

Cross-cultural variation in eye contact comfort

Agnieszka Sorokowska  · Marta Rokosz · Marta Kowal  · Michał Misiak ·
Wojciech P. Malecki · Piotr Sorokowski · S. Craig Roberts

Received: 24 November 2025 / Accepted: 3 September 2026

© The Author(s) 2026

Abstract

Eye contact is one of fundamental components of nonverbal communication, yet affective evaluations of direct gaze are complex and highly context-dependent. Cultural background appears to play a crucial role in shaping the interpretation and social function of gaze behaviors, likely leading to significant cross-cultural variation in preferences for eye contact. However, cross-cultural empirical research on eye contact comfort remains limited. The present study addresses this gap using a large and diverse sample of 10,387 participants (aged 18–73) from 51 study sites, who reported their comfort with direct eye contact when interacting with strangers, acquaintances, and close others. In line with expectations, individuals report feeling most comfortable making eye contact with close others, followed by acquaintances, and finally strangers. Beyond geosocial factors such as socioeconomic status, Human Development Index, and climate, our analyses identify collectivism and gender equality as important predictors of eye contact comfort. These findings suggest that cultural variation in gaze behavior is more multifaceted than commonly assumed and cannot be reduced to simple regional dichotomies. Although the present study is exploratory and based on self-reported assessments of eye contact comfort, it provides one of the first large-scale cross-cultural examinations of this construct and generates novel, testable hypotheses regarding the cultural and socioecological foundations of gaze behavior. Overall, the findings highlight the need to consider both individual-level and contextual variables when examining nonverbal communication across societies and provides a unique, large-scale dataset documenting global variation in eye contact comfort.

Keywords Eye contact · Eye contact comfort · Gaze behavior · Cross-cultural differences · Nonverbal communication · Social interactions

Introduction

In many non-human species, particularly primates and other vertebrates, direct gaze often functions as a signal of dominance, challenge, or imminent aggression^{1,2}. In humans, however, eye contact is among the most important components of nonverbal communication, occurring across a wide range of social contexts from infancy through adulthood^{3,4}, serving as a critical element in interpersonal relationship formation^{5–7} and constituting a crucial channel for transmitting interpersonal signals^{8–11}. Direct gaze, in particular, plays a pivotal role in initiating and

This Article in Press is shared early to give you faster access to new research. It is citable and carries a permanent DOI. The final edited version will replace it automatically.



regulating face-to-face interactions¹², capturing visual attention and prompting cognitive and emotional engagement¹³. Eye contact further exerts significant influence on various social evaluations^{14,15}, with individuals who maintain it often being perceived more favorably than those who avert their gaze (for a review see⁷). Direct gaze has been linked to social attributes such as dominance, potency, and control^{16,17}, has been shown to influence judgments of likability, attractiveness, intelligence, and credibility^{18–20} and to affect individual mate choice²¹. The complex roles and meanings of eye contact are often categorized within the so-called “dual function of gaze”²², presenting the eye contact both as the means for information gathering and information signalling^{23–25}.

However, affective evaluations of direct gaze seem to be complex and context-dependent (for a review, see⁷, with culture emerging as a prominent factor affecting the assessment and perception of eye contact. Much of the foundational work on this topic stems from research conducted several decades ago. Early studies framed global differences in eye contact acceptance and aversion through the dichotomy of *contact* and *non-contact* cultures²⁶, a classification of a range of different non-verbal behaviors derived from early cross-cultural research on proxemics (see also²⁷. Research has examined the interpretation of direct eye contact, observed eye contact behaviors, and the interpersonal assessments elicited by direct gaze.

Survey studies performed in Western cultures, such as the United Kingdom and Italy, indicated that maintaining eye contact is traditionally interpreted as a sign of attentiveness and social engagement^{16,28}. By contrast, an early theoretical work concerning nonverbal expression²⁹ suggests that in East Asian cultures, such as Japan and China, gaze aversion can be interpreted as a gesture of respect or deference. These cultural norms seem to be reflected in behavioral patterns recorded in observational studies. A culture-focused review indicated that Japanese managers were found to make less mutual eye contact than their American counterparts during negotiations³⁰, while two other laboratory-based studies reported that individuals from Japan generally maintained less eye contact when conceiving an answer to various questions^{31,32}. These observations were further tested in experimental settings involving physiological reaction measurement and a questionnaire assessment. While Japanese and Finnish participants did not differ significantly in their physiological responses to direct and averted gaze, in the direct gaze condition the Japanese participants rated the presented face as angrier, less pleasant and less approachable. This suggests that direct gaze can be perceived as threatening and unpleasant in Japanese culture³³. Such cultural differences in affective evaluation seem to stem from culturally informed social norms^{7,33,34}. Nevertheless, while these findings have become canonical, they reflect just a part of sociocultural realities and may not capture the complex dynamics of gaze behavior.

In attempt to better understand and explain the cross-cultural differences eye contact, some recent studies employed more sophisticated experimental paradigms targeting gaze behaviors. Cross-cultural eye-tracking studies revealed that East Asian participants looked in the eyes less in than Western participants in a mutual gaze condition³⁵ and that, when attempting to learn or recognize a face, East Asian participants looked at the eyes less than Western participants³⁶. Using wearable eye-trackers, Hessels and colleagues²² further performed a study focused on face gazing of Japanese and Dutch participants during unstructured conversation and joint task completion. While not targeting eye contact specifically, the study reported less face-oriented gazing behavior in the Japanese participants²². However, a different work³⁷ showed that during social interactions, Western (British and Irish) participants exhibited more mouth-oriented and less eye- and central face region-oriented gazes than Japanese participants. While the study focused on gaze behaviors and not mutual eye contact (only the participants' gaze behaviors was recorded), the authors' observations were replicated in another work, which showed that dyads of East Asian origin exhibited longer mutual gazes than dyads of Western origin³⁸. The cultural background (East Asian/Western European) of children aged between 1 and 7 years affected how they looked at another person's eyes and mouth, but not their eye contact patterns³⁹.

These studies challenge the idea of “simple” gaze avoidance in East Asian cultures and suggest that contextual factors can affect this behavioral pattern (see also³⁸.

Overall, the existing literature on eye contact comfort seems to be in need of supplementing. Although the dichotomy between Western “gaze engagement” and Eastern “gaze avoidance” may not be absolute, previous

research suggests that preferences and norms regarding eye contact indeed vary substantially across cultural contexts. Its variability appears to mirror the differences between *contact* and *non-contact* cultures²⁶ observed in other aspects of nonverbal behaviors, like, in interpersonal distancing⁴⁰. This assumption seems to be justified by some early psychological studies²⁷. However, despite eye contact being a powerful communicative cue influencing social behaviors and evaluations, existing cross-cultural research is scarce. Descriptive data are missing and it is not fully clear to what extent cultural norms and individual differences predict the preferred degree of direct eye contact. Existing findings tend to be limited to a few geographical and cultural contexts and are often laboratory-based, which decreases their generalizability. Scarceness of studies involving so-called “non-WEIRD” populations (Henrich et al., 2010), outside of Westernized cultures and developed Eastern countries, is also very problematic, given cultural and geographical influences on numerous aspects of social behaviors^{41,42}. Previous research also suggests that specific individual characteristics, such as gender, may be related to one’s eye contact preference²⁸, but has provided few examples of other relevant variables or explanations for their effects. Finally, existing works seldom combine the individual and cultural variables, leaving this research area to be further explored.

Here, we aimed to assess the degree of eye contact comfort in a cross-cultural context. The first aim of this study was to generate descriptive data for eye contact comfort in a large multinational sample. Specifically, we focused on explicit self-assessments of eye contact comfort, defined as the degree to which individuals feel comfortable maintaining mutual eye contact with another person. Although exploratory in nature, we assumed that such assessments could serve as a useful proxy for direct eye contact behaviors, while also reflecting broader social norms and cultural conventions surrounding eye contact. In turn, this approach may provide a valuable basis for generating further hypotheses and research concerning nonverbal communication across cultures.

