (53.5%) boys. All analyses focused on ethnic minority group students' attitudes toward their classmates of the Dutch ethnic majority (n = 710) and all students' attitudes toward their classmates from Turkey (n = 79) and Morocco (n = 23). The class compositions in classes where there was at least one student of the particular group ranged from 1 to 15 Turkish students, 1 to 3 Moroccans, and 3 to 28 Dutch students.

Procedure. The only difference with Study 1 was that all students in a class completed the questionnaire simultaneously online on separate computers in a school computer lab.

Measurements and Coding

Ethnicity. Ethnicity was determined in a slightly different way than in Study 1. Based on the country of birth of the parents, students with at least one foreign-born parent were again assigned to this ethnic group. To reduce misclassification of students with foreign-born parents who actually identify as Dutch, all students were asked to answer the questions, "Do you feel Dutch?" and, if they had a foreign-born parent, "Do you feel [ethnicity of parent]?" Answers were given on 5-point scales ranging from 1 (*not at all)* to 5 (*very strongly)*. If students with a foreign-born parent scored higher on the Feeling-Dutch Scale than on the other scale, they were recoded as being Dutch. Eight students with parents born in Turkey and four students with parents born in Morocco scored equally high on both scales; they were excluded from the analyses. The final sample size was 960.

Positive and negative attitudes toward individuals. As in Study 1, students were asked to indicate how much they liked or disliked each classmate, with the difference being that the number of answer categories was increased to 9. Several participants in Study 1 had indicated that a 5-point scale was not sufficient to differentiate between all the relationships they had with their classmates. The liking indicator thus ranged from 0 to 4 and the disliking indicator from −4 to 0.

Outgroup attitudes. Some participants in Study 1 indicated that they found it difficult to answer "how many" persons of a particular ethnic group possessed certain traits. Hence, students' outgroup attitudes were measured using four slightly different questions with respect to Turkish, Moroccan, and Dutch people. Participants indicated on 7-point scales how much they agreed with the four propositions "all [ethnic groups] are" (a) honest, (b) friendly, (c) smart, and (d) helpful (1 = *totally disagree*; 7 = *totally agree*). Only positive items were used, for the same reason as in Study 1. The items showed high internal consistencies, with Cronbach's alphas of .93 or higher for attitudes toward each ethnic group.

Analysis. The cross-lagged associations between interpersonal liking, interpersonal disliking, and students' interethnic attitudes were examined in Mplus. Again, the nestedness of students in classes was controlled for using the "complex" procedure (L. K. Muthén & Muthén, 1998-2010). The latent factor of interethnic attitudes was constituted by four attitude measures at each wave. All other indicators were presumed to be perfectly measured using single indicators. Also here, students who belonged to the ethnic group under consideration were removed from the analyses. Of the 960 students who could be matched, 881 were not Turkish. Of those students, 510 had at least one Turkish classmate, but 29 were excluded due to missing values, which left 481 non-Turkish students in the sample. Of the 937 non-Moroccan students who could be matched, 338 had at least one Moroccan classmate, but 14 had to be excluded due to missing values. Accordingly, attitudes toward Moroccans were analyzed among 324 non-Moroccan students. Thirteen of the 259 non-Dutch students were excluded due to missing values so that attitudes toward the Dutch were analyzed among 246 minority group students.

Results and Discussion

Before turning to the central analyses, we checked for selective attrition by comparing matched and unmatched respondents on all variables using univariate analyses of variance. The only significant differences were that unmatched respondents had on average 0.17 fewer Moroccan classmates, $F(1, 1298) = 9.05$, $p = .02$, and that non-Turkish students in the unmatched sample liked their Turkish classmates significantly less, $F(1, 631) = 10.66$, $p < .01$, just as the non-Dutch students in the unmatched sample liked their Dutch classmates less, $F(1, 341) = 4.69$, $p = .03$. Given the large sample and these few differences, we concluded that it was unlikely that selective attrition had influenced our results substantively.

All means, standard deviations, and intercorrelations of the attitude measurements, interpersonal liking, and interpersonal disliking are reported in Tables 3 and 4. Interpersonal liking and disliking were generally highly correlated with students' interethnic attitudes in the same wave. Only non-Dutch students' disliking scores of Dutch classmates at Wave 1 did not correlate with their attitudes toward the Dutch. The liking and disliking indicators correlated moderately with each other for each ethnic group. Correlations varied between $r = .30$ (Dutch classmates Wave 1) and $r = .44$ (Dutch classmates Wave 2). Like in Study 1, the mean values of liking of Turkish and Dutch classmates were significantly higher at each wave than the absolute mean values of disliking those classmates (Turks Wave 1: $t(480) = 5.82$, Wave 2: $t(480) = 3.04$, Wave 3: $t(480) = 4.46$, all $p < .01$; Dutch Wave 1: $t(245) = 6.08$, Wave 2: $t(245) = 5.36$, Wave 3: $t(245) = 7.03$, all $p < .001$). However, the absolute mean values of liking and disliking of Moroccan classmates did not differ significantly (Wave 1: $t(323) = 0.96$, Wave 2: $t(323) = -0.34$, Wave 3: $t(323) = 0.49$, all $p > .05$).

