A processing fluency explanation of bias against migrants

Mark Rubin [a,*], Stefania Paolini [a], Richard J. Crisp [b]

[a] The University of Newcastle, Australia
[b] Centre for the Study of Group Processes, Department of Psychology, University of Kent, Canterbury Kent, CT2 7NP, UK

A B S T R A C T

This research investigated whether people are biased against migrants partly because they find migrants more difficult to cognitively process than nonmigrants. In Study 1, 181 undergraduate students evaluated migrant and nonmigrant members of two minimal groups and reported the difficulty that they experienced in thinking about each type of target. Participants rated migrants less positively than nonmigrants, and difficulty ratings partially mediated this effect. Study 2 ($N = 191$) replicated these findings and demonstrated similar findings for individuals who had been excluded from minimal groups. This evidence implies that migrant bias can be explained partly in terms of the difficulty that people have in processing information about migrants, and that it is related to migrants' exclusion from their original group.

© 2009 Elsevier Inc. All rights reserved.

A processing fluency explanation of migrant bias

People tend to have relatively negative attitudes towards migrants (e.g., Crawley, 2005; Krings & Olivares, 2007; Pettigrew, 1998; Reif & Melich, 1991; Thalhammer, Zucha, Enzenhofer, Salfinger, & Ogris, 2001). For example, a 2003 survey of around 30,000 people from across Europe revealed that 38% of respondents were opposed to normal civil rights for legally established immigrants (European Monitoring Centre on Racism, 2005, p. 12). In the present research, we investigated an explanation of migrant bias that is based on the ease or difficulty with which people cognitively process migrants. In order to provide a clear test of this processing fluency explanation, we excluded two other potential causes of migrant bias from our analyses: out-group bias and minority group bias.

Out-group and minority group explanations of migrant bias

Migrants are usually members of out-groups. For example, migrants tend to belong to national, cultural, and ethnic groups to which members of their host population do not belong. Furthermore, people tend to be biased against out-group members (for a review, see Hewstone, Rubin, & Willis, 2002). Hence, bias against migrants can be explained as a specific form of a more general bias against out-group members. For example, a bias that is shown by an American against an Algerian who has moved to the United States can be explained as a bias shown by a member of an in-group (Americans) against a member of an out-group (Algerians).

In his review of the migrant bias literature, Pettigrew (2006) reached a similar conclusion, arguing that social psychologists have tended to treat migrant bias as specific instances of intergroup prejudice and discrimination (e.g., Berry, 2001; Esses, Dovidio, Jackson, & Armstrong, 2001; Jackson, Brown, Brown, & Marks, 2001; Piontkowski, Rohmann, & Florack, 2002; Pratto & Lemieux, 2001; Stephan, Ybarra, & Bachman, 1999). As Pettigrew noted, "at this level, anti-immigrant prejudice and discrimination share many features in common with outgroup prejudice and discrimination in general" (pp. 96–97).

Migrants also tend to be members of minority groups, because their national, cultural, and ethnic groups are numerically smaller than those of the host population. Given that people tend to be biased against members of minority groups (e.g., Farley, 1982; Gardikiotis, Martin, & Hewstone, 2004; Lorenzi-Cioldi, 1998; Seyranian, Atuel, & Crano, 2008), migrant bias can also be explained as a specific form of bias against minority group members.

In the present research, we excluded out-group bias and minority group bias from our analyses in order to investigate whether a third, more basic, cognitive process might be at least partly responsible for migrant bias. This third explanation is based on the cognitive fluency with which migrants are processed.

A processing fluency explanation of migrant bias

Processing fluency refers to the ease with which a stimulus can be cognitively processed, and it has been linked to biased evaluations in

---

* Corresponding author. Address: School of Psychology, The University of Newcastle, Callaghan, NSW 2308, Australia. Fax: +61 (0)2 4921 6980.
E-mail address: Mark.Rubin@newcastle.edu.au (M. Rubin).

a number of domains (for reviews, see Reber, Schwarz, & Winkielman, 2004; Winkielman, Schwarz, Fazendeiro, & Reber, 2003). For example, processing fluency has been used to explain people's preference for prototypical stimuli (e.g., Reber et al., 2004; Winkielman, Halberstadt, Fazendeiro, & Catty, 2006). Reber et al. (2004) proposed that this *prototypicality bias* occurs because prototypical stimuli are processed more fluently than less typical stimuli, and the positive affect that is associated with this facilitated processing is attributed to prototypical stimuli. Consistent with this explanation, differences in processing fluency have been found to partially mediate the prototypicality bias (Winkielman et al., 2006).

Processing fluency has also been used to explain biased evaluations of stimuli that are presented in nonpredictive contexts. For example, Whittlesea (1993, Experiment 5) found that participants pronounced words slower and judged them less positively when the words were embedded in a nonpredictive semantic context than when they were embedded in a predictive context. To illustrate, participants pronounced the word *boat* slower and rated it less positively when it was embedded in the nonpredictive sentence "he saved up his money and bought a *boat*", than when it was embedded in the predictive sentence "stormy seas tossed the *boat*". Whittlesea concluded that a nonpredictive semantic context reduces the processing fluency of a target stimulus, and that this reduced processing fluency leads to a less positive evaluation of that stimulus.

In the present research, we hypothesized that one of the reasons that people may be biased against migrants is because, by definition, migrants are located in a nonpredictive social category, and this makes them relatively difficult to process cognitively. For example, an Algerian who has moved to the United States would be more difficult to process than an Algerian who is living in Algeria, because the category "United States" is predictive of American inhabitants, rather than Algerian inhabitants. We predicted that differences in processing fluency may be at least partly responsible for differences in evaluation between migrants and nonmigrants.

Overview of the present research

In the present research, we hypothesized that if processing fluency is at least partly responsible for migrant bias, then (a) migrant bias should occur independent from out-group bias and minority group bias, and (b) processing fluency should mediate the migrant bias effect.

In Study 1, we used minimal groups that contained some of our participants, and we eliminated out-group bias from our analyses by counterbalancing in-group/out-group membership across migrant and nonmigrant targets. In Study 2, we used minimal groups that did not contain any of our participants, so that participants had no basis for categorizing target individuals as either in-group or out-group members. In both studies, we eliminated minority group bias from our analyses by creating two artificial populations of target individuals and arranging for each population to contain the same number of migrants and nonmigrants.

