

Empathy towards individuals of the same and different ethnicity when depicted in negative
and positive contexts

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Abstract

Individuals can show different empathy responses towards others depending on in-group and out-group biases. The present research tested empathy biases related to ethnicity when targets were depicted in negative and positive contexts. Caucasian ($n = 99$) and Asian ($n = 99$) participants gave subjective ratings for images depicting same or other ethnicity individuals in socially-relevant negative and positive contexts. Participants rated significantly higher on all three dimensions of empathy (affect, perspective taking, and understanding) for same ethnicity targets than for other ethnicity targets. However, this bias was found only for targets depicted in negative contexts. Moreover, no ethnicity bias was found for ratings of valence, arousal, distress, and interest. The results suggest that ethnicity-related biases in empathy are present, are limited to negative contexts, and are not merely a manifestation of a more general cognitive or affective bias.

Keywords: empathy, ethnicity, race, similarity, bias.

1. Introduction

Empathy is regarded as the ability to share, perceive, or imagine the experiences of others (Batson, 2009; Hoffman, 2007) and is associated with compassion, sympathy, and prosocial behaviour (Preston & de Waal, 2002). Theorists have suggested that empathy is a multidimensional construct (Batson, 2009; Preston & de Waal, 2002) and that it contains three main components (Decety & Lamm, 2009). These components are (i) a perspective taking process where cognitive and affective experiences of the other (or 'target') are shared, (ii) an emotional simulation process that mirrors the emotional elements of the target's bodily experience, and (iii) an emotion-regulation process which controls one's reaction to the target's distress and enables one to respond with understanding (Decety & Lamm, 2009).

Ethnicity-related biases in empathic responding have been observed in social psychology (Hornstein, 1978; Johnson et al., 2002) and neuroscience research (Avenanti, Sirigu, & Aglioti, 2011; Brown, Bradley, & Lang, 2006; Xu, Zuo, Wang, & Han, 2010). For example, Xu et al. (2009) found that Caucasian and Asian participants showed stronger neural responses in the anterior cingulate cortex, an area argued to reflect the affective component of empathy, for same ethnicity targets than for other ethnicity targets experiencing pain. Johnson et al. (2002) asked white university students to read a passage about either a black or a white man who was charged with a criminal offence. The participants who read the passage about the black defendant reported significantly higher empathy and assigned significantly more lenient punishments than those who read the passage about the white defendant.

Ethnicity-related biases in empathy may reflect that individuals are more responsive to in-group members (Batson, Turk, Shaw, & Klein, 1995; Houston, 1990). This has been termed the in-group empathy hypothesis (Brown et al., 2006) and it suggests that individuals show stronger empathic reactions to same ethnicity than to other ethnicity targets due to

perceived similarities or identity with the targets' ethnic group. However, the bias may not be consistent across all situations. Brown et al. (2006) found physiological and behavioural evidence consistent with the in-group empathy hypothesis when African American and European American participants viewed pleasant and unpleasant pictures of the same or other ethnic group. Exaggerated responses to the same ethnic group target were not consistently observed for the European American participants when they viewed pleasant pictures, suggesting that the valence of the situation is a potential moderating variable.

The in-group empathy hypothesis may be explained by one or more underlying processes. Empathy is related to face and emotion recognition ability (Bate, Parris, Haslam, & Kay, 2010; Besel & Yuille, 2010) and emotional contagion following recognition is thought to influence the strength of the empathic response (Preston & de Waal, 2002). Emotional contagion may be stronger for in-group members than out-group members (Heitanen, Surakka, & Linnankoski, 1998), at least in part because individuals are more accurate and faster at identifying the emotions of same ethnicity individuals (Elfenbein & Ambidi, 2002). Alternatively, empathy is influenced by perceptions of similarity (Preston & de Waal, 2002) due to perceived overlap in variables such as gender (Feschback & Roe, 1968) or relatedness (Cialdini, Brown, Lewis, Luce, & Neuberg, 1997). Individuals will perceive greater similarity with same ethnicity targets and this may produce a richer representation of the target. A richer representation gives access to more associations and a more elaborate response to the target's situation thereby enhancing the empathic response (Preston & de Wall, 2002).