Establishing Longitudinal Factorial Invariance. To fit longitudinal structural equation models to our data, we followed the approach suggested by Little, Preacher, Selig, and Card (2007). At first, appropriate null models were specified which assumed stable variances and means of corresponding indicators over time. This was done only for the outgroup attitudes because they were measured by multiple indicators. The chi-square statistics of these models for the analyses of attitudes toward Turks, Moroccans, and the Dutch can be found in Table 5. In a subsequent step, we tested for factorial invariance in the measurement models. Only if the indicators show the same relative loadings and means at every time point can it be assumed that the same underlying construct was measured over time. Table 5 shows that the data met the criteria for strong factorial invariance for all three models.

Table 3. Means, Standard Deviations, and Intercorrelations in Study 2 for the Models of Attitudes Toward Turks and Moroccans.

Measurement	1	2	3	4	5	6	7	8	9	*M*	*SD*
1 Outgroup attitudes Wave 1[a]	—	.40****	.34****	.16****	.19****	.18****	.17****	.07	.06	4.07	1.29
2 Outgroup attitudes Wave 2[a]	.31****	—	.46****	.22****	.25****	.26****	.15****	.17****	.25****	4.25	1.40
3 Outgroup attitudes Wave 3[a]	.37****	.42****	—	.10**	.22****	.20****	.11**	.20****	.20****	4.09	1.31
4 Liking Wave 1	.16***	.14***	.11**	—	.49****	.45****	.31****	.22****	.15***	1.04	1.18
5 Liking Wave 2	.14**	.29****	.16***	.62****	—	.53****	.20****	.38****	.24****	0.94	1.05
6 Liking Wave 3	.05	.13**	.21****	.44****	.47****	—	.17****	.23****	.37****	0.95	1.07
7 Disliking[b] wave 1	.24****	.13**	.18****	.37****	.21****	.26****	—	.40****	.21****	−0.56	1.05
8 Disliking[b] Wave 2	.18****	.27****	.28****	.28****	.43****	.26****	.42****	—	.44****	−0.69	1.14
9 Disliking[b] Wave 3	.11**	.15***	.14**	.22****	.20****	.42****	.38****	.41****	—	−0.61	0.98
M	3.87	4.03	3.89	0.85	0.88	0.90	−0.74	−0.92	−0.84		
SD	1.29	1.41	1.34	1.23	1.18	1.25	1.24	1.36	1.30		

Note: Correlations, means, and standard deviations above the diagonal refer to the model of attitudes toward Turk and below the diagonal to the model of attitudes toward Moroccans. Above the diagonal are all non-Turkish students with at least one Turkish classmate who could be matched, $n = 481$. Below the diagonal are only non-Moroccan students with Moroccan classmates who could be matched, $n = 324$.
[a]The four attitudes questions have been collapsed into one additive index (value range 1-7) in each wave for a better overview.
[b]Higher values indicate less disliking.
**$p < .05$. ***$p < .01$. ****$p < .001$.

Table 4. Means, Standard Deviations, and Intercorrelations in Study 2 for the Model of Attitudes Toward the Dutch.

Measurement	1	2	3	4	5	6	7	8	9
1 Outgroup attitudes Wave 1[a]	—								
2 Outgroup attitudes Wave 2[a]	.33****	—							
3 Outgroup attitudes Wave 3[a]	.37****	.38****	—						
4 Liking Wave 1	.19***	.27****	.28****	—					
5 Liking Wave 2	.14**	.27****	.29****	.61****	—				
6 Liking Wave 3	.22****	.16**	.39****	.50****	.63****	—			
7 Disliking[b] Wave 1	.06	.10	.17***	.30****	.33****	.23****	—		
8 Disliking[b] Wave 2	.12	.16**	.23****	.26****	.44****	.26****	.59****	—	
9 Disliking[b] Wave 3	.10	.08	.27****	.21****	.27****	.33****	.49****	.58****	—
M	4.45	4.19	4.26	1.03	1.16	1.18	−0.55	−0.65	−0.58
SD	1.42	1.53	1.55	0.78	0.88	0.87	0.77	0.88	0.77

Note: All non-Dutch students with Dutch classmates who could be matched: $n = 246$.
[a]The four attitudes questions have been collapsed into one additive index (value range 1-7) in each wave for a better overview.
[b]Higher values indicate less disliking.
**$p < .05$. ***$p < .01$. ****$p < .001$.

The reduction in CFI between a more constrained model and one that put fewer constraints on the data was never larger than the critical value of .01 (Cheung & Rensvold, 2002). Hence, the attitude indicators measured the same construct at every point in time, and the fit of longitudinal models to the data was appropriate.[3]

Cross-Lagged Longitudinal Associations. Table 6 presents the tests of the bidirectional relationships between interpersonal liking, interpersonal disliking, and interethnic attitudes. All variables were entered in the models as predictors of one another between each subsequent wave, while within-wave correlations and stability paths were controlled for. The within-wave associations of Waves 2 and 3 indicate correlated change and can be interpreted as overlapping relative change of the two variables involved. These correlations together with the cross-lagged paths indicate longitudinal associations.

