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The Look that Binds: Partner-Directed Altruistic Motivation and Biased Perception in Married Couples

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Abstract   A trustworthy appearance is regarded as a marker of a globally positive personality and, thus, evokes a host of benevolent responses from perceivers. Nevertheless, it is yet to be determined whether the reverse is also true, that is, whether social targets who evoke unambiguously benign motivations in perceivers are regarded as possessing a more trustworthy appearance (cf. Oosterhof and Todorov in Emotion 9:128–133, 2008). To this end, elderly long-term married couples completed measures of partner-directed altruistic motivation, accommodative behaviors, marital satisfaction, and trust in the partner. They also completed a face-processing task involving spousal and stranger faces 1 year later. Higher motivation to prioritize a spouse's well-being (but none of the other relationship functioning variables assessed) predicted perceiving one's spouse's emotionally neutral face as being more trustworthy-looking. Results are discussed in the context of the reciprocal relationship between higher-order motivational processes and basic perceptual mechanisms in shaping relational climates.

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Introduction

Because efficient detection of a potential friend or foe is crucial to both interpersonal success and personal well-being, humans have evolved rapid, intuitive, unreflective mechanisms for making such decisions based solely on the physical attributes of their conspecifics (Todorov et al. 2008; Zebrowitz et al. 1996). Indeed, a growing body of research attests to the impact of facial appearance on perceivers' trustworthiness evaluations and consequent behaviors towards strangers. For example, in a courtroom-like experimental setting, participants required less evidence to reach a guilty verdict and were more confident in their decision when the supposed defendant had an untrustworthy, rather than trustworthy, appearance (Porter et al. 2010). Likewise, in the context of an economic trust game, participants gave more money to trustworthy, relative to untrustworthy, game partners (independent of the partners' perceived physical attractiveness)—an effect that persisted to some extent even when participants were provided with diagnostic behavioral information regarding their game partners (Rezlescu et al. 2012; van't Wout and Sanfey 2008).

Said et al. (2009) proposed that perceiving trustworthiness in emotionally neutral faces is supported by emotion recognition systems that extract valence-related information from structural facial characteristics suggestive of emotional expressions—information that is subsequently mapped onto socially relevant personality traits. So, for example, faces judged to be the most trustworthy structurally resemble expressions of happiness, whereas faces judged to be the most untrustworthy structurally resemble expressions of anger (Oosterhof and Todorov 2008). Importantly, however, such faces are consciously perceived as being emotionally neutral. Thus, although the emotional arousal in perceivers that results from recruitment of emotion processing systems biases their global evaluation of target faces, perceivers tend to misattribute that arousal, interpreting it as indicative of the presence of socially relevant traits—such as trustworthiness—manifest by the target faces (Said et al. 2009). Faces that elicit negatively valenced arousal are judged therefore as globally negative and perceived as untrustworthy, whereas faces that elicit positively valenced arousal are judged as globally positive and perceived as trustworthy (Oosterhof and Todorov 2008; Todorov and Engell 2008).

Of particular relevance to the present research, Petrican et al. (2014) used the model of face evaluation developed by Oosterhof and Todorov (2008) to show that structural facial characteristics suggestive of greater trustworthiness impact the social evaluations of older targets among older perceivers: Elderly targets with a more trustworthy appearance were expected to be more pleasant interlocutors and ascribed a more globally positive personality by both their spouses and unfamiliar, elderly raters. Thus, irrespective of the age of targets or perceivers, a trustworthy appearance seems to be regarded by perceivers as reflecting a globally positive personality capable of evoking a host of benevolent perceiver reactions (Porter et al. 2010; Rezlescu et al. 2012; van't Wout and Sanfey 2008).

Is it possible that the reverse is also true? That is, might perceivers regard targets who evoke an unambiguously benign motivation as having a globally positive (i.e., more trustworthy) physical appearance (cf. Oosterhof and Todorov 2008)? We would argue that this is an important research question, for it has the potential to shed light on the perceptual

mechanisms supporting the stability of interpersonal motivations, and also to elucidate some of the mechanisms through which a perceiver's expectations and goals may evoke congruent behaviors from a social target.

Such a line of inquiry may be particularly relevant to situations that entail prolonged contact between a perceiver and a social target, such as an intimate partnership context. Indeed, investigations of this sort have some precedent in close relationships research. For example, there is evidence that global, relationship-relevant motivational factors impact intimates' basic cognitive-perceptual responding. Thus, individuals who are committed to their relationship evaluate their partner—including his or her physical attributes—in an idealized manner (i.e., more positively than the partner evaluates himself or herself or is evaluated by others: Murray et al. 1996; Penton-Voak et al. 2007; Swami et al. 2010). Complementarily, they attend less to (Maner et al. 2009; Miller 1997) or derogate (Lydon et al. 2003) tempting alternative partners, and this can manifest even at a basic perceptual level (e.g., in their memory representation of an alternative partner's face, as in Karremans et al. 2011). It has yet to be determined, however, whether more specific partner-directed motivational factors (i.e., beyond global relationship commitment) would similarly distort cognitive-perceptual processing.