In a similar vein, we sought to explore whether (and which) individual- and culture-level variables predict the degree of eye contact comfort. Given the scarcity of cross-cultural research in the eye contact domain, we based our exploratory framework on research concerning two other established non-verbal expressions of social intimacy—interpersonal distance preferences and touch behaviors—which have previously been associated with the contact-non-contact cultural dichotomy^{26,43–45}. To investigate possible explanatory mechanisms, the computed models comprised variables that were previously found to be associated with these constructs (see e.g.^{41,42,46} ...).

At the individual level, we included gender, age, pathogen stress, conservatism, religiosity, and gender equality attitudes. On the populational level, the models comprised average regional temperature, Human Development Index, pathogen stress, conservatism, collectivism, gender equality attitudes, and religiosity. Although the selection of these predictors was exploratory, previous theoretical and empirical work suggests that these variables may plausibly relate to eye contact norms and comfort. At the same time, existing literature does not allow for straightforward predictions regarding the direction of these associations. For example, early observational studies often reported lower levels of eye contact in East Asian cultures, which are commonly characterized as more collectivistic. However, the collectivism–individualism dimension primarily concerns the relationship between individuals and their social groups, as well as the organization of these groups within society⁴⁷. From this perspective, collectivist cultures could also promote stronger social cohesion and socially oriented nonverbal behaviors, including eye contact, because social ties within groups tend to be more stable and interdependent than in highly individualistic cultures. Similarly, Behavioral Immune Theory⁴⁸ may provide a useful framework for understanding cultural variation in nonverbal behavior. Safer environments characterized by lower pathogen prevalence may facilitate more approach-oriented and affiliative behaviors, whereas ecological threat may alter social signaling strategies. Previous studies have indeed shown that regional pathogen prevalence can be associated with behaviors related to the contact–non-contact cultural distinction⁴⁹. Importantly, many of the variables included in the present analyses are likely interconnected. For instance, individualism has been linked to economic development both as a potential antecedent and consequence of affluence: economic prosperity increases opportunities for personal autonomy, while greater autonomy may foster innovation and further economic growth⁴⁷. Likewise, cultural gender inequality and broader societal development may shape both internal emotional processes (e.g., appraisals) and external emotional display rules⁵⁰. Finally, climatic factors such as temperature have frequently

been associated with emotional expressiveness and social behavior^{51,52}. Collectively, these findings suggest that eye contact comfort may emerge from a complex interplay of ecological, cultural, socioeconomic, and psychological influences.

Materials and methods

Participants

The study comprised 10,414 adult participants from 51 countries and territories (see Table 1). The recruitment plan was focused on as high cultural diversity as possible within the allocated budget and resources. Participants were panel members of an external survey company, recruited with pre-defined distributions of age, gender and residential area. The survey company invited and compensated them. The subsample within each study site was to comprise about 200 participants to ensure sufficient power for two-level models⁵³. For clarity of the further analyses, which also included gender as a factor, we decided not to analyze responses from 27 participants who did not disclose their gender or described it as “other” rather than male or female. The final sample comprised 10,387 participants aged 18–73 ($M_{age} = 39.46 \pm 14.13$, 50% women), with 63.8% being in a relationship and 58.2% having children. Descriptive characteristics of participants from each included study site are presented in Table 1.

Methods

The participants completed an on-line survey on eye contact comfort and several other constructs, which are described in detail in the section below. This study was part of a larger project (see Kowal et al., 2024, 2025), and the survey contained also some other measures unrelated to the current study. The translations of all scales were performed by professional translators with substantial experience in academic and cross-language translation work and particular attention was paid to semantic equivalence and cultural appropriateness during the translation process. The protocols of all studies complied with the Declaration of Helsinki and were accepted by the Ethics Committee of the Institute of Psychology, University of Wrocław. All participants provided informed consent to be included in the research.

Eye contact comfort

To assess eye contact comfort, we developed a brief scale consisting of six items. Each item addressed comfort with maintaining direct eye contact in different relational categories: a same-sex stranger, an opposite-sex stranger, a same-sex acquaintance (someone the participant knows but not well), an opposite-sex acquaintance, a same-sex close person (e.g., close friend, relative, or partner), and an opposite-sex close person. Participants were asked to rate their agreement with the statement, “I feel comfortable maintaining direct eye contact with...” for each of the analyzed relational categories. Responses were recorded on a 7-point Likert scale ranging from 1 (definitely not true) to 7 (definitely true). The scale was inspired by the interpersonal distance preference scale successfully employed in previous cross-cultural research⁴¹.

Based on the individual responses we collected, we computed eye contact comfort indices: (a) an *individual eye contact comfort index*, a mean of the six answers, for each participant included in the study (the index further used in the main data analysis), and (b) a *culture-level eye contact comfort index* for each study site (recorded for descriptive purposes and presented in Table 2). For exploratory purposes, we further computed the mean values of culture-level indices of eye contact preference in three relational categories (stranger, acquaintance, close person) listed in the questionnaire (for descriptive data, see Table 2).

Table 1 Descriptive characteristics for the included study sites.

