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Perceived to feel less: Intensity bias in interethnic emotion perception^{☆, ☆, ☆}

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ABSTRACT

The quality of interactions between individuals from different ethnic groups partly depends on how emotions of individual ethnic group members are interpreted. Previous research has found that facial expressions of emotions of a different ethnic group are recognized less accurately than facial expressions of members of the same ethnic group. The current research focuses on a bias in intensity perception and tests the hypothesis that individuals perceive facial expressions of emotions in ethnic outgroup members as less intense than those of ingroup members' expressions. In addition to nine previously conducted and reported studies (focussing only on embarrassment, Kommattam, Jonas, & Fischer, 2017, Studies 1–9), we conducted a series of three additional studies including white Dutch, U.S., and U.K. participants (N total = 3201) judging the intensity of nine different emotions displayed by different ethnic group members. A random effects model meta-analysis shows that individuals perceive less intense emotions in ethnic outgroup members than in ethnic ingroup members ($d = 0.33$ [0.08–0.59], $r = 0.16$). This intensity bias in interethnic emotion perception points to a systematic downplaying of the intensity of outgroup emotions and suggests an empathy gap towards members from other ethnic groups.

1. Introduction

The quality of interactions between individuals partly depends on how they interpret each other's facial expressions. The perception of others' emotions can be influenced by characteristics of the person expressing an emotion (Hess, Adams, & Kleck, 2009), the visibility and intensity of emotional cues (Fischer, Gillebaart, Rotteveel, Becker, & Vliek, 2012), or group membership (Iyer & Leach, 2009; Tam et al., 2008; Zebel, Doosje, & Spears, 2009). A meta-analysis by Elfenbein and Ambady (2002) on facial emotion recognition within and across cultures has shown that individuals are better at recognizing emotions in other group members' facial expressions if they belong to the same ethnic, national or regional group (Elfenbein, 2013; Elfenbein & Ambady, 2002). This ingroup advantage was larger when cultural groups were less exposed to each other. In another line of research, Hugenberg and colleagues (Hugenberg & Bodenhausen, 2003; Hugenberg, Young, Bernstein, & Sacco, 2010) have shown that White Americans are faster to categorize black rather than white faces as angry, referred to as the Other Race Effect.

Together, these different research lines clearly suggest that people

are more likely to incorrectly categorize facial emotion displays by other ethnic group members. In daily interactions, however, emotion perception does not merely entail correctly or incorrectly recognizing an emotion, but also the interpretation of the strength of another's feeling. The strength or intensity of emotions is important, because we are less inclined to act upon another's weak emotions than upon strong emotions, which may be more impactful for one's relation with the other person. To date, less attention has been given to this aspect of emotion perception, and hence the focus of the current research is on the perceived intensity of facial expressions in intercultural settings.

Previous research has found that individuals empathize less with others if they belong to a different ethnic group (Forgiarini, Gallucci, & Maravita, 2011; Gutsell & Inzlicht, 2010; Gutsell & Inzlicht, 2012; Trawalter, Hoffman, & Waytz, 2012). We therefore assume that differences in perceived emotion intensity may be associated with this reduced empathy for ethnic outgroup members. The present research tests the hypothesis that individuals perceive the facial expressions of ethnic outgroup members as *less* intense than those of ingroup members, which we will refer to as 'intensity bias'. We report a meta-analysis of 12 studies in which we investigated this hypothesis, testing white

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^{**} Part of the data included this paper has also been reported at the level of single experiments in: Kommattam, P., Jonas, K. J., & Fischer, A. H. (2017). We are sorry, they don't care: Misinterpretation of facial embarrassment displays in Arab–White intergroup contexts. *Emotion*, 17(4), 658. This research was supported by the Dutch Organization for Scientific Research (NWO) under Grant number 017.009.046. Kai J. Jonas is now at Maastricht University, the Netherlands.

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participants perceiving emotion expressions of ethnic ingroup and outgroup facial expressions.

1.1. Reduced empathy with ethnic outgroup members

The interpretation of the intensity of other's emotions may reflect the extent to which one empathizes with others. Recent research has found that people show more empathy with ethnic ingroup members than with outgroup members at both an explicit and implicit level. This so-called "empathy gap" is mirrored in neurological, physiological, and attitudinal measures of empathy (Forgiarini et al., 2011; Gutsell & Inzlicht, 2010; Gutsell & Inzlicht, 2012; Trawalter et al., 2012). Research on the empathy gap suggests that there is less mental simulation of behaviour (Gutsell & Inzlicht, 2010) and facial expressions of emotions (Gutsell & Inzlicht, 2012) when individuals observe ethnic outgroup members compared to ingroup members. Specifically, participants displayed mu suppression (suppression of EEG oscillations at scalp locations over primary motor cortex in the 8–13 Hz mu frequency), suggesting an increase in motor-cortex activity compared to a baseline measure, when they observed not only themselves but also ethnic ingroup members performing an action. In contrast, when they observed ethnic outgroup members performing the same actions (Gutsell & Inzlicht, 2010), this suppression was not found. Similarly, participants showed more alpha asymmetry, suggesting withdrawal and negative emotionality, when they observed sad ethnic ingroup members compared to sad ethnic outgroup members. This effect was enhanced for participants high in prejudice, meaning that the more prejudiced they were, the less they showed alpha asymmetry when observing outgroup members (Gutsell & Inzlicht, 2012). Decreased mental simulation of behaviour and emotions of ethnic outgroup members points to an ingroup bias in empathy, that is, reduced empathy with ethnic outgroup members.

