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Mimicry and just world beliefs: Mimicking makes men view the world as more personally
just

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Abstract

People's just world beliefs are related to how they feel and behave towards others: the stronger people hold beliefs that the world treats them fairly, the more they feel and act pro-socially towards others. It is conceivable, therefore, that pro-social feelings and behaviours towards others can strengthen people's personal belief in a just world, especially when people expect these positive feelings to be returned. Because mimicry enhances pro-social feelings towards others, we argue that mimicry may strengthen peoples' personal just world beliefs via positive feelings for the mimicked person and the expectation that these positive feelings are returned. Moreover, we expect these effects to be more pronounced for men because men have stronger reciprocity beliefs than women. The results of three studies supported this line of reasoning, showing that mimicry made men believe more strongly that the world is personally just to them. Further support for our line of reasoning was obtained by positive feelings for the (non)mimicked person (Study 2) and reciprocity beliefs (Study 3) mediating the effects. Taken together, the findings suggest that mimicry makes men view the world as more just.

Over the last 30 years, our psychological understanding of just world beliefs has increased. Research showing that beliefs that the world is just for the self are related to helping behaviour, trust, and forgiveness suggests that people's personal belief in a just world reflects people's pro-sociality (e.g., Lucas, Young, Zhdanova, & Alexander, 2010; Strelan, 2007). Therefore, it is conceivable that when people's pro-social feelings towards others are enhanced, for instance by mimicking others, this could lead to stronger beliefs that the world is just for the self. To further enhance our understanding of just world beliefs, we investigate whether mimicking others influences people's just world beliefs. More specifically, the aim of the present paper is to investigate whether mimicry affects peoples' beliefs about whether they are being treated fairly by the world. It is important to investigate this because people often mimic each other in everyday life (e.g., Cheng & Chartrand, 2003) and because just world beliefs influences how people perceive other people around them and how they perceive events that happen in the world (e.g., Furnham, 2003). Whether mimicry affects peoples' just world beliefs has, to date, not been empirically investigated.

Mimicry

Mimicry is defined as 'doing what others are doing'; a non-conscious tendency to imitate others' behaviours (Stel, Van Baaren, & Vonk, 2008). Research has often demonstrated that we mimic other peoples' behaviours, postures, gestures, mannerisms, words, accents, speech rates, and facial expressions outside of our awareness (e.g., Bernieri, 1988; Chartrand & Bargh, 1999; Chartrand & Van Baaren, 2009; Dimberg 1982; Webb, 1972). A consequence of mimicry is that people have more positive feelings for others: mimickers and mimicked rate each other more positively than people who do not mimic each other (e.g., Chartrand & Bargh, 1999). One explanation for this finding is that when mimicking, people are more physically similar to each other (e.g., Chartrand & Bargh, 1999). Furthermore, when mimicking the facial expressions of another person, one is likely to feel similar emotions as the mimicked (e.g., Stel *et al.*, 2008) because of the feedback effects of the facial muscles that are activated by mimicking on corresponding emotions (e.g., Tomkins, 1982). As a result, mimickers are better able to understand the emotions of others, and they also report more empathy for the person being mimicked. Thus, mimicking others leads people to have more positive feelings for others due to feeling more similar to the mimicked person and experiencing more understanding for that person. This happens even when the other person is expressing sad emotions (Stel *et al.*, 2008). The expectation that positive feelings for the person may be reciprocated could lead to stronger beliefs that the world is just. Before we

elaborate on why mimicry could strengthen just world beliefs, we will first introduce the concept of just world beliefs.

Just world beliefs

Just world beliefs are beliefs about whether the world is a place in which people get what they deserve. People who hold strong just world beliefs, strongly believe that good things happen to good people and bad things happen to bad people. According to just world theory (Lerner, 1980), this belief protects us from the view that something bad could happen to us: accepting a situation in which a person is unfairly treated badly means that we are also at risk to be treated badly.