Study site	<i>N</i>	Age (M)	Age (SD)	Gender (% women)	Relationship (% in a relationship)	Children (% of parents)	SES ^a (M)	HDI	Temperature
Algeria	213	38.39	14.12	46.90	54.50	39.90	6.038	0.745	23.8
Argentina	201	39.27	13.79	50.20	60.70	59.70	5.896	0.849	15.4
Australia	201	40.13	14.45	50.70	52.70	62.20	5.05	0.946	22.4
Bangladesh	202	39.36	13.70	49.00	63.90	48.00	6.51	0.67	25.5
Bolivia	201	39.78	14.20	49.30	57.20	51.70	5.468	0.698	20.9
Brazil	202	39.18	14.35	50.50	58.90	63.40	6.153	0.76	25.7
Bulgaria	202	39.51	14.54	49.00	70.30	57.90	5.723	0.799	12.1
Chile	200	39.13	14.42	50.00	66.50	59.00	5.76	0.86	9.6
China	202	39.20	14.00	51.00	80.70	76.20	6.188	0.788	7.9
Colombia	202	39.66	14.42	50.50	63.40	56.40	5.564	0.758	25.2
Ecuador	199	39.14	13.82	50.30	59.30	57.80	5.764	0.765	21.6
Egypt	206	39.44	13.92	51.00	71.40	69.90	6.718	0.728	23.6
Ethiopia	200	39.33	13.68	50.00	57.00	47.50	5.66	0.492	23.6
France	202	40.07	14.48	51.00	63.90	69.80	5.361	0.91	12.1
Germany	202	40.39	14.68	52.00	57.90	51.00	5.411	0.95	10.2
Ghana	202	39.29	14.06	49.50	53.50	43.60	5.911	0.602	27.9
Greece	199	39.40	14.20	49.70	66.30	55.30	5.719	0.893	14.8
Guatemala	204	39.53	14.21	51.00	62.70	61.30	5.775	0.629	23.9
Honduras	202	39.36	13.45	50.00	67.80	67.80	5.837	0.624	24.9
Hong Kong*	202	38.86	13.89	50.00	76.70	58.40	6.49	0.956	21.75
India	203	39.25	14.13	49.80	59.10	49.30	7.251	0.644	25.1
Indonesia	210	40.52	14.95	51.90	64.80	58.60	6.557	0.713	26.1
Italy	200	39.49	14.60	50.50	69.50	52.00	5.68	0.906	13.7
Japan	202	39.40	14.62	49.50	53.50	33.70	4.812	0.92	12.1
Kazakhstan	202	37.83	11.50	50.50	68.30	64.90	6.198	0.8	7.6
Kenya	205	39.31	14.35	51.20	74.10	72.70	6.122	0.601	25.2
Malaysia	216	40.23	14.64	46.30	61.10	54.20	6.44	0.807	26.6
Mexico	200	39.28	13.90	50.00	68.50	62.00	6.295	0.781	21.7
Morocco	219	40.72	14.62	46.10	55.30	47.50	5.447	0.698	18.5
New Zealand	202	39.23	14.04	50.00	68.80	58.90	6.257	0.939	10.9
Nicaragua	200	39.07	14.27	50.00	58.00	66.00	5.48	0.669	26
Nigeria	201	38.82	13.71	50.20	70.60	60.70	6.294	0.548	27.5
Pakistan	202	39.44	14.34	49.50	66.30	59.90	6.317	0.54	21.7
Panama	203	39.03	14.55	49.30	64.50	62.10	5.936	0.82	25.8
Paraguay	199	39.33	14.27	50.30	58.80	55.80	5.869	0.731	24.1
Peru	202	39.04	13.99	49.50	59.40	55.00	6.05	0.762	19.8
Philippines	204	39.94	14.74	51.00	60.30	52.50	6.294	0.71	26.5
Poland	202	39.54	14.34	51.50	73.30	63.90	5.762	0.881	9.4
Romania	198	39.72	14.03	50.00	68.70	56.10	5.98	0.827	11
Singapore	202	39.12	14.03	49.50	80.20	70.80	6.955	0.949	27.9
South Africa	203	39.82	14.47	51.20	58.60	74.90	5.621	0.717	18.5
South Korea	202	39.54	14.03	50.00	72.80	60.40	5.639	0.929	12.6
Spain	201	39.49	14.13	49.80	63.20	53.20	5.98	0.911	14.5
Sri Lanka	201	39.48	14.22	49.30	51.20	31.80	6.184	0.78	27.4
Thailand	202	39.58	14.60	50.00	50.00	51.00	5.663	0.803	27.1
Turkey	204	39.55	14.07	51.00	76.00	76.50	6.652	0.855	12.3
Uganda	200	39.58	14.77	49.50	62.00	52.00	5.57	0.55	23.2
UK	200	38.71	13.29	50.50	67.00	57.50	5.26	0.94	9.5
USA	257	41.00	13.56	45.50	54.50	63.40	5.891	0.927	9.9
Venezuela	200	39.36	14.28	50.00	67.50	67.50	5.7	0.699	25.45
Vietnam	201	39.13	14.11	50.20	67.70	64.70	5.965	0.726	25

^aSocioeconomic status.

*Provided the distinct sociocultural context, data from Hong Kong and China were analyzed separately.

Table 2 Means of culture-level variables and eye contact comfort across study sites.

Study site	Religiosity	Gender inequality	Collectivism	Conservatism	Pathogen prevalence	Eye contact strangers	Eye contact acquaintances	Eye contact close person	Eye contact total
Algeria	5.98	4.32	5.81	4.23	0.37	3.43	4.13	5.43	4.33
Argentina	4.43	1.90	4.75	3.22	0.28	4.20	4.74	5.50	4.82
Australia	3.74	2.61	4.60	3.32	0.21	4.89	5.09	5.66	5.21
Bangladesh	6.95	4.53	5.67	4.19	1.57	3.91	3.89	4.99	4.26
Bolivia	4.05	2.41	4.45	3.94	0.82	3.46	3.87	5.04	4.13
Brazil	6.15	2.57	5.08	3.39	0.73	4.03	4.73	5.55	4.77
Bulgaria	5.31	3.23	4.52	3.94	0.08	4.39	5.05	5.62	5.02
Chile	4.36	1.86	4.51	3.15	0.28	3.66	4.29	5.44	4.46
China	2.54	3.20	4.39	3.78	0.14	3.71	4.12	4.68	4.17
Colombia	4.72	2.11	4.60	3.53	0.36	3.84	4.34	5.37	4.52
Ecuador	4.71	2.22	4.55	3.71	0.46	3.52	4.04	5.26	4.27
Egypt	6.73	5.05	6.11	4.46	0.38	3.82	4.10	5.31	4.41
Ethiopia	6.39	3.45	5.24	3.72	1.54	3.85	3.83	5.02	4.23
France	3.49	2.41	4.87	2.93	0.28	4.64	5.04	5.55	5.08
Germany	3.60	2.69	4.55	2.67	0.23	4.11	4.37	5.26	4.58
Ghana	6.72	4.02	4.95	4.10	2.17	3.88	4.13	5.12	4.38
Greece	5.67	2.72	5.36	3.49	0.07	4.06	4.69	5.63	4.79
Guatemala	4.78	2.59	4.61	4.00	0.76	3.68	4.10	5.30	4.36
Honduras	5.21	2.22	4.80	3.52	0.53	4.02	4.53	5.45	4.66
Hong Kong	4.27	3.94	4.78	3.36	1.37	4.11	4.35	4.90	4.45
India	6.61	4.30	5.31	3.98	1.50	4.57	4.49	5.29	4.78
Indonesia	6.86	4.39	5.27	4.48	1.18	4.91	5.15	5.86	5.31
Italy	5.17	2.56	4.51	3.20	0.24	4.63	5.00	5.47	5.03
Japan	2.16	3.07	3.60	2.64	0.04	2.84	3.38	4.39	3.54
Kazakhstan	5.27	3.92	4.62	3.68	0.18	4.05	4.97	5.56	4.86
Kenya	6.95	3.75	4.18	4.20	2.16	4.41	4.56	5.64	4.87
Malaysia	6.78	4.17	4.83	4.04	0.34	3.60	4.19	5.02	4.27
Mexico	4.41	2.22	4.28	3.51	0.38	3.85	4.45	5.47	4.59
Morocco	6.28	4.17	5.78	4.25	0.38	3.63	4.18	5.48	4.43
New Zealand	4.55	3.41	4.59	3.38	0.18	4.57	4.67	5.20	4.81
Nicaragua	4.78	2.43	4.59	3.69	0.65	3.27	4.14	5.28	4.23
Nigeria	6.78	4.57	5.31	4.48	2.77	4.12	4.49	5.47	4.69
Pakistan	6.90	4.96	5.54	4.21	1.35	4.17	4.12	5.03	4.44
Panama	5.35	2.43	4.91	3.57	0.32	3.89	4.35	5.42	4.55
Paraguay	4.31	2.58	4.44	4.00	1.11	3.69	4.16	5.25	4.36
Peru	4.88	2.14	4.28	3.70	0.32	3.63	4.14	5.14	4.30
Philippines	6.41	4.61	5.41	4.48	0.46	3.40	4.57	5.49	4.49
Poland	5.77	2.91	3.82	3.44	0.24	4.06	4.81	5.57	4.81
Romania	6.03	3.29	4.84	3.50	0.06	4.61	5.05	5.63	5.10
Singapore	5.22	3.86	4.83	3.97	1.08	4.05	4.28	4.67	4.33
South Africa	6.79	3.51	4.76	4.07	0.29	4.53	4.67	5.72	4.98
South Korea	3.54	2.80	3.54	3.12	0.15	3.03	3.85	4.34	3.74
Spain	4.40	1.74	4.71	2.75	0.20	4.25	4.78	5.46	4.83
Sri Lanka	5.81	3.73	4.99	3.75	0.33	4.20	4.30	4.96	4.48
Thailand	4.85	3.80	4.70	3.27	0.65	4.14	4.71	5.53	4.79
Turkey	7.19	3.15	5.16	3.41	0.22	5.10	5.50	5.81	5.47
Uganda	6.69	3.75	4.87	3.87	2.07	3.94	4.42	5.19	4.52
UK	3.72	2.49	4.69	2.88	0.37	4.59	4.80	5.48	4.95
USA	5.69	3.04	4.46	3.82	0.34	5.04	5.23	5.70	5.32
Venezuela	4.94	2.12	4.82	3.47	0.34	4.18	4.59	5.45	4.74
Vietnam	2.66	3.87	5.21	3.46	2.19	4.34	4.43	5.42	4.73

Individual-level variables

The survey completed by the participants contained several questionnaires (some of which were unrelated to the scope of this study). For the purpose of the eye contact study, we recorded and analyzed data regarding the participant's gender, age (in years), relationship status (several options which were further recoded to a dichotomic distinction: currently in a relationship vs. not in a relationship), and parenthood status (parent vs. childless). The participants also reported their socioeconomic status, religiosity, gender inequality attitude, collectivism, pathogen history and conservatism (for details of the scales and measures see below).

