

# In the Eye of the Beholder: Eye Contact Increases Resistance to Persuasion

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## Abstract

Popular belief holds that eye contact increases the success of persuasive communication, and prior research suggests that speakers who direct their gaze more toward their listeners are perceived as more persuasive. In contrast, we demonstrate that more eye contact between the listener and speaker during persuasive communication predicts less attitude change in the direction advocated. In Study 1, participants freely watched videos of speakers expressing various views on controversial sociopolitical issues. Greater direct gaze at the speaker's eyes was associated with less attitude change in the direction advocated by the speaker. In Study 2, we instructed participants to look at either the eyes or the mouths of speakers presenting arguments counter to participants' own attitudes. Intentionally maintaining direct eye contact led to less persuasion than did gazing at the mouth. These findings suggest that efforts at increasing eye contact may be counterproductive across a variety of persuasion contexts.

## Keywords

conflict, attitudes, persuasion, eye contact, face processing, social interaction, eye movements, face perception

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People do not like to change their minds. Although early research suggested that individuals easily succumb to the influence of others (Asch, 1951; Sherif, 1936), later evidence has shown that, having taken a stand, people resist amending their attitudes (Briñol, Rucker, Tormala, & Petty, 2004; McGuire, 1964), judgments (Minson, Liberman, & Ross, 2011; Yaniv, 2004), and beliefs (Lord, Ross, & Lepper, 1979; Ross, Lepper, & Hubbard, 1975), even when it would be rational, profitable, and socially desirable to do so. Misunderstanding and even conflict can thus be perpetuated by individuals' unwillingness to modify their views in response to persuasion.

Throughout human history, eye contact has been considered a powerful tool of interpersonal influence. From the mythology of Medusa's stony stare to 20th-century theories of hypnosis, popular accounts suggest that returning gaze opens one up to the will of others. "Look at me when I am talking to you!" is a frequent demand of frustrated parents, angry spouses, and parties in conflict—a reflection of the belief that eye contact aids persuasion. Indeed, prior research has demonstrated that

speakers who direct more gaze toward their audience are rated as more persuasive, likeable, and competent by third parties (see Kleinke, 1986; Segrin, 1993). However, such evidence is limited and one-sided: Prior work has focused on the gaze behavior of the speaker and generally overlooked that of the listener.

In the present research, we explored the possibility that rather than opening the listener to persuasion, direct gaze into the speaker's eyes may instead have the opposite effect, reducing attitude change in the direction advocated by the speaker. Precisely because people see eye contact as a means of psychological influence, and because eye contact is associated with assertion of dominance and challenge across species and cultures (Mazur, 1985), we hypothesized that in persuasion contexts, eye

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contact may motivate recipients to resist influence attempts, thereby decreasing the success of the persuasive effort.

We conducted two studies to examine the relationship between eye contact and the effectiveness of persuasive communication. We went beyond prior research by using eye-tracking technology to examine the effects of not simply the direction of the speaker's gaze, but actual eye contact. In addition, we measured listeners' receptiveness to the speaker's message in order to determine whether direct eye contact decreases persuasion by motivating listeners to avoid similar encounters in the future.

### **Gaze Direction and Psychological States**

Direct gaze is often associated with attention, attraction, and openness to social approach. Both newborn humans (Farroni, Csibra, Simion, & Johnson, 2002) and infant chimpanzees (Myowa-Yamakoshi, Tomonaga, Tanaka, & Matsuzawa, 2003) return gaze directed toward them. Direct gaze from attractive individuals activates the ventral striatum, a brain region associated with reward processing (Kampe, Frith, Dolan, & Frith, 2001). Intranasal administration of the neuropeptide oxytocin, known for its central role in social approach and bonding (Heinrichs, von Dawans, & Domes, 2009; Meyer-Lindenberg, Domes, Kirsch, & Heinrichs, 2011), increases gazing at others' eyes (Domes, Steiner, Porges, & Heinrichs, 2013; Gamer, Zurowski, & Büchel, 2010; Guastella, Mitchell, & Dadds, 2008). Together, this research suggests that because direct gaze is associated with affiliative behaviors, it may enhance the success of persuasive efforts.

In addition to its role in affiliative interactions, however, eye contact plays an important role in the competitive or hostile encounters of many species. For example, dogs stare opponents in the eye during dominance contests (Bradshaw & Nott, 1995). In primates, direct eye gaze is a reliable activator of the fight-or-flight response (Emery, 2000; Skuse, Morris, & Lawrence, 2003). In humans, viewing an angry expression that is combined with direct gaze activates the amygdala, a brain region responsive to potential threats (Adams, Gordon, Baird, Ambady, & Kleck, 2003).