People have beliefs about whether the world treats *them* fairly ('Personal Belief in a Just World') and beliefs about whether the world treats *other people* fairly ('Other Belief in a Just World'). Both theory and research suggest that personal and other just world beliefs are conceptually distinct (e.g., Alves & Correia, 2008; Lucas, Zhdanova, & Alexander, 2011). Personal just world beliefs better predict pro-social orientations and subjective well-being (i.e., Dzuka & Dalbert, 2002; Lipkus, Dalbert, & Siegler, 1996; Lucas *et al.*, 2010; Sutton & Winnard, 2007), whereas other just world beliefs better predict anti-social tendencies (i.e., negative and discriminatory reactions to victims, elderly and poor people; Bègue & Bastounis, 2003; Sutton & Douglas, 2005; Sutton & Winnard, 2007). For instance, Lucas *et al.* (2010) demonstrated that personal just world beliefs were positively associated with forgiveness, whereas other just world beliefs were negatively related.

The relationship between personal just world beliefs and pro-social values may exist because both involve a positive perception of humanity (e.g., Lerner, 1980). Additionally, Strelan (2007) argued that people who have strong personal just world beliefs are more pro-social because they believe that investments of being pro-social towards others will be returned. Thus, if people believe that the world is fair to them, they act accordingly (Strelan, 2007).

Relationship between mimicry and just world beliefs

If people's belief about whether the world treats them fairly is related to how people feel and behave towards others, it is likely that feelings and behaviours towards others can influence one's just world beliefs. Mimicry leads people to feel more positive towards the mimicked person (see, e.g., Stel *et al.*, 2008). As people would like these positive feelings to be

returned, the enhanced positive feelings due to mimicry could lead people to more strongly believe that the world should treat them fairly. In other words, the more people feel positive emotions for another person, the more they believe that the other person will feel and act positive to them as well (e.g., Perugini, Galluci, Presaghi, & Ercolani, 2003). This reciprocity belief may strengthen people's belief that the world treats them fairly as it is regarded as fair when positive feelings towards another person are returned. Therefore, we expect that when you have stronger reciprocity beliefs due to enhanced positive feelings by mimicking, this will positively influence your beliefs in a just world. This expectation is in line with the findings of Edlund, Sagarin, and Johnson (2007) showing that reciprocity and just world beliefs are related. They demonstrated that people with a stronger belief in a just world reciprocated a gift more often than people with a less strong belief in a just world. To this date, however, we do not know whether stronger reciprocity beliefs influence beliefs in a just world as well.

Furthermore, we expect the effect of mimicry on just world beliefs to be more pronounced for men than for women as men have stronger reciprocity beliefs than women (e.g., Kahn, Hottes, & Davis, 1971; Terhune, 1970). For instance, in games of trust, men are more likely to respond with reciprocity to the responses of another person than women (Kahn *et al.*, 1971). More specifically, when a person cooperated, men were more likely to cooperate; when a person competed, men were more likely to compete. Women showed less reciprocity and were more influenced by other cues in their decisions to cooperate or compete. As men have stronger reciprocity ideas, they may expect – more than women – that positive feelings for another person will be returned to them. So when men mimic another person, they may expect more than women that their efforts to connect with this person and the positive feelings they have for this person will be reciprocated. These reciprocity beliefs may be projected on the world in general. As a result, men's belief that the world is fair to them may be more strongly affected than the just world beliefs of women. In sum, we expect that mimicking the non-verbal behaviours of others lead to stronger beliefs that the world is personally just, especially for men. Moreover, we expect that positive feelings felt for the mimicker and reciprocity beliefs mediate this effect.

The present studies

To investigate the effects of mimicry on personal just world beliefs, we conducted three studies in which the amount of mimicry was varied or measured. In Studies 1 and 2,

participants watched a video fragment and either mimicked or did not mimic the non-verbal movements of the person on the video. In Study 3, we measured participants' spontaneous mimicry reactions to the behaviours of the person on the video. Then, in a part presented as unrelated to the first part of the study, we assessed participants' beliefs in a just world. In Study 1, we wanted to find out whether mimicking particularly influences *personal* just world beliefs or influences just world beliefs in general. As we propose positive feelings for the mimicked person to be responsible for the effect of mimicry on just world beliefs and as personal just world beliefs are related to pro-social orientation, we expect that mimicry influences personal, but not other just world beliefs. In Study 2, we more directly investigated whether positive feelings towards the person being mimicked play a role in the link between mimicry and just world beliefs. In Study 3, we examined whether reciprocity beliefs are affected by mimicry and play a role in the link between mimicry and just world beliefs.