Socioeconomic status (SES)

SES was self-reported by the participants using MacArthur Scale of Subjective Social Status, a simple visual “ladder” task wherein participants rate their status in comparison to other people in their culture. The possible responses ranged from 1 to 10, with 1 indicating the lowest, and 10 the highest possible SES⁵⁴.

Gender inequality

Gender inequality perception was assessed using three items from the Gender subscale of Gender Equitable Men Scale e.g.: *A man should have the final word about decisions in his home*⁵⁵. The responses were provided using a 1–7 scale (from 1–“definitely disagree” to 7–“definitely agree”), and a higher mean score used in further analyses indicated holding higher levels of individual-level gender inequality beliefs. Cronbach's α for this scale in our sample was 0.84.

Religiosity

Religiosity was measured with a self-report answer to a question “*Are you religious?*” with Likert-type response scale ranging from 1 (“not at all”) to 7 (“extremely”).

Conservatism

Conservatism was assessed using five positively worded items selected from the International Personality Item Pool Conservatism Scale (IPIP; <https://ipip.ori.org/>). The scale serves as a proxy for the Traditionalism subscale within the Multidimensional Personality Questionnaire (MPQ) (Tellegen, 1995). The responses were provided using a scale with “yes” and “no” response options, which were further recoded to 1 and 0, respectively. The final score was a sum of all positive responses (0–5 range). Cronbach's α for this scale in our sample was 0.47.

Pathogen stress

Participants reported their previous history of nine contagious diseases (e.g., malaria, typhus, dengue). The response scale had three options: never, once, and multiple times; recoded into 0, 1, and 2, respectively. A total sum score was used in further analyses as an index of individual pathogen stress.

Individualism-collectivism

Collectivism was assessed using three reverse-coded items from Collectivism Scale⁵⁶, e.g.: “*Group welfare is more important than individual rewards*”. Collectivism operationalized in this scale aligns with Hofstede's proposed cultural dimensions^{57,58}, and the scale has been successfully used in previous research⁵⁹. The responses were provided using a 1–7 scale (ranging from 1–“definitely disagree” to 7–“definitely agree”), with a higher mean score indicating higher collectivism. Cronbach's α for this scale in our sample was 0.84.

Culture-level variables

Individual scores of Religiosity, Gender inequality, Conservatism, Parasite history and Collectivism were aggregated at the *Culture level* to form an index for each culture (for details, see: *Analytic approach* section).

Temperature

Annual average temperatures for each country/territory was recorded using data reported on the World Economics website (<https://www.worlddeconomics.com/Indicator-Data/ESG/Environment/Temperatures/>; retrieved February 19, 2025); since data on Venezuela and Hong Kong were not reported, different sources were used for these study sites (<https://globaldatalab.org/> and <https://www.hko.gov.hk/en/>, respectively).

Human development index

Human Development Index data for each included country and territory were retrieved from the record of subnational HDIs for 2022 (<https://globaldatalab.org/shdi/table/>; data retrieved February 19, 2025).

Analytic approach

All statistical analyses were conducted in SPSS version 29, and the data for this study are available in an online repository (https://osf.io/fg8z2/overview?view_only=6c9acb8ad4344586970c7895a76405ea). First, we computed the eye contact comfort indices described in the *Eye contact comfort* section and reported them for each study site (see Table 2). Second, we explored the degree of similarity of *eye contact comfort indices* across relational categories (eye contact with strangers, acquaintances, close persons) by conducting a Pearson's correlation test between the three eye contact comfort proxies. Furthermore, using individual responses, we conducted a repeated measures ANOVA to compare eye contact comfort between the three relational categories.

Third, we conducted a multilevel linear model to test differences between study sites in levels of eye contact comfort as well as whether individual-level predictors and culture-level variables predicted the *individual eye contact comfort index*. Participants' responses were nested within countries to account for the non-independence of observations within the same country. Individual-level predictor variables were group-mean centered for the analysis, while culture-level predictor variables were grand-mean centered. No violations of collinearity were found, as variance inflation factors (VIFs) did not exceed 5⁶⁰.

For each dependent variable, we followed a three-step modelling approach. We first ran an empty model including only study site as a random intercept to assess whether the dependent variable varied across study sites. We then added all individual-level predictors as fixed effects in the second model, followed by a third model incorporating all culture-level predictors. Intraclass correlations (ICCs) were computed for each model to estimate the proportion of variance associated with between-country differences.

Results

Culture-level eye contact comfort

Detailed means for each study site on culture-level variables (religiosity, gender inequality, collectivism, conservatism, pathogen prevalence) and eye contact comfort (with strangers, acquaintances, close persons, and total) are presented in Table 2. Additionally, supplementary Table S1 presents standard deviations in culture-level variables and eye contact comfort across study sites and supplementary Table S2 shows inter-correlations between culture-level predictors. The global distribution of mean eye contact comfort is additionally illustrated in Fig. 1.

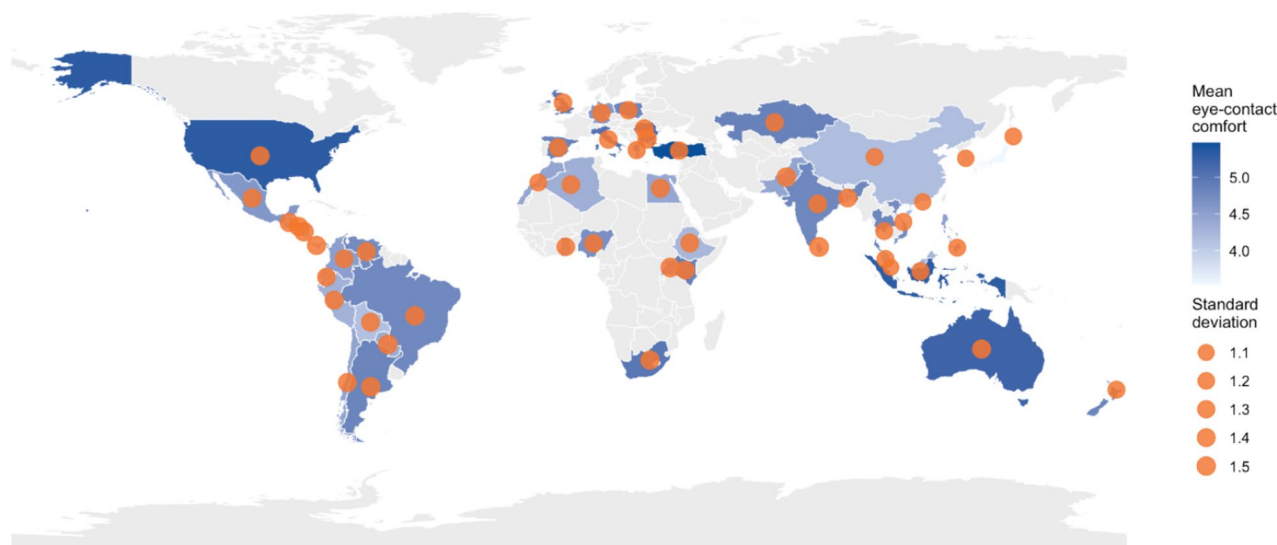


Fig. 1 Global distribution of eye contact comfort. Circles reflect standard deviation size in a given study site: the smallest ranging from 1.07 to 1.23, medium-sized: 1.24–1.4, and the largest: 1.41 to 1.56. The visualisation was created using R Statistical Software (v4.6.0⁶¹).