In order to test the processing fluency explanation, we measured the ease or difficulty that participants experienced when they thought about migrant and nonmigrant targets. We predicted that participants would find it more difficult to think about migrants than nonmigrants, and that this difference in processing fluency would mediate an evaluative bias against migrant targets.

Study 1

In Study 1, we asked participants to evaluate migrant and nonmigrant members of minimal groups using a points distribution task and a trait ratings measure. We then asked participants to indicate the ease or difficulty that they had in thinking about the migrant and nonmigrant targets.

Method

Participants

Participants were 184 undergraduate students who were enrolled in nonpsychology courses at an Australian university. Participants received 15 Australian dollars as reimbursement for their time and travel costs. In an examination of their postexperimental comments, we found that three participants (1.63% of the sample) referred to an evaluative bias in relation to the minimal groups under investigation. We excluded these participants from our analyses. The final sample consisted of 181 students (90 men and 91 women) who had a mean age of 23.88 years ($SD = 7.30$).

Procedure

We asked participants to imagine a situation in which 40 people were assembled together in a room and then randomly divided into two equal-sized groups called "Group A" and "Group B". Participants further imagined that, through a process of random selection, 20 people stayed in their original group (i.e., nonmigrant control individuals), and 20 people changed to the other group (i.e., migrant individuals). We counterbalanced group membership ("Group A"/"Group B") across target type (control/migrant) so that control and migrant individuals were each represented by 10 members of Group A and 10 members of Group B.

We asked some participants to imagine that they were one of the people in the groups.[1] Due to the counterbalancing of group membership ("Group A"/"Group B") across target type (control/migrant), half of the control and migrant individuals were in-group members and half were out-group members for these participants. Hence, any potential out-group bias was unconfounded from migrant bias in our analyses.

Participants awarded points to individuals using 12 of Bornstein et al.'s (1983) Multiple Allocation Matrices (for an illustration, see also Gaertner & Insko, 2000). Each matrix allowed participants to simultaneously award points to a control individual and a migrant individual. Each individual was identified by their current group membership (Group A and Group B) and an alphanumeric code that indicated their initial group membership (A1–A30 and B1–B30). Ten matrices were presented as appears on page 331 of Bornstein et al.'s (1983) article. The first two matrices were repeated at positions 11 and 12 in order to complete the set of 12 matrices.

We counterbalanced target type (control vs. migrant) across the top and bottom rows of the matrices. We counterbalanced both initial and current group membership ("Group A"/"Group B") across control and migrant individuals. We presented pairs of target individuals in each of the matrices in a single random order. We counterbalanced the number of matches and mismatches between (a) each pair's original group memberships and (b) each pair's current group memberships across matrices. No code numbers matched in any pair.

---

[1] We asked a third of our participants to imagine that they were one of the people who had been selected to remain in their original group (either "A4 of Group A" or "B4 of Group B") and a third to imagine that they were one of the people who had been selected to move to the other group (either "A4 of Group B" or "B4 of Group A"). The remaining third of participants did not imagine that they were any of the people that they were asked to consider. Hence, a third of participants imagined that they were nonmigrants, a third imagined that they were migrants, and a third did not imagine that they were any of the people. One-way ANOVAs revealed that this experimental manipulation of affiliation did not have any significant effect on either (a) differential fluency, $F(2, 178) = 1.26$, $p = .29$, $\eta_p^2 = .01$, (b) the migrant bias on the trait-ratings measure, $F(2, 178) = .49$, $p = .61$, $\eta_p^2 = .01$, or (c) the migrant bias on the points distribution measure, $F(2, 175) = 2.31$, $p = .10$, $\eta_p^2 = .03$. For the purposes of brevity and clarity, we do not discuss this manipulation any further.

We asked participants to pay close attention to the identity codes and group memberships of the people in the points distribution task in order to be prepared to recall some of this information later on. This instruction was intended to increase the salience of the identity code and group membership information (Abrams, 1985; Oakes, Haslam, & Turner, 1994).

Participants then rated how much they imagined that "people who stayed in their group" and "people who changed to the other group" possessed five positive traits (honest, attractive, friendly, kind, helpful) and five negative traits (deceitful, unintelligent, aggressive, self-centered, rude) using a 7-point Likert-type scale (1 = *not at all,* 7 = *extremely*). Previous research has demonstrated the validity of these traits as positively and negatively valenced traits (Bochner & Van Zyl, 1985; Brown & Dutton, 1991; Crocker, Thompson, McGraw, & Ingerman, 1987). Participants made their ratings for both categories of people on each trait before moving on to the next trait.

Following the trait ratings, participants indicated how easy or difficult they found it to think about each target type (i.e., "people who stayed in their group" and "people who changed to the other group") using a 7-point Likert-type scale (1 = *extremely easy,* 7 = *extremely difficult*).

After completing a series of ancillary measures, participants provided their age and gender. They then completed a series of items that were intended to investigate the potential influence of demand characteristics in our research. First, participants wrote down (a) whether they had heard anything about the research from previous participants, (b) what they thought the research was trying to show and how it was trying to show it, and (c) any suspicions or doubts that they had about the research. Participants then responded to four statements that measured their perceived awareness of the research hypothesis (PARH). The PARH statements were (1) "I knew what the researchers were investigating in this research", (2) "I wasn't sure what the researchers were trying to demonstrate in this research" (reverse scored), (3) "I had a good idea about what the hypotheses were in this research", and (4) "I was unclear about exactly what the researchers were aiming to prove in this research" (reverse scored). Participants responded to each of these statements using a 7-point scale (1 = *strongly disagree,* 7 = *strongly agree*).

Results and discussion

Testing for a bias against migrants
Points distribution measure. Following previous researchers (e.g., Diehl, 1990; Platow, McClintock, & Liebrand, 1990), we computed the mean difference in point allocations to each target type. Specifically, we subtracted the mean number of points that participants awarded to migrant individuals from the mean number of points that they awarded to control individuals. This computation resulted in a single difference score in which positive values represented a bias in favor of control individuals and against migrant individuals.[2] We performed a one sample *t* test on this difference score, using a test value of 0. Consistent with predictions, the difference score was positive (M = .51), indicating that participants awarded more points to control individuals than to migrant individuals. However, this trend was nonsignificant, t(177) = 1.61, p = .11.