The present research used a picture viewing paradigm (Brown et al., 2006) and asked participants to make subjective ratings. Unlike prior research (e.g., Avenanti et al., 2012), the present study sampled participants from different countries to ensure that they were representative of a given culture and ethnicity (Oluwatoyin Olatundun, 2009). In addition,

multiple dimensions of empathy were measured. Due to the observed overlap in the components of empathy (e.g., D'Ambrosio, Olivier, Didon, & Besche, 2009) it was hypothesized that ethnic bias in empathy (i.e., more empathy towards same ethnicity than other ethnicity targets) would be observed for each of perspective taking, affect sharing, and understanding of others' situation. However, as affective responses are less consistently observed for positive valenced stimuli (Brown et al., 2006), it was hypothesized that ethnic bias in empathy would be found for targets in negative circumstances but not for targets in positive circumstances. Participants also made ratings of valence, arousal, interest, and distress to the stimuli. The notion that the ethnic bias in empathy reflects stronger emotional contagion leads to the hypothesis that an ethnic bias will also be observed for these measures (e.g., lower pleasantness for same ethnicity than other ethnicity targets in a negative situation).

2. Material and Methods

2.1. Participants

Two samples of participants were recruited. The Caucasian sample consisted of 99 volunteer psychology students who participated in exchange for course credit from Griffith University and Bond University, located on the Gold Coast City, Australia. The three largest ancestries in the city population are Australian (31.8%), English (39.6%), and Irish (10.3%), with Asian ancestries such as Chinese (2.1%), Japanese (1.0%), Filipino (0.8%), and Korean (0.6%) making up the minority. All Caucasian participants reported identification with the Caucasian ethnic group and reported nationalities of Australian ($n = 65$), English ($n = 14$), Irish ($n = 3$), Scottish ($n = 1$), Norwegian ($n = 4$), Russian ($n = 3$), Italian ($n = 2$), New Zealander ($n = 2$), Romanian ($n = 1$), Canadian ($n = 1$), Swedish ($n = 1$), Croatian ($n = 1$), and Serbian ($n = 1$). The Asian sample comprised 99 volunteer students from Renrenmin University, the Chinese Academy of Sciences, the Southwest University, the University of

Political Law and Science, Peking University, and the China Agricultural University. These universities are located in Beijing or Chongqing, with populations predominantly of Han Chinese origin (95.7% in Beijing and 91% Chongqing) and a minority of a Caucasian origin (<1%). All Asian participants were of Chinese ethnicity. The two samples did not differ significantly in gender ratio (Caucasian: 73 females, 26 males; Asian: 70 females, 29 males), $\chi^2(N = 198) = 0.23, p = .64$. The mean age of the Caucasian sample ($M = 25.44$ years, $SD = 9.41$) was higher than that of the Asian sample ($M = 20.89$ years, $SD = 1.70$), $t(196) = 4.74, p < .001$.

The *Depression Anxiety Stress Scale-21* (DASS-21; Lovibond & Lovibond, 1995) was used to measure depression, anxiety, and stress. Each question was answered on a scale ranging from 0 = *did not apply to me at all*, to 3 = *applied to me very much, or most of the time*. Compared with the Asian sample, the Caucasian sample reported significantly higher ratings of depression (Caucasian: $M = 4.89, SD = 5.03$; Asian $M = 2.04, SD = 2.20$), $t(196) = 5.12, p < .001$, and stress (Caucasian: $M = 9.68, SD = 6.87$; Asian $M = 4.15, SD = 2.79$), $t(196) = 7.43, p < .001$, but not anxiety (Caucasian: $M = 4.14, SD = 4.31$; Asian $M = 3.39, SD = 2.56$), $t(196) = 1.48, p = .14$.