Eye contact comfort indices across relational categories

We explored differences in eye contact comfort depending on the relational category. Eye contact comfort between the three types of relationship (strangers, acquaintances, close persons) all correlated with each other, with high correlations between acquaintances with both strangers ($r=.66$, $p<.001$) and close persons ($r=.62$; $p<.001$), and a moderate correlation between strangers and close persons ($r=.48$; $p<.001$).

We further conducted a repeated measures ANOVA comparing individual assessments of eye contact comfort across relational categories. The results indicated a significant main effect of type of relational category ($F_{2,20772}=3821.84$, $p<.001$, $\eta^2_{\text{partial}}=0.269$): eye contact with a close person was regarded as the most comfortable ($M=5.33\pm0.02$) as compared to both acquaintances ($M=4.47\pm0.02$), and strangers ($M=4.05\pm0.02$), with the latter two groups also differing significantly (all Tukey's post-hoc comparisons $p<.001$). Visualization of this result is presented in Fig. 2.

Predicting eye contact comfort

All detailed coefficients for each of the computed multilevel linear models are presented in Table 3. The empty model indicated that eye contact comfort significantly differed across cultures ($p<.001$), and that the ICC indicated 6.50% of the total variance was attributable to between study sites differences (for full results see Table 3). The individual-level model showed that higher interpersonal eye contact comfort was associated with male gender (non-standardized coefficients: $B=-0.16$, $SE=0.03$, $p<.001$), older age ($B=0.01$, $SE=0.01$, $p<.001$), higher socioeconomic status ($B=0.06$, $SE=0.01$, $p<.001$), higher individual-level gender equality ($B=-0.03$, $SE=0.01$, $p=.004$), collectivism ($B=0.09$, $SE=0.01$, $p<.001$), and conservatism ($B=0.04$, $SE=0.01$, $p=.010$). Relationship status, parenthood status, and individual religiosity were found not to significantly contribute to the model.

In the third model, with culture-level predictors, average eye contact comfort was higher in more religious ($B=0.18$, $SD=0.05$, $p<.001$), collectivistic ($B=0.26$, $SD=0.11$, $p=.026$) cultures with higher gender equality ($B=-0.21$, $SD=0.08$, $p=.009$) and higher average pathogen history ($B=0.21$, $SD=0.10$, $p=.030$). Eye contact

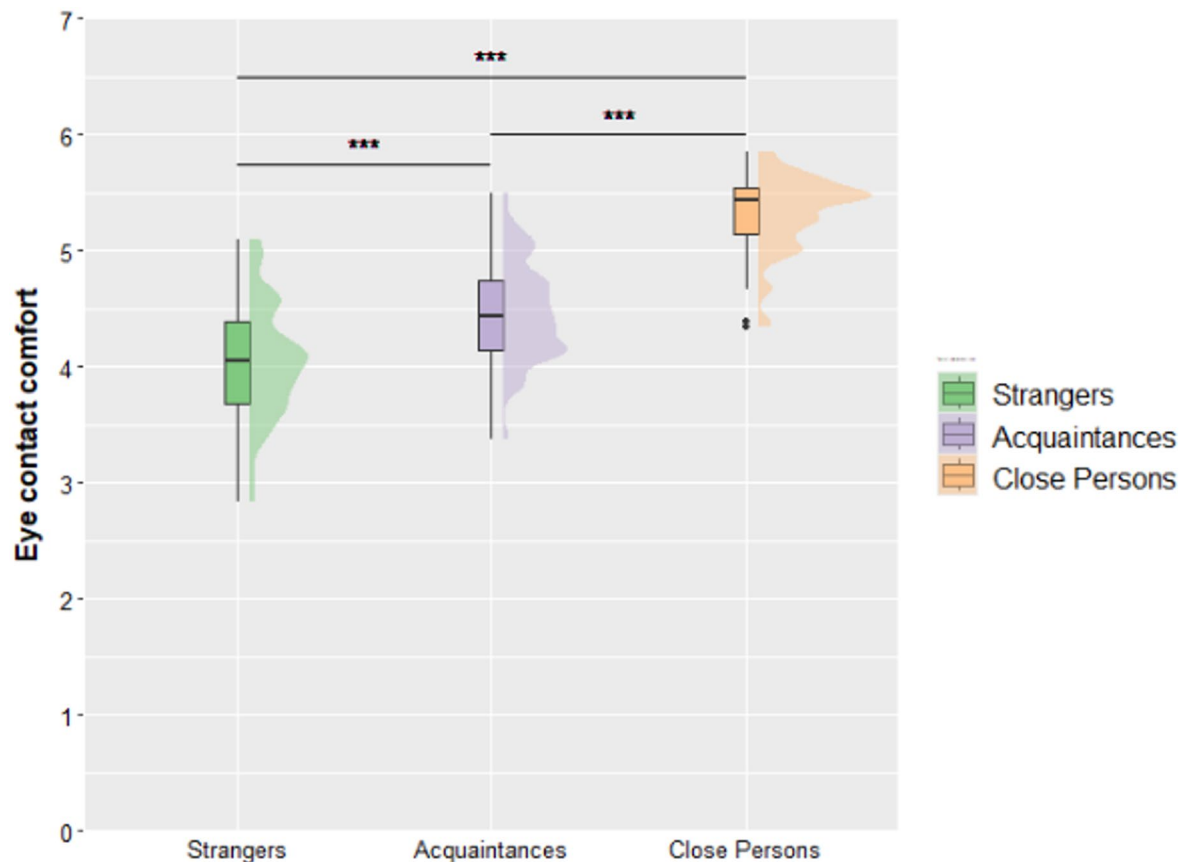


Fig. 2 Differences in eye contact comfort across relational categories.

comfort also seemed to be higher in slightly colder study sites ($B=-0.02$, $SD=0.01$, $p=.021$) with higher HDI ($B=1.67$, $SD=0.57$, $p=.005$). Culture-level conservatism was not associated with eye contact comfort. Each of the tested models showed a greater fit than the previous, as shown by the χ^2 test of the -2 -Log Likelihood indices (see Table 3).

Discussion

Our study aimed to assess the degree of eye contact comfort across a large, multinational sample, addressing the relative scarcity of cross-cultural research in this domain. The dataset provides one of the richest descriptive sources to date which can be used to generate testable hypotheses crucial for understanding the variability in eye contact comfort across societies. Our findings provide empirical evidence that eye contact with close individuals is perceived as most comfortable, followed by acquaintances, and finally, strangers. This gradient of comfort aligns with earlier studies emphasizing the relational and contextual dependence of gaze behavior^{4,16,33}. Furthermore, the primary focus of the current research were the potential cross-cultural differences, and we have indeed observed considerable cross-cultural variability in reported eye contact comfort. A multilevel model confirmed that around 6% of the total variance in eye contact comfort was associated with study sites, indicating meaningful cultural and contextual differences. Our data showed that the lowest levels of eye contact comfort were observed not only in several Asian cultures but also in South American nations, while the highest eye contact comfort was observed in many European cultures. This finding challenges Hall's²⁶ classic “contact vs. non-contact” cultural typology and complements the traditional East–West distinction reported in earlier literature (e.g.^{33,34}).

Table 3 Eye contact comfort: multilevel analysis.