In line with this research, both correlational and experimental studies support the idea that ethnic outgroup members are a priori presumed to feel less pain than ingroup members (Trawalter et al., 2012). A further illustration of the empathy gap comes from a study showing that observing ethnic outgroup compared to ingroup members in pain results in less physical arousal as measured by skin-conductance (Forgiarini et al., 2011). Taken together, research on the empathy gap has demonstrated that people overall show less brain activity, physiological arousal and facial mimicry in reaction to ethnic outgroup members compared to ethnic ingroup members' emotions and behaviour. Inferring less intense feelings from the facial displays of ethnic outgroup members may be another indication of an empathy gap.

1.2. Dehumanization and infra-humanization of outgroup members

Research on dehumanization also suggests that individuals may perceive emotions of ethnic outgroups as less intense. Harris and Fiske (2006) define dehumanization as a failure to consider the inner mind of others, especially if those others belong to groups that are perceived to be low in warmth and competence. In a similar vein, research on infra-humanization suggests that outgroups are perceived as less human than ingroups, leading to the attribution of less 'uniquely human' emotions to outgroup members compared to ingroup members (Haslam, Bain, Douge, Lee, & Bastian, 2005; Haslam & Loughnan, 2014; Leyens et al., 2000; Leyens et al., 2003; Leyens et al., 2001; Vaes, Leyens, Paladino, & Miranda, 2012). Further, infra-humanization has also been shown to be a predictor of intergroup empathy (Čehajić, Brown, & Gonzalez, 2009). Whereas reminders of past wrongdoings of the ingroup generated ingroup responsibility and empathy for the outgroup, they decreased attribution of uniquely human (i.e., secondary) emotions to the outgroup, resulting in decreased empathy towards the outgroup.

Similarly, other intergroup research has demonstrated that infra-humanization can undermine reconciliation between different groups (Wohl, Hornsey, & Bennett, 2012), because reduced attribution of

uniquely human emotions to the outgroup resulted in less acceptance of outgroup apologies. Furthermore, awareness of the ingroup's mass killing can increase infra-humanization of the victims (Castano & Giner-Sorolla, 2006). Infra-humanization thus serves as a mechanism to maintain psychological equanimity: seeing others as less human in order to feel better about one self and one's ingroup. Overall, research on infra-humanization shows the tendency to see others as less human and to attribute less uniquely human emotions to outgroups.

This same tendency may be observed in how we interpret the intensity of facial expressions in outgroup members. However, research on infra-humanization has commonly uses emotion words rather than facial expressions, and thus we do not know whether the attribution of different emotions to ingroups and outgroups may merely reflect a linguistic bias. If facial expressions of ethnic outgroups would be interpreted as less intense, this could be another indication of the infra-humanization of ethnic outgroups.

1.3. Bias in emotion recognition

There is abundant research on the question of whether facial expressions of emotions can be recognized across cultures above chance levels (Ekman, 1992; Ekman & Friesen, 1971; Elfenbein & Ambady, 2002) or faster (Craig & Lipp, 2018). In this type of research, participants are usually asked to pick an emotion label that matches displayed emotions in faces of different ethnic or cultural group members best (i.e., emotion categorization). In their influential meta-analysis, Elfenbein and Ambady (2002) have found that people are better at categorizing emotions if the other is a member of their own ethnic, national, and regional group compared to ethnic, national, and regional outgroup members. They referred to this phenomenon as the 'ingroup advantage'. Our own research has further suggested that emotional displays of ethnic outgroup members can be falsely perceived as another emotion. We showed that displays of embarrassment were perceived as embarrassment in ethnic ingroup members, but as disinterest in ethnic outgroup members (Kommattam, Jonas, & Fischer, 2017). This was considered particularly relevant in the case of intergroup embarrassment, because this interpretation of outgroup emotions may undermine reconciliation of different group members and increasing intergroup tension.