Trait ratings measure. We subtracted participants' mean ratings on negative traits from their mean ratings on positive traits for each

target individual in order to create overall trait ratings in which positive values represented positive evaluations and negative values represented negative evaluations. To test for a bias against migrants, we performed a paired samples *t* test on this trait ratings data, using target type (control/migrant) as the independent variable. Consistent with predictions, participants rated migrant individuals (M = .46) significantly less positively than control individuals (M = 1.38), t(180) = 4.76, p < .01, $\eta_p^2 = .11$.

Testing the processing fluency explanation
We used a four-step sequential approach in order to investigate whether a significant difference in processing fluency could explain the significant difference in the evaluation of control and migrant individuals on the trait ratings measure. In the first step, we examined whether processing fluency varied significantly as a function of target type (control/migrant). Null results at this step would immediately rule out processing fluency as an explanation of the migrant bias, making further tests of this hypothesis unnecessary. In the second step, we examined whether there was a significant correlation between differences in processing fluency and differences in the evaluation of control and migrant individuals. Again, a null finding at this stage would contradict the processing fluency explanation and make further tests unnecessary. In the third step, we conducted a test of mediation using Judd, Kenny, and McClelland's (2001) within-subjects mediation technique. This mediation test examined whether the effect of target type on trait ratings could be explained by the effect of target type on processing fluency. If we obtained evidence of significant mediation, then we proceeded to a fourth step in which we conducted a test of reverse mediation. Previous research has shown that people spend more time processing negative than positive stimuli (e.g., Otten & Mummendey, 2000, p. 38). Hence, initially negative evaluations of migrant targets may explain a subsequent reduction in the fluency with which migrants are processed. In order to investigate this possibility, we examined whether trait ratings mediated the effect of target type on processing fluency. This test allowed us to establish whether differences in the evaluation of control and migrant targets explained differences in the fluency with which they are processed.

Step 1: In this first step, we examined whether processing fluency varied significantly as a function of target type (control/migrant). We performed a paired samples *t* test on the difficulty data, using target type as the independent variable. Consistent with the processing fluency explanation, participants found it significantly more difficult to think about migrant individuals (M = 4.03) than control individuals (M = 3.72), t(180) = 2.70, p < .01, $\eta_p^2 = .04$.

Step 2: In the second step, we examined whether target type differences in processing fluency were correlated with target type differences in evaluation. We computed an index of differential evaluation by subtracting trait ratings of migrant individuals from trait ratings of control individuals. We also computed an index of differential fluency by subtracting difficulty ratings of control individuals from difficulty ratings of migrant individuals. Consistent with the processing fluency explanation, we found a significant positive correlation between the evaluation and difficulty difference scores (r = .15, p = .05, N = 180).[3] This correlation indicated that the more difficult participants found it to think about migrant individuals relative to control individuals, the less positively they rated migrant individuals relative to control individuals.

Step 3: In the third step, we carried out a test of mediation using Judd et al.'s (2001) within-subjects technique in order to investigate whether participants' difficulty ratings mediated the effect

---

[2] The particular configuration of values in the Multiple Allocation Matrices resulted in an overall average difference in favor of control individuals (M = .24). In order to compensate for this artefactual bias, we subtracted .24 from the mean difference score. The resulting data contained three outliers (± 3.50 *SD*s from the mean) that we excluded from our analyses.

[3] Based on Mahalanobis Distance, we identified and excluded one multivariate outlier from analyses involving the fluency and trait rating measures ($\chi^2 = 14.33$, p < .001).

of target type on their trait ratings. In the first test, we regressed the control–migrant trait ratings difference onto the migrant–control difficulty difference and z scores of the sum of the control and migrant difficulty ratings. The difficulty difference significantly predicted the trait ratings difference ($\beta = .15$, $p = .05$), indicating a significant mediation effect. The intercept in this regression analysis represents the effect of target type on trait ratings after taking into account the effect of difficulty ratings. The intercept was significant (B = .85, $p < .01$), indicating that processing fluency only partially mediated the bias against migrant individuals.

Step 4: In the fourth step, we conducted a test of reverse mediation in order to investigate whether participants' trait ratings mediated the effect of target type on their difficulty ratings. In this reverse mediation test, we regressed the migrant–control difficulty difference onto the control–migrant trait ratings difference and z scores of the sum of the control and migrant trait ratings. The trait ratings difference significantly predicted the difficulty difference ($\beta = .16$, $p = .04$), and the intercept was nonsignificant (B = .20, $p = .10$). Hence, differences in evaluation fully mediated differences in processing fluency.

In summary, we found that processing fluency partially mediated the bias against migrant individuals. In other words, participants were biased against migrants partly because they found it more difficult to think about them.

Interestingly, the migrant bias also mediated differences in processing fluency. This evidence of reverse mediation suggests a bidirectional relationship between processing fluency and evaluation that has not been reported previously (Halberstadt, 2006; Winkielman et al., 2006). We discuss this bidirectional relationship further in the General Discussion.

Testing the demand characteristics explanation

The participants in our research may have believed that they were expected to exhibit a bias against migrants, and they may have conformed to this expectation in order to be "good" participants and not "ruin" the research (Orne, 1962). We analyzed the data from the Perceived Awareness of the Research Hypothesis (PARH) scale in order to investigate this demand characteristics explanation.

After reverse scoring the two negatively worded items, we found that the PARH items had good internal consistency ($\alpha = .77$). We averaged item scores to produce an index in which the higher the score, the more participants believed that they were aware of the research hypothesis during the research. A one sample t test showed that participants' mean PARH score was significantly lower than the scale's midpoint of 4.00 (M = 3.66, SD = 1.22), $t(180) = 40.23$, $p < .01$. This result indicates that participants significantly disagreed that they were aware of the research hypothesis.

Contrary to the demand characteristics explanation, the PARH index did not correlate significantly with the control–migrant difference scores for either the trait ratings or the difficulty ratings ($ps \geqslant .22$). Hence, we did not find any evidence that our results could be explained as an artefact of our participants' expectations.