We theorized that most persuasion attempts, particularly those involving deeply held, personally relevant issues, take place in the presence of some disagreement, if not outright conflict. Thus, such situations may be best conceptualized as competitive interactions in which individuals strive to negate their opponent's arguments and vie for dominance. Prior research suggests that individuals confronted with disagreement do not process information in an unbiased manner, judiciously weighing their

own prior views against those being presented to them. Instead, they actively resist persuasion by producing counterarguments (Festinger & Maccoby, 1964; Petty, Wells, & Brock, 1976), derogating the source of the conflicting message (Pronin, Gilovich, & Ross, 2004), and bolstering their own prior beliefs (Lord et al., 1979). Given the lay belief that eye contact can be deployed as an influence technique, and also given the associations among eye contact, dominance, and intimidation, direct eye gaze may trigger motivated resistance to persuasion and make listeners less receptive to both the message and the messenger.

### **Eye Gaze and Persuasion**

In contrast to our current hypothesis, prior research on gaze and persuasion has found that speakers who gaze more at listeners are rated higher in persuasiveness, likeability, and competence (see Kleinke, 1986; Segrin, 1993). These studies, however, assessed the speakers' gaze direction only; the listeners were free to look where they chose. Thus, the amount of actual eye contact between the speakers and listeners, along with the psychological implications of the listeners' gaze behavior, is unclear. Furthermore, although listeners offered subjective evaluations of speakers' persuasiveness, they did not report their attitudes before and after the communication, so it is impossible to evaluate whether actual attitude change occurred.

In the current research, we tracked the gaze of participants while they watched video-recorded persuasive communications on several hot-button political topics. We measured participants' attitudes before and after the videos to establish the effect of eye contact on persuasion. Additionally, we measured the strength with which participants held their attitudes and their receptiveness to future persuasive attempts, in order to explore the psychological process that drives this relationship. In Study 1, we measured participants' spontaneous gaze patterns. In Study 2, we manipulated eye contact in order to establish causality.

#### **Study 1**

In Study 1, we investigated the relationship between spontaneous eye contact and reactions to persuasive communication. Participants watched videos gathered from Internet sources and reported their reactions. Using prerecorded video messages simulates many modern communicative contexts while keeping constant across participants stimulus features such as speech content and the speaker's appearance, tone of voice, facial expressions, and proximity to the viewer.

## Method

**Participants.** Twenty students (13 female, 7 male; mean age = 20.9 years,  $SD = 0.9$  years) from the University of Freiburg participated in the study for course credit.

**Attitudes questionnaire.** Before the day of the experiment, participants reported their agreement with 18 statements about controversial issues using a 7-point Likert scale (from *strongly disagree*, -3, to *strongly agree*, +3). Five of those statements concerned the target issues of university tuition, quotas for hiring women, assisted suicide, nuclear energy, and federal referendums (Table 1). Responses were recoded as needed (i.e., when the view in the video opposed the view in the questionnaire statement) so that all scores indexed premanipulation disagreement (from *strong disagreement*, -3, to *strong agreement*, +3) with the views presented in the videos.

**Video stimuli and eye tracking.** Seven videos (mean duration = 91 s,  $SD = 86$  s) were selected from Internet sources to represent various opinions regarding the five target issues. In each video, the speaker's head was centered on the screen. The speaker either faced the camera directly (three videos) or was angled slightly away from the camera with both eyes fully visible (four videos). Participants were told to watch the videos as they would naturally.

An iView X RED 250 remote eye tracker (SensoMotoric Instruments, Teltow, Germany) collected eye position information. Eye movements were recorded at a 250-Hz sampling rate with a spatial resolution of better than  $0.1^\circ$  and gaze position accuracy of better than  $0.5^\circ$ . The videos were presented on a 56-cm screen ( $1680 \times 1050$  pixels) at a viewing distance of 62 cm. The faces measured approximately  $18 \times 24$  cm.

**Dependent measures.** The percentage of viewing time during which fixation was directed at the eye region of the speaker was calculated using stimulus-specific templates. BeGaze (SensoMotoric Instruments, Teltow,

Germany) was used to identify fixation events, which were defined using a peak saccadic velocity threshold of  $40^\circ$  per second and a minimum fixation duration of 50 ms. Data from the participants' left and right eyes were averaged.