Variables	Model 1: empty model	Model 2: individual model	Model 3: cultural model
	Model estimates (standard error)		
Fixed intercept	4.61 (0.05)***	4.61 (0.05)***	4.63 (0.04)***
Individual level variables			
Gender		− 0.16 (0.03)***	− 0.16 (0.03)***
Age		0.01 (<0.01)***	0.01 (<0.1)***
Relationship status		0.22 (0.03)	0.22 (0.03)
Parenthood status		− 0.01 (0.03)	− 0.01 (0.03)
Socioeconomic status		0.06 (0.01)***	0.06 (0.01)***
Religiosity		0.01 (0.01)	0.01 (0.01)
Gender inequality		− 0.03 (0.01)**	− 0.03 (0.01)**
Collectivism		0.09 (0.01)***	0.09 (0.01)***
Conservatism		0.04 (0.01)*	0.04 (0.01)*
Parasite history		0.02 (0.01)	0.02 (0.01)
Culture-level variables			
Culture religiosity			0.18 (0.05)***
Culture gender inequality			− 0.21 (0.08)**
Culture collectivism			0.26 (0.11)*
Culture conservatism			0.04 (0.17)
Culture parasite history			0.21 (0.10)*
Study site temperature			− 0.02 (0.01)*
Culture human development index			1.67 (0.57)**
Random effects			
Variance indices			
Residual variance	1.86 (0.13)***	1.79 (0.03)***	1.79 (0.03)***
Study site variance	0.13 (0.02)***	0.13 (0.03)***	0.08 (0.02)**
ICC (%)	6.50	6.77	4.28
Model fit indices			
− 2-Log Likelihood	36036.34	35679.77	35653.41
df	3	13	20
χ^2		356.57***	26.36***

*** $p < .001$.

** $p < .01$.

* $p < .05$.

Gender direction: 1—man, 2—woman; Relationship status and Parenthood status direction: 0—no, 1—yes.

The coefficients are not standardized.

Despite the exploratory nature of our study, we were able to generate and test the relevance of several individual- and culture-level assumptions in explaining the variability of eye contact comfort. Direct gaze serves not only to extract relevant visual information (the encoding function), but also to signal one's mental state to another person (the signalling function)^{23,25}. Eye contact conveys agency and dominance¹⁷, and direct gaze has been linked to credibility and authority in educational settings^{62,63}. In this context, interpreting our individual-level findings in terms of the “sender's” comfort with using this meaningful form of nonverbal communication, the pattern of individual-level predictors provides some evidence for a “power-related” interpretation. In our sample, higher eye contact comfort was associated with older age and higher individual socioeconomic status, both being

potential markers of social capital and authority. These associations suggest that individuals who occupy positions of relative power or confidence may experience less discomfort and greater agency in maintaining direct gaze. Relatedly, gender also emerged as an important factor in shaping eye contact comfort, with men reporting higher comfort with eye contact than women. This pattern may be explained by different visual scanning behaviors of men and women, wherein women tend to continually switch the gaze over different regions of the interlocutor's face⁶⁴. Referring to the collective pattern of our findings, lower eye contact comfort can also reflect persistent gender asymmetries in social dominance, or perceived safety during interpersonal encounters, where men may feel more secure initiating or maintaining direct gaze.

Relatedly, both individual- and culture-level gender equality were positively associated with eye contact comfort. This finding aligns with evidence that gender-equal societies promote more open, direct, and egalitarian interpersonal behaviors, including nonverbal communication⁶⁵. As gender equality increases, gender-based distinctions in nonverbal expressivity tend to diminish, suggesting that egalitarian norms foster mutual visibility and comfort in direct interaction. In a similar vein, our findings concerning the Human Development Index showed that higher levels of socioeconomic development were associated with greater eye contact comfort. Economic development has been previously linked to cultural values being increasingly trusting and participatory⁶⁶. Collectively, these findings suggest that greater comfort with direct eye contact may be characteristic of social environments perceived as more open, predictable, egalitarian, and socially safe.

Further predictors related to norms and sociocultural values—religiosity and conservatism—revealed nuanced patterns. Higher individual-level conservatism predicted greater eye contact comfort, whereas culture-level conservatism was unrelated to gaze comfort. Individual religiosity was not a significant predictor, but cultures with higher average religiosity exhibited higher eye contact comfort. A potential explanation is that religious and conservative value systems often emphasize prosocial norms and community trust, which may encourage socially engaging behaviors⁶⁷, including eye contact. The positive association between cultural-level religiosity and eye contact comfort could also reflect the role of shared moral frameworks and social cohesion in reducing social anxiety or uncertainty during interpersonal encounters, reflected in the usage of direct interpersonal behaviors.

Also collectivism emerged as a significant predictor of eye contact comfort. Notably, higher collectivism—both at the individual and culture level—was positively associated with greater eye contact comfort. This finding is interesting in light of previous research linking collectivism to more restrained emotional expression, attributed in part to an emphasis on group harmony and relational attunement^{68–70}. However, emotional expressiveness and comfort with eye contact represent distinct aspects of social behavior, and collectivism may therefore not uniformly predict greater restraint across forms of nonverbal communication.

Our findings may also seem contradictory to the previous reports on low eye contact levels in typically collectivist, East Asian countries. However, contemporary East Asian societies may no longer map directly onto the traditional collectivism–individualism distinction. In our sample, East Asian countries did not score the highest on collectivism, potentially reflecting certain underlying trends and cultural shifts associated with modernization and globalization^{71,72}. Longitudinal and cross-national research indicates increasing individualistic values and practices alongside socioeconomic development, urbanization, and changing social institutions^{73,74}. In East Asia specifically, a recent meta-analysis of 99 studies spanning 1988–2023 found evidence of declining collectivism in Asian societies as economic, political, and urban-development conditions changed⁷³.

More broadly, our findings suggest that collectivism may shape not only whether direct gaze is used, but also the social meaning and perceived utility of this form of communication. Although collectivistic cultures often emphasize indirect communication, they also place strong value on maintaining interpersonal harmony, affiliation, and coordination within social groups^{75,76}. One possibility, therefore, is that greater orientation toward relational interdependence increases the attentional and social value of nonverbal cues such as eye gaze. Direct gaze can convey important information²², and may facilitate interpersonal coordination and affiliation, including behavioral synchronization⁷⁷. From this perspective, greater collectivism could be associated with greater comfort with eye contact not because collectivistic individuals are generally more expressive, but because gaze may be particularly relevant for monitoring and maintaining social connectedness. This interpretation remains

tentative, as the present data cannot establish whether greater sensitivity to relational cues mediates the association between collectivism and eye contact comfort. Nevertheless, it offers a possible explanation for why collectivism may be positively associated with comfort with direct gaze despite the greater emphasis on indirect communication often attributed to collectivistic cultures. Together with our findings on religiosity and conservatism, these results suggest that cohesive and traditionally structured social environments—whether grounded in cultural values or moral systems—may facilitate greater ease in establishing and maintaining direct eye contact during social interactions, as well as normalize its use in everyday social relations. Rather than implying that collectivism universally promotes direct gaze, our findings suggest that the relationship between cultural orientation and eye contact may depend on the social functions attributed to gaze within a given cultural context.

Further examinations revealed that higher culture-level pathogen stress was associated with greater eye contact comfort. This finding could be interpreted from the Behavioral Immune System theory perspective, which posits that environments with higher health threats enhance social monitoring and vigilance⁴⁸. Consequently, eye contact may serve as a functional cue for assessing others' health, trustworthiness, or social intentions. Comfort with gaze under such conditions might represent a secondary adaptation—facilitating protective or cooperative social behaviors in high-threat environments. However, it remains unclear why this positive association was observed solely at the culture, and not at the individual level.