Study 2

Study 2 was designed to undertake a more advanced analysis of the minimal group migrant bias that we had observed in Study 1. In addition, Study 2 used a different approach to exclude out-group bias from our analysis of migrant bias. We elaborate on each of these issues below.

Participants in Study 1 may have found it relatively difficult to process migrant individuals either because migrants were (a) excluded from a predictive category that would have facilitated their processing, (b) included in a nonpredictive category that inhibited their processing, or both (a) and (b). This issue is important in the processing fluency literature, because it concerns whether changes in fluency occur as the result of facilitation, inhibition, or both (e.g., see Winkielman et al.'s, 2003, p. 205, discussion of Whittlesea's, 1993, research). There is some evidence that the effects of processing fluency can operate via both facilitation and inhibition (Fazendeiro & Winkielman, 2000, as cited in Winkielman et al., 2003; Winkielman & Fazendeiro, 2000, as cited in Winkielman et al., 2003). This issue is also important from the perspective of the migration literature, because it concerns whether people are biased against migrants because migrants have left their own group, joined a new group, or both. To our knowledge, no previous research on migration has addressed this issue.

In Study 2, we investigated the source of migrant–nonmigrant differences in processing fluency and evaluation by asking participants to make judgments about *excluded* individuals as well as migrants. Like migrants, excluded individuals have left their original, predictive social category. However, unlike migrants, excluded individuals have not proceeded to join a new, nonpredictive category. Instead, they remain excluded from the predefined categories within the category system. A comparison between responses to migrant and excluded individuals allowed us to establish whether differences in processing fluency and evaluation are related to migrants' inclusion in a nonpredictive group, exclusion from a predictive group, or both. If inclusion in a nonpredictive group is solely responsible, then participants should rate migrants as significantly less fluent and positive than either excluded or control individuals (i.e., migrant < [excluded = control]), because only migrants are included in a nonpredictive group. In contrast, if exclusion from a predictive group is solely responsible, then participants should rate both migrant and excluded individuals as significantly and equally less fluent and positive than control individuals (i.e., [migrant = excluded] < control), because both migrants and excluded individuals are excluded from a predictive group. Finally, if both inclusion and exclusion are responsible, then participants should rate migrant individuals as significantly less fluent and positive than excluded individuals, due to the combined effects of inclusion and exclusion, and excluded individuals as significantly less fluent and positive than control individuals, due to the sole effect of exclusion (i.e., migrant < excluded < control).

A further method of distinguishing these inclusion and exclusion models is to examine the correlations between ratings of migrant and excluded individuals: There should only be significant correlations between ratings of migrant and excluded individuals when migrant–nonmigrant differences in fluency and evaluation are based either solely or partly on migrants' exclusion from their original group. No significant correlation should occur if migrant–nonmigrant differences are based solely on migrants' inclusion in a nonpredictive group.

In Study 1, some of the participants were members of the minimal groups that formed the basis for establishing migrant status, and we unconfounded out-group bias from our analysis of migrant bias by counterbalancing in-group/out-group membership across control and migrant target individuals. In Study 2, we used a different approach. We ensured that none of the participants were members of the minimal groups to which they were responding. Hence, participants did not have any basis for categorizing migrant or nonmigrant targets as either in-group members or out-group members.

Method

Participants

Participants were 196 undergraduate students who were enrolled in first-year psychology courses at an Australian university. Participants received course credit in exchange for their participation.

Two participants' research sessions were interrupted by fire alarms and evacuations. Furthermore, in their postexperimental comments, three participants (1.53% of the sample) referred to an evaluative bias in relation to the target groups under investigation. We excluded these five participants from the analyses. The final sample consisted of 191 students (41 men and 150 women) who had a mean age of 22.94 years (*SD* = 7.34).

Procedure

The procedure was similar to that for Study 1. The following key changes were made:

1. No participants were given identity codes or group memberships. Hence, all participants made judgements about the members of two groups to which they did not belong.
2. Participants imagined a situation in which 60, rather than 40, people were assembled together in a room, with 30 people in Group A and 30 people in Group B. Participants imagined that 20 of these 60 people stayed in their original group (control individuals), 20 changed to the other group (migrant individuals), and 20 left their group and did not belong to either group (excluded individuals). We counterbalanced group membership (Group A/Group B) across target type (control/migrant/excluded) so that 10 members of Group A and 10 members of Group B represented each of the three target types.
3. Six of the Bornstein et al. (1983) Multiple Allocation Matrices paired control individuals (e.g., "Person B11 of Group B") with migrant individuals (e.g., "Person B7 of Group A"). The other six matrices paired control individuals with excluded individuals (e.g., "Person A2 of Neither Group").
4. We obtained trait ratings and easy-difficult ratings for "people who left both groups" (i.e., excluded individuals) as well as for "people who stayed in their group" (i.e., control individuals) and "people who changed to the other group" (i.e., migrant individuals).[4]

Results and discussion

Testing for a bias against migrant and excluded individuals
Points distribution measure. We subtracted the mean number of points that participants awarded to migrant individuals from the mean number of points that they awarded to control individuals in the six control–migrant matrices. We also subtracted the mean number of points that participants awarded to excluded individuals from the mean number of points that they awarded to control individuals in the six control–excluded matrices.[5] We performed

---

[4] We included an experimental manipulation of participants' mood in Study 2 via a video that participants watched at the beginning of the research. A one-way ANOVA on a mood manipulation check based on Tamir and Robinson (2004) showed a significant effect of condition (*p* < .01), and least significant difference post hoc tests showed that participants in the positive mood condition had a significantly more positive mood than participants in either the neutral or negative mood conditions (*ps* < .01). We performed a one-way ANOVA on the migrant and excluded biases from the points distribution measure and found no significant effects of mood (*ps* ⩾ .08). We also performed a 3 (mood: positive/neutral/negative) × 3 (target type: control/ migrant/excluded) × 2 (trait valence: positive/negative) mixed-model ANOVA on the trait ratings data with repeated measures of the last factor. There were no significant effects of mood (*ps* ⩾ .29). However, the main effect of target type that is reported in the main text was qualified by a two-way interaction between target type and trait valence, $F(2, 187) = 12.17$, $p < .01$, $\eta_p^2 = .08$. Follow-up analyses revealed that migrant and excluded biases were significant on positive and negative traits (*ps* < .01) apart from in the case of the migrant bias on positive traits, which was only marginally significant (*p* = .07). For the purposes of brevity and clarity, we do not discuss these aspects of the research any further.