The present study took a first step in that direction by exploring whether individual differences in the motivation to preserve and promote a partner's well-being, even if costly to the self (i.e., altruistic motivation), would contribute to congruent perceptual biases. We focused on partner-directed altruistic motivation because it is the most unambiguously benign interpersonal motivation, as the actor is presumably willing to sacrifice his/her own well-being for that of his/her partner. Thus, we sought to elucidate whether such a globally positive motivational orientation toward a partner would predict biases in perceptual processing, indicative of "seeing" the partner's face as having a globally positive (i.e., trustworthy) appearance. Importantly, although we regarded such perceptual biases as by-products (rather than determinants) of a perceiver's motivational orientations, we reasoned that these biases nevertheless may elicit congruent behaviors from a target and therefore contribute indirectly to the stability of interpersonal motivations.

In light of Petrican et al. (2014), we focused on elderly, long-term married couples: Given the duration of these relationships, we assumed that spouses' motivational orientations toward each other (i.e., more vs. less altruistic) and any potential congruent cognitive-perceptual distortions would be at least somewhat stable (cf. Murray and Holmes 2009). We hypothesized that comparatively greater partner-directed altruistic motivation among intimates would predict a subsequently greater tendency to perceive that partner's face as containing "objective" cues indicative of his or her trustworthiness (i.e., globally positive self; cf. Oosterhof and Todorov 2008).

To this end, we collected data in two waves. At Time 1, participants completed self-report measures of partner-directed altruistic motivation, frequency of accommodative behaviors during relational conflicts, and measures of marital satisfaction and trust in the partner. The partner-directed altruistic motivation measure was the primary predictor variable of interest. The accommodative behaviors measure was included for two purposes. First, we reasoned that a positive correlation between our partner-directed altruistic motivation measure and self-reported incidence of partner-directed accommodative behaviors would contribute to the construct validity of the former. Second, because prior research has documented that both actor and partner relationship-relevant (i.e., self-serving vs. partner- and/or relationship-promoting) behaviors impact longitudinal change in partner evaluations (cf. Murray and Holmes 2009; Murray et al. 2010), the respective Time 1 actor and partner self-reports of accommodative behaviors were used as control variables in the

analyses involving the effect of Time 1 partner-directed altruistic motivation on Time 2 partner face processing (described below). Similarly, inclusion of the marital satisfaction measure allowed us to rule out the possibility that performance on the face processing task could be attributed to global positive/negative feelings about the marriage. Finally, we reasoned that inclusion of the measure assessing trust in the partner would help us show that it is not the partner's "actual" trustworthiness (as perceived by the actor), but rather the actor's motivational orientation towards the partner, that determines how the actor perceives the partner. Importantly, despite the inherent subjectivity of such judgments, prior research suggests that an actor's trust in the partner is influenced by actual partner attributes relevant to predictability (e.g., self-concealment, Finkenauer et al. 2009) and dependability (e.g., willingness to behave in a pro-relationship manner, Wieselquist et al. 1999 or ability to act on his/her good intentions, i.e., self-control, Righetti and Finkenauer 2011).

Spouses completed the putative face processing task at Time 2, 1 year later. Two facial morphs—appearing either trustworthy or untrustworthy (cf. Oosterhof and Todorov 2008)—were created to be equally structurally similar to an emotionally neutral representation of the spouse's face. We were particularly interested in whether spouses who reported greater partner-directed altruistic motivation would perceive their partner's face as being more similar to the trustworthy-looking versus the untrustworthy-looking morph.

In order to establish the specificity of the relationship between partner-directed altruistic motivation and biased perception of the partner's face, participants also responded to five unfamiliar faces of the same age and gender as the partner. This control seemed critical in light of prior findings showing that although older adults may exhibit a positivity bias in information processing, this effect shows considerable inter-individual variation (for a review, see Mather and Carstensen 2005). Thus, including non-partner faces allowed us to isolate partner-specific effects by controlling for such inter-individual variation.

Method

Participants[1]

Participants were both members of fifty-two elderly couples [women's age: $M = 69.79$ years ($SD = 6.22$); men's age: $M = 71.43$ years ($SD = 6.42$)]. They had been married between 15 and 60 years ($M = 42.14$, $SD = 9.48$). All were screened for cognitive or neurological problems.

Procedure

Time 1

During this session, participants' photographs were taken. Subsequently, they filled out measures of partner-directed altruistic motivation, accommodative behaviors, marital satisfaction, and trust in the partner.