It should be noted that the time intervals between the assessments were not equal, because twice as much time passed between Waves 2 and 3 than between the first two waves. According to Cole and Maxwell (2003), one would generally expect effects in longitudinal models to be stationary, and accordingly, stability should decrease when the time span between measurement occasions increases. However, as Cole and Maxwell (p. 564) note, the assumption of stationarity is not appropriate for all kinds of causal relations. For situations such as those in the present study, in which social relationships are examined that have to be newly developed because individuals are meeting for the first time,

Table 5. Test for Measurement Invariance in the Models for Attitudes Toward the Three Ethnic Groups in Study 2.

Model	χ^2	*df*	*p*	RMSEA	CFI	Constraint tenable
Attitudes toward Turks (*n* = 481)						
Null	4177.53	169	<.001	—	—	—
Configural invariance	91.40	93	.53	.000	1.000	—
Loading invariance	95.72	99	.57	.000	1.000	Yes
Intercept invariance	106.18	105	.45	.005	1.000	Yes
Attitudes toward Moroccans (*n* = 324)						
Null	2738.23	169	<.001	—	—	—
Configural invariance	126.74	93	.01	.033	.987	—
Loading invariance	132.63	99	.01	.032	.987	Yes
Intercept invariance	136.93	105	.02	.031	.988	Yes
Attitudes toward the Dutch (*n* = 246)						
Null	2746.36	169	<.001	—	—	—
Configural invariance	125.68	93	.01	.038	.987	—
Loading invariance	137.44	99	<.01	.040	.985	Yes
Intercept invariance	144.25	105	<.01	.039	.985	Yes

Note: RMSEA = root mean square error of approximation; CFI = comparative fit index. Except for in the null model, correlations are included between the same attitude items in each wave and between all latent constructs, the liking, and the disliking items. Controlled for clustering in school classes: 33 classes for attitudes toward Turks, 20 classes for attitudes toward Moroccans, and 49 classes for attitudes toward the Dutch.

a shorter time span is recommended between the initial assessments because more change can be expected to happen, thus resulting in an increase in stability over time (Veenstra & Steglich, 2012). For instance, in a study with a monthly assessment among college freshmen of their first 5 months in college, stability paths were found to increase in the first 3 months, and to remain stable only from Wave 3 onward (Selfhout, Denissen, Branje, & Meeus, 2009). Likewise, in the present study, stability was higher between the latter two assessments, as shown in the top panel of Table 6. Stability paths for most effects were somewhat smaller between Waves 2 and 3, but none were as small as might be expected for stationary processes after the lag length was doubled.

Preliminary analyses of the model using Satorra–Bentler scaled chi-square tests (Satorra, 2000) revealed that the cross paths of liking and disliking on interethnic attitudes at Wave 2 were not significantly different from one another (Turks: $\Delta\chi^2 = 1.27$; Moroccans: $\Delta\chi^2 = 0.50$; Dutch: $\Delta\chi^2 = 3.12$, all $\Delta df = 1$, $p > .05$). The same was true for the cross paths of these indicators at Wave 3 (Turks: $\Delta\chi^2 = 0.81$; Moroccans: $\Delta\chi^2 = 2.50$; Dutch: $\Delta\chi^2 = 0.07$, all $\Delta df = 1$, $p > .05$). Like in Study 1, the effects of interpersonal liking and disliking were equally strong predictors of students' interethnic attitudes. Therefore, these paths were constrained to be equal at each time point.

Moreover, correlated change of liking and disliking with students' interethnic attitudes was also invariant at each time point, except for the last wave in the model of students' attitudes toward Moroccans ($\Delta\chi^2 = 5.91$, $\Delta df = 1$, $p < .001$). Accordingly, the correlated change paths were also constrained to be equal at each wave, with the exception of the last measurement in the model of attitudes toward Moroccans. The goodness-of-fit indices of these more parsimonious models indicated that all three models provided a good fit to the data.

The within-wave correlations of Wave 1 in Table 6 show a pattern similar to that found in the bivariate correlations. Except for the correlation between interpersonal disliking of Dutch classmates and students' attitudes toward the Dutch, all constructs correlated with each other at the initial assessment. The correlated change associations between interpersonal liking and disliking were high for each ethnic group at each wave. The remaining correlated change paths indicated longitudinal associations between students' liking and disliking of classmates and interethnic attitudes. We found significant correlated change at the second wave for attitudes toward Turks and Moroccans, and at the last wave for attitudes toward the Dutch. Change in students' attitudes toward Moroccans at Wave 3 was correlated with change only in their liking scores, not in their disliking scores.

The longitudinal relationship between the interpersonal liking and disliking indicators and students' interethnic attitudes were even more apparent in the cross-lagged associations presented in the lower part of Table 6. Results better fitted the causal direction predicted by the literature on attitude change, not on stereotyping. Interpersonal liking and disliking of Turkish and Dutch classmates were significant predictors of the change in students' attitudes toward Turkish and Dutch people in a later wave. These causal paths were only marginally significant for liking and disliking of Moroccan classmates and students' attitudes toward Moroccans in general

Table 6. Cross-Lagged Panel Analyses of Attitudes Toward Other Ethnic Groups with Liking and Disliking of Classmates From the Other Ethnic Groups in Study 2 (Standardized Parameters).