Immediately after each video, participants answered nine questions using 7-point Likert scales. Specifically, participants reported how receptive they felt toward the speaker's view, how willing they would be to receive more information supporting the speaker's view, and how willing they would be to engage in discussion with a group of people holding the speaker's view (Minson & Chen, 2013). Responses to these three items were averaged to create a *receptiveness* composite (Cronbach's  $\alpha = .86$ ). We also asked participants how certain they were of their attitude toward the issue in the video, how clear they were regarding their attitude, and how confident they were about their attitude (Tormala & Petty, 2002). Responses to these three items were averaged to create an *attitude-strength* composite (Cronbach's  $\alpha = .97$ ). Participants also answered three questions assessing how *interesting* they found the video, how *valid* they found the arguments, and how *emotional* they felt while watching the video. These final three items were included to determine the specificity of relationships between eye gaze and various psychological reactions that might be induced by the videos.

After completing the eye-tracking portion of the experiment, participants again reported their attitudes regarding the 18 sociopolitical issues. The difference between post- and premanipulation attitudes was calculated to assess attitude change for the five target issues.

**Analyses.** We used hierarchical linear modeling with robust standard errors to control for nonindependence of observations. We entered both the dependent and the independent variables at the item level and grouped observations by participant. We entered a dummy code for each video to control for video-specific effects and  $z$ -scored all dependent variables. We decided a priori to recruit at least 20 participants, analyze all complete observations, and report all manipulations and measures (Simmons, Nelson, & Simonsohn, 2012).

## Results

**Exploratory analyses.** Participants spent a greater percentage of time looking at the speaker's eyes when their prior attitude on the target issue was closer to that of the speaker ( $b = 0.20$ ,  $z = 3.40$ ,  $p = .001$ ). This may explain the lay belief that eye contact is a signal of successful persuasion: Because people spontaneously look at the eyes of those they agree with, persuaders may misattribute returned gaze to their persuasion skills,

**Table 1.** Sociopolitical Issues Used in Study 1 and Study 2

|   |
|---|
| Assisted suicide should be allowed. <sup>a</sup>  |
| Current animal farming practices (for meat production) are inhumane. <sup>b</sup>               |
| Germany needs a mandatory quota for women in business.  |
| The federal constitution should provide for more referendums at the federal level. <sup>a</sup> |
| The rapid phaseout of nuclear energy is the right decision.                                     |
| Tuition fees are justified because they improve university teaching.                            |

<sup>a</sup>These issues were used in Study 1 only. <sup>b</sup>This issue was used in Study 2 only.

overlooking the role played by prior agreement. Participants also spent a greater percentage of time looking at the speaker's eyes when the speaker's gaze was averted than when it was direct ( $b = -1.19, z = -5.15, p < .001$ ), which suggests that eye contact in persuasion contexts may be somewhat aversive. Because of these effects, we report subsequent analyses in which prior agreement and speaker's direction of gaze (dummy coded: 0 = averted gaze, 1 = direct gaze) were included as covariates.<sup>1</sup> There were no significant effects of viewer's sex on gaze (all  $z$ s < 1, n.s.).

**Eye gaze and receptiveness.** Greater time spent looking at the speaker's eyes was associated with greater receptiveness to the speaker's opinion ( $b = 0.17, z = 1.98, p < .05$ ). When we included prior agreement and the interaction between prior agreement and time spent looking at the speaker's eyes in the model, the main effect of gaze time dropped to nonsignificance ( $b = 0.12, z = 1.17, n.s.$ ) because of the presence of a significant interaction ( $b = 0.18, z = 2.42, p < .02$ ).<sup>2</sup> The positive relationship between receptiveness and gaze time was primarily driven by cases in which the participant previously agreed with the speaker's opinion ( $b = 0.33, z = 2.38, p < .02$ ) and was not significant in cases in which the participant disagreed with the speaker's opinion or had no prior opinion ( $b = 0.08, z < 1, n.s.$ ).

**Eye gaze and attitude change.** Greater time spent looking at the speaker's eyes reduced the persuasiveness of the videos as reflected in the change from pre- to post-experimental attitudes ( $b = -0.18, z = -2.47, p < .02$ ). Post hoc tests revealed that the effect was somewhat stronger when the viewer either previously disagreed with the speaker's position (33% of cases) or had no prior opinion on the issue (20% of cases;  $b = -0.30, z = -1.94, p < .06$ ) than when the viewer's attitude was previously aligned with the speaker's (47% of cases;  $b = -0.13, z = -1.06, n.s.$ ). It was also somewhat stronger when the speaker exhibited direct gaze ( $b = -0.22, z = -1.63, p = .10$ ) than when the speaker exhibited averted gaze ( $b = -0.12, z < 1, n.s.$ ). Although correlational, these results provide some preliminary evidence for the idea that direct gaze in the context of persuasive communication, and particularly in cases of disagreement, may lead listeners to resist persuasion.