Currently, there are two explanations for the ingroup advantage. One is that each group has their own emotional dialects (Elfenbein, 2013), that is, subtle differences in non-verbal expression across cultural groups, similar to linguistic dialects. Due to increased exposure to a particular culture, individuals would become better at categorizing emotions of their own cultural group compared to other groups (see also Elfenbein & Ambady, 2003; Elfenbein, Beaupré, Lévesque, & Hess, 2007). A second explanation, which is relevant for our current studies, focuses on the observer, suggesting that observers may be less motivated to fully process outgroup members' facial expressions. Research by Thibault, Bourgeois, and Hess (2006) for instance shows that identification with a social group (with the same ethnic background) resulted in better categorization of emotions in ingroup members compared to outgroup members. The authors interpret this finding as an increased effort to decode emotions of individuals they identify with. Accordingly, people should be less motivated to interpret emotions of individuals they less identify with, such as ethnic outgroup members. Such decreased motivation is also associated with less configural processing of outgroup faces, and results in less accuracy in the categorization of emotions, even in a minimal intergroup paradigm (Young & Hugenberg, 2010). Hugenberg et al. (2010) have further shown that individuals with an implicit race bias are more likely to see the stereotypical emotions in outgroup faces, such as anger in black faces (the Other Race Effect or Cross Race Effect). Taken together, these studies point out that individuals are more likely to make mistakes in identifying emotions in outgroup members' faces. Reduced motivation to get to know emotions of outgroup members could also underlie the

intensity bias that we are investigating in the current paper. In addition to making mistakes in correctly identifying emotions, we may also be biased in interpreting the strength of feelings of ethnic outgroup members when watching their face.

1.4. Intensity bias in perceiving emotions in ethnic outgroups

The different research lines reviewed above suggest that we are less motivated to attend to ethnic outgroup members, to feel empathy with them, and to even see them as less human compared to members of our own group, which may all result in the perception of less intense emotions in intercultural settings. The question of whether observers differ in perceiving *how much* another person feels rather than *what* another person feels, has received limited attention to date. Classic emotion research (Ekman et al., 1987) has provided some initial evidence for the idea that people attribute less intense emotions to ethnic outgroup members, showing that individuals judged facial expressions of surprise, fear, and happiness as less intense in ethnic outgroup members. Based on these findings the authors speculate that individuals may have the tendency to underestimate the intensity of outgroup emotions. In the current studies, we will extend this research to include more emotions, various intergroup contexts, and different, more standardized stimuli. We focus on *ethnic* outgroups, because previous research has found a larger bias when there is less exposure and less physical proximity (Elfenbein & Ambady, 2002). Perceiving less intense emotions in ethnic others may justify distancing oneself from or even mistreatment of ethnic outgroup members, thereby helping to protect a positive self- and group image.

We test the general hypothesis that emotions are perceived as less intense for ethnic outgroup members. We further expected that this intensity bias has boundary conditions. First, the amount of emotional information may affect intensity perception. The more information on the emotional context (i.e. knowing the reason for an emotion), the less likely the intensity bias will occur. In such cases, only the available information on the ethnic intergroup context may bias the interpretation of the strength of one's feelings. Second, some of the emotions we included are more difficult to recognize, such as embarrassment, contempt and pride (see e.g., Hawk, van Kleef, Fischer, & van der Schalk, 2009). We assume that emotions that are least reliably recognized are also more likely to fall prey to the intensity bias. Alternatively, previous studies on infra-humanization research suggest that 'secondary' emotions, i.e. contempt, pride, and embarrassment, would also be more prone to the intensity bias than primary emotions, such as anger, fear or happiness. In other words, on the basis of two different explanations, we may expect that the intensity of contempt, pride and embarrassment maybe interpreted in a different way in an interethnic context. Both boundary conditions reflect the room for interpretation when observing emotions in others' faces: either the lack of other emotional information or the ambiguity of the face itself may make an intensity bias more

likely.

2. Current research

In addition to nine previously reported studies (Kommattam et al., 2017), we conducted a series of three additional studies on the intensity bias in interethnic emotion perception, together testing the hypothesis that individuals will perceive less intense emotions in ethnic outgroup members than in ethnic ingroup members. Whereas the previously reported data focused on the misinterpretation of one individual emotion (embarrassment), the current analyses focused on the aggregated perceived intensity of nine different emotional displays (anger, disgust, fear, happiness, sadness, surprise, contempt, embarrassment, and pride). Accordingly, the overlap between the previously reported data and the currently reported data is minimal, as we used different dependent variables. We state that we disclose all measures, manipulations, and exclusions; all other relevant materials can be found in the Supplemental Materials. Inclusion criteria for the meta-analysis were as follows. All studies used a) facial expressions of emotions as stimuli, b) a manipulation of ethnic ingroup or outgroup by showing facial expressions of Western individuals (models of Dutch or European-American descent) versus Arab individuals (models of Moroccan or Turkish descent), and c) an intergroup manipulation prior to the main task in order to make the interethnic context salient, that is, to make sure that the faces of outgroup members were indeed categorized as belonging to an ethnic outgroup. The studies differed in the exact nature of the stimuli and information, the dependent measures, the assigned ingroup and outgroup labels. This was done in order to test the generalizability of the findings, and to examine the boundary conditions, that is, whether more room for interpretation would lead to a greater bias.