2.2. Apparatus

2.2.1. Stimuli

Full colour photographs depicting European (Caucasian) or Chinese (Asian) individuals in positive or negative circumstances were sourced from the International Affective Picture System (IAPS; Lang, Bradley, & Cuthbert, 2008) and from the Internet*. The photographs depicted an individual in a circumstance that was either positive (e.g., a party) or negative (e.g., ill). The photographs of the different ethnic groups were matched on the nature of the context as well as on the specific nature of their condition (e.g., illness). All images depicted adults only. A total of 70 photographs were used (35 per ethnic group).

Within each ethnic group, 26 photographs depicted a negative context (10 related to injury, 6 related to illness, 4 related to grief, 2 related to a natural disaster, 2 related to confinement, and 2 related to assault) and 9 depicted a positive context (6 related to smiling, 2 related to a party, and 1 related to an amusement park). The IAPS images used were numbers 3181, 6560, and 9250.

2.2.2. Rating scale

Participants completed ratings on nine-point scales ranging from 0 to 8 for three dimensions of empathy and for valence, arousal, distress, interest, and clarity. Participants were given definitions of each of the constructs. The following anchors were used for empathy-perspective taking (0 = *Difficult to take perspective*; 8 = *Easy to take perspective*), empathy-affect sharing (0 = *Difficult to feel the target's feeling*; 8 = *Can easily feel the target's feeling*), empathy-understanding of others' situation (0 = *Difficult to understand*; 8 = *Easy to understand*), valence (0 = *Unpleasant*; 8 = *Pleasant*), arousal (0 = *Calm*; 8 = *Alert/jittery*), interest (0 = *Boring*; 8 = *Interesting*), distress (0 = *Not at all distressing*; 8 = *Very distressing*), and clarity (0 = *Picture is unclear*; 8 = *Picture is clear*).

2.3. Procedure

After providing informed consent, participants completed a demographics questionnaire and the DASS-21. Next, participants were seated in front of a computer and were asked to rate the images shown. Participants were further told that after making a rating for an image, they should press the space bar on the computer keyboard to advance to the next image. Five different random sequences of images were developed and allocated to participants in counterbalanced order.

2.4. Statistical Analyses

The independent variables were participant ethnicity (Caucasian, Asian), target ethnicity (Caucasian, Asian), and target valence (negative, positive) and the dependent

variables were ratings on the subjective scales. Preliminary analyses indicated that all images were rated highly on clarity ($M = 6.07$, $SD = 1.16$) and thus, all were retained for the analyses. The dimensions of arousal and distress were positively skewed while empathy-perspective taking, empathy-affect sharing, and empathy-understanding, and valence were negative skewed. Square root and reflect square root transformations were applied to normalise the distributions. As analyses conducted with and without the transformed data yielded similar outcomes, original data are reported. MANCOVAs and ANCOVAs were conducted with the SPSS GLM command using age, DASS-21 depression, DASS-21 anxiety, and DASS-21 stress scale scores as covariates. Only significant main effects and the highest level interactions are reported.

3. Results

3.1. Correlations between the rating dimensions

The bivariate correlations between the rating dimensions are shown in Table 1. The three empathy dimensions were significantly correlated among themselves and with distress. Arousal and interest were also significantly correlated. Furthermore, for the Caucasian sample only, arousal was significantly correlated with interest, valence, and distress. The mean ratings for the dimensions in the correlational analysis were as follows for empathy-perspective taking (Caucasian: $M = 5.65$, $SD = 1.17$; Asian: $M = 5.67$, $SD = 1.23$), empathy-affect sharing (Caucasian: $M = 5.85$, $SD = 1.11$; Asian: $M = 5.95$, $SD = 1.11$), empathy-understanding (Caucasian: $M = 5.92$, $SD = 1.08$; Asian: $M = 5.87$, $SD = 1.05$), valence (Caucasian: $M = 4.44$, $SD = 0.73$; Asian: $M = 4.07$, $SD = 0.56$), arousal (Caucasian: $M = 2.26$, $SD = 1.26$; Asian: $M = 3.70$, $SD = 1.35$), interest (Caucasian: $M = 3.39$, $SD = 1.15$; Asian: $M = 4.17$, $SD = 1.14$), and distress (Caucasian: $M = 1.93$, $SD = 0.87$; Asian: $M = 2.31$, $SD = 0.82$).