	Attitudes toward Turks (n = 481)			Attitudes toward Moroccans (n = 324)			Attitudes toward the Dutch (n = 246)		
	Wave 1	Wave 2	Wave 3	Wave 1	Wave 2	Wave 3	Wave 1	Wave 2	Wave 3
Stability paths									
Attitudes Wave 1		.38****	.17***		.30***	.28****		.31****	.22**
Attitudes Wave 2			.37****			.30****			.25***
Liking Wave 1		.46****	.24****		.61****	.22***		.55****	.17***
Liking Wave 2			.38****			.33****			.54****
Disliking[a] Wave 1		.37****	.03		.36****	.21****		.57****	.21**
Disliking[a] Wave 2			.38****			.31****			.47****
Within-wave correlations									
Liking ←→ disliking	.31****	.33****	.29****	.37****	.37****	.35****	.30****	.32****	.25****
Attitudes ←→ liking[b]	.17***	.14**	.05	.17**	.27****	.17***	.18***	.11	.23****
Disliking. ←→ attitudes[b]	.17****	.12**	.06	.24****	.21****	−.01	.05	.11	.24****
Cross-lagged paths									
Liking[c] → attitudes		.10***	.08**		.06*	.06*		.12***	.13***
Disliking[c] → attitudes		.09***	.08**		.06*	.07*		.12***	.13***
Attitudes → liking		.10**	.12**		.04	−.01		.03	−.03
Attitudes → disliking		−.01	.17***		.07	.04		.08	−.02
Liking → disliking		.10**	.05		.14***	.01		.06	.00
Disliking → liking		.05	.01		−.02	.06		.17****	−.01
Model fit									
$\chi^2(df)$	114.45(115)			146.23**(114)			157.47***(115)		
CFI	1.000			.987			.982		
RMSEA	.000			.030			.039		
SRMR	.020			.029			.045		

Note: CFI = comparative fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual. Controlled for clustering in school classes: 33 classes for attitudes toward Turks, 20 classes for attitudes toward Moroccans, and 49 classes for attitudes toward the Dutch.

[a]Higher values indicate less disliking.

[b]Correlated changes between liking and attitudes and between disliking and attitudes were not significantly different (with the exception of Wave 3 in the model of attitudes toward Moroccans) and were, therefore, constrained to be equal.

[c]The lagged effects of liking and disliking were not significantly different from each other and were, therefore, constrained to be equal.

*p < .1. **p < .05. ***p < .01. ****p < .001.

(Wave 2: β_{liking} = .06 and $\beta_{disliking}$ = .06, p = .06; Wave 3: β_{liking} = .06 and $\beta_{disliking}$ = .07, p = .08). However, there were no significant effects in the reversed direction, from students' outgroup attitudes toward their liking and disliking scores as predicted by stereotyping in the models for attitudes toward Moroccans and the Dutch. Only students' attitudes toward Turkish people predicted their liking and disliking scores of Turkish classmates at a later wave.

In sum, the findings of Study 2 also showed no evidence for stronger generalization of negative interpersonal attitudes into attitudes toward the entire outgroup. Both interpersonal liking and disliking of outgroup members proved to be equally strong predictors of change in students' attitudes toward these groups over time. However, Study 2 could clarify which causal process better explains the equally strong relationship between positive and negative interpersonal attitudes and general outgroup attitudes. Attitudes toward individual outgroup members were mainly generalized toward outgroup attitudes in general. This is in line with research on stereotype change and indicates that students in our sample did not base their attitudes toward individual outgroup members on what they thought about their ethnic group in general. However, because the longitudinal associations were equally strong for positive and negative attitudes, there was no evidence for the presumption that category salience (Paolini et al., 2010) or intergroup anxiety (Stephan & Stephan, 1985) would facilitate the generalization of negative attitudes.

General Discussion

We investigated the relative magnitude of the generalization of positive and negative attitudes toward individual outgroup members to students' attitudes toward the entire outgroup.

Previous studies pointed to a stronger effect of negative attitudes compared with positive ones (Dolderer et al., 2009; Paolini et al., 2010), but this possibility has not been tested rigidly. We improved upon earlier research on stereotype change by testing simultaneously whether negative (disliking) and positive (liking) interpersonal attitudes would generalize to outgroup attitudes to the same extent.

Positive and Negative Generalization

In the cross-sectional Study 1, we found that negative attitudes toward individual outgroup members uniquely contributed to students' interethnic attitudes even after their positive interpersonal attitudes were controlled for. This compares with previous findings of unique contributions of the frequency (Pettigrew, 2008; Schmid, Tausch, Hewstone, Hughes, & Cairns, 2008) and the quality (Bekhuis, Ruiter, & Coenders, 2011) of negative contact experiences to outgroup attitudes. In contrast to our theoretical expectations, negative interpersonal attitudes were not more strongly associated with outgroup attitudes. The relationships between both positive and negative interpersonal attitudes and students' outgroup attitudes were instead equally strong. This was true for students' attitudes toward classmates from two different ethnic minority groups and minority group students' attitudes toward classmates from the majority group.