**Eye gaze and other psychological variables.** The percentage of time spent looking at the speaker's eyes did not predict participants' self-reported attitude strength regarding the issue ( $b = -0.04, z < -1, n.s.$ ) or their ratings of how interesting the video was ( $b = 0.01, z = 1.46, n.s.$ ), how emotional they felt while viewing the video ( $b = 0.01, z < 1, n.s.$ ), or how valid the presented arguments were ( $b = 0.08, z < 1, n.s.$ ).

## Discussion

Study 1 demonstrated that in the context of persuasive communication, spontaneous gaze at the speaker's eyes is correlated with prior agreement with the speaker's opinion. Although gaze at the speaker's eyes was correlated with greater receptiveness in cases of prior agreement with the speaker's view, greater eye gaze was also associated overall with less persuasion (i.e., attitude change). This effect was particularly pronounced when the speaker gazed directly at the viewer (i.e., in cases of eye contact between the speaker and viewer).

Our findings that spontaneous gaze at a speaker's eyes is associated with greater prior agreement and (sometimes) greater receptiveness, but also with less attitude change, highlight the importance of the social context in interpreting the psychological meaning of eye contact. In Study 2, we directly manipulated gaze direction in order to establish causality, focused on cases of disagreement between speaker and listener, and explored the psychological mechanism behind the effect of direct gaze on attitude change.

## Study 2

The results of Study 1 provided preliminary evidence that spontaneous gaze directed at a speaker's eyes reduces the speaker's persuasive success. In Study 2, we achieved greater experimental control by recording scripted videos and using the same speaker to present the opposing views on a given issue, and by manipulating listeners' gaze direction. Additionally, to more closely replicate naturalistic persuasion settings, we always presented participants with views with which they disagreed.

We explored the psychological mechanism behind this effect by probing participants' willingness to engage in future interaction with people holding the speaker's view and to learn more about the ideas they advocated. Receptiveness to the message and the messenger has long been hypothesized to be an important precursor to attitude change (McGuire, 1966). We construe receptiveness as a nonjudgmental cognitive stance characterized by openness to opposing views and willingness to engage in future contact with holders of those views (Minson & Chen, 2013). To the extent that participants associate direct eye contact with attempts at influence and domination, we predicted that eye contact would reduce receptiveness to both the message and the messenger. Thus, instead of listening in an open-minded manner, participants who experienced direct eye contact would be motivated to resist persuasion and avoid future persuasive encounters. Therefore, in Study 2, we tested whether decreased receptiveness mediated the relationship between greater eye contact and decreased persuasion.

## Method

**Participants.** Forty-two university students (13 female, 29 male; mean age = 23.0 years,  $SD = 3.5$  years) participated in the study for either payment (€7) or course credit. We randomly assigned participants (stratifying on the basis of sex) to one of two eye-gaze conditions, which differed in whether participants were instructed to focus on the speaker's eyes or mouth while watching the videos.

**Attitudes questionnaire.** As in Study 1, upon registering for the study, participants completed a survey about 18 current sociopolitical issues. The target statements for Study 2 assessed participants' attitudes about university tuition, quotas for hiring women, animal farming practices, and nuclear energy (Table 1). These five statements were scored as in Study 1.

**Video stimuli and eye tracking.** Eight videos, each showing one of four students (two female, two male), were filmed for Study 2. In each video (mean duration = 140 s,  $SD = 19$  s), the speaker's head was centered against a white background, and the speaker faced the camera directly. Each speaker was recorded for two separate videos, each time speaking from a script either in favor of or against one of the four target statements.

Each participant viewed four videos advocating an opinion opposite to that he or she expressed in the premanipulation survey. When participants expressed no opinion about the target issue (16%), they viewed the video expressing the majority view. Participants in the two conditions did not differ in their level of prior disagreement with the opinions in the videos,  $t(40) = 1.00$ , n.s.

We informed participants that we were investigating "the role of various parts of the face in communication." Participants in the *eyes condition* were asked to focus

only on the speaker's eyes while watching the videos, whereas participants in the *mouth condition* were asked to focus only on the speaker's mouth. Before each video began, an instruction screen reminded participants to focus on the eyes or mouth.