Insert Table 1 about here

3.2. Effect of participant ethnicity, target ethnicity, and target valence

The mean ratings by each ethnic group to each picture type are shown in Table 2. A $2 \times 2 \times 2$ (target ethnicity x target ethnicity x target valence) MANCOVA showed significant overall multivariate effects for all main effects and interactions. This included the highest order three-way interaction between participant ethnicity \times target ethnicity \times target valence, $F(7,186) = 3.86, p = .001, \eta_p^2 = .127$. Follow-up analyses were conducted for each rating dimension with separate $2 \times 2 \times 2$ (participant ethnicity \times target ethnicity \times target valence) univariate ANCOVAs. To protect against inflated Type I error, a Bonferroni adjusted alpha level was used for these ANCOVAs ($\alpha' = .007$) and *post hoc* analyses.

Insert Table 2 about here

3.2.1. Empathy

The subjective ratings for the three empathy dimensions are shown in Figure 1. As can be seen, a consistent pattern emerged across all three dimensions. Empathy ratings were higher for targets of the same ethnicity than for targets of the other ethnicity. However, this difference was limited to targets in a negative context.

Insert Figure 1 about here

Empathy-perspective taking showed a main effect for target valence, $F(1,192) = 26.95, p < .001, \eta_p^2 = .123$, and participant ethnicity \times target ethnicity \times target valence

interaction, $F(1,192) = 8.99, p = .003, \eta_p^2 = .045$. Further examination ($\alpha' = .0125$) revealed that Caucasian participants rated Caucasian targets higher than Asian targets in negative contexts, $F(1,98) = 34.24, p < .001, \eta_p^2 = .259$. A similar ethnic bias was present for Asian participants, $F(1,98) = 5.27, p = .024, \eta_p^2 = .051$. The comparisons between Caucasian and Asian targets did not reach statistical significance for positive contexts in either participant group, both $F_s < 6.27, p > .014$.

For empathy-affect sharing, there was a main effect for target valence, $F(1,192) = 22.86, p < .001, \eta_p^2 = .106$, and a significant participant ethnicity \times target ethnicity \times target valence interaction, $F(1,192) = 9.75, p = .002, \eta_p^2 = .048$. Again, comparisons ($\alpha' = .0125$) showed that Caucasian participants gave higher empathy ratings for Caucasian targets than for Asian targets in negative contexts, $F(1,98) = 20.21, p < .001, \eta_p^2 = .171$, and Asian participants gave higher ratings for Asian targets in negative contexts, $F(1,98) = 18.12, p < .001, \eta_p^2 = .156$. For images depicting positive contexts, Asian participants gave higher ratings for Caucasian targets than for Asian targets, $F(1,98) = 6.93, p = .01, \eta_p^2 = .066$, whereas there was no significant difference for Caucasian participants.

Finally, empathy-understanding revealed a main effect for target valence, $F(1,192) = 29.18, p < .001, \eta_p^2 = .132$, and a participant ethnicity \times target ethnicity \times target valence interaction, $F(1,192) = 9.74, p = .002, \eta_p^2 = .048$. Similar to the other two empathy dimensions, further analyses ($\alpha' = .0125$) showed that for images of negative contexts Caucasian participants gave higher ratings for Caucasian targets than Asian targets, $F(1,98) = 34.93, p < .001, \eta_p^2 = .263$, whereas this difference was reversed for Asian participants, $F(1,98) = 9.75, p = .002, \eta_p^2 = .09$. For images in positive contexts, Caucasian participants showed higher ratings for Caucasian targets than Asian targets, $F(1,98) = 10.62, p = .002, \eta_p^2 = .098$, whereas there was no significant difference for Asian participants.