Null Hypothesis Significance Testing (NHST) is less suitable for testing the probability of our hypotheses, because it only suggests that the likelihood of finding an effect by chance is less than 5%. We therefore performed a meta-analysis (Field & Gillett, 2010; Rosenthal, 1995) to test the existence and to estimate the effect size of the intensity bias in interethnic emotion perception.

2.1. Method

Studies 1–9 were part of previously reported data on an individual study paper (Kommattam et al., 2017, Studies 1–9), whereas additional studies 1 (Study 10), 2 (Study 11), and 3 (Study 12) were conducted to complete the meta-analytical approach. Whereas the previously reported findings solely focused on one single emotional display (embarrassment), the current paper focused on the aggregated average of all emotional displays. All 12 studies reported in the meta-analysis shared a 2 (group: ingroup (IG) versus outgroup (OG)) between subjects design (see Table 1 for a full overview of designs per study). In addition to this factor, we included various other factors in the different studies,

Table 1
Full overview of designs, N per study, and cell.

Study	Design	N
Study 1	2 (BS, group: IG/OG) × 2 (BS, context: emotional/neutral) × 2 (BS, face: face/name)	187 (IG = 99, OG = 88)
Study 2	2 (BS, group: IG/OG) × 2 (BS, context: emotional/neutral) × 2 (BS, intensity: high/low)	175 (IG = 92, OG = 83)
Study 3	2 (BS, group: IG/OG) × 2 (BS, context: emotional/neutral) × 2 (BS, gender: female/male)	229 (IG = 114, OG = 115)
Study 4	2 (BS, group: IG/OG) × 2 (BS, gender: female/male)	107 (IG = 56, OG = 51)
Study 5	2 (BS, group: IG/OG) × 2 (WS, gender: female/male)	59 (IG = 30, OG = 29)
Study 6	2 (BS, group: IG/OG) × 2 (WS, gender: female/male)	60 (IG = 28, OG = 32)
Study 7	2 (BS, group: IG/OG) × 2 (BS, gender: female/male)	109 (IG = 52, OG = 57)
Study 8	2 (BS, group: IG/OG) × 2 (BS, intensity: high/low)	193 (IG = 99, OG = 94)
Study 09	2 (BS, group: IG/OG) × 2 (BS, gender: female/male) × 2 (BS, context: emo/neu)	409 (IG = 207, OG = 202)
Study 10	2 (BS, group: IG/OG) × 2 (BS, nationality: US/Arab) × 2 (BS, set: 1/2)	502 (IG = 257, OG = 245)
Study 11	2 (BS, group: IG/OG) × 2 (BS, nationality: UK/Arab) × 2 (BS, set: 1/2)	442 (IG = 224, OG = 218)
Study 12	2 (BS, group: IG/OG) × 2 (BS, gender: female/male) × 3 (BS, intensity: high/medium/low)	729 (IG = 365, OG = 364)

Note. BS = between-subjects; WS = within-subjects; IG/OG = ingroup/outgroup.

in order to test boundary conditions and generalizability. First, we manipulated *context* (Kommattam et al., 2017, Study 1–4) by presenting either an emotional context ('this person accidentally burps out loud in an expensive restaurant') or a neutral context ('he was standing next to his car') along with the facial expressions. In Study 4 (Kommattam et al., 2017, Study 4) we aimed to replicate the findings from Study 1–3 (Kommattam et al., 2017, Study 1–3), while assessing time spent looking at the context, the facial expression, and the interpretation of the perceiver separately. Second, we manipulated *intensity* of the facial expression (Kommattam et al., 2017, Study 2 and 8) by presenting high intensity or low intensity static facial displays of emotion. In order to test the generalizability of the findings, we added gender as a between-subject factor, with the inclusion of female and male models for both ethnic in- and outgroups (Kommattam et al., 2017, Study 3, 7, and 9). Further, in Study 5 we introduced a new stimulus set (Stimulus set 2) (Kommattam et al., 2017, Study 5), using the same models, but different facial expressions per model. Study 6 (Kommattam et al., 2017, Study 6) is a replication of Study 5. In Study 10 we merged stimulus set 1 and 2. Study 11 is a replication of Study 10 with a different ethnic ingroup (white British vs. white US Americans). In Study 12 we aimed to replicate our findings with a third stimulus set, containing dynamic stimuli at three levels of intensity (low, medium, and high; ADFES BIV, Wingenbach, Ashwin, & Brosnan, 2016).

All studies shared the same between-subject manipulation of group. We presented white European models as ingroup and Arab (Turkish and Moroccan) models as outgroup (see section 'Stimuli' for more information, Supplemental Material 1 contains illustration of sample stimuli per emotion, all sample stimuli can be obtained from the last author). All studies were conducted in the period of January 2013 to December 2016.