The same eye-tracking hardware, software, and parameters used in Study 1 were used in Study 2. The face stimuli measured approximately  $9 \times 18$  cm. As manipulation checks, we calculated the percentage of viewing time directed toward the speaker's eyes and toward the speaker's mouth.

**Dependent measures and analyses.** Immediately after each video, the nine questions used in Study 1 appeared on the screen. Responses to items measuring receptiveness and attitude strength were again averaged to create composite variables (Cronbach's  $\alpha = .75$  and  $.90$ , respectively). The dependent variables, measured at the item level (Level 1), were regressed on condition (dummy coded: mouth = 0, eyes = 1), entered at the participant level (Level 2). As in Study 1, we decided a priori to recruit at least 20 participants per condition, analyze all complete observations, and report all manipulations and measures (Simmons et al., 2012).

## Results

**Eye contact and attitude change.** Table 2 summarizes results for the dependent measures (and manipulation checks). As in Study 1, looking at the speaker's eyes decreased persuasion. Participants in the eyes condition shifted their attitudes less in the direction advocated by the speaker than did participants in the mouth condition ( $b = -0.47$ ,  $z = -2.71$ ,  $p < .01$ ). Prior agreement was not a significant predictor of attitude change ( $b = 0.11$ ,  $z = 1.26$ , n.s.), but the analysis revealed a marginally significant

**Table 2.** Results From Study 2: Descriptive Statistics and Comparisons Between Conditions

| Measure                          | Eyes condition ( $n = 21$ ) | Mouth condition ( $n = 21$ ) | Comparison between conditions   |
|----------------------------------|-----------------------------|------------------------------|---------------------------------|
| Dependent measures               |                             |                              |                                 |
| Attitude change                  | 0.14 (0.44)                 | 0.60 (0.63)                  | $b = -0.47$ , $z = -2.71^*$     |
| Receptiveness                    | -0.28 (0.93)                | 0.60 (0.80)                  | $b = -0.61$ , $z = -3.48^{**}$  |
| Attitude strength                | 2.85 (0.55)                 | 2.79 (0.40)                  | $b = 0.11$ , $z < 1.00$         |
| Interest in video                | 0.45 (1.33)                 | 0.95 (0.63)                  | $b = -0.32$ , $z = -1.65$       |
| Emotion during video             | -0.49 (1.11)                | 0.11 (0.82)                  | $b = -0.29$ , $z = -1.87$       |
| Validity of arguments            | -0.50 (1.10)                | -0.07 (0.93)                 | $b = -0.32$ , $z = -1.84$       |
| Manipulation checks              |                             |                              |                                 |
| Eye fixations (% viewing time)   | 65.46 (19.40)               | 6.72 (13.36)                 | $b = 58.29$ , $z = 11.13^{**}$  |
| Mouth fixations (% viewing time) | 2.34 (2.65)                 | 59.87 (33.35)                | $b = -57.06$ , $z = -7.65^{**}$ |

Note: Standard deviations are shown in parentheses. Attitude change was calculated by subtracting premanipulation attitude from postmanipulation attitude (both of which were coded relative to the speaker's opinion); larger values indicate more change in the direction advocated by the speaker. All other dependent measures are from response scales ranging from -3 to +3; larger values indicate greater receptiveness, attitude strength, etc.

\* $p < .01$ . \*\* $p < .001$ .

interaction between condition and prior agreement ( $b = -0.26, z = -1.96, p = .05$ ). The effect of the manipulation was marginally greater the less strongly participants disagreed with the speaker's view prior to the experiment.

**Mediating role of receptiveness.** Consistent with our theorizing, the data revealed that participants in the eyes condition were significantly less receptive to the counter-attitudinal information and the prospect of future exposure to the holders of such views than were participants in the mouth condition ( $b = -0.61, z = -3.48, p < .001$ ). To examine whether this decrease in receptiveness mediated the relationship between condition and attitude change, we followed the Monte Carlo procedure for multilevel data developed by Selig and Preacher (2008). Having established that condition significantly affected both the dependent variable (attitude change) and the mediator (receptiveness), we regressed attitude change on both receptiveness and condition. We observed a significant effect of receptiveness ( $b = 0.31, z = 3.02, p < .001$ ) and a nonsignificant effect of condition ( $b = -0.28, z = -1.63, n.s.$ ). The test for the significance of the indirect effect of condition on attitude change yielded a 95% confidence interval that did not include zero (lower bound:  $-0.38$ ; upper bound:  $-0.05$ ). Thus, receptiveness significantly mediated the effect of condition on attitude change (Fig. 1). Participants instructed to look at the speakers' eyes rather than the speakers' mouths were less receptive to the arguments and less open to interaction with the advocates of the opposing views, and thus were less persuaded.