STUDY 1

Method

Participants and design. Participants were 50 students at Tilburg University (39 women, $M_{\text{age}} = 21.10$ years, range = 18–37 years). They participated for payment (€3) or course credits and were randomly assigned to the conditions of a 2 (mimicry: present vs. absent) \times 2 (video: male vs. female) between-participants design. Men and women were equally distributed among the mimicry conditions.

Procedure. Participants were told that the experiment consisted of two unrelated parts. In the first part, we manipulated participants' mimicry of the movements of another person; in the second part, we measured participants' beliefs in a just world. First, participants watched a video of either a young man or young woman talking about what a typical day looks like for him/her. On the 2-min video, the young person talked about doing a thesis for his/her communication study, preparing for an internship in Kenya, and visiting friends and family.

On the video, the upper part of the body was visible. While talking, the person naturally showed nine behaviours, one at each time. The behaviours were cheek scratching, hair and chin touching, movements of the head, smiling, and frowning. The male and female videos were similar in verbal and non-verbal content: the text was identical and they showed the same behaviours. The timing of expressing the non-verbal behaviours was also similar. The male and female target person did not differ in attractiveness, $F < 1$.

Before watching this video, participants received instructions to either mimic or not to mimic the expressions of the person displayed on the video. The instructions were taken from Stel, Van Dijk, and Olivier (2009). Half of the participants received an instruction to mimic the movements of the person on the video, while the other half received an instruction not to mimic the movements. The instructions for both conditions were specific, guided by examples, and were matched for content. All participants received instructions to pay attention to specific movements of eyes, eyebrows, mouth, and head. The mimicry present group was instructed to mimic these movements; the mimicry absent group not to do so. Participants in the mimicry absent group were not instructed to refrain from moving in general, they were only asked not to show the same movements as the targets at the same time. After the video, participants received some general questions about the video fragment to back up the cover story that Parts 1 and 2 were unrelated.

In the second part, participants were asked to evaluate general statements. They received Lipkus *et al.*'s (1996) belief in just world (BJW) scale. This scale measures the degree to which people believe that they themselves are being treated fairly by the world (personal BJW; e.g., 'I feel that the world treats me fairly', 'I feel that the awards and punishments that I receive are rightly') and the degree to which they believe that other people are being treated fairly (other BJW; e.g., 'I feel that the world treats other people fairly', 'I feel that the awards and punishments that other people receive are rightly'). The personal and other BJW scales each consisted of eight items, all measured on seven-point scales (1 = *strongly disagree*, 7 = *strongly agree*). Cronbach's alpha for the personal BJW scale was .84, for the other BJW scale the alpha was .87.

In an open-ended question, participants were asked if they knew what the study was about. None of them reported anything related to the actual goals of our study. Finally, demographic variables were assessed. Afterwards, we thanked and debriefed the participants.

Results

Mimicry. A trained coder rated the movements of all participants and compared these to the coded movements of the target person of the video (inter-reliability between trained coders varies between .96 and .98). The movements of the participants were observed and matched with the target's movements using a time limit of 5 s. A participants' movement was scored as

mimicry if it matched the movement of the target and occurred after that movement within the time limit. Thus, if one of the targets' movements (cheek scratching, hair or chin touching, movements of the head, smiling, or frowning) at a certain time were also shown by the participant after the targets' movement and within the time limit, the participants' movement was scored as mimicry. This is the same procedure as used in previous studies (see, Stel *et al.*, 2008; 2009). Due to technical problems, we did not obtain the mimicry score of one male participant.

A 2 (gender of participant: male vs. female) \times 2 (mimicry: present vs. absent) \times 2 (video: male vs. female) analysis of variance (ANOVA) was conducted on the number of mimicked behaviours. A main effect of mimicry, $F(1, 41) = 34.86, p < .001, \eta^2 = .46$, indicated that participants who were instructed to mimic mimicked more ($M = 5.53, SD = 2.13$; 61.48% of all the behaviours shown by the target) than participants who were instructed not to mimic ($M = 0.89, SD = 1.15$; 9.94% of all the behaviours shown by the target). There were no other main or interaction effects, $F_s(1, 41) < 1.78, p_s > .19, \eta^2_s < .04$.