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[1] The sample is the same as the one used in Petrican et al. (2014). Nevertheless, there is no overlap in the discussed measures, although in the Control Analyses section, we verify that the main predictor variable from Petrican et al., the participants' software-based facial trustworthiness (cf. Oosterhof and Todorov 2008), did not impact our present findings.

Time 2

One year after completing the first session, all couples were contacted and invited to participate in a follow-up session in which they completed the face processing task (see below). Although we intended for the study to have a longitudinal design, the actual length of the delay between the two study sessions was dictated by practical constraints pertaining to both participants' availability (i.e., most couples were only available for testing September–November and February–May) and to the creation of the task stimuli, which was accomplished in a different laboratory from the one in which participants were tested.

Only 31 couples were willing to return to the lab. There were no significant differences between couples who participated in the Time 2 session versus those who did not on any of the measures collected apart from relationship length, $t(50) = -2.284$, $p = .027$ [all other $ps > .10$; for partner-directed altruistic motivation, $t(101) = -.352$, $p = .726$]. That is, couples who participated in the Time 2 session had been married longer at Time 1 ($M = 44.33$ years, $SD = 8.72$ years) relative to those who did not ($M = 38.34$ years, $SD = 9.76$ years). Controlling for relationship length left all reported results unchanged and exerted no significant moderating effects (all $ps > .57$), however; consequently, we present the simpler analyses.

Tasks and Measures

Partner-Directed Altruistic Motivation

Participants completed a self-report scale assessing their motivation to preserve and promote their spouse's well-being (i.e., partner-directed altruistic motivation, cf. Rempel and Burris 2005) comprised of four items: "I think I would endure a lot myself if I truly believed it would keep my partner from suffering;" "Whether or not I am part of it, I truly want what's best for my partner;" "I value my partner's happiness and well-being and want to contribute to his/her life in some way for no other reason than that;" "I truly want good things to happen to my partner whether they affect me directly or not." The thematic content of this scale has been shown elsewhere to map distinctively onto the experience of emotional empathy (Rempel et al. 2008), which is one of the most reliable precursors of prosocial motivation and behavior (see Batson 1990). The scale used a 1 (*doesn't match my experience at all*) to 7 (*matches my experience exactly*) response format. Cronbach's alpha was .75 ($M = 6.01$; $SD = .99$).

Biased Partner Perception

Participants also completed a self-paced, 60-trial face processing task. For each trial, participants saw a face presented at the top center of the screen, and two faces presented on the lower left and right, respectively. Participants' task was to decide as quickly as possible which of the two lateral faces was most similar to the top central face.

Across all trials, participants saw six different central faces: One was the Facegen model of their spouse's face, and the remaining five were Facegen models of other opposite sex study participants. To obtain models of participants' faces, photographs of each participant were taken at the beginning of the Time 1 study session using a Canon PowerShot SD870 1S digital camera. In order to encourage a neutral expression, participants were instructed to imagine that they were posing for a Canadian passport-type photograph in which no smile or any other emotional display is permitted. Models of participants' faces were

generated in Facegen using the Photofit option on one forward facing picture for each person. More than half of the participants were wearing glasses (all had clear frames); because we were concerned that their removal might adversely impact ability to maintain a neutral expression (e.g., by squinting their eyes to be able to see the photographer more clearly), we allowed participants to keep their glasses on (with posing adjusted as needed to minimize glare). Preliminary analyses confirmed that the glasses variable did not significantly impact any of the effects reported (all $ps > .43$).