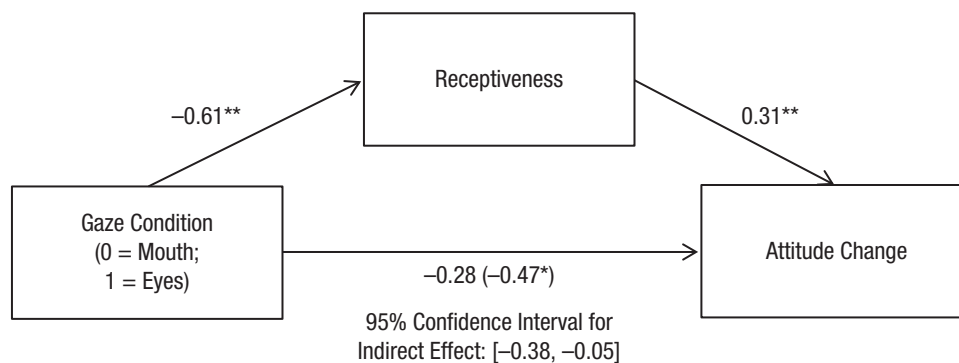
**Eye contact and other psychological variables.** The manipulation did not significantly influence participants' self-reported attitude strength regarding the target issue ( $b = 0.11, z < 1, n.s.$ ) or their ratings of how interesting the video was ( $b = -0.32, z = -1.65, n.s.$ ), how emotional

they felt while watching the video ( $b = -0.29, z = -1.87, n.s.$ ), or how valid the presented arguments were ( $b = -0.32, z = -1.84, n.s.$ ).

### General Discussion

Contrary to cultural belief and suggestions of some prior research, the present work demonstrates that eye contact *decreases* the success of attempts at persuasion. In two studies, individuals who returned the gaze of a speaker delivering a persuasive message were less likely to shift their attitudes in the direction advocated than were individuals who averted their gaze. Although spontaneous gaze at the speaker's eyes was associated with psychological receptiveness in Study 1, this relationship was driven primarily by cases in which the viewer agreed with the opinion presented. When participants disagreed with the message, they were more likely to look away, thus avoiding a potentially aversive experience.

Most notably, in Study 2, participants who viewed videos presenting views opposing their own were less swayed by those views when they were instructed to maintain eye contact with the speakers than when they were instructed to gaze at the speakers' mouths. In line with our theorizing about the role eye contact may play in triggering resistance to persuasion, results showed that participants were less receptive to the message and less open to future exposure to the view presented when they maintained eye contact with the speaker. This decrease in receptiveness mediated the effect of eye-gaze condition on attitude change. As eye contact can be cognitively demanding (Phelps, Doherty-Sneddon, & Warnock, 2006), follow-up research should investigate whether participants are any less able to process the content of a persuasive message when they gaze into the speaker's eyes. However, cognitive load seems unlikely to account for the effect we observed. Particularly in



**Fig. 1.** Results from Study 2: the effect of eye-gaze condition on attitude change as mediated by receptiveness. Along the lower path, the value in parentheses indicates the magnitude of the unmediated effect of condition on attitude change; the value outside the parentheses indicates the magnitude of the effect after receptiveness was added to the model. Asterisks indicate significant coefficients (\* $p < .01$ , \*\* $p < .001$ ).

cases of disagreement, the default response to persuasion is the generation of counterarguments. High cognitive load or distraction reduces participants' ability to generate counterarguments and therefore should lead to enhanced, not reduced, persuasion (Festinger & Maccoby, 1964; Petty et al., 1976; Zemborain & Johar, 2007).

It is possible that spontaneous (Study 1) and directed (Study 2) eye contact led to the same outcome (decreased persuasion success) through different mechanisms. However, our findings are generally consistent with prior research suggesting that direct gaze is used across species in competitive or hostile interactions to assert dominance and intimidate others (Bradshaw & Nott, 1995; Mazur, 1985). Given that eye contact is an evolutionarily primitive phenomenon, it is likely that gaze behavior and responses to others' gaze are not fully accessible to conscious reflection (Terburg, Aarts, & van Honk, 2012). We suggest that the very experience of meeting the gaze of a disagreeing other, whether such experience is arrived at spontaneously or effortfully, creates a social dynamic characterized by resistance to persuasion. Future research assessing neural activation, psychophysiological responses, and endocrinological reactions during persuasive communication may provide a more direct means of investigating this relationship. For example, neuroimaging, facial electromyographic data, and hormonal assays might reveal informative patterns of amygdala activation, subconscious emotional expression, or testosterone release in response to eye contact during persuasive communication.