[5] In Study 2, the particular configuration of values in the Multiple Allocation Matrices resulted in an overall average difference in favor of control individuals in the six control-migrant matrices (*M* = .05) and against control individuals in the six control-excluded matrices (*M* = −.81). In order to compensate for this artefactual bias, we subtracted .05 from the mean difference score for the control-migrant matrices and added .81 to the mean difference score for the control-excluded matrices.

one sample *t* tests on these control–migrant and control–excluded difference scores, using a test value of 0.

Consistent with predictions, the control–migrant difference score was significantly greater than zero (*M* = 1.98), $t(190) = 3.43$, $p < .01$, indicating that participants awarded significantly more points to control individuals than to migrant individuals. In addition, the control–excluded difference score was significantly greater than zero (*M* = 1.87), $t(190) = 2.43$, $p = .02$, indicating that participants awarded significantly more points to control individuals than to excluded individuals.

Trait ratings measure. As in Study 1, we subtracted mean ratings on negative traits from mean ratings on positive traits for each target individual in order to create overall trait ratings. We performed a repeated measures ANOVA on these overall trait ratings, with target type (control/migrant/excluded) as the independent variable. The assumption of sphericity was violated (Mauchly's *W* = .81, *p* < .01). Using the Hyun-Feldt correction, we found a significant main effect of target type, $F(1.69, 66.43) = 16.68$, $p < .01$, $\eta_p^2 = .08$. Consistent with Study 1, participants rated migrant individuals (*M* = .72) significantly less positively than control individuals (*M* = 1.29), $t(190) = 3.09$, $p < .01$, $\eta_p^2 = .05$. In addition, participants rated excluded individuals (*M* = .21) significantly less positively than control individuals (*M* = 1.29), $t(190) = 4.90$, $p < .01$, $\eta_p^2 = .11$. Finally, participants rated excluded individuals (*M* = .21) significantly less positively than migrant individuals (*M* = .72), $t(190) = 3.42$, $p < .01$, $\eta_p^2 = .06$. This pattern of evidence (i.e., excluded < migrant < control) suggests that people are biased against migrants because of their exclusion from their original group.

Examining the relationship between evaluations of migrant and excluded individuals

We computed correlations between control–migrant differences and control–excluded differences on the points distribution measure. We found a significant large positive correlation ($r = .51$, $p < .01$, $N = 191$).

We also computed correlations between evaluations of migrant and excluded individuals on the trait ratings measure. There was a significant medium-sized positive correlation between evaluations of migrant and excluded individuals ($r = .39$, $p < .01$, $N = 191$). Again, these medium to large sized correlations suggest that people are biased against migrants because of their excluded status.

Testing the processing fluency explanation

We used the same four-step approach that we used in Study 1 to investigate whether significant differences in processing fluency could explain significant differences in the evaluation of control, migrant, and excluded individuals.

Step 1: We performed a repeated measures ANOVA with target type (control/migrant/excluded) as the independent variable and difficulty ratings as the dependent variable. There was a significant violation of the assumption of sphericity (Mauchly's *W* = .89, *p* < .01). Using the Hyun-Feldt correction, we found a significant effect of target type, $F(1.81, 343.78) = 10.71$, $p < .01$, $\eta_p^2 = .05$. Consistent with the processing fluency explanation, participants found it significantly more difficult to think about migrant individuals (*M* = 4.05) than control individuals (*M* = 3.61), $t(190) = -4.36$, $p < .01$, $\eta_p^2 = .09$. In addition, participants found it significantly more difficult to think about excluded individuals (*M* = 4.06) than control individuals (*M* = 3.61), $t(190) = -3.50$, $p < .01$, $\eta_p^2 = .06$. There was no significant difference in participants' difficulty ratings for migrant individuals (*M* = 4.05) and excluded individuals (*M* = 4.06), $t(190) = -.10$, $p = .92$, $\eta_p^2 < .01$. Hence, participants' difficulty ratings followed the same pattern as their trait ratings for

migrant–control and excluded–control comparisons, but not for the migrant–excluded comparison. Consequently, we stopped our investigation of the migrant–excluded comparison at this point.

Step 2: We computed correlations between control–migrant and control–excluded evaluation and difficulty differences on the points distribution and trait ratings measures. On the points distribution measure, there were no significant correlations between evaluation and difficulty differences ($ps \geqslant .23$). However, on the trait ratings measure, there were significant positive correlations for both the control–migrant comparison ($r = .18$, $p = .01$, $N = 190$) and the control–excluded comparison ($r = .14$, $p = .05$, $N = 191$).[6] Hence, processing fluency represented a potential mediator of the bias against migrant and excluded individuals on the trait ratings measure, but not on the points distribution measure.

Step 3: Using the same procedure as in Study 1, we carried out two tests of within-subjects mediation in order to establish whether processing fluency mediated the effects of target type on the trait ratings measure. In the control–migrant test, the difficulty difference significantly predicted the trait ratings difference ($\beta = .17$, $p = .02$), and the intercept was significant ($B = .42$, $p = .03$), indicating that processing fluency partially mediated the bias against migrants. Likewise, in the control–excluded test, the difficulty difference significantly predicted the trait ratings difference ($\beta = .15$, $p = .04$), and the intercept was significant ($B = .97$, $p < .01$), indicating that processing fluency partially mediated the bias against excluded individuals.

Step 4: As in Study 1, we conducted two reverse mediation tests. The trait ratings difference significantly predicted the difficulty difference in both regression analyses (control–migrant: $\beta = .18$, $p = .01$; control–excluded: $\beta = .18$, $p = .01$), and the intercept was significant in both analyses (control–migrant: $B = .36$, $p < .01$; control–excluded: $B = .34$, $p = .01$). These results indicated that differences in trait ratings partially mediated differences in processing fluency.

In summary, we found that processing fluency partially mediated the bias against migrant and excluded individuals on the trait ratings measure, and that this migrant bias partially mediated target type differences in processing fluency.