3.2.2. Valence

The ratings for valence, revealed a main effect of target ethnicity, $F(1,192) = 4.86, p = .029, \eta_p^2 = .025$, a main effect of target valence, $F(1,192) = 217.06, p < .001, \eta_p^2 = .531$, a main effect of participant ethnicity, $F(1,192) = 27.31, p < .001, \eta_p^2 = .125$, a target valence \times target ethnicity interaction, $F(1,192) = 5.83, p = .017, \eta_p^2 = .029$, and a participant ethnicity \times target ethnicity interaction, $F(1,192) = 4.79, p = .03, \eta_p^2 = .024$. Examination of the latter interaction ($\alpha' = .025$) showed that although both groups of participants rated the Caucasian targets higher in pleasantness than Asian targets, the magnitude of the difference was larger for Asian, $F(1,98) = 73.67, p < .001, \eta_p^2 = .43$, than for Caucasian participants, $F(1,98) = 10.58, p = .002, \eta_p^2 = .097$.

3.2.3. Arousal

Similar to the empathy ratings, a significant three-way participant ethnicity \times target ethnicity \times target valence interaction was found for arousal ratings, $F(1,192) = 9.53, p = .002, \eta_p^2 = .047$. In addition, analyses revealed a main effect for target valence, $F(1,192) = 6.06, p = .015, \eta_p^2 = .031$, and participant ethnicity, $F(1,192) = 36.27, p < .001, \eta_p^2 = .159$. Analyses for the three-way interaction ($\alpha' = .0125$) showed that Caucasian participants gave lower arousal ratings for Caucasian targets than for Asian targets in negative contexts, $F(1,98) = 8.62, p = .004, \eta_p^2 = .081$. Although the same difference was observed for Asian participants, the effect was substantially larger, $F(1,98) = 79.51, p < .001, \eta_p^2 = .448$. Similarly, Caucasian participants gave higher ratings for Caucasian targets than for Asian targets in positive contexts, $F(1,98) = 7.17, p = .009, \eta_p^2 = .068$, but the same difference was larger for Asian participants, $F(1,98) = 17.68, p < .001, \eta_p^2 = .153$.

3.2.4. Interest

A main effect for participant ethnicity, $F(1,192) = 10.32, p = .002, \eta_p^2 = .051$, and a participant ethnicity \times target valence interaction, $F(1,192) = 39.68, p < .001, \eta_p^2 = .171$, was

observed for interest ratings. Multiple comparisons ($\alpha' = .025$) examining the latter interaction showed that interest ratings were higher for Asian participants than for Caucasian participants for images of positive contexts, $F(1,196) = 67.84, p < .001, \eta^2 = .346$, whereas there was no significant difference for images of negative contexts, $F < 1$.

3.2.5. Distress

Finally, ratings for distress revealed a main effect for target ethnicity, $F(1,192) = 6.37, p = .012, \eta_p^2 = .032$, a main effect for target valence, $F(1,192) = 81.04, p < .001, \eta_p^2 = .297$, a main effect participant ethnicity, $F(1,192) = 9.22, p = .003, \eta_p^2 = .046$, a target ethnicity \times target valence interaction, $F(1,192) = 7.75, p = .006, \eta_p^2 = .039$, and a participant ethnicity \times target ethnicity interaction, $F(1,192) = 6.60, p = .011, \eta_p^2 = .011$. Further analysis of the latter interaction showed that Caucasian participants gave lower distress ratings for Caucasian targets than for Asian targets, $F(1,98) = 9.27, p = .003, \eta_p^2 = .086$. The same difference was observed for Asian participants, although it was substantially larger, $F(1,98) = 42.03, p < .001, \eta_p^2 = .30$.

4. Discussion

The results showed that reported empathy was higher for same ethnicity targets than for other ethnicity targets. The findings are consistent with the hypothesis that an ethnicity-related bias would be found in empathy and it would be observed for all components of empathy, namely perspective taking, affect sharing, and understanding of others' situation. In addition, the ethnicity-related bias was found for targets in negative circumstances and not for targets in positive circumstances. This finding was consistent with the hypothesis that the ethnicity-related bias in empathy would be stronger for negatively valenced situations. Ratings of valence, arousal, distress, and interest showed no evidence of a bias towards same race individuals. These results did not support the hypothesis that the ethnicity-related bias in empathy is due to enhanced emotional contagion with same ethnicity targets.