The two lateral faces were created by using the computational model of face evaluation developed by Oosterhof and Todorov (2008) and implemented in Facegen Modeller software version 3.2. Specifically, the participants' faces were imported in Facegen and scores on facial trustworthiness were automatically generated for each face as standard deviations from zero (i.e., the average of the database of faces on which the face evaluation model is based). Subsequently, ten novel pairs of facial stimuli were created for each participant using his/her Facegen model and the Valence/Trustworthiness control in Oosterhof and Todorov's program. Within each pair, the structural features of each face were manipulated to be physically equidistant (i.e., equally similar) from the original face in the direction of either greater or lesser trustworthiness (for sample face sets, see Fig. 1a, b). The pair most similar to the original was two standard deviations above and below, respectively, the trustworthiness score of the original face, as determined by Oosterhof and Todorov's (2008) software (see above). The subsequent pairs were created in 0.10 SD increments, such that the pair most dissimilar to the original was 2.90 SDs above and below, respectively, the trustworthiness score of the original face. The location of the two facial morphs was counterbalanced across trials, such that for each of the six central faces
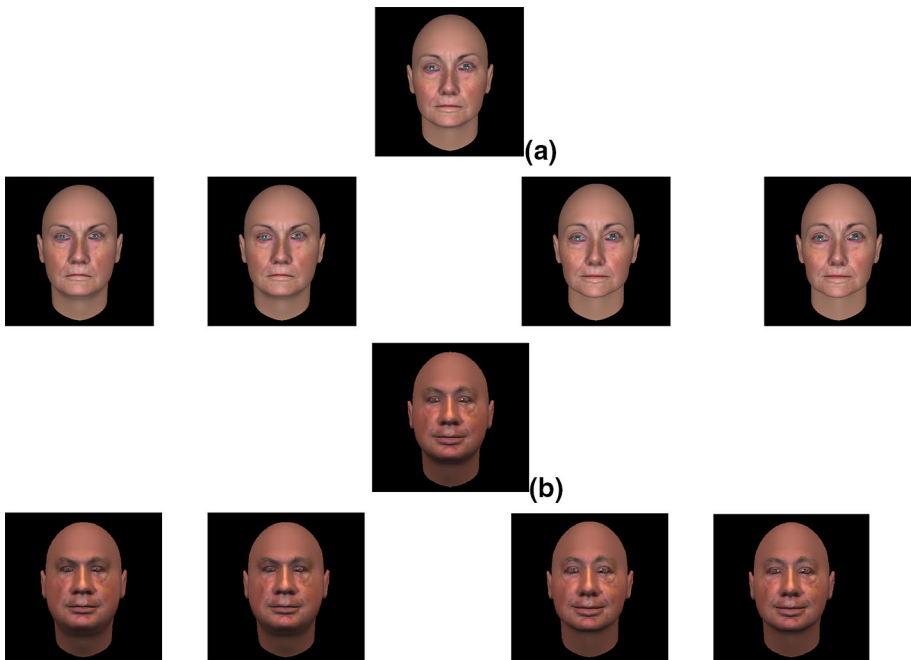
Fig. 1 Examples of female (**a**) and male (**b**) faces and morphs 2.9 and 2.5 standard deviations below (*Left*) and above (*Right*) the valence/trustworthiness score of the original face

that each participant saw, the trustworthy morph appeared on the right for half of the trials, and on the left for half of the trials. In the task, each participant made 60 judgments in total: ten based on pairs of morphs of his/her spouse's face, and 50 based on pairs of morphs based on the faces of five other opposite-sex participants (i.e., ten pairs each). The presentation of the 60 face pairs was randomized for each participant.

Control Measures

Accommodative Behaviors

To assess exposure to marital situations in which either spouse behaved, or failed to behave, responsively at Time 1 (cf. Murray et al. 2010), we developed a 16-item instrument of accommodative behaviors during relationship conflicts based on the description of a similar instrument in Wieselquist et al. (1999). The instrument contained four stems, each describing a situation in which a partner behaved destructively (e.g., "When my partner is upset and says something mean to me or snaps at me…"). Each stem was followed by four items—one each for an active, negative response (i.e., "I feel so angry that I want to walk right out the door"), an active positive response (i.e., "I urge my partner to discuss and find solutions to our problems"), a passive positive response (i.e., "I am waiting and hoping for things to improve"), and a passive negative response (i.e., "I ignore him/her and/or criticize him/her for things unrelated to the real problem"). Participants reported the frequency with which they engaged in each of 16 responses (four responses for each of the four stems; $1 = never,\ 7 = always$). Following Wieselquist et al.'s guidelines, we reverse-scored the negative behavioral responses and averaged them with the positive behavioral responses to relationship conflicts. Thus, higher (vs. lower) values indicate greater frequency of behaving constructively during relational duress. The resulting 16-item scale evidenced good psychometric qualities (Cronbach's alpha .81; $M = 5.10$; $SD = .84$).

Marital Satisfaction

Using a 5-point (*strongly disagree* to *strongly agree*) response format, participants completed Norton's (1983) 6-item Quality of Marriage Index (e.g., "My relationship with my partner makes me happy"). Cronbach's alpha was .89 ($M = 4.51$; $SD = .62$).

Trust in the Partner

To gauge participants' faith in their partner's dependability and future expressions of good will, we had them complete a 15-item trust scale (Rempel and Holmes 1986) that assessed ($1 = not\ at\ all\ confident$; $7 = extremely\ confident$) participants' confidence in predicting a number of future positive and negative (reverse-coded) partner behaviors. The scale demonstrated good psychometric qualities (Cronbach's alpha .97; $M = 5.54$; $SD = 1.31$).