2.1.1. Participants

All studies were conducted online with either European-American participants on Amazon's Mechanical Turk (www.mturk.com) (Kommattam et al., 2017, Study 2, 3, 4, 5, 6, 8, 9, and Study 10; 54.17% of the total number of participants) or white Dutch undergraduate students from the Netherlands (Kommattam et al., 2017, Study 1 and 7; 9.25% of the total number of participants). The only two exceptions were Study 11, which was conducted among a white British sample via Crowdfunder (www.crowdfunder.com) (13.81% of the total number of participants) and Study 12, which was conducted via prolific (www.prolific.ac) (22.77% of the total number of participants). All participants were white European, European-American, or British. After removal of participants with other ethnic backgrounds than white, European descended ($N = 665$), a total of 3201 participants across 12 studies remained (see Table 1 for a distribution of participants per study and cell).

2.1.2. Procedure

Participants first filled in a number of socio-demographic questions. The subsequent elements of the studies were presented as independent studies. In order to create the necessary intergroup context in all studies, participants completed a ranking task, in which they had to sort a number of ethnic groups that are represented in the Netherlands/the United States/the United Kingdom according to size of their population (Waldzus, Mummendey, Wenzel, & Weber, 2003, Exp. 2). Subsequently, participants were told that they were about to partake in the actual study, in which they would have to evaluate various everyday situations. Here, participants saw emotional faces, either displayed by ingroup members or outgroup members. After completion of the study, participants were thanked and debriefed. The ethical committee of the Faculty of Social and Behavioural Sciences of the University of Amsterdam approved all studies as meeting the requirements of standard survey research. EC codes in italic print refer to previously reported studies from Kommattam et al. (2017). (2013-SP-2642; 2013-SP-2988; 2013-SP-3081; 2013-SP-3104; 2013-SP-3110; 2013-SP-3148; 2014-SP-

3554; 2014-SP-3722; 2014-SP-3723; 2014-SP-3779; 2014-SP-3780, 2016-SP-7051).

2.1.3. Stimuli

The stimuli were taken from the Amsterdam Dynamic Facial Expression Set (ADFES, Van der Schalk, Hawk, Fischer, & Doosje, 2011). The ADFES is a stimulus set with dynamic facial expressions of emotions of ethnic in- and outgroup members for the Dutch context, which also applies to a European-American and British context. The models had either a Western (Dutch or American) or a Moroccan or Turkish background. Moroccan and Turkish people form the largest ethnic minorities in the Netherlands and are often referred to as "Arabs". For the purpose of this research we made still images of the videos. In all studies, the actual ethnic group was used to manipulate ethnic ingroup versus outgroup (e.g., ethnic European versus ethnic Arab models). Low intensity stimuli were taken from the onset of an emotion, which was determined for each model and emotion individually, due to individual differences in speed of expression and the nature of the emotion. In Study 12 we made use of a third stimulus set, the ADFES BIV (Wingenbach et al., 2016), which is a newly developed stimulus set that provides dynamic stimuli at three different levels of intensity (low, medium, and high). The most important advantage of this set is that it provides standardized versions of different levels of intensity, which was achieved by extracting consecutive frame sequences that all start with a neutral expression. Each video contained 26 frames with a frame rate of 25/s, resulting in videos that had a 1040 ms length. All stimuli were created by Tanja Wingenbach and were based on our own stimulus set, used in the majority of our studies (ADFES). Nine different emotion displays were included: Anger, disgust, fear, happiness, sadness, surprise, contempt, embarrassment, and pride.

2.1.4. Materials and measures

After each picture, participants rated the intensity of facial expressions of emotions on four emotion labels (e.g., *happy*, *content*, *proud*, *superior*) ranging on a scale from 0 (*absolutely not*) to 100 (*very much*). The emotion labels differed for each emotion stimulus and consisted of the emotions that were considered most relevant for the emotion display at hand. Unlike all other studies, Study 1 (Kommattam et al., 2017, Study 1) made use of a scale from 0 (*absolutely not*) to 10 (*very much*). The meta-analysis was therefore performed with standardized effect sizes.

2.2. Results

2.2.1. Analytic strategy

We performed a random effects model (REM) meta-analysis for two reasons. At a theoretical level our goal was to assess the effect size of intensity differences in interethnic emotion perception for the population (Field & Gillett, 2010). At an empirical level, a REM allowed us to deal with the heterogeneity of effect sizes unlike the commonly used fixed – effect model. The results of the meta-analysis are reported as Cohen's d , followed by 95% confidence intervals. Analyses were performed using the metafor package (version 1.9–3, Viechtbauer, 2010) for R (Version 3.1.0; 2014).

2.2.2. Basic meta-analysis

An overview of all effect sizes and confidence intervals can be found in the forest plot in Fig. 1. The plot represents the standardized mean differences in interethnic intensity differences, followed by 95% confidence intervals. Positive values indicate effect sizes in the predicted direction, that is, people perceiving more intense emotions in ingroup members than in outgroup members. The size of the dots is in proportion to the effect size of the individual study. Table 2 contains all F values, p values and degrees of freedom per study (Fig. 2).