Testing the demand characteristics explanation

After reverse scoring negatively worded items, we found that the PARH items had acceptable internal consistency ($\alpha = .81$). As in Study 1, a one sample *t* test showed that participants' mean PARH score was significantly lower than the scale's midpoint of 4.00 ($M = 2.91$, $SD = 1.27$), $t(190) = 31.73$, $p < .01$. Again, this result indicates that participants significantly disagreed that they were aware of the research hypotheses. Contrary to the demand characteristics explanation, the PARH index did not correlate significantly with either the control–migrant or control–excluded evaluative differences (points distribution or trait ratings) or the difficulty differences ($ps \geqslant .16$).

General discussion

Migrant bias can occur independent from out-group bias and minority group bias

In the present research, we analyzed migrant bias separately from out-group bias. In addition, we precluded the influence of minority group bias by using artificial populations of individuals ("Group A" and "Group B") that contained the same number of

individuals from each target type (control/migrant). We found that participants exhibited a significant evaluative bias against migrant individuals in both studies. This evidence suggests that migrant bias can occur independent from both out-group bias and minority group bias. In other words, although people may dislike migrants because they are "not one of us" (out-group bias) and because they are "different from most other people" (minority group bias), there appears to be an additional cause for migrant bias that can operate in the absence of either of these other two causes.

Processing fluency can partially explain migrant bias

Cognitive processing fluency partially mediated the migrant bias in both studies. In other words, participants were biased against migrant individuals partly because they found it more difficult to think about them.

We also found evidence of reverse mediation in both studies. Hence, although people may dislike migrants because they are more difficult to process, they may also take longer to process migrants, because migrants are initially regarded in a relatively negative light (e.g., Otten & Mummendey, 2000, p. 38). Future research should investigate the causes of this potential initial bias against minimal group migrants.

Migrant bias is related to migrants' exclusion from their original group

In Study 2, participants rated excluded individuals as significantly less positive than migrants and migrants as significantly less positive than control individuals (i.e., excluded < migrant < control). In addition, participants rated migrant and excluded individuals as significantly and equally less fluent than control individuals (i.e., [migrant = excluded] < control). These patterns of results suggest that the migrant bias that we observed was mainly due to a reduction in the facilitatory processing effect that was provided by migrants' original, predictive social category. There was no evidence of an additional inhibition of processing due to migrants' inclusion in a nonpredictive group. Consistent with this exclusion per se interpretation, there were medium to large positive correlations between evaluations of migrant and excluded individuals on the points distribution and trait rating measures ($rs = .51$ & $.39$ respectively).

Altogether, this evidence suggests a close empirical correspondence between bias against migrants and bias against excluded individuals, and it implies that people may dislike migrants partly because, like excluded individuals, they are excluded from a salient predictive category. This finding implies that strategies that are intended to reduce the processing fluency component of migrant bias should address migrants' exclusion from their original groups more than their inclusion in new groups.

Ruling out demand characteristics

It is possible that our research methodology cued participants to our hypothesis of a bias against migrant individuals, and that participants strategically manipulated their responses in order to validate this hypothesis. However, a number of points mitigate against this demand characteristics explanation.

First, we excluded any participants from our analyses whose postexperimental comments indicated an awareness of the research hypothesis. Second, the fact that only a small percentage of our participants were aware of the hypothesis (1.63% in Study 1, 1.53% in Study 2) suggests that the hypothesis was neither obvious nor widely accessible. Third, data from the Perceived Awareness of the Research Hypothesis (PARH) scale showed that, in both studies, participants significantly disagreed that they were aware of the research hypothesis. Fourth, there were no significant

---

[6] Based on Mahalanobis Distance, we identified and excluded one multivariate outlier from analyses involving the fluency and trait rating measures ($\chi^2 = 16.74$, $p < .001$).

correlations between participants' perceived awareness of the research hypotheses and differential evaluation or fluency in either study. Taken together, this evidence suggests that the biases that we identified represent genuine psychological phenomenon rather than artefacts caused by our participants' expectations.

Measurement issues

In Study 1, we obtained a significant migrant bias on the trait ratings measure but only a nonsignificant trend on the points distribution measure. In Study 2, we obtained significant biases against migrant and excluded individuals on both measures, but processing fluency only mediated the effects on the trait ratings measure. It is possible that the points distribution task provided a less sensitive and reliable measure of minimal migrant bias than the trait ratings measure. It is also possible that participants perceived the points distribution measure to be less relevant than the trait ratings measure to the measure of processing fluency. This second possibility may have occurred because (a) the measure of processing fluency always followed the trait ratings measure in our research survey, and/or (b) the measures of processing fluency and trait ratings both referred to general targets (i.e., "people who stayed in their group"), whereas the points distribution measure referred to individual targets (i.e., "Person B11 of Group B"). Future research should use alternative measures of migrant evaluation and counterbalance their order of presentation in order to confirm the generalizability of the effects that we have reported.

Processing fluency did not fully account for the migrant bias that we observed. In particular, processing fluency did not mediate the migrant bias that was shown on the points distribution measure in Study 2, and it only partially mediated the migrant bias that was shown on the trait ratings measures in Studies 1 and 2. This pattern of results may be due to the particular measure of fluency that we used. We used a two-item measure of processing fluency, and this relatively small number of items may have limited the reliability and sensitivity of our measure. In addition, we used a relatively general measure of processing fluency that asked participants to indicate how easy or difficult they found it to think about the migrant and nonmigrant targets in the research. A more specific measure of processing fluency that directs participants to consider particular aspects of the targets and/or particular steps in the judgment process might produce more reliable and complete mediation effects. Finally, we used a subjective, self-report measure of processing fluency. Future research might complement this measure with a more objective, behavioral measure of processing fluency, such as measures based on participants' reaction time towards migrant and nonmigrant individuals (e.g., Whittlesea, 1993; Winkielman et al., 2006).

The advantages and disadvantages of using minimal group migrants

Our use of relatively abstract and artificial minimal group migrants allowed us to eliminate out-group bias and minority group bias as potential explanations of migrant bias. This elimination would have been difficult to achieve using real world migrants, because real world migrants are usually members of minority out-groups.