Data Analytic Strategy

In all analyses, we used hierarchical linear modeling techniques (HLM 7.01, Raudenbush et al. 2013; see also Nezlek 2008). All models contained two levels, wherein individuals (level-1) were nested within couples (level-2). To test our hypothesis regarding the effect of partner-directed altruistic motivation on spousal face processing, we conducted a Poisson regression (with constant exposure) in HLM, because the outcome (i.e., percentage

of trials on which the trustworthy morph was selected in response to spousal vs. non-spousal faces) was a count-like variable. Following the recommendations of Campbell and Kashy (2002) for analysis of dyadic data in HLM, we tested hypotheses by running fixed slopes regression models. All level-1 variables were mean-centered. Because the level-1 data violated normality assumptions, we report the robust standard error estimates for all analyses below (Hox 2002).

Results

Preliminary Analyses

Relationship Functioning

Using a two-level HLM model, with individuals (level-1) embedded in couples (level-2), we verified at Time 1 that stronger partner-directed altruistic motivation predicted greater self-reported incidence of partner-directed accommodative behaviors, $b = .31$, $SE = .08$, $t(51) = 3.84$, $p < .01$. Moreover, spouses who were more satisfied with their marriage reported both stronger partner-directed altruistic motivation, $b = .40$, $SE = .13$, $t(51) = 3.02$, $p < .01$, and greater incidence of accommodative behaviors, $b = .64$, $SE = .10$, $t(51) = 6.17$, $p < .01$. Similar effects were observed in spouses who reported greater trust in their partner, $b = .28$, $SE = .08$, $t(51) = 3.57$, $p < .01$ (for partner-directed altruistic motivation), and $b = .25$, $SE = .06$, $t(51) = 4.40$, $p < .01$ (for incidence of accommodative behaviors). Nevertheless, reflective of its unique explanatory power, partner-directed altruistic motivation remained significantly associated with accommodative behaviors even after controlling for self-reported marital satisfaction and trust in the partner, $b = .21$, $SE = .06$, $t(49) = 3.59$, $p < .01$.

Face Processing

We first explored whether there were any between- or within-couple differences in performance on the face processing task. For these analyses, we conducted Poisson regressions (with constant exposure) on participants' face processing responses using two-level HLM models. For the analyses involving between-couple effects, marriage length was introduced as a level-2 predictor. For the analyses involving within-couple effects, gender was introduced as a level-1 predictor.

Between-Couple Effects

There was no effect of perceivers' marriage length on their tendency to choose the trustworthy-looking morph in response to either their spouse or a stranger (both $ps > .54$). Likewise, there was not a significant link between the targets' marriage length and strangers' perceptions of the targets' trustworthiness, as reflected on the face processing task ($p > .63$).

Within-Couple Effects

There was no effect of gender on the tendency to choose the trustworthy looking morph in response to one's spouse ($p > .47$). Nevertheless, in response to strangers, women

($M = 64.65 \pm 1.66$ % of the trials) chose the trustworthy looking morph more often than men did ($M = 53.16 \pm 2.82$ % of the trials), $b = .20$ $SE = .06$, $t(30) = 3.49$, $p < .01$. In light of the absence of a significant effect of gender on responses to the spouse's face and the fact that controlling for gender left all reported results unchanged, we present the simpler analyses that do not include gender as a covariate below.

Cross-Target Effects

To test whether there was a tendency for some participants to choose the trustworthy looking morph in response to both their spouse's face and strangers' faces, we conducted a Poisson regression (with constant exposure) on participants' face processing responses using a two-level HLM model. The results indeed offered evidence consistent with inter-individual differences in the tendency to choose the trustworthy looking morph as being more similar to the target face, irrespective of the latter's identity, $b = .02$, $SE = .01$, $t(30) = 2.77$, $p = .01$.

Time 1 Partner-Directed Altruistic Motivation and Time 2 Biased Partner Perception

To test our hypothesis regarding the effect of partner-directed altruistic motivation on participants' valence-related processing of spousal faces, we used a two-level HLM model and conducted a Poisson regression (with constant exposure) on the percentage of trials in which participants chose the trustworthy morph in response to their spouse's face. Because preliminary analyses revealed systematic inter-individual differences in the tendency to choose the trustworthy looking morph across all identities, we controlled for the percentage of trials that the trustworthy looking morph was selected in responses to the faces of strangers. Likewise, self and partner accommodative behaviors at Time 1 were introduced as controls due to their reported impact on longitudinal fluctuations in partner evaluations (cf. Murray and Holmes 2009; Murray et al. 2010). Partner altruistic motivation was also introduced as a covariate in the model to control for the possibility that partner altruistic motivation at Time 1, manifest in behaviors that were not assessed in our study, could impact responses on the face processing task at Time 2. Finally, in light of the significant positive association between marital satisfaction and altruistic motivation directed towards the spouse (see "Preliminary Analyses"), we also introduced actor and partner marital satis-faction as controls to verify that all the observed effects were not merely an artifact of lower versus higher marital quality. Results supported the hypothesis that greater altruistic moti-vation directed towards the spouse would predict a higher percentage of trials on which the trustworthy versus untrustworthy-looking morph would be selected as being more similar to the spouse's face, $b = .14$, $SE = .06$, $t(24) = 2.30$, $p = .03$ ($M = 63.43 \pm 3$ % of the trials vs. $M = 49.90 \pm 2.5$ % of the trials; see regression 1 in Table 1).