The different pattern of findings for empathy than valence, arousal, interest, and distress suggests that the observed empathy bias is not merely a general cognitive or affective bias towards in-group ethnicity members. They also argue against the explanation that the ethnicity-related bias in empathy manifests because of enhanced emotional contagion for in-group ethnicity members. The correlational analyses also support this interpretation. No consistent correlations were observed between empathy ratings and ratings of valence, arousal, and interest. Only distress was correlated with all three components of empathy. Preston and de Waal (2002) noted that personal distress is related to emotional contagion, but is distinguished from empathy in that there is no self-other distinction (Preston & de Waal, 2002). However, no ethnicity-related bias was observed for distress ratings.

The observed ethnicity-related bias is consistent with the hypothesis that empathy was influenced by the perceived similarity with the target due to physical appearance. Theoretical models of empathy highlight the effects that similarity can have on the empathic response (e.g., Preston & de Waal, 2002) and such effects have also been empirically demonstrated (e.g., Brown et al., 2006; Cialdini et al., 1997; Feshback & Roe, 1968). The present results are thus consistent with these findings and, along with other research (Avenanti et al., 2010; Brown et al., 2006; Johnson et al., 2002; Xu et al., 2009), extend them to the case of similarity in ethnic background.

Ethnicity-related biases in empathy were observed only for targets in negative circumstances. Other research is consistent with the notion that empathy is more strongly affected by negative situations than positive situations. For example, negative emotions influence the behaviour of infants to a larger extent than do positive emotions and dyads of depressed mothers and their infants match negative behaviour states more than positive ones (Field et al., 1990). In the present experiment, the similarity with the target in positive circumstances may not be as salient as for negative circumstances because of an overall

greater familiarity with or prior exposure to individuals in positive situations. The significantly higher arousal ratings for negative stimuli than positive stimuli are consistent with this explanation. Thus, perceived similarity in ethnicity appears only to influence empathic processes in sufficiently arousing or negatively valenced situations.

Similarity with another person's ethnic background has been implicated in overt prejudicial behaviours, such as differential employment for minority groups (Dovidio & Gaertner, 2000). However, the impact of implicit in-group bias (when conscious regulation is absent, such as body language or decisions made under time pressure) is also likely to regulate behaviour (Quillian, 2006). The present finding of an ethnicity-related bias in empathy suggests that it may manifest as an implicit form of prejudice towards others. Moreover, given the link between empathy and overt behaviours, the implicit empathy bias may influence behaviours such as the expression of sympathy and pro-social behaviour when the target is in a negative situation.

Differences between the two participant ethnic groups were observed in ratings of valence, arousal, interest, and distress. Asian participants gave lower pleasantness ratings for Asian targets, higher arousal ratings for Asian targets in negative situations, higher distress for Asian targets, and overall higher interest ratings for positive contexts. Caucasian participants also gave higher arousal ratings for Asian targets in negative situations and higher distress ratings for Asian targets. These differences may reflect that the stimuli showing Asian targets depicted situations that were more emotive, at least for the negative situations, than for the Caucasian targets. However, the stimuli were matched on contextual variables such as the type of situation and the facial expressions shown. Moreover, the important aspect of the differences between the different ethnicity targets was that it interacted with participant ethnicity. In this respect, the results for the Asian participants are consistent with the in-group empathy hypothesis and prior research (Brown et al., 2006)

which proposes heightened reactions to same ethnic group members.