The longitudinal Study 2 also did not provide evidence for our hypothesis that negative attitudes toward individuals are generalized more readily than positive attitudes to form attitudes toward the outgroup as a whole. In this three-wave study, we found that the quality of both positive and negative attitudes toward individual outgroup members predicted change in students' attitudes toward ethnic outgroups over time. However, these effects did not differ significantly from each other. Instead, we found that the absolute mean values of negative interpersonal attitudes toward Dutch and Turkish classmates were significantly lower than the mean values of positive attitudes. This indicates that, in our sample, positive interpersonal attitudes more highly determined attitudes toward the outgroup as a whole than did negative attitudes. Both positive and negative attitudes are generalized to the same extent, but more positive interpersonal attitudes will translate into more positive outgroup attitudes.

Context Dependency of Negative Effects

Why did earlier research then point to stronger generalization of negative attitudes toward individual outgroup members? We suspect that the different time dimensions in which attitude generalization was studied may affect the outcome. Previous research that found higher category salience after negative intergroup interaction (Paolini et al., 2010) or stronger generalization of negative information (Dolderer et al., 2009; Ratliff & Nosek, 2011) focused on situations in which the individual outgroup members were previously unknown. Negative information may have more impact in such contexts because it fits expectations about negatively perceived outgroups (Oakes et al., 1994). Unexpected positive information, in contrast, might not make group categories salient but instead lead to subtyping (Paolini et al., 2010).

Positive information may, however, have more effect in a long-term perspective (Pettigrew, 1998). Stereotype disconfirming information has been found to affect group attitudes more strongly if it is provided by a more typical outgroup member (Brown & Hewstone, 2005; Johnston & Hewstone, 1992; Kunda & Oleson, 1997) or if it is dispersed over multiple outgroup members (Weber & Crocker, 1983). Exposure to the same outgroup members over a longer period may have similar effects. Long-term exposure disperses the information about the outgroup over time and it also increases the chance that an outgroup member is perceived at times as being typical on some dimension while he or she may still disconfirm the stereotype on other dimensions. Because the students in our sample were exposed to their outgroup classmates over months, positive and negative interpersonal attitudes may have had the same impact. Future research may be able to provide a direct test of this hypothesis with a longitudinal study that has much shorter lag lengths between measurements.

Another way in which our study differed from previous research is that students in school classes may be able to minimize interaction with disliked outgroup members. In the experimental studies that found stronger effects of negative information, participants could not choose their interaction partner. However, people tend to avoid interactions that they believe will lead to negative experiences (Brown & Hewstone, 2005). Recent research indicates that negative outgroup experiences may be more likely and may have more impact on outgroup attitudes if interacting with outgroup members is not entirely voluntary. Pettigrew (2008), for example, found that positive contact occurred both at work and in the neighborhood whereas negative contact occurred only at work—a setting in which contact can less easily be avoided. Moreover, Pettigrew and Tropp (2011) showed that negative contact has less impact on outgroup attitudes when contact is voluntary than when it is involuntary. There might have been a certain degree of involuntary contact in the school classes in our sample, but being in the same class generally only provides the opportunity for contact but does not define with whom students interact (Wagner, Van Dick, Pettigrew, & Christ, 2003). A replication of our study among an adult sample outside of the laboratory might shed more light on this question.

Causal Order

Our results favor the notion that attitudes mainly generalize from individual outgroup members to outgroups as a whole. We found much weaker support for the reversed causal process as predicted by stereotyping (Blair, 2002; Oakes et al., 1994). Students tended to not generalize from their attitudes

toward the ethnic outgroups to their attitudes toward classmates from these groups. Only students' attitudes toward Turkish people in general predicted change in their liking and disliking of individual group members over time. Importantly, in contrast to the prediction based on increased intergroup anxiety (Stephan & Stephan, 1985), negative attitudes toward individual outgroup members were not more strongly affected by group attitudes than were positive interpersonal attitudes.

Intergroup Contact and Interpersonal Liking and Disliking

The results of the current research also advance the understanding of positive and negative effects of intergroup contact (Paolini et al., 2010; Pettigrew, 2008). The generalization of interpersonal attitudes forms the last step in the intergroup contact process after interpersonal interaction between members of different groups has shaped their perceptions of each other (Brown & Hewstone, 2005; Pettigrew, 1998).

Recent research on the effects of positive and negative contact experiences produced mixed results on their relative impact on outgroup attitudes. Two studies in which positive and negative contact were not measured on equivalent scales found stronger associations of positive contact experiences with outgroup attitudes than of negative contact experiences (Pettigrew, 2008; Schmid et al., 2008). The most compelling evidence using equivalent scales comes from a series of studies that found a slight advantage of negative contact (Barlow et al., 2012). In line with our results, the only study that focused on the consequences of long-term contact in school classes found equally strong associations for positive and negative contact (Bekhuis et al., 2011).

Our findings advance this literature in two ways. First, all of these intergroup contact studies relied on cross-sectional data. Hence, it remained unclear whether it was truly the positive or negative contact experience that caused respondents' outgroup attitudes. Our longitudinal results provide support for the claim that both positive and negative interpersonal attitudes that are developed through intergroup contact generalize to the outgroup as a whole (Paolini et al., 2010; Pettigrew, 2008). Second, the ethnic group membership was made salient in these previous studies when it was asked for the quality of intergroup contact. Bekhuis et al. (2011) for example asked, "How positive or negative do you perceive contact with your Turkish classmates to be?" This approach may cause an endogeneity problem as ethnic prejudice may lead respondents to report more negative contact in the first place, or to rationalize the contact afterward as being more negative so that it fits their attitudes. In our study, only the names of the outgroup classmates were mentioned on the questionnaire but not their ethnicities.