Control Analyses

Perceiver/Actor-Relevant

Biased Perception of Unfamiliar Faces   To test the specificity of the hypothesized effect of partner-directed altruistic motivation on biased partner perception, we subsequently conducted the complementary analysis that focused on the percentage of trials in which the trustworthy looking morph was selected in response to unfamiliar faces: This analysis used

the same regression predictors as the main hypothesis testing analysis, but with percentage of trials that the trustworthy-looking morph was chosen in response to spousal faces as an additional covariate. Results provided no evidence of a significant effect of partner-directed altruistic motivation on biased perception of unfamiliar faces, $b = -.06$, $SE = .03$, $t(24) = -1.97$, $p = .06$ (see regression 2 in Table 1).

Trust in the Partner   To further probe the specificity of the hypothesized effect of partner-directed altruistic motivation on biased partner perception, we examined whether this association would be impacted by the partner's "actual" trustworthiness, as rated by the actor. The effect of partner-directed altruistic motivation remained significant when controlling for trust, $b = .13$, $SE = .06$, $t(23) = 2.20$, $p = .04$ (see regression 3 in Table 1). Thus, it is not the partner's "actual" trustworthiness as judged by the actor, but rather the actor's motivation, that determines what s/he sees in the partner.

Target/Partner-Relevant

Facial Trustworthiness (Software-Based)   We also conducted a set of analyses to verify that the association between partner-directed altruistic motivation and biased partner perception could not be accounted for by actual structural features of the target's unaltered face as reflected in his/her facial trustworthiness score obtained via Oosterhof and Todorov's (2008) software (cf. Petrican et al. 2014). Results revealed no significant association between a target's software-assigned facial trustworthiness score and the percentage of trials that his or her spouse selected the trustworthy-looking morph as being more similar to the target's face, $b = .04$, $SE = .10$, $t(30) = .45$, $p > .65$. Consequently, controlling for a target's structural facial trustworthiness score left intact the link between his or her spouse's partner-directed altruistic motivation and biased perception of the target's face, $b = .14$, $SE = .06$, $t(23) = 2.31$, $p = .03$ (see regression 4 in Table 1).

Facial Trustworthiness (as Judged by Strangers)   As an extension of the above logic, we also explored whether there was a significant correlation between the percentage of trials that the trustworthy morph was selected in response to a target by the target's spouse and by other participants of the same gender as the target's spouse who were not acquainted with the target. We found no evidence of a significant link between the two, $b = .004$, $SE = .004$, $t(30) = .94$, $p = .35$. Hence, controlling for strangers' responses to the target left unchanged the reported effect of the perceiving spouse's altruistic motivation, $b = .14$, $SE = .06$, $t(23) = 2.32$, $p = .03$ (see regression 5 in Table 1).

Discussion

The present study is the first, to our knowledge, to show that motivational processes germane to close relationship dynamics predict congruent partner-related biases in face perception. Specifically, complementing previous findings that trustworthy-looking targets—compared to their untrustworthy-looking counterparts—are more likely to elicit a host of global positive responses from strangers (Petrican et al. 2014; Rezlescu et al. 2012; van't Wout and Sanfey 2008), we found that participants who reported comparatively greater partner-directed altruistic motivation tended to perceive their spouse's emotionally neutral face as reflective of greater trustworthiness (i.e., having a globally positive

Table 1 HLM Regression Analyses Predicting the Percentage of Trials on which the Actor Selected the Trustworthy Looking Morph in Response to His/Her Partner or the Stranger as a function of Altruistic Motivation (Actor and Partner Effects), Accommodative Behaviors (Actor and Partner Effects), Marital Satisfaction (Actor and Partner Effects), Trust in the Partner (Actor Effect) and the Partner's Facial Trustworthiness