Personal BJW. A 2 (gender of participant: male vs. female) \times 2 (mimicry: present vs. absent) \times 2 (video: male vs. female) ANOVA was conducted on the degree to which participants believed the world treats them fairly. Table 1 presents the means and standard deviations. The analysis revealed an interaction between gender of the participant and mimicry, $F(1, 42) = 4.89, p = .03, \eta^2 = .10$. For men, mimicking another person led to a stronger belief that the world is personally just ($M = 5.36, SD = 0.66$) than not mimicking ($M = 4.50, SD = 0.35$), $F(1, 46) = 5.54, p = .02$. There was no effect of mimicry for women ($M_{mim} = 4.44, SD = 0.82$ vs. $M_{nomim} = 4.74, SD = 0.58$), $F(1, 46) = 2.23, p = .14$. The interaction also revealed that in the mimicry present condition, men rated the world as more personally just ($M = 5.36, SD = 0.66$) compared to women ($M = 4.44, SD = 0.82$), $F(1, 46) = 8.13, p = .01$. There was no difference between men and women in the mimicry absent condition ($M_{men} = 4.50, SD = 0.35$ vs. $M_{women} = 4.74, SD = 0.58$), $F < 1$. Thus, mimicry made participants more strongly believe that the world is personally just, but only for men. There was no interaction between gender, mimicry, and video, $F < 1$. In other words, the obtained effects were not different for the male and female video.

Table 1. Mean ratings of participants' personal just world beliefs by mimicry and gender of the participant for Study 1

| Mimicry | Gender | | | |
|---------|-------------------|-----------|-------------------|-----------|
| | Men | | Women | |
| | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> |
| Present | 5.36 _a | 0.66 | 4.44 _b | 0.82 |
| Absent | 4.50 _b | 0.35 | 4.74 _b | 0.58 |

Note. Means with non-common sub-scripts differ significantly ($p < .05$) within each column.

Other BJW. A 2 (gender of participant) \times 2 (mimicry) \times 2 (video) ANOVA was conducted with as dependent variable the degree to which participants felt that other people are treated fairly by the world. This analysis revealed no main or interaction effects, all F s $<$ 1.

Discussion

In line with our hypotheses, the results revealed that previously mimicking a person resulted men to adhere more strongly to the belief that the world treats them fairly. Mimicry did not influence personal just world beliefs among women, nor did it affect participants' ratings of how the world treats other people. These results were obtained regardless whether the person on the video was male or female.

The finding that personal, not other, just world belief was affected is in line with our proposed mechanism of the effect: we proposed positive feelings for the mimickee to be responsible for the effects of mimicry on just world belief and as personal just world beliefs (not other just world beliefs) are related to pro-social orientation, we expected mimicry to affect only personal just world beliefs. The current study, however, did not directly show that positive feelings for the mimickee are responsible for the effect. To address this limitation, we conducted Study 2.

STUDY 2

Study 1 demonstrated that, for men, mimicking resulted in stronger beliefs that the world is personally just. In Study 2, we zoomed in on this effect. That is, a first aim of Study 2 was to investigate whether the effect of mimicry on personal just world beliefs could be replicated. A second aim was to examine a possible mediator of the effect. As outlined in the introduction, we expected that pro-social feelings for the mimicked person play a role in the link between

mimicry and just world beliefs. Therefore, in Study 2, we also measured participants' feelings for the mimicker to assess whether these feelings mediated the effect we obtained in Study 1 and expect to replicate in Study 2.

Method

Participants and design. Participants were 27 students at Utrecht University (14 women and 13 men, mean age = 22.04 years, range = 18–27 years). They received €3 or course credits for participation. Participants were randomly assigned to one of the conditions of a two (mimicry: present vs. absent) between-participants design. Men and women were equally distributed among the mimicry conditions.

Procedure. The procedure was the same as in Study 1, except that participants watched a different video. On this 3-min video, a student talked about doing her thesis and internship for her Art History study. She described her activities, what she liked and did not like about those activities, and what she had learned during the time in which she did her thesis and internship. On the video, her head and part of her shoulders were visible. While talking, she naturally moved her head, eyes, eyebrows, mouth, lips, hands, and shoulders.

In addition to measuring participants' personal beliefs in a just world (measured as in Study 1, $\alpha = .80$), we also measured the participants' feelings for the person on the video. To assess whether participants felt positively or negatively towards the person in the video, we asked them to indicate on a seven-point scale (1 = *not at all*, 7 = *very much*) to what level they felt enthusiastic, pleased, cheerful happy, sad, angry, tense, worried, irritated, confused, dreary, and mad towards the other person (Cronbach's alpha for positive feelings is .85; Cronbach's alpha for negative feelings is .87). Finally, none of the participants reported anything related to the actual goals of our study when asked in an open-ended question if they knew what the study was about.