One potential disadvantage with using minimal group migrant targets is that they lack ecological validity. However, as Brewer (2000, pp. 12–13) and Mook (1983) explained, low ecological validity does not necessarily threaten the overall validity or usefulness of social psychological research. A high degree of ecological validity would be crucial for research that intended to explain a particular instance of migrant bias as it occurred in the real world. However, the present research studies were not intended to provide this type of explanation. Instead, they were designed to test

a set of predictions that were drawn from a particular theoretical explanation of migrant bias. Consequently, the usefulness of the present research does not depend on the *mundane realism* (Aronson, Wilson, & Brewer, 1998) of our migrant targets but rather on the clarity of the conclusions that it provides about the theory-based predictions in question. In this respect, the present approach is similar to that of Asch (1956), Milgram (1963), Tajfel, Billig, Bundy, and Flament (1971) and others (for a review, see Mook, 1983), in that it represents an artificial laboratory-based demonstration that is designed to advance our theoretical understanding of a phenomenon rather than to accurately represent that phenomenon as it occurs in the real world.

Minimal groups have proven to be an invaluable tool in the analysis of in-group bias (Hornsey, 2008), and we believe that they have a further role to play in the analysis of migrant bias. Nonetheless, an obvious next step in this line of research is to investigate the influence of processing fluency on evaluations of migrants in the real world. In the following section, we consider potential moderators of processing fluency in real world cases of migrant bias.

Moderators of processing fluency in real world cases of migrant bias

Winkielman et al. (2003) and Reber et al. (2004) speculated that processing fluency is likely to be most influential when people do not have access to other bases for forming evaluations. In the present research, we excluded out-group membership and minority group membership as two alternative bases for forming evaluations about migrants. These exclusive conditions provided an optimal setting for demonstrating the effects of processing fluency in the laboratory. However, these conditions would be unusual in real world cases of migrant bias. Consequently, it is possible that our results are limited to the laboratory, and that processing fluency becomes redundant when migrants are evaluated under more natural conditions in which out-group and minority group membership are accessible as alternative bases for forming evaluations. However, several additional proposed moderators of processing fluency should be considered before dismissing its potential influence in real world situations.

Winkielman et al. (2003) and Reber et al. (2004) suggested that people who are under time pressure, have a limited cognitive capacity, and/or who lack motivation may not process higher level semantic aspects of stimuli and instead depend more on "their initial fluency-based gut response" (Reber et al., 2004, p. 378). Hence, we predict that processing fluency will be most likely to make a significant contribution to migrant bias in the real world when people respond to migrants in a quick and cursory manner and without considering their out-group and/or minority group membership. Again, future researchers may wish to examine this moderator hypothesis using real world migrants.

Implications

To our knowledge, the present research is the first research to analyse migrant bias independent from out-group and minority group bias, the first to use minimal groups to investigate migrant bias, the first to make empirical comparisons between migrant and excluded individuals, and the first to investigate a processing fluency explanation of migrant bias. The research findings suggest that bias against migrants can occur independent from out-group bias and minority group bias and can be explained partly by the difficulty that people have in processing individuals who have been excluded from their original, predictive social groups.

It is important to stress that our conclusions do not diminish the importance of studying out-group bias and minority group bias as explanations of migrant bias. However, they do call for future research to consider processing fluency and exclusion from original

groups as additional and potentially important factors in explanations of migrant bias.

Acknowledgements

References

Abrams, D. (1985). Focus of attention in minimal intergroup discrimination. *British Journal of Social Psychology, 24*, 65–74.

Aronson, E., Wilson, T., & Brewer, M. B. (1998). Experimentation in social psychology (4th ed.. In D. Gilbert, S. Fiske, & G. Lindzey (Eds.). *The handbook of social psychology* (Vol. 1, pp. 99–142). Boston: McGraw-Hill.

Asch, S. E. (1956). Studies of independence and conformity: A minority of one against a unanimous majority. *Psychological Monographs: General and Applied, 70*, 1–70.

Berry, J. W. (2001). A psychology of immigration. *Journal of Social Issues, 57*, 615–631.

Bochner, S., & Van Zyl, T. (1985). Desirability-ratings of 110 personality trait words. *Journal of Social Psychology, 125*, 459–465.

Bornstein, G., Crum, L., Wittenbraker, J., Harring, K., Insko, C. A., & Thibaut, J. (1983). On the measurement of social orientations in the minimal group paradigm. *European Journal of Social Psychology, 13*, 321–350.

Brewer, M. (2000). Research design and issues of validity. In H. T. Reis & C. M. Judd (Eds.), *Handbook of research methods in social and personality psychology* (pp. 3–16). New York: Cambridge University Press.

Brown, J. D., & Dutton, K. A. (1991). *The many faces of self-love: Self-esteem and its correlates.* Seattle: University of Washington. Unpublished manuscript.

Crawley, H. (2005). *Evidence on attitudes to asylum and immigration: What we know, don't know and need to know.* Centre on Migration Policy and Society, <http://www.compas.ox.ac.uk/publications/papers/Heaven%20Crawley% 20WP0523.pdf> Retrieved 19.01.08.

Crocker, J., Thompson, L. L., McGraw, K. M., & Ingerman, C. (1987). Downward comparison, prejudice, and evaluations of others: Effects of self-esteem and threat. *Journal of Personality and Social Psychology, 52*, 907–916.

Diehl, M. (1990). The minimal group paradigm: Theoretical explanations and empirical findings. *European Review of Social Psychology, 1*, 63–292.

Esses, V. M., Dovidio, J. F., Jackson, L. M., & Armstrong, T. L. (2001). The immigration dilemma: The role of perceived group competition, ethnic prejudice, and national identity. *Journal of Social Issues, 57*, 389–412.

European Monitoring Centre on Racism and Xenophobia. (2005). *Majorities' attitudes towards migrants and minorities: Key findings from the Eurobarometer and the European Social Survey.* European Union Agency for Fundamental Rights, <http://fra.europa.eu/fra/material/pub/eurobarometer/EB2005/EB2005-summary.pdf> Retrieved 19.01.08.

Farley, J. (1982). *Majority minority relations.* Englewood Cliffs, NJ: Prentice Hall.