Finally, also colder climates predicted higher eye contact comfort, reinforcing the differences observed between geographical regions. As study sites similar in eye contact comfort were also often close geographically in the current research, some socioecological influences driven by geographical proximity and cultural transmission within certain parts of the world are possible. Interestingly, our findings diverge from previous research on other domains of nonverbal behavior, such as interpersonal distance preferences and touch behaviors. Sorokowska⁴¹, demonstrated that preferred interpersonal distance tends to be smaller in warmer climates, whereas interpersonal touch behaviors were found to be most diverse in warmer, less conservative, and less religious societies⁴². Both of these studies, like the present one, relied on large cross-cultural datasets, raising intriguing questions about the potential specificity of direct eye contact compared with other elements of non-verbal and interpersonal behaviors. One possible explanation is that direct gaze, as a more distal and “less tactile” form of social connection, may be perceived as more acceptable in regions where physical contact is culturally restricted or less normative. This interpretation aligns with theoretical perspectives on proxemic and haptic behavior, suggesting that societies regulate different channels of nonverbal communication—such as gaze, gesture, and touch—according to social norms governing intimacy and public behaviors^{26,78,79}. Thus, while physical proximity and touch may be constrained in certain cultural contexts, eye contact could serve as a socially acceptable alternative for expressing engagement and affiliation.

Concluding the discussion of our findings we propose that our results could be analyzed from a different, novel angle. Perhaps, some variance in eye contact comfort may be interpreted from the perspective of social safety. Although highly preliminary, our findings tentatively suggest that comfort with direct gaze may increase under several partially distinct social conditions. One possible pathway could be termed *default safety*, reflected in factors such as higher HDI, socioeconomic status, individual gender equality, older age, and male gender, wherein greater stability, equality and affluence reduce interpersonal risk and allow eye contact to function as a low-cost affiliative signal. A second pathway may involve *moral-cohesive safety*, tentatively associated with higher collectivism, conservatism, and religiosity, where dense networks of shared norms and moral order provide predictability and trust, making direct gaze comfortable within secure in-group contexts. Finally, a third potential pathway, which we term *vigilant safety*, may be linked to higher pathogen stress, where external threats demand heightened social monitoring and eye contact can serve as a tool for vigilance and information gathering. Importantly, these proposed pathways should not be interpreted as empirically established categories or latent dimensions, but rather as speculative heuristic interpretations intended to organize patterns observed in the present data. They are not mutually exclusive and may overlap substantially. Moreover, other unmeasured variables may ultimately provide more accurate explanations for the observed associations. Nevertheless, this tentative framework may help reconcile seemingly paradoxical effects—such as the positive associations of eye contact comfort with both

gender equality and conservatism—by suggesting that eye contact can serve multiple social functions depending on contextual and cultural conditions, including affiliation, vigilance, and trust reinforcement. At the current stage of research, these interpretations remain hypothetical and should primarily be viewed as a source of falsifiable predictions. For example, future research could examine gaze comfort and gaze behavior toward in-group versus out-group targets in collectivist societies; use eye-tracking to test whether gaze in high-pathogen contexts is specifically directed at health-assessment or vigilance-related cues; experimentally manipulate different forms of perceived safety threat (e.g., social, ecological, or moral) to assess their causal influence on eye contact comfort and function. Such approaches may allow for a more precise understanding of how gaze behavior is modulated by social and environmental safety demands across cultures. It should be noted that given the exploratory nature of the study and the indirect associations, the proposed framework is a preliminary model that requires further testing. It is possible that other variables not included in the present analysis may represent better candidate factors for explaining our observations. Also, other methods of analysis, such as clustering could potentially reveal meaningful cultural patterns which have not been observable with the methodological approach we selected.

Several limitations should be considered when interpreting the present findings. First, the study relies on self-reported comfort with eye contact, which may not directly reflect actual gaze behaviour in real interactions, but—for example—reflect gaze behaviors directed at faces and not just eyes^{80,81}. Further, different cultures (or even different people within a single culture) may implicitly assume different durations or interactional norms when interpreting “maintaining” eye contact. Although such ratings can capture internalised norms and expectations, they are not ideal to account for the dynamic and context-sensitive nature of eye contact in everyday social settings^{82,83}. At the same time, this approach enables systematic cross-cultural comparison of perceived norms across a large and diverse set of populations, which would be difficult to achieve using more behaviorally intensive methods. Relatedly, the operationalisation of context using broad categories (strangers, acquaintances, close others) necessarily simplifies the wide variability of real interactions, which may differ in goals, power relations, emotional tone, and situational demands.

Second, the use of country-level aggregates derived from individual-level data may obscure substantial within-country heterogeneity, particularly given variation in sampling strategies. Similarly, the use of a single country-level temperature indicator simplifies complex environmental conditions and does not capture regional or seasonal variability. We treated this measure as a proxy for broad, long-term climatic exposure, consistent with common practices in cross-cultural research (e.g.^{57,58}), but we are aware that it reduces ecological precision. Furthermore, as mentioned in previous parts of the discussion, the applied measure of collectivism showed some unexpected differences between regions included in this study. This may reflect certain underlying trends and cultural shifts in collectivism in the modern world^{71–74}, but it may also mean that the short measure of collectivism we applied only grasps a specific sub-dimension of this concept. In future large-scale investigations, more accurate measures should be applied, such as Horizontal and Vertical Individualism and Collectivism Scale^{84,85}.

These limitations reflect broader trade-offs between cross-cultural comparability and ecological validity in large-scale research. Future studies would benefit from multi-level designs incorporating behavioral and observational measures (e.g., eye-tracking in naturalistic interaction paradigms^{22,38} or interactions with virtual agents⁸⁶, more fine-grained contextual manipulations, and spatially resolved environmental indicators. For example, studies using dual, wearable eye trackers in various interactions should ideally be performed in locations we found to differ most in terms of eye contact comfort. Such a behavioral assessment would provide an interesting supplement to the current investigation. It should be noted, however, that while being a more objective method of assessment of gaze behaviors than observational methods or questionnaires, the applied technologies can also make the recorded contacts rather less natural.

Finally, the proportion of variance attributable to study-site differences, although statistically significant, was relatively modest, suggesting that variability in eye contact comfort is distributed across multiple levels of influence. Importantly, such effect sizes are not uncommon in cross-cultural psychology, where country- or culture-level effects frequently account for approximately 5–15% of the observed variance^{87–89}. This pattern indicates that, while cultural context meaningfully contributes to eye contact comfort, a substantial proportion of variability

likely reflects additional factors operating at the individual and interpersonal levels, including psychological characteristics, social experiences, biological variability, and other influences not directly assessed in the present study. At the same time, this finding highlights promising directions for future research aimed at identifying and integrating these additional determinants into more comprehensive models of cross-cultural gaze behavior.

Conclusion

In sum, the present study represents one of the most extensive cross-cultural examinations of comfort with direct eye contact conducted to date. Our findings suggest that eye contact comfort is shaped not only by interpersonal and relational factors, but also by broader cultural, socioecological, and value-related variables, including collectivism, religiosity, gender equality, pathogen stress, and Human Development Index. Together, these results emphasize the complex, multidimensional, and culture-dependent nature of gaze behavior, while also motivating novel interpretations linking eye contact comfort to broader perceptions of social safety and social cohesion. More generally, the findings underscore the importance of integrating both individual-level and contextual variables into theories of nonverbal communication and social perception across societies. At the same time, the associations identified in the present study are necessarily exploratory and largely post hoc in nature. Accordingly, the proposed interpretations should be viewed as preliminary hypotheses rather than definitive explanations. We therefore see the current work primarily as an initial large-scale investigation that generates testable predictions and opens new directions for more targeted, ecologically valid, and experimentally controlled research. Importantly, we believe that the publicly available dataset collected in this project constitutes a major contribution in its own right. Given the scarcity of cross-cultural research on eye contact and eye contact comfort, the dataset provides a unique resource for future analyses, replications, and theory development. We hope that other researchers will use these data to conduct additional tests, develop alternative explanatory models, and further investigate cultural variation in gaze behavior. We also aim to establish eye contact comfort as a meaningful dimension of nonverbal communication that may be relevant to the classical contact–non-contact cultural distinction. Although the survey-based nature of our methodology constitutes an important limitation, the construct of perceived comfort remains theoretically informative, as it may reflect social norms and expectations that guide behavior even if they do not map perfectly onto moment-to-moment gaze patterns. In this sense, we view the present study as a first step toward a broader understanding of cross-cultural variability in eye contact behavior and its psychological and cultural foundations.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1038/s41598-026-70707-y>.