Results

Personal BJW. A 2 (gender of participant) \times 2 (mimicry) ANOVA was conducted on the degree to which participants believed the world treats them fairly. Table 2 presents the means and standard deviations. A main effect of mimicry indicated that mimickers evaluated the world as more personally just ($M = 5.23$, $SD = 0.69$) than non-mimickers ($M = 4.70$, $SD = 0.82$), $F(1, 23) = 5.22$, $p = .03$, $\eta^2 = .19$.

Table 2. Mean ratings of participants' personal just world beliefs by mimicry and gender of the participant for Study 2.

| Mimicry | Gender | | | |
|---------|-------------------|-----------|-------------------|-----------|
| | Men | | Women | |
| | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> |
| Present | 5.83 _a | 0.73 | 4.86 _b | 0.32 |
| Absent | 4.63 _b | 1.11 | 4.79 _b | 0.10 |

Note. Means with non-common sub-scripts differ significantly ($p < .05$) within each column.

This main effect was qualified by a gender \times mimicry interaction, $F(1, 23) = 4.16, p = .05, \eta^2 = .15$. For men, mimicking another person led to a stronger belief that the world is personally just ($M = 5.83, SD = 0.73$) than not mimicking ($M = 4.63, SD = 1.11$), $F(1, 23) = 7.71, p = .01$. There was no effect of mimicry for women ($M_{mim} = 4.86, SD = 0.32$ vs. $M_{nomim} = 4.79, SD = 0.10$), $F < 1$. The interaction also revealed that, as in Study 1, only in the mimicry present condition men rated the world as more personally just ($M = 5.83, SD = 0.73$) compared to women ($M = 4.86, SD = 0.32$), $F(1, 23) = 4.13, p = .05$. There was no effect in the mimicry absent condition between men and women ($M_{men} = 4.63, SD = 1.11$ vs. $M_{women} = 4.79, SD = 0.10$), $F < 1$. Thus, mimicry made participants more strongly believe that the world is personally just, but only for men.

Feelings. A 2 (gender of participant) \times 2 (mimicry) \times 2 (feelings) repeated measures ANOVA was conducted with participants' feelings for the person on the video (positive vs. negative) as a within-subjects factor. A main effect of feelings indicated that participants experienced more positive emotions for the person on the video ($M = 4.50, SD = 0.89$) than negative emotions ($M = 2.02, SD = 0.86$), $F(1, 23) = 76.75, p < .001, \eta^2 = .77$. An interaction effect between mimicry and feelings demonstrated that participants who mimicked experienced more positive feelings ($M = 4.75, SD = 0.68$) and less negative feelings ($M = 1.63, SD = 0.55$) than participants who did not mimic (respectively, for positive feelings: $M = 4.27, SD = 1.02$; and for negative feelings: $M = 2.38, SD = 0.96$), $F(1, 23) = 5.07, p = .03, \eta^2 = .18$. Thus, mimickers experienced more positive and less negative feelings for the other person than non-mimickers. This effect of mimicry and feelings did not differ for men and women, that is, there was no gender \times mimicry \times feelings interaction, $F < 1$.

Correlations and mediation. For men, positive feelings for the person on the video were significantly correlated to personal just world beliefs, $r = .61, n = 13, p = .03$. This correlation was not significant for women, $r = .07, n = 14, p = .81$. Furthermore, negative feelings were marginally significantly correlated to personal just world beliefs for men: $r = -.52, n = 13, p = .07$, but not for women: $r = .02, n = 14, p = .94$. Therefore, it is possible that feelings for the (non)mimicked person mediated the differential mimicry effects for men and women on personal just world beliefs. We hypothesized that mimicry affects feelings for the (non)mimicked person (main effect), and that gender influences whether these feelings for the (non)mimicked person in turn affects personal just world beliefs. To test this possible moderated mediation, which is depicted in Figure 1, we used the regression method proposed by Muller, Judd, and Yzerbyt (2005). In agreement with Judd, Kenny and McClelland (2001), we used the difference score of experienced positive and negative feelings as a dependent variable in regression analyses.