Gardikiotis, A., Martin, R., & Hewstone, M. (2004). The representation of majorities and minorities in the British press: A content analytic approach. *European Journal of Social Psychology, 34*, 637–646.

Gaertner, L., & Insko, C. A. (2000). Intergroup discrimination in the minimal group paradigm: Categorization, reciprocation, or fear? *Journal of Personality and Social Psychology, 79*, 77–94.

Halberstadt, J. (2006). The generality and ultimate origins of the attractiveness of prototypes. *Personality and Social Psychology Review, 10*, 166–183.

Hewstone, M., Rubin, M., & Willis, H. (2002). Intergroup bias. *Annual Review of Psychology, 53*, 575–604.

Hornsey, M. J. (2008). Social identity theory and self-categorization theory: A historical review. *Social and Personality Psychology Compass, 2*, 204–222.

Jackson, J. S., Brown, K. T., Brown, T. N., & Marks, B. (2001). Contemporary immigration policy orientations among dominant-group members in Western Europe. *Journal of Social Issues, 57*, 431–456.

Judd, C. M., Kenny, D. A., & McClelland, G. H. (2001). Estimating and testing mediation and moderation in within-subject designs. *Psychological Methods, 6*, 115–134.

Krings, F., & Olivares, J. (2007). At the doorstep to employment: Discrimination against immigrants as a function of applicant ethnicity, job type, and raters' prejudice. *International Journal of Psychology, 42*, 406–417.

Lorenzi-Cioldi, F. (1998). Group status and perceptions of homogeneity. *European Review of Social Psychology, 9*, 31–75.

Milgram, S. (1963). Behavioral study of obedience. *Journal of Abnormal and Social Psychology, 67*, 371–378.

Mook, D. G. (1983). In defense of external invalidity. *American Psychologist, 38*, 379–387.

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

Orne, M. (1962). On the social psychology of the psychology experiment: With particular reference to demand characteristics and their implications. *American Psychologist, 17*, 776–783.

Otten, S., & Mummendey, A. (2000). Valence-dependent probability of ingroup favouritism between minimal groups: An integrative view on the positive–negative asymmetry in social discrimination. In D. Capozza & R. Brown (Eds.), *Social identity processes: Trends in theory and research* (pp. 33–48). London: Sage.

Pettigrew, T. F. (1998). Reactions toward the new minorities of Western Europe. *Annual Review of Sociology, 24*, 77–103.

Pettigrew, T. F. (2006). A two-level approach to anti-immigrant prejudice and discrimination. In R. Mahalingam (Ed.), *Cultural psychology of immigrants* (pp. 95–112). Mahwah, NJ: Lawrence Erlbaum.

Piontkowski, U., Rohmann, A., & Florack, A. (2002). Concordance of acculturation attitudes and perceived threat. *Group Processes and Intergroup Relations, 5*, 221–232.

Platow, M. J., McClintock, C. G., & Liebrand, W. B. G. (1990). Predicting intergroup fairness and ingroup bias in the minimal group paradigm. *European Journal of Social Psychology, 20*, 221–239.

Pratto, F., & Lemieux, A. F. (2001). The psychological ambiguity of immigration and its implications for promoting immigration policy. *Journal of Social Issues, 57*, 413–430.

Reber, R., Schwarz, N., & Winkielman, P. (2004). Processing fluency and aesthetic pleasure: Is beauty in the perceiver's processing experience? *Personality and Social Psychology Review, 8*, 364–382.

Reif, K., & Melich, A. (1991). *Euro-barometer 30: Immigrants and out-groups in Western Europe, October–November 1988.* Ann Arbor, MI: Inter-University Consortium for Political and Social Research.

Rubin, M., Paolini, S., & Crisp, R. (2007). An evaluative bias against migrant stimuli. In R. Crisp, S. Paolini, & M. Rubin (Convenors), *New perspectives on category-based discrimination.* Symposium conducted at the Annual Meeting of the Society of Experimental Social Psychology, Chicago, USA.

Rubin, M., Paolini, S., & Crisp, R. (2008). Why don't people like migrants? In M. Rubin (Convenor), *Understanding prejudice against migrants and identifying factors that promote migrant adaptation.* Symposium conducted at the 15th General Meeting of the European Association of Experimental Social Psychology, Opatija, Croatia.

Rubin, M., Paolini, S., & Crisp, R.J. (2009). *A processing fluency explanation of bias against migrants.* Paper presented at the 39th Annual Meeting of the Society for Australasian Social Psychologists, Melbourne, Australia.

Seyranian, V., Atuel, H., & Crano, W. D. (2008). Dimensions of majority and minority groups. *Group Processes Intergroup Relations, 11*, 21–37.

Stephan, W. G., Ybarra, O., & Bachman, G. (1999). Prejudice toward immigrants. *Journal of Applied Social Psychology, 29*, 2221–2237.

Tamir, M., & Robinson, M. D. (2004). Knowing good from bad: The paradox of neuroticism, negative affect, and evaluative processing. *Journal of Personality and Social Psychology, 87*, 913–925.

Tajfel, H., Billig, M. G., Bundy, R. P., & Flament, C. (1971). Social categorization and intergroup behaviour. *European Journal of Social Psychology, 1*, 149–178.

Thalhammer, E., Zucha, V., Enzenhofer, E., Salfinger, B., & Ogris, G. (2001). *Attitudes towards minority groups in the European Union: A special analysis of the Eurobarometer 2000 opinion poll on behalf of the European Monitoring Centre on Racism and Xenophobia.* European Commission, <http://ec.europa.eu/public_opinion/archives/ebs/ebs_138_tech.pdf> Retrieved 19.01.09.

Whittlesea, B. W. A. (1993). Illusions of familiarity. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 19*, 1235–1253.

Winkielman, P., Halberstadt, J., Fazendeiro, T., & Catty, S. (2006). Prototypes are attractive because they are easy on the mind. *Psychological Science, 17*, 799–806.

Winkielman, P., Schwarz, N., Fazendeiro, T. A., & Reber, R. (2003). The hedonic marking of processing fluency: Implications for evaluative judgement. In J. Musch & K. C. Klauer (Eds.), *The psychology of evaluation: Affective processes in cognition and emotion* (pp. 189–217). Mahwah, NJ: Lawrence Erlbaum.