Despite these advantages of our approach, it remains unknown what level of actual contact led to students' liking or disliking of outgroup classmates in our sample. As mentioned before, being in the same class does not guarantee actual contact (Binder et al., 2009; Wagner et al., 2003). Future research should investigate which forms of intergroup contact lead to liking and disliking of individual outgroup members. Earlier research points to the importance of similarity in personality characteristics (Tenney, Turkheimer, & Oltmanns, 2009).

Limitations

There are some limitations of our work that point to directions for future research. First, by using social network measurements to assess students' attitudes to outgroup classmates, a new dependency structure was introduced to the data, and more research is needed in that regard. As with most social networks, it is quite likely that structural processes such as reciprocity (I like Tom because he likes me) or transitivity (I like Tom because I like Jim, and Jim likes Tom) play a role in shaping the network of interpersonal attitudes. Unfortunately, no statistical technique currently exists to control for such structural processes. Recently developed stochastic actor-based models (Snijders, Van de Bunt, & Steglich, 2010; Veenstra & Steglich, 2012) make it possible to account for this kind of dependency in dichotomous networks, but not yet in valued networks such as the liking nominations used in the current research.

A second problem is that the number of classmates for a particular ethnic group varied widely between classrooms. Non-Dutch students generally had a large number of classmates from the majority group, so it was very likely that they would like at least some of them. This may be a reason for the finding that the effects of disliking in Study 1 and at Wave 1 in Study 2 were not significant for attitudes toward the Dutch. Disliking one of their far fewer Turkish or Moroccan classmates may have more determined students' interethnic attitudes than did disliking a Dutch classmate for their attitudes toward the majority group. Controlled experiments might give better insights into these differences.

An alternative explanation for the relationship between more positive interpersonal attitudes and more positive intergroup attitudes is that students differed in their personal positivity. To test this alternative, we operationalized the dependent variable in supplementary analyses of Study 1 for a subgroup of our sample (Dutch, Turkish, and Moroccan students) as difference scores between attitudes toward the outgroup and attitudes toward the students' own ethnic groups. Difference scores cannot be affected by students' general tendency toward positivity, because such a tendency would affect their attitudes toward the outgroup and toward the ingroup equally. Using this dependent variable, we replicated the strong effect of Dutch students' evaluations of Turkish classmates ($\beta_{liking} = .17$ and $\beta_{disliking} = .17$; $p < .001$, $n = 250$) and Moroccan classmates ($\beta_{liking} = .20$ and $\beta_{disliking}$ .22; $p < .01$, $n = 139$). The effects on attitudes toward the Dutch were also positive but not significant ($\beta_{liking} = .11$ and

$\beta_{disliking}$ = .11; p = .17, n = 105), probably due to the reduced sample size. These results indicate that not personal positivity but rather generalization from members to groups better explained the data. We did not use difference scores throughout the research because changes in the difference scores over time in Study 2 could have been caused by a change in attitudes toward either the outgroup or the ingroup.

Conclusion

Our results indicate that negative interpersonal attitudes can harm attitudes toward entire outgroups. Even though negative attitudes do not seem to have more impact than positive attitudes, they still determine the development of general group perceptions. Yet, research on stereotype change and intergroup contact has only begun to understand which factors undermine the ability of experiences with outgroup members to improve outgroup attitudes (Barlow et al., 2012; Dolderer et al., 2009; Paolini et al., 2010; Pettigrew, 2008). Future research should investigate whether mediators of positive contact, such as intergroup anxiety and perceived threats (Binder et al., 2009; Swart et al., 2011), and moderators of positive attitude generalization, such as category salience (Johnston & Hewstone, 1992), similarly mediate and moderate effects of negative experiences with outgroup members. This will improve our understanding of the conditions that enhance or even reverse the ability of intergroup contact to promote more positive intergroup attitudes.

Acknowledgments

The authors would like to thank Stefania Paolini, Sabine Otten, Nina Hansen, Michael Mäs, Roel Bosker, and two anonymous reviewers for their helpful comments on earlier versions of this article. The authors also thank all the students and school administrators who participated in the data collection.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work was supported by the Arnhem Housing Corporations (GOW); the Institute for Integration and Social Efficacy (ISW) at the University of Groningen; and an Innovational Research Incentive Scheme grant by the Netherlands Organisation for Scientific Research (NWO) awarded to the second author (VIDI Grant 452-04-351).