Figure 1. Interrelatedness between mimicry, gender, feelings experienced for the (non)mimickee, and personal just world beliefs of Study 2 (moderated mediation).

First, a regression with gender, mimicry, and an interaction term of gender and mimicry on feelings for the person on the video showed a significant main effect of mimicry, $\beta = -.43, t = -2.25, p = .03$. Secondly, a regression with gender, mimicry, and an interaction term of gender and mimicry on personal just world beliefs produced a main effect of mimicry, $\beta = .41, t = 2.28, p = .03$, and an interaction effect between gender and mimicry, $\beta = .36, t = 2.04, p = .05$ (same effects as the ANOVA analysis). After inclusion of the mediator (feelings), the main effect of mimicry on personal just world beliefs was non-significant, $\beta = .20, t = 1.15, p = .26$. Moreover, there was a significant effect of feelings for the (non)mimicked person on personal just world beliefs, $\beta = -.49, t = -2.86, p = .01$. To test whether this mediation was significant, we used a bootstrap method, as proposed by Preacher

and Hayes (2008). With 1,000 re-samples, the confidence interval did not contain zero at the 95% level (indirect effect: CI = .04–.40), indicating that positive feelings was a mediator, $p < .05$. Thus, as hypothesized, mimicry affected positive feelings, which together with gender influenced participants' personal just world beliefs.

Discussion

The present study replicated the results of Study 1: mimicking others changed participants' belief in a personal just world, but only for men. Furthermore, the present study demonstrated that participants' feelings for the (non)mimickee were responsible for this effect. Both male and female mimickers experienced more positive and less negative feelings for the person on the video than non-mimickers. This difference in experienced feelings due to mimicry led participants to view the world differently. Specifically, this latter effect of feelings for the (non)mimickee influencing just world beliefs occurred for men only.

We interpret these findings that when people experience more positive feelings for another person due to mimicking, they also more strongly expect these positive feelings to be returned, which influences their beliefs that the world is just. As men's reciprocity beliefs are stronger than women's and are possibly more strongly influenced by increased positive feelings due to mimicry, this effect occurred for men only. A limitation of the study is that we did not test whether this is the case and whether these beliefs play a mediating role in the effect of mimicry on just world beliefs.

Another limitation of Studies 1 and 2 is that we varied mimicry by instructing participants to either mimic or not mimic the expressions of a person. A control group in which no mimicry instructions are given would have been useful to show whether men's personal just world beliefs are increased due to mimicking or decreased due to not mimicking. Furthermore, we do not know whether spontaneous, non-instructed mimicry would lead to the same effects.

STUDY 3

Studies 1 and 2 demonstrated that, for men, instructing participants to mimic resulted in stronger beliefs that the world is personally just. A first aim of Study 3 was to investigate whether the effect of mimicry on personal just world beliefs could be replicated when measuring participants' spontaneous, non-instructed mimicry reactions. A second aim was to examine whether reciprocity plays a role in the effect. Therefore, in Study 3, we observed participants' spontaneous mimicry reactions and assessed participants' reciprocity beliefs and personal just world beliefs.

We do not expect the results to be different for spontaneous, non-instructed mimicry. Both instructed as non-instructed mimicry lead, via facial feedback of the mimicked movements, to more empathy and understanding and more liking for the person being mimicked. This has been demonstrated in previous studies (e.g., Stel *et al.*, 2009) showing that consequences of non-instructed, spontaneous mimicry does not differ from instructed mimicry. Furthermore, as outlined in the introduction, we expect reciprocity to mediate the effect of mimicry on personal just world beliefs.

Method

Participants and design. Participants were 49 students at Utrecht University (26 women, $M_{\text{age}} = 21.92$ years, range = 18–36 years). They participated for payment (€3) or course credits. The predictor was the amount of mimicry and the dependent variables were reciprocity and personal just world beliefs.

Procedure. The procedure was the same as in Study 2, except that this time we measured the amount of spontaneous mimicry. Thus, participants did not receive any mimicry instructions before they watched the video. While watching the video, their non-verbal reactions were unobtrusively being taped to measure the amount of mimicry participants spontaneously engaged in. After the video, participants received a questionnaire measuring reciprocity and personal just world beliefs. Reciprocity was measured by the 27-item reciprocity scale by Perugini *et al.* (2003) (e.g., ‘When I compliment somebody, I expect that this person will compliment me as well’, $\alpha = .69$). Participants’ personal beliefs in a just world were measured as in Studies 1 and 2 ($\alpha = .82$). All items were measured on seven-point scales (1 = *strongly disagree*, 7 = *strongly agree*). At the end of the experiment, participants were asked in an open-ended question, if they knew what the study was about. None of them reported anything related to the actual goals of our study.