The meta-analysis revealed an overall effect of $d = 0.33$

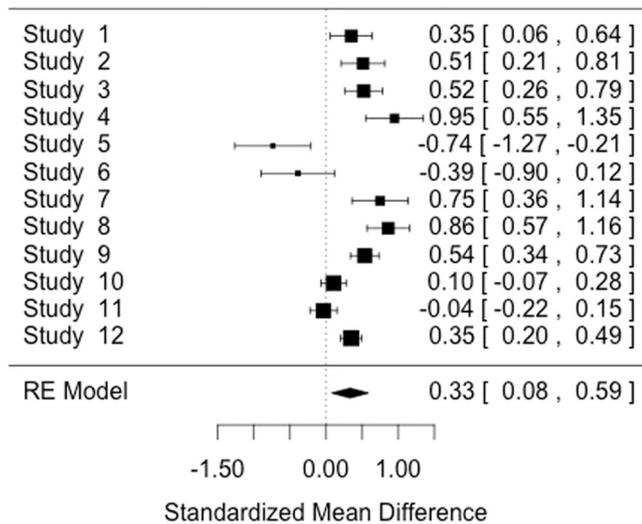


Fig. 1. Forest plot of standardized mean differences of the intensity bias for all target emotions.

Table 2
Degrees of freedom, exact F-values, and exact p-values per study.

Study	DF's	F	p
01	1, 185	5.699	+ .018*
02	1, 173	11.54	+ .000846***
03	1, 224	15.48	+ .000111***
04	1, 105	24.38	+ 3e-06***
05	1, 57	8.239	- .00574**
06	1, 58	2.325	- .133
07	1, 106	15.32	+ .000161***
08	1, 191	36.11	+ 9.29e-09***
09	1, 407	29.45	+ 9.86e-08***
10	1, 500	1.333	+ .249
11	1, 493	0.137	- .711
12	1, 718	21.87	+ 3.49e-06***

Note. '+' indicates effects in line with prediction, '-' indicates opposite effects.
* p < .05, ** p < .01, *** p < .001

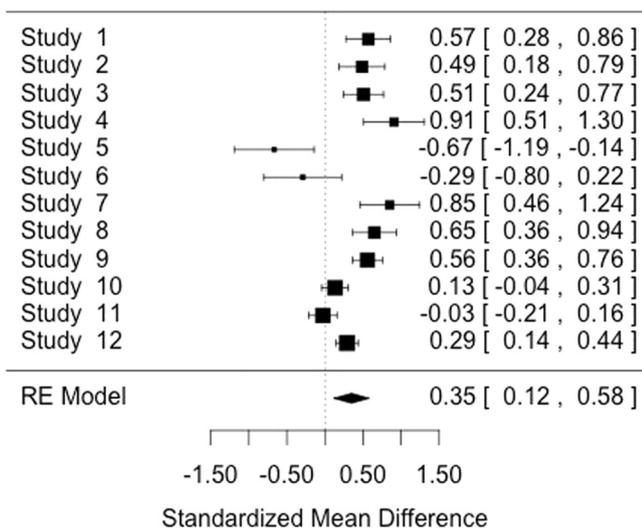


Fig. 2. Forest plot of standardized mean differences of the intensity bias for secondary emotions only (contempt, embarrassment, pride).

[0.08–0.59], ($r = 0.16$) pointing to an intensity bias in interethnic emotion perception. Eight out of twelve studies yielded effect sizes in the predicted direction. Unexpectedly, two studies in which we tried to

validate a second stimulus set revealed effects in the opposite direction (Kommattam et al., 2017, Study 5 & 6). The results of these studies need to be interpreted with caution at a single-study level, however, because they not only included a different stimulus set, but also had the lowest sample sizes of all studies and can be judged to be underpowered. As methodological research demonstrates, effect sizes fluctuate in underpowered studies (Lakens & Evers, 2014). Meta-analytic techniques control for sample size, and thus even underpowered studies can be included. Indeed, the confidence interval points to a variability of the effect [0.08–0.59]. This variability was also driven by two studies with effect sizes around 0 (Study 10 and 11). These studies made use of both stimulus set 1 and 2. In sum, all studies that made use of stimulus set 1 and the ADFES BIV (Wingenbach et al., 2016) supports the idea of an intensity bias in interethnic emotion perception.¹

2.2.3. Additional analyses

In order to examine which emotions primarily drive the intensity bias, we conducted a series of MANOVAs with group as the only predictor per study. These revealed that facial expressions of embarrassment, pride, surprise, and fear most frequently lead to the intensity bias in intergroup emotion perception. The exact means and a full overview of which emotions drove the effect of group are reported in Supplemental Material 2 (S2, means in *italic* refer to reverse effects). To follow up on the infra-humanization literature, we divided the nine facial expressions of the ADFES (Van der Schalk et al., 2011) into 'primary emotions' (anger, fear, surprise, disgust, sadness, happiness) and 'secondary emotions' (contempt, embarrassment, pride), and calculated separate *d*'s for each type of emotion ('*d*-sec' for secondary emotions and '*d*-prim' for primary emotions, see Supplemental Material 2). Based on this, we also performed separate meta-analyses for primary and secondary emotions.