Although gaze directed at a speaker's eyes reduced persuasion in our studies, it is important to keep in mind that in many settings, eye contact is associated with affiliative behavior, openness to approach, and trust. The fact that this ubiquitous social behavior can lead to different outcomes depending on the social context deserves attention and speaks to the complexity of the processes at play. Given that the prevalence and meaning of eye contact are culturally variable (Argyle & Cook, 1976; McCarthy, Lee, Itakura, & Muir, 2006), additional research is necessary to determine the generalizability of our results.

Our studies go beyond prior work by demonstrating the effect of actual eye contact (not merely the speaker's gaze direction) on attitudes regarding controversial social issues. In doing so, they overturn a common belief regarding the relationship between eye contact and successful persuasion. We suggest that the common efforts to look into the eyes of a persuasion target and demand that this person return gaze may be counterproductive to changing hearts and minds. More broadly, our research indicates that listeners' gaze behavior may serve as a readily observable and quantifiable marker of psychological states relevant for parents, politicians, mediators, and advertisers alike.

## Author Contributions

F. S. Chen and J. A. Minson contributed equally to this work and share first authorship. F. S. Chen and J. A. Minson developed the study concept. All authors contributed to the study design. Testing and data collection were performed by M. Schöne. F. S. Chen and J. A. Minson performed the data analysis and interpretation. F. S. Chen and J. A. Minson drafted the manuscript, and all authors provided critical revisions. All authors approved the final version of the manuscript for submission.

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The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

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## Notes

1. All significant results reported remained significant when we did not include the covariates in the regression model.
2. In all analyses, we checked for interactive effects of covariates and eye-gaze direction on our variables of interest. Unless noted otherwise, the interaction terms were not significant and were removed from analysis.

## References

- Adams, R. B., Gordon, H. L., Baird, A. A., Ambady, N., & Kleck, R. E. (2003). Effects of gaze on amygdala sensitivity to anger and fear faces. *Science*, *300*, 1536.
- Argyle, M., & Cook, M. (1976). *Gaze and mutual gaze*. Oxford, England: Cambridge University Press.
- Asch, S. E. (1951). Effects of group pressure on the modification and distortion of judgements. In H. Guetzkow (Ed.), *Groups, leadership and men* (pp. 177–190). Pittsburgh, PA: Carnegie Press.
- Bradshaw, J. W. S., & Nott, H. M. R. (1995). Social and communication behaviour of companion dogs. In J. Serpell (Ed.), *The domestic dog: Its evolution, behaviour and interactions with people* (pp. 115–130). Cambridge, England: Cambridge University Press.
- Briñol, P., Rucker, D., Tormala, Z. L., & Petty, R. E. (2004). Individual differences in resistance to persuasion: The role of beliefs and meta-beliefs. In E. S. Knowles & J. A. Linn (Eds.), *Resistance and persuasion* (pp. 83–104). Mahwah, NJ: Erlbaum.
- Domes, G., Steiner, A., Porges, S. W., & Heinrichs, M. (2013). Oxytocin differentially modulates eye gaze to naturalistic social