Fixed effect	Coefficient	SE	t value (dfs)
1.Outcome: % Trials on which the ACTOR selects the TRUSTWORTHY looking morph in response to his/her SPOUSE			
For INTERCEPT, β_0	4.03	.05	75.39 (30)**
For ACTOR altruistic motivation SLOPE, β_1	.14	.06	2.30 (24)*
For PARTNER altruistic motivation SLOPE, β_2	−.01	.07	−.16 (24)
For ACTOR accommodative behaviors SLOPE, β_3	−.01	.02	−.37 (24)
For PARTNER accommodative behaviors SLOPE, β_4	.01	.03	.55 (24)
For ACTOR marital satisfaction SLOPE, β_5	−.02	.12	−.15 (24)
For PARTNER marital satisfaction SLOPE, β_6	−.01	.17	−.05 (24)
For % trials on which the ACTOR selects the TRUSTWORTHY looking morph in response to the STRANGER, β_7	.02	.01	3.23 (24)**
2.Outcome: % Trials on which the ACTOR selects the TRUSTWORTHY looking morph in response to the STRANGER			
For INTERCEPT, β_0	4.07	.03	141.53 (30)**
For ACTOR altruistic motivation SLOPE, β_1	−.06	.03	−1.97 (24)
For PARTNER altruistic motivation SLOPE, β_2	.01	.04	.36 (24)
For ACTOR accommodative behaviors SLOPE, β_3	−.01	.01	−.92 (24)
For PARTNER accommodative behaviors SLOPE, β_4	−.002	.01	−.16 (24)
For ACTOR marital satisfaction SLOPE, β_5	−.08	.05	−1.57 (24)
For PARTNER Marital Satisfaction SLOPE, β_6	.07	.08	.97 (24)
For % trials on which the ACTOR selects the TRUSTWORTHY looking morph in response to his/her SPOUSE, β_7	.003	.002	2.30 (24)*
3.Outcome: % Trials on which the ACTOR selects the TRUSTWORTHY looking morph in response to his/her SPOUSE			
For INTERCEPT, β_0	4.03	.05	74.91 (30)**
For ACTOR altruistic motivation SLOPE, β_1	.13	.06	2.20 (23)*
For PARTNER altruistic motivation SLOPE, β_2	−.01	.07	−.19 (23)
For ACTOR accommodative behaviors SLOPE, β_3	−.01	.02	−.40 (23)
For PARTNER accommodative behaviors SLOPE, β_4	.01	.03	.53 (23)
For ACTOR marital satisfaction SLOPE, β_5	−.05	.21	−.24 (23)
For PARTNER marital satisfaction SLOPE, β_6	−.01	.16	−.08 (23)
For % trials on which the ACTOR selects the TRUSTWORTHY looking morph in response to the STRANGER, β_7	.02	.01	3.22 (23)**
For ACTOR trust in the partner, β_8	.02	.08	.23 (23)
4.Outcome: % Trials on which the ACTOR selects the TRUSTWORTHY looking morph in response to his/her SPOUSE			
For INTERCEPT, β_0	4.03	.05	75.38 (30)**
For ACTOR altruistic motivation SLOPE, β_1	.14	.06	2.31 (23)*
For PARTNER altruistic motivation SLOPE, β_2	−.01	.07	−.17 (23)
For ACTOR accommodative behaviors SLOPE, β_3	−.01	.02	−.38 (23)
For PARTNER accommodative behaviors SLOPE, β_4	.02	.03	.54 (23)
For ACTOR marital satisfaction SLOPE, β_5	−.02	.12	−.15 (23)

Table 1 continued

Fixed effect	Coefficient	SE	t value (dfs)
For PARTNER marital satisfaction SLOPE, β_6	−.01	.18	−.03 (23)
For % trials on which the ACTOR selects the TRUSTWORTHY looking morph in response to the STRANGER, β_7	.02	.01	3.16 (23)**
For software-based PARTNER facial trustworthiness, β_8	−.01	.12	−.11 (23)
5. Outcome: % Trials on which the ACTOR selects the TRUSTWORTHY looking morph in response to his/her SPOUSE			
For INTERCEPT, β_0	4.03	.05	73.78 (30)**
For ACTOR altruistic motivation SLOPE, β_1	.14	.06	2.32 (23)*
For PARTNER altruistic motivation SLOPE, β_2	−.02	.08	−.30 (23)
For ACTOR accommodative behaviors SLOPE, β_3	−.01	.02	−.40 (23)
For PARTNER accommodative behaviors SLOPE, β_4	.01	.03	.44 (23)
For ACTOR marital satisfaction SLOPE, β_5	−.04	.14	−.27 (23)
For PARTNER marital satisfaction SLOPE, β_6	.01	.19	.08 (23)
For % Trials on which the ACTOR selects the TRUSTWORTHY looking morph in response to the STRANGER, β_7	.02	.01	2.99 (23)**
For stranger-evaluated PARTNER facial trustworthiness, β_8	.002	.01	.41 (23)

* $p < .05$, ** $p < .01$. All predictor variables were entered simultaneously. The order in which the predictor variables appear in the table merely reflects the conceptual organization of the manuscript

appearance, cf. Oosterhof and Todorov 2008) 1 year later. Importantly, this effect appeared specific to partner-directed altruistic motivation: It could not be explained in terms of either the partner's "actual" trustworthiness (as judged by the actor) or the actor's self-reported level of marital satisfaction.