The meta-analytical model for secondary emotions was $d = 0.35$ [0.12–0.58], ($r = 0.17$), which was higher than the overall model ($d = 0.33$). The meta-analytical model for primary emotions was $d = 0.23$ [0.05–0.42], ($r = 0.11$), hence weaker than the overall model and the model for secondary emotions only. As such, this model suggests that the intensity bias is stronger for the facial expression of secondary emotions than primary emotions (Fig. 3).

Furthermore, we included an additional meta-analysis as an alternative model. We ran a random effects model meta-analysis for neutral contexts only. For this analysis, all conditions that included emotional contextual information were excluded. The analysis yielded an effect size of $d = 0.38$ [0.09–0.66], ($r = 0.19$). Compared to the meta-analytical model that includes all contexts ($d = 0.33$), this model has a higher effect size, suggesting that the intensity bias is more pronounced when the context does not provide additional information on the reason for the emotion, in addition to the facial expression (Fig. 4).

3. General discussion

Our data provide support for the idea that European descended individuals perceive less intense emotions on the faces of ethnic out-group members. We used a meta-analytical approach and found an overall effect, showing that white European, European-American, and British perceivers judged emotions expressed by models of Turkish or Moroccan descent as less intense than emotions expressed by Europeans

¹ We also tested our hypothesis using different ethnic groups of perceivers in a series of three follow up studies. Since these studies did not include the intergroup manipulation that was part of all 12 studies of the meta-analysis, these studies did not meet the inclusion criteria for our meta-analysis and were therefore excluded from the results listed above. The detailed methods and results of these three studies can be found in Supplemental Material 4. Furthermore, we added ANOVA's for all between-subjects factors as predictors and target emotion as outcome variable for Studies 1–12 in Supplemental Material 3.

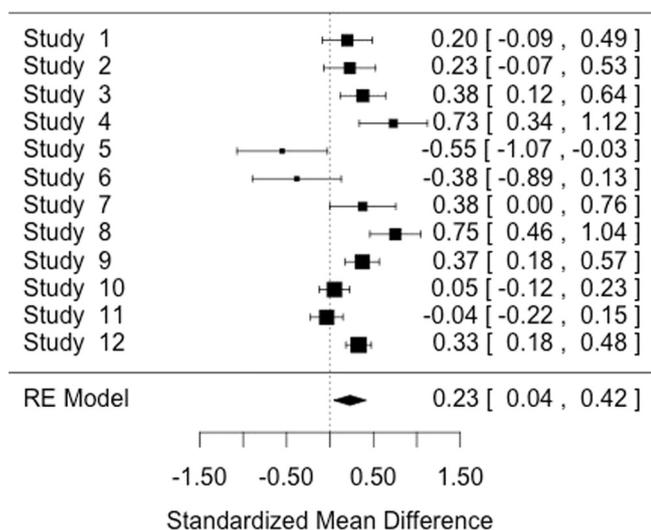


Fig. 3. Forest plot of standardized mean differences of the intensity bias for primary emotions only (anger, disgust, fear, happiness, sadness, surprise).

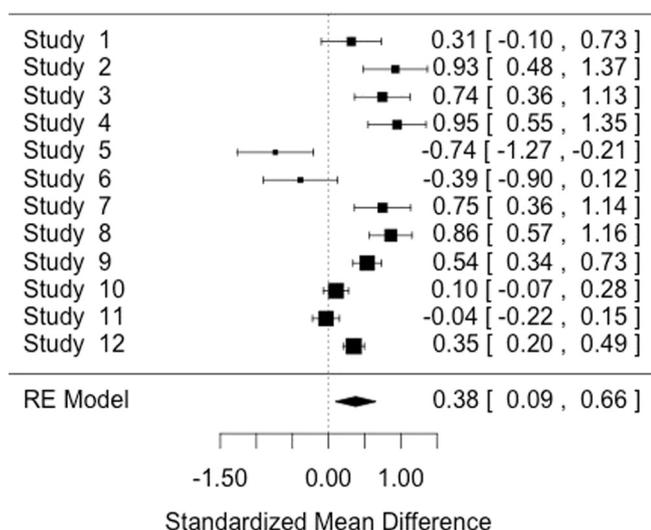


Fig. 4. Forest plot of standardized mean differences of the intensity bias for neutral contexts only.

or European-Americans. A random effects model allowed us to estimate the effect size of this intensity bias in the population. The effect was small ($d = 0.33$, $r = 0.16$) and shows variability (as indicated by the confidence interval [0.08–0.59]), but provided clear support for an intensity bias. In Study 5 and 6 reversed effects were found (Kommattam et al., 2017, Study 5 and 6), which may suggest that the intensity bias only occurs when using a specific stimulus set. However, the fact that we again found the bias in a third stimulus set (Study 12) speaks against this explanation. We think that these reverse effects may be due to the unfortunate low power in those two studies ($N = 59$ and $N = 60$ respectively, while $N = 729$ in Study 12).