- signals of happiness and anger. *Psychoneuroendocrinology*, *38*, 1198–1202.
- Emery, N. J. (2000). The eyes have it: The neuroethology, function and evolution of social gaze. *Neuroscience & Biobehavioral Reviews*, *24*, 581–604.
- Farroni, T., Csibra, G., Simion, F., & Johnson, M. H. (2002). Eye contact detection in humans from birth. *Proceedings of the National Academy of Sciences, USA*, *99*, 9602–9605.
- Festinger, L., & Maccoby, N. (1964). On resistance to persuasive communications. *Journal of Abnormal and Social Psychology*, *68*, 359–366.
- Gamer, M., Zurowski, B., & Büchel, C. (2010). Different amygdala subregions mediate valence-related and attentional effects of oxytocin in humans. *Proceedings of the National Academy of Sciences, USA*, *107*, 9400–9405.
- Guastella, A., Mitchell, P., & Dadds, M. (2008). Oxytocin increases gaze to the eye region of human faces. *Biological Psychiatry*, *63*, 3–5.
- Heinrichs, M., von Dawans, B., & Domes, G. (2009). Oxytocin, vasopressin, and human social behavior. *Frontiers in Neuroendocrinology*, *30*, 548–557.
- Kampe, K. K. W., Frith, C. D., Dolan, R. J., & Frith, U. (2001). Reward value of attractiveness and gaze. *Nature*, *413*, 589.
- Kleinke, C. L. (1986). Gaze and eye contact: A research review. *Psychological Bulletin*, *100*, 78–100.
- Lord, C. G., Ross, L., & Lepper, M. R. (1979). Biased assimilation and attitude polarization: The effects of prior theories on subsequently considered evidence. *Journal of Personality and Social Psychology*, *37*, 2098–2109.
- Mazur, A. (1985). A biosocial model of status in face-to-face primate groups. *Social Forces*, *64*, 377–402.
- McCarthy, A., Lee, K., Itakura, S., & Muir, D. W. (2006). Cultural display rules drive eye gaze during thinking. *Journal of Cross-Cultural Psychology*, *37*, 717–722.
- McGuire, W. J. (1964). Inducing resistance to persuasion: Some contemporary approaches. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 1, pp. 191–229). New York, NY: Academic Press.
- McGuire, W. J. (1966). Attitudes and opinions. *Annual Review of Psychology*, *17*, 475–514.
- Meyer-Lindenberg, A., Domes, G., Kirsch, P., & Heinrichs, M. (2011). Oxytocin and vasopressin in the human brain: Social neuropeptides for translational medicine. *Nature Reviews Neuroscience*, *12*, 524–538.
- Minson, J. A., & Chen, F. S. (2013). *Eating with the enemy: Receptiveness and attitude strength in hostile dialogue*. Unpublished manuscript, University of Pennsylvania, Philadelphia, PA.
- Minson, J. A., Liberman, V., & Ross, L. (2011). Two to tango: Effects of collaboration and disagreement on dyadic judgment. *Personality and Social Psychology Bulletin*, *37*, 1325–1338.
- Myowa-Yamakoshi, M., Tomonaga, M., Tanaka, M., & Matsuzawa, T. (2003). Preference for human direct gaze in infant chimpanzees (*Pan troglodytes*). *Cognition*, *89*, 113–124.
- Petty, R. E., Wells, G. L., & Brock, T. C. (1976). Distraction can enhance or reduce yielding to propaganda: Thought disruption versus effort justification. *Journal of Personality and Social Psychology*, *34*, 874–884.
- Phelps, F., Doherty-Sneddon, G., & Warnock, H. (2006). Functional benefits of children's gaze aversion during questioning. *British Journal of Developmental Psychology*, *24*, 577–588.
- Pronin, E., Gilovich, T., & Ross, L. (2004). Objectivity in the eye of the beholder: Divergent perceptions of bias in self versus others. *Psychological Review*, *111*, 781–799.
- Ross, L., Lepper, M. R., & Hubbard, M. (1975). Perseverance in self-perception and social perception: Biased attributional processes in the debriefing paradigm. *Journal of Personality and Social Psychology*, *32*, 880–892.
- Segrin, C. (1993). The effects of nonverbal behavior on outcomes of compliance gaining attempts. *Communication Studies*, *44*, 169–187.
- Selig, J. P., & Preacher, K. J. (2008). Monte Carlo method for assessing mediation: An interactive tool for creating confidence intervals for indirect effects [Computer software]. Available from <http://quantpsy.org/medmc/medmc111.htm>
- Sherif, M. (1936). *The psychology of social norms*. New York, NY: Harper.
- Simmons, J. P., Nelson, L. D., & Simonsohn, U. (2012). *A 21 word solution*. Retrieved from <http://ssrn.com/abstract=2160588>
- Skuse, D., Morris, J., & Lawrence, K. (2003). The amygdala and development of the social brain. *Annals of the New York Academy of Sciences*, *1008*, 91–101.
- Terburg, D., Aarts, H., & van Honk, J. (2012). Testosterone affects gaze aversion from angry faces outside of conscious awareness. *Psychological Science*, *23*, 459–463.
- Tormala, Z. L., & Petty, R. E. (2002). What doesn't kill me makes me stronger: The effects of resisting persuasion on attitude certainty. *Journal of Personality and Social Psychology*, *83*, 1298–1313.
- Yaniv, I. (2004). Receiving other people's advice: Influence and benefit. *Organizational Behavior and Human Decision Processes*, *93*, 1–13.
- Zemboian, M. R., & Johar, G. V. (2007). Attitudinal ambivalence and openness to persuasion: A framework for interpersonal influence. *Journal of Consumer Research*, *33*, 506–514.