Results

Mimicry. Mimicry was coded as in Study 1. The observed movements of the target were movements of head, eyes, eyebrows, mouth, lips, hand gestures, and shoulders. In total, 74 target movements were observed. Due to technical problems with the camera, we did not obtain mimicry scores of five participants (three men and two women).

A 2 (gender of participant) ANOVA was conducted with as dependent variable the number of participants’ spontaneous mimicry reactions. The analysis revealed that there was no effect of

gender, $F < 1$, *ns*: the spontaneous mimicry levels of men ($M = 9.05$, $SD = 11.95$; 12.23% of all the behaviours shown by the target) and women ($M = 6.17$, $SD = 8.77$; 8.34% of all the behaviours shown by the target) did not differ.

Personal BJW. A regression analyses was conducted with the level of mimicry, gender, and an interaction term of the standardized variables mimicry and gender as predictors and with the degree to which participants believed the world treats them fairly as dependent variable. The interaction between mimicry and gender was significant, $\beta = .30$, $t = 1.97$, $p = .05$. The interaction entails that for men, the more they engaged in spontaneous mimicry, the more they believed that the world treats them fairly, $\beta = .44$, $t = 2.08$, $p = .05$. For women, mimicry did not predict their personal belief in a just world, $\beta = -.18$, $t < 1$, *ns*. There were no main effects of mimicry or gender, $t < 1$, *ns*.

Reciprocity. A regression analyses was conducted with the level of mimicry, gender, and an interaction term of the standardized variables mimicry and gender as predictors and with as dependent variable participants' reciprocity level. An interaction between mimicry and gender was marginally significant, $\beta = .26$, $t = 1.70$, $p = .10$. The interaction entails that for men, the more they engaged in spontaneous mimicry, the more they believed that their feelings and behaviours would be reciprocated, $\beta = .51$, $t = 2.49$, $p = .02$. For women, mimicry did not predict their reciprocity beliefs, $\beta = -.08$, $t < 1$, *ns*. There were no main effects of mimicry or gender, $t < 1$, *ns*.

Mediation. To test whether participants' reciprocity belief was a mediator in the effect of mimicry and gender on personal BJW, we used the regression method proposed by Baron and Kenny (1986). The effect of mimicry and gender on personal just world beliefs, $\beta = .30$, $t = 1.97$, $p = .05$ (see also above), was non-significant after inclusion of the mediator (reciprocity), $\beta = .23$, $t = 1.50$, $p = .14$. Moreover, there was a marginally significant effect of reciprocity on personal just world beliefs, $\beta = .27$, $t = 1.77$, $p = .08$. To test whether this mediation was significant, we used a bootstrap method, as proposed by Preacher and Hayes (2008). With 1,000 re-samples, the confidence interval did not contain zero at the 95% level (indirect effect: $CI = .05-.56$), indicating that reciprocity was a mediator, $p < .05$.

Discussion

The effects of Studies 1 and 2 were replicated when measuring participants' non-instructed, spontaneous mimicry reactions: spontaneous mimicry reactions were related to personal just world beliefs for men, but not for women. Furthermore, reciprocity beliefs mediated this effect. Contrary to our expectations, men did not have stronger reciprocity beliefs than women in general. They did, however, have stronger reciprocity beliefs than women in the mimicry condition. This is not surprising as especially when one feels positive about another person, for instance via mimicry, one would like these feelings to be reciprocated. These enhanced reciprocity beliefs of men due to mimicry, in turn, affected their personal beliefs in a just world. In sum, the results show that the stronger men mimicked, the stronger they believed that their feelings will be returned, which in turn affected their beliefs that the world is just for them.