The present findings have several implications for research on emotions and interpersonal functioning. First, with respect to close relationships dynamics, Oosterhof and Todorov (2009) provided evidence that "objective" structural facial characteristics, suggestive of greater or lesser trustworthiness, interact with voluntarily expressed emotions to influence perceivers' evaluations of targets' affective experiences. Thus, at the same level of affective intensity, an untrustworthy-looking other is perceived as being angrier than a trustworthy-looking other. Consequently, if motivationally biased perceptions of facial trustworthiness interact similarly with voluntarily expressed emotions, an individual who perceives his or her spouse as looking untrustworthy (vs. trustworthy) might also perceive him/her as more hostile during a relationship conflict, even when holding constant the spouse's level of expressed anger. Because the automatic reaction to a partner's destructive behaviors is to respond destructively in turn (Yovetich and Rusbult 1994), perceptions of greater spousal hostility could diminish the likelihood that one would behave constructively during conflict (see Finkel and Campbell 2001). In turn, one's own increased hostility would be likely to elicit more destructive behaviors from a partner, thereby perpetuating a cycle of relational negativity.

Second, on a broader level, the present study suggests one possible mechanism underlying both dispositional and situation-induced variations in face perception processes. For example, with respect to the former, the question arises as to whether chronic tendencies to pursue self-serving rather than other-focused goals may be accompanied by face processing biases wherein others are perceived to be untrustworthy-looking and, thus, unworthy of self-sacrifice. Complementarily, one may wonder how situational factors such

as changes in group membership could affect perceptions of facial trustworthiness in others. Indeed, a sizeable body of research attests to people's tendency to behave altruistically towards the members of one's social group, but to treat with indifference or even hostility outgroup members (i.e., parochial altruism, Brewer 1999; Hewstone et al. 2002). Thus, the process of being inducted in a new social group may provide a good opportunity to study the potential development of ingroup/outgroup face processing biases that underlie selective prosocial motivation and behavior.

Third, future research is needed to probe the relationship between "objective" and motivationally constructed facial trustworthiness in the context of intimate partnerships and/or larger social groups. For example, Petrican et al. (2014) have documented that individuals whose facial appearance contains structural cues suggestive of greater trustworthiness are evaluated more positively not only by strangers, but also by their own spouses, in domains that are not directly relationship-relevant (i.e., the big five personality traits). Thus, the question arises whether, with longer acquaintanceship duration, "objective" and motivationally constructed facial trustworthiness continue to exert parallel effects on social judgments, with the latter being pivotal to interpersonal dynamics, but the former still impacting evaluations in areas that are less relevant to the partnership.

Inevitably, the present research has several limitations. One is the exclusive focus on older adults in close relationships. We purposefully selected a sample in which some of the targets were associated with strong motivational orientations in the perceivers. Nevertheless, future studies focusing on the perceptual (face) processing of motivationally inconspicuous targets are definitely needed to further elucidate the bidirectional relationship between facial appearance and dispositional variations in interpersonal motivational orientations. Research involving age-diverse samples and investigating larger social group dynamics are also recommended.

A second limitation is the correlational design of our study. Future research that employs experimental manipulations of motivational orientations toward the other would help to illuminate further the impact of the latter on basic face perception processes.

Finally, although our study had enough power to demonstrate the specificity of our hypothesized effect (i.e., that of partner-focused altruistic motivation perception of that partner's facial trustworthiness), it may have been underpowered to detect any potential effects driven by target partner variables. For example, it may be the case that although actor motivational orientation plays the most important part, certain attributes of the partner, such as the frequency with which s/he engages in accommodative behaviors, may still contribute, albeit to a much lesser degree, to biased partner perception processes. Likewise, consonant with previous findings that the evaluative context can impact trustworthiness evaluations (see Study 1 in Rule et al. 2013), there was a trend for participants who reported greater partner-directed altruistic motivation to be more likely to choose the *untrustworthy* looking morph as being more similar to the unfamiliar faces. Subsequent analyses revealed that this contrast effect emerged as a joint function of perceiver marital satisfaction and partner-directed altruistic motivation, which may explain why, in our main analyses, focused on the unique effect of altruistic motivation, this effect failed to reach significance ($p = .06$). Although exploration of these effects were beyond the scope of our investigation, future studies with larger sample sizes, probing such potential contrast effects in face processing in response to (less vs. more) valued familiar and unfamiliar others, as well as actor and partner perceptual effects would certainly make a valuable contribution to the literature.

In sum, the present study has provided suggestive evidence regarding the interplay of motivational and perceptual mechanisms in social dynamics. Research is now needed to

identify the processes through which strangers come to endow each other with the look that binds them together as intimates.

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