5. Conclusions

In conclusion, Caucasian and Asian participants recruited and tested in different countries showed an ethnicity-related bias in empathy towards targets in negative contexts. The bias appears to reflect the influence of perceived similarity in ethnicity. The important role that empathy plays in social interactions with others suggests that such empathy-related influences should be considered in future work that involves individuals showing compassion, sympathy, or pro-social behaviour towards others. Future research could also be conducted to include psychophysiological measurements (e.g., Westbury & Neumann, 2008) or experimentally manipulate the level of perceived ethnic similarity to determine its effect on the ethnicity-related bias in empathy.

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Footnotes

*Copies of the stimulus materials are available from the authors upon request.

Table 1

Correlations Between Measures for Caucasian and Asian Participants

| Measures | Empathy- Perspective Taking | Empathy- Affect Sharing | Empathy- Understanding | Valence | Arousal | Interest | Distress |
|----------------------------|--------------------------------|----------------------------|---------------------------|---------|---------|----------|----------|
| Empathy-Perspective Taking | — | .64** | .72** | -.04 | .16 | .18 | .16 |
| Empathy-Affect Sharing | .73** | — | .68** | -.13 | .26* | .25* | .27** |
| Empathy-Understanding | .64** | .63** | — | -.08 | .14 | .13 | .32** |
| Valence | -.07 | -.12 | -.11 | — | -.46** | -.56** | -.19 |
| Arousal | .14 | .17 | .10 | -.16 | — | .76** | .30** |
| Interest | .18 | .18 | .11 | -.05 | .59** | — | .32* |
| Distress | .31** | .39** | .47** | -.09 | .18 | .04 | — |

Note: * $p < 0.05$, ** $p < .01$. Inter-correlations for Caucasian participants are presented above the diagonal and inter-correlations for Asian participants are presented below the diagonal.

Table 2

Means (standard deviations) for Caucasian and Asian Participants on Negative/Positive Situations and Caucasian/Asian targets

| Measures | Caucasian Participant | | | | Asian Participant | | | |
|----------------------------|-----------------------|-----------------|---------------------|-----------------|---------------------|-----------------|---------------------|-----------------|
| | Negative Target | | Positive Target | | Negative Target | | Positive Target | |
| | Caucasian target | Asian target | Caucasian target | Asian target | Caucasian target | Asian target | Caucasian target | Asian target |
| Empathy-Perspective Taking | 4.96 (1.57) | 4.68 (1.71) | 6.53 (1.27) | 6.42 (1.30) | 5.34 (1.44) | 5.43 (1.42) | 6.03 (1.25) | 5.89 (1.34) |
| Empathy-Affect Sharing | 5.24 (1.50) | 5.01 (1.66) | 6.63 (1.20) | 6.51 (1.17) | 5.53 (1.27) | 5.69 (1.28) | 6.33 (1.15) | 6.23 (1.20) |
| Empathy-Understanding | 5.46 (1.40) | 5.15 (1.54) | 6.61 (1.18) | 6.46 (1.26) | 5.66 (1.15) | 5.77 (1.15) | 6.02 (1.23) | 6.02 (1.24) |
| Valence | 2.29 (0.78) | 2.11 (0.77) | 6.71 (1.26) | 6.67 (1.22) | 1.80 (0.76) | 1.56 (0.75) | 6.57 (0.96) | 6.36 (1.02) |
| Arousal | 3.20 (1.55) | 3.33 (1.61) | 1.53 (1.53) | 1.38 (1.43) | 3.77 (1.39) | 4.15 (1.43) | 3.58 (1.77) | 3.28 (1.65) |
| Interest | 3.90 (1.24) | 4.12 (1.32) | 2.88 (1.50) | 2.67 (1.41) | 3.83 (1.31) | 3.90 (1.35) | 4.58 (1.51) | 4.36 (1.52) |
| Distress | 3.58 (1.64) | 3.77 (1.62) | 0.20 (0.42) | 0.17 (0.35) | 4.03 (1.32) | 4.40 (1.40) | 0.40 (0.71) | 0.43 (0.72) |

Figures

Figure 1. Mean ratings for the three empathy dimensions of perspective taking (top panel), affect sharing (middle panel), and understanding (bottom panel) as a function of participant ethnicity, target ethnicity, and target valence