Notes

1. Attitudes toward Turkish and Moroccan people were examined among students from the majority and the other minority groups, simultaneously. We tested for measurement invariance of the attitude measurements across these two groups using multiple group analysis to make sure that the same construct was measured (cf. Kline, 2010). In both models, model fit did not worsen significantly when the factor loadings and intercepts were constrained to equality across both groups, as compared with less restrictive models in which they could vary across groups. The measurement models specifying scalar invariance showed good model fit for attitudes toward Turks, $\chi^2(12) = 10.50$, $p = .57$; comparative fit index (CFI) = 1.000; root mean square error of approximation (RMSEA) = .000; standardized root mean square residual (SRMR) = .021, and Moroccans, $\chi^2(12) = 12.16$, $p = .43$; CFI = 1.000; RMSEA = .010; SRMR = .040.
2. Seven classes were excluded from the sample. Three classes could not participate in at least one wave due to time constraints. In two other classes, more than 50% of the students transferred to different classes after Wave 1, leaving the composition impossible to compare over time. In two more classes, children answered the questionnaire unsupervised. This led to a high rate of nonresponse.
3. We also tested for measurement invariance of the attitude measurements across the majority and minority group students using multiple group analysis. Measurement models specifying scalar invariance showed good model fit for attitudes toward Turks, $\chi^2(219) = 287.28$, $p < .01$; CFI = .984; RMSEA = .036; SRMR = .041, and Moroccans, $\chi^2(219) = 288.77$, $p < .01$; CFI = .976; RMSEA = .044; SRMR = .035, and did not fit the data worse than less restrictive models.

References

Allen, B. P. (1996). African Americans' and European Americans' mutual attributions: Adjective Generation Technique (AGT) stereotyping. *Journal of Applied Social Psychology*, *26*, 884-912.

Barlow, F. K., Paolini, S., Pedersen, A., Hornsey, M. J., Radke, H. R. M., Harwood, J., & Sibley, C. G. (2012). The contact caveat: Negative contact predicts increased prejudice more than positive contact predicts reduced prejudice. *Personality and Social Psychology Bulletin*, *38*, 1629-1643.

Bekhuis, H., Ruiter, S., & Coenders, M. (2011). Xenophobia among youngsters: The effect of inter-ethnic contact. *European Sociological Review*. Advance online publication. doi:10.1093/esr/jcr057

Binder, J., Zagefka, H., Brown, R., Funke, F., Kessler, T., Mummendey, A., & Leyens, J.-P. (2009). Does contact reduce prejudice or does prejudice reduce contact? A longitudinal test of the contact hypothesis among majority and minority groups in three European countries. *Journal of Personality and Social Psychology*, *96*, 843-856.

Blair, I. V. (2002). The malleability of automatic stereotypes and prejudice. *Personality and Social Psychology Review*, *6*, 242-261.

Brown, R., & Hewstone, M. (2005). An integrative theory of intergroup contact. *Advances in Experimental Social Psychology*, *37*, 255-343.

Byrne, D. E. (1971). *The attraction paradigm*. New York, NY: Academic Press.

Byrne, D. E. (1997). An overview (and underview) of research and theory within the attraction paradigm. *Journal of Social and Personal Relationships*, *14*, 417-431.

Chen, F. F., & Kenrick, D. T. (2002). Repulsion or attraction? Group membership and assumed attitude similarity. *Journal of Personality and Social Psychology*, *83*, 111-125.

Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling*, *9*, 233-255.

Cole, D. A., & Maxwell, S. E. (2003). Testing mediational models with longitudinal data: Questions and tips in the use of structural equation modeling. *Journal of Abnormal Psychology*, *112*, 558-577.

Dolderer, M., Mummendey, A., & Rothermund, K. (2009). And yet they move: The impact of direction of deviance on stereotype change. *Personality and Social Psychology Bulletin*, *35*, 1368-1381.

Ensari, N., & Miller, N. (2002). The out-group must not be so bad after all: The effects of disclosure, typicality, and salience on intergroup bias. *Journal of Personality and Social Psychology*, *83*, 313-329.

Feddes, A. R., Noack, P., & Rutland, A. (2009). Direct and extended friendship effects on minority and majority children's interethnic attitudes: A longitudinal study. *Child Development*, *80*, 377-390.

Garcia-Marques, L., & Mackie, D. M. (1999). The impact of stereotype-incongruent information on perceived group variability and stereotype change. *Journal of Personality and Social Psychology*, *77*, 979-990.

Hewstone, M., & Brown, R. (1986). Contact is not enough: An intergroup perspective on the "contact hypothesis." In M. Hewstone & R. Brown (Eds.), *Contact and conflict in intergroup encounters* (pp. 1-44). Oxford, UK: Blackwell.

Hu, L.-T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*, 1-55.

Johnston, L., & Hewstone, M. (1992). Cognitive models of stereotype change: III. Subtyping and the perceived typicality of disconfirming group members. *Journal of Experimental Social Psychology*, *28*, 360-386.

Kline, R. B. (2010). *Principles and practice of structural equation modeling*. New York, NY: Guilford.

Kunda, Z., & Oleson, K. C. (1997). When exceptions prove the rule: How extremity of deviance determines the impact of deviant examples on stereotypes. *Journal of Personality and Social Psychology*, *72*, 965-979.

Little, T. D., Preacher, K. J., Selig, J. P., & Card, N. A. (2007). New developments in latent variable panel analyses of longitudinal data. *International Journal of Behavioral Development*, *31*, 357-365.

Macrae, C. N., & Bodenhausen, G. V. (2000). Social cognition: Thinking categorically about others. *Annual Review of Psychology*, *51*, 93-120.

Muthén, B. O., & Satorra, A. (1995). Complex sample data in structural equation modeling. *Sociological Methodology*, *25*, 267-316.

Muthén, L. K., & Muthén, B. O. (1998-2010). *Mplus user's guide* (5th ed.). Los Angeles, CA: Author.