GENERAL DISCUSSION

Across three studies, we have demonstrated that mimicry is related to men's personal just world beliefs. More specifically, we revealed that instructed mimicking, compared to not mimicking, led male participants to stronger beliefs that the world treats them fairly (Studies 1–2) and that non-instructed, spontaneous mimicking is related to stronger just world beliefs for men (Study 3). In all three studies, these effects were obtained for men, not for women. Beliefs about whether the world treats other people fairly remained unaffected by mimicry (Study 1). This result that personal just world beliefs, but not other just world beliefs were affected was replicated in an additional, unpublished study (Stel & Van den Bos, 2011).² Finally, in the present studies, we showed that the differential mimicry effect for men and women on personal just world beliefs was mediated by their feelings for the person they did or did not mimic: when mimicking the expressions of a person, men and women felt more positive and less negative towards this person. These feelings played a role in the effect of mimicry on personal just world beliefs (Study 2). These positive feelings due to mimicry were more strongly expected to be returned by men, which influenced their beliefs about whether the world treats them fairly (Study 3).

These findings extend previous research on mimicry and just world beliefs by showing that the two are related. With the current studies, we showed that mimicry influences male's beliefs about whether they are treated fairly by the world. As these beliefs influence whether we see the world positively and whether we feel and act positive towards others in general, our results have important implications. The results imply that when we attempt to socially connect with other people, this produces a belief that the world is just for the self because

people feel more positive emotions for the other person and expect these emotions to be returned.

In our studies, we found an effect of mimicry on the personal belief in a just world. The just world beliefs were measured with a scale that is normally used to measure stable individual differences in people's just world beliefs. Our results are interesting, we believe, because we showed that the belief in a just world scale can be influenced depending on the specific situation a person is in and on other people that are in that situation. This is in line with the findings of Schmitt, Gollwitzer, Maes, and Arbach (2005) showing that a substantial amount of variance of justice judgments is not explained by stable individual differences (see also Wijn & Van den Bos, 2010). Relatedly, the effects of mimicry are powerful in that they showed that mimicking *one* specific person increased men's beliefs about whether *the world* generally treats them fairly. We expect even stronger effects when people judge fairness with regard to the mimicry situation. For example, when people would evaluate whether a judgment about them made by another person was fair after they mimicked or not mimicked this person. This could be investigated in future research.

A limitation of the present studies is that we did not investigate both mediators, feelings for the (non)mimicked person and reciprocity beliefs, in one study. Despite this limitation, we do feel that a strong case can be made on the basis of the combination of our findings. Furthermore, it is important to note that in Study 3, reciprocity beliefs measured the extent to which participants believed that feelings for another person and acts towards another person are reciprocated. Thus, the reciprocity beliefs which mediated the effects of mimicry and gender on personal just world beliefs did refer to feelings felt for a specific other person. We have no indication that the results were due to instruction effects. First, the results of Studies 1 and 3 showed that men and women did not show differences in their instructed or spontaneous mimicry levels. Most importantly, the results of Study 3 showed that non-instructed mimicry affected personal just world beliefs in the same way as instructed mimicry. As participants in Study 3 were unaware that we were interested in mimicry behaviour, a demand characteristics explanation could not explain the results. Moreover, we can think of no reason why men and women and why personal and other beliefs would be differentially affected by effects due to instructions.

We interpret the effect of mimicry on personal just world beliefs as caused by specific feelings for the mimicked person, which are expected to be returned. Alternatively, one could argue that although we asked participants to indicate their feelings towards the person on the video, it is possible that mimicry caused them to generally feel more positive and less negative. We do think that the results are caused by feelings for the (non)mimicked person and not by mood. First of all, previous studies showed no general mood effects due to mimicking others, but did show effects on feelings for the mimickee (e.g., see Stel *et al.*, 2008). More importantly, if the results were due to a general positive mood caused by mimicry, one would expect that this positive mood influenced judgments in general. However, participants' beliefs about whether the world treats other people fairly, were unaffected by mimicry. Also, please recall that just world beliefs are not necessarily positive beliefs: they also entail that punishments were justified. Finally, in Study 3 we showed that beliefs about positive and negative feelings for another person and positive and negative acts towards another person being reciprocated mediated the effect.

To conclude, this paper extends previous research by showing that mimicry influences just world beliefs for men. As people mimic each other continuously in everyday life, our results are important because it implies that peoples' view of being treated fairly by others is dynamically influenced by our daily interactions. When having been mimicking the movements of another person, men feel that they are being treated more fairly by the world. Thus, for men, mimicry makes the world seem as a just place for them!

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