In the studies included in the meta-analysis, the intercultural or interethnic context was made salient. We would like to stress that we defined this as a precondition for the intensity bias to occur (see also Hogg & Turner, 1987). Indeed, we did not find an intensity bias in earlier studies in which we did not make the intergroup context salient (i.e. without the ranking task).² These studies were therefore not

²The detailed methods and results of these studies are available in Supplemental Material 4.

included in the meta-analysis, as we defined the presence of an interethnic context as one of the inclusion criteria. The salience of the interethnic context aimed to guarantee that the faces of strangers were seen in an interethnic context, and thus categorized as belonging to an ethnic ingroup or outgroup.

We also found evidence for the two boundary conditions. First, information on the emotional context reduces the intensity bias, as reflected in a difference between conditions where emotional (e.g., ‘this woman just won the lottery’) versus neutral or no information was provided. This boundary condition is crucial since clear emotional cues are oftentimes absent in everyday interactions. In professional or educational settings, or when interacting with strangers for example, we often may see subtle signs of emotions, but we do not know what happened to that person, nor do we want to ask. Second, the intensity bias was more pronounced for so-called secondary emotions, namely contempt, pride and embarrassment. We cannot draw conclusions on whether these latter findings support one of the two explanations, however, because the secondary emotions are also least well recognized. In short, the bias may increase when the context is unknown, and when perceivers do not exactly know what happened to a person. Both boundary conditions suggest that more room for interpretation increases the intensity bias in an interethnic context.

The current data speak to various lines of research. The intensity bias may be an indicator of an interethnic empathy gap (Forgiarini et al., 2011; Gutsell & Inzlicht, 2010; Gutsell & Inzlicht, 2012; Trawalter et al., 2012), as well as a signal of dehumanization (Harris & Fiske, 2006) or infra humanization (Castano & Giner-Sorolla, 2006; Čehajić et al., 2009; Haslam et al., 2005; Haslam & Loughnan, 2014; Leyens et al., 2000; Vaes et al., 2012; Wohl et al., 2012). We think that the intensity bias especially plays a role in small-scale social interactions, which may lead to misunderstandings, conflicts or exclusion of ethnic outgroup members. The interpretation that members of ethnic outgroups have a more superficial emotional life may lead to ignoring or disregarding their feelings. Such perceptions may in turn be fertile ground for the rise of xenophobia targeting Muslims, migrants, and asylum seekers all over Europe and the United States.

There are also some limitations with regard to our present research. First, it should be emphasized that our data do not justify any conclusions on directionality. It could be that the perception of less intense emotions in ethnic outgroup members may lead to less empathy or more infra-humanization, but the reverse relations are also possible. Further research is needed in order to determine how these two biases are related. In addition, another limitation is that we have only included participants of European descent who perceive emotions displayed by ethnic outgroup members, especially from a Turkish or Moroccan descent. It is important to test a larger variety of perceiver groups in addition to only European descended perceivers in order to examine the generalizability of the effect.

Despite these limitations, we believe that these findings provide new and valuable insights. We demonstrated the presence of an intensity bias across nine different emotions, different ingroup and outgroup models, and with different European descended white samples, with a total 3201 participants. Furthermore, we established the effect using low intensity still images (Kommattam et al., 2017, Studies 1–4 and 7–9), as well as with standardized dynamic stimuli across three levels of intensity (Study 12). Finally, we performed a meta-analysis, which allowed us to estimate an effect size in the population, unlike null hypothesis significance testing (Field & Gillett, 2010; Rosenthal, 1995). Accordingly, these findings may be seen as a basis for follow up research testing different moderators of the intensity bias.

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jesp.2019.04.007>.

Open practices

We state that we disclosed all measures, manipulations, and

exclusions; all other relevant materials can be found in the Supplemental Materials. Supplemental Material 1 only contains a subset of sample stimuli, because not all models gave consent for public distribution. All sample stimuli can be obtained from the last author for replication purposes: a.h.fischer@uva.nl. In combination with the manuscript the data and materials enable independent researchers to reproduce the reported methodology and results.

Open Data: Authors complete two disclosure items for each Open Data badge application:

1. Data can be found on the OSF – <https://osf.io/9x6wm/>
2. Is there sufficient information for an independent researcher to reproduce the reported results? Yes, the anonymized data and the syntax and an overview of the data are available

Open Materials: Authors complete two disclosure items for each Open Materials badge application:

1. All materials can also be found on the OSF – <https://osf.io/9x6wm/>
2. Is there sufficient information for an independent researcher to reproduce the reported methodology? Yes

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