Oakes, P. J., Haslam, S. A., & Turner, J. C. (1994). *Stereotypes and social reality*. Oxford, UK: Blackwell.

Paolini, S., Crisp, R. J., & McIntyre, K. (2009). Accountability moderates member-to-group generalization: Testing a dual process model of stereotype change. *Journal of Experimental Social Psychology*, *45*, 676-685.

Paolini, S., Harwood, J., & Rubin, M. (2010). Negative intergroup contact makes group memberships salient: Explaining why intergroup conflict endures. *Personality and Social Psychology Bulletin*, *36*, 1723-1738.

Pettigrew, T. F. (1998). Intergroup contact theory. *Annual Review of Psychology*, *49*, 65-85.

Pettigrew, T. F. (2008). Future directions for intergroup contact theory and research. *International Journal of Intercultural Relations*, *32*, 187-199.

Pettigrew, T. F., & Tropp, L. R. (2006). A meta-analytic test of intergroup contact theory. *Journal of Personality and Social Psychology*, *90*, 751-783.

Pettigrew, T. F., & Tropp, L. R. (2011). *When groups meet: The dynamics of intergroup contact*. Philadelphia, PA: Psychology Press.

Ratliff, K. A., & Nosek, B. A. (2011). Negativity and outgroup biases in attitude formation and transfer. *Personality and Social Psychology Bulletin*, *37*, 1692-1703.

Reynolds, K. J., Turner, J. C., & Haslam, S. A. (2000). When are we better than them and they worse than us? A closer look at social discrimination in positive and negative domains. *Journal of Personality and Social Psychology*, *78*, 64-80.

Rosenbaum, M. E. (1986). The repulsion hypothesis: On the nondevelopment of relationships. *Journal of Personality and Social Psychology*, *51*, 1156-1166.

Rutland, A., Brown, R. J., Cameron, L., Ahmavaara, A., Arnold, K., & Samson, J. (2007). Development of the positive-negative asymmetry effect: In-group exclusion norm as a mediator of children's evaluations on negative attributes. *European Journal of Social Psychology*, *37*, 171-190.

Satorra, A. (2000). Scaled and adjusted restricted tests in multi-sample analysis of moment structures. In R. D. H. Heijmans, D. S. G. Pollock, & A. Satorra (Eds.), *Innovations in multivariate statistical analysis. A Festschrift for Heinz Neudecker* (pp. 233-247). London, England: Kluwer.

Schmid, K., Tausch, N., Hewstone, M., Hughes, J., & Cairns, E. (2008). The effects of living in segregated vs. mixed areas in Northern Ireland: A simultaneous analysis of contact and threat effects in the context of micro-level neighbourhoods. *International Journal of Conflict and Violence*, *2*, 56-71.

Selfhout, M., Denissen, J., Branje, S., & Meeus, W. (2009). In the eye of the beholder: Perceived, actual, and peer-rated similarity in personality, communication, and friendship intensity during the acquaintanceship process. *Journal of Personality and Social Psychology*, *96*, 1152-1165.

Snijders, T. A. B., Van de Bunt, G. G., & Steglich, C. E. G. (2010). Introduction to stochastic actor-based models for network dynamics. *Social Networks*, *32*, 44-60.

Stark, T. H., & Flache, A. (2012). The double edge of common interest: Ethnic segregation as an unintended byproduct of opinion homophily. *Sociology of Education*, *85*, 179-199.

Stephan, W. G., Boniecki, K. A., Ybarra, O., Bettencourt, A., Ervin, K. S., Jackson, L. A., & Renfro, C. L. (2002). The role of threats in the racial attitudes of Blacks and Whites. *Personality and Social Psychology Bulletin*, *28*, 1242-1254.

Stephan, W. G., & Stephan, C. W. (1985). Intergroup Anxiety. *Journal of Social Issues*, *41*, 157-175.

Swart, H., Hewstone, M., Christ, O., & Voci, A. (2011). Affective mediators of intergroup contact: A three-wave longitudinal study in South Africa. *Journal of Personality and Social Psychology*, *101*, 1221-1238.

Tenney, E. R., Turkheimer, E., & Oltmanns, T. F. (2009). Being liked is more than having a good personality: The role of matching. *Journal of Research in Personality*, *43*, 579-585.

Turner, J. C. (1985). Social categorization and the self-concept: A social cognitive theory of group behaviour. In E. J. Lawler (Ed.), *Advances in group processes* (Vol. 2, pp. 77-122). Greenwich, CT: JAI.

Veenstra, R., & Steglich, C. (2012). Actor-based model for network and behavior dynamics. In B. Laursen, T. D. Little, & N. A. Card (Eds.), *Handbook of developmental research methods* (pp. 598-618). New York, NY: Guilford.

Verkuyten, M. (2005). *The social psychology of ethnic identity*. Hove, UK: Psychology Press.

Wagner, U., Van Dick, R., Pettigrew, T. F., & Christ, O. (2003). Ethnic prejudice in East and West Germany: The explanatory power of intergroup contact. *Group Processes & Intergroup Relations*, *6*, 22-36.

Weber, R., & Crocker, J. (1983). Cognitive processes in the revision of stereotypic beliefs. *Journal of Personality and Social Psychology*, *45*, 961-977.