Author contributions A.S.: Conceptualization, Methodology, Investigation, Formal analysis, Visualization, Writing - Original Draft, Writing – review & editing, Funding acquisition; M.R.: Formal analysis, Visualization, Writing - Original Draft, Writing – review & editing; M.K.: Conceptualization, Investigation, Project administration, Funding acquisition, Writing - Original Draft, Writing – review & editing; M.M., W.M.: Conceptualization, Investigation, Funding acquisition, Writing – review & editing; P.S., C.R.: Conceptualization, Methodology, Investigation, Project administration, Funding acquisition, Writing – review & editing. All authors have approved the submitted version of the manuscript.

Funding This work was supported by “Being Human” Scientific Excellence Incubator (University of Wrocław, Poland).

Data availability All statistical analyses were conducted in SPSS version 29, and the data for this study are available in an online repository (https://osf.io/fg8z2/overview?view_only=6c9acb8ad4344586970c7895a76405ea).

Declarations

Competing interests The authors declare no competing interests.

Open Access This article is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License, which permits any non-commercial use, sharing, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if you modified the licensed material. You do not have permission under this licence to share adapted material derived from this article or parts of it. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by-nc-nd/4.0/>.

References

1. Emery, N. J. The eyes have it: The neuroethology, function and evolution of social gaze. *Neurosci. Biobehav. Rev.* **24**(6), 581–604. [https://doi.org/10.1016/S0149-7634\(00\)00025-7](https://doi.org/10.1016/S0149-7634(00)00025-7) (2000).
2. Harrod, E. G., Coe, C. L. & Niedenthal, P. M. Social structure predicts eye contact tolerance in nonhuman primates: Evidence from a crowd-sourcing approach. *Sci. Rep.* **10**(1), 6971. <https://doi.org/10.1038/s41598-020-63884-x> (2020).
3. Farroni, T., Csibra, G., Simion, F. & Johnson, M. H. Eye contact detection in humans from birth. *Proc. Natl. Acad. Sci. U. S. A.* **99**(14), 9602–9605. <https://doi.org/10.1073/pnas.152159999> (2002).
4. Kleinke, C. L. Compliance to requests made by gazing and touching experimenters in field settings. *J. Exp. Soc. Psychol.* **13** (3), 218–223. [https://doi.org/10.1016/0022-1031\(77\)90044-0](https://doi.org/10.1016/0022-1031(77)90044-0) (1977).
5. Croes, E. A. J., Antheunis, M. L., Schouten, A. P. & Krahmer, E. J. The role of eye-contact in the development of romantic attraction: Studying interactive uncertainty reduction strategies during speed-dating. *Comput. Hum. Behav.* **105**, 106218. <https://doi.org/10.1016/j.chb.2019.106218> (2020).
6. Grumet, G. W. Eye contact: the core of interpersonal relatedness. *Psychiatry* **1**, 1. <https://doi.org/10.1080/00332747.1983.11024189> (1983).
7. Hietanen, J. K. Affective eye contact: An integrative review. *Front. Psychol.* <https://doi.org/10.3389/fpsyg.2018.01587> (2018).
8. Adams, R. B. Jr. & Kleck, R. E. Perceived gaze direction and the processing of facial displays of emotion. *Psychol. Sci.* **14**(6), 644–647. https://doi.org/10.1046/j.0956-7976.2003.psci_1479.x (2003).
9. Adams, R. B. Jr. & Kleck, R. E. Effects of direct and averted gaze on the perception of facially communicated emotion. *Emotion* **5**(1), 3–11. <https://doi.org/10.1037/1528-3542.5.1.3> (2005).
10. Cook, M. Gaze and mutual gaze in social encounters: how long—and when—we look others in the eye is one of the main signals in nonverbal communication. *Am. Sci.* **65** (3), 328–333 (1977).
11. Einav, S. & Hood, B. M. Tell-tale eyes: Children's attribution of gaze aversion as a lying cue. *Dev. Psychol.* **44**(6), 1655–1667. <https://doi.org/10.1037/a0013299> (2008).
12. Holler, J. & Kendrick, K. H. Unaddressed participants' gaze in multi-person interaction: Optimizing reciprocity. *Front. Psychol.* **6**, 98. <https://doi.org/10.3389/fpsyg.2015.00098> (2015).
13. Frischen, A., Bayliss, A. P. & Tipper, S. P. Gaze cueing of attention: Visual attention, social cognition, and individual differences. *Psychol. Bull.* **133** (4), 694–724. <https://doi.org/10.1037/0033-2909.133.4.694> (2007).
14. Mason, M. F., Tatkov, E. P. & Macrae, C. N. The look of love: Gaze shifts and person perception. *Psychol. Sci.* **16**(3), 236–239. <https://doi.org/10.1111/j.0956-7976.2005.00809.x> (2005).
15. Wirth, J. H., Sacco, D. F., Hugenberg, K. & Williams, K. D. Eye gaze as relational evaluation: Averted eye gaze leads to feelings of ostracism and relational devaluation. *Pers. Soc. Psychol. Bull.* **36**(7), 869–882. <https://doi.org/10.1177/0146167210370032> (2010).
16. Argyle, M., Henderson, M., Bond, M., Iizuka, Y. & Contarello, A. Cross-cultural variations in relationship rules. *Int. J. Psychol.* **21** (1–4), 287–315. <https://doi.org/10.1080/00207598608247591> (1986).
17. Tang, D. & Schmeichel, B. J. Look me in the eye: manipulated eye gaze affects dominance mindsets. *J. Nonverbal Behav.* **39** (2), 181–194. <https://doi.org/10.1007/s10919-015-0206-8> (2015).
18. Abele, A. Functions of gaze in social interaction: Communication and monitoring. *J. Nonverbal Behav.* **10** (2), 83–101. <https://doi.org/10.1007/BF01000006> (1986).
19. Larsen, R. J. & Shackelford, T. K. Gaze avoidance: Personality and social judgments of people who avoid direct face-to-face contact. *Personal. Individ. Differ.* **21**(6), 907–917. [https://doi.org/10.1016/S0191-8869\(96\)00148-1](https://doi.org/10.1016/S0191-8869(96)00148-1) (1996).
20. Shrout, P. E. & Fiske, D. W. Nonverbal behaviors and social evaluation. *J. Pers.* **49** (2), 115–128. <https://doi.org/10.1111/j.1467-6494.1981.tb00732.x> (1981).
21. Hoffmann, A. et al. Sharing and receiving eye-contact predicts mate choice after a 5-minute conversation: evidence from a speed-dating study. *Arch. Sex Behav.* **53** (3), 959–968. <https://doi.org/10.1007/s10508-023-02806-0> (2024).

22. Hessels, R. S. et al. Gaze behavior in face-to-face interaction: A cross-cultural investigation between Japan and The Netherlands. *Cognition* **263**, 106174. <https://doi.org/10.1016/j.cognition.2025.106174> (2025).
23. Gobel, M. S., Kim, H. S. & Richardson, D. C. The dual function of social gaze. *Cognition* **136**, 359–364. <https://doi.org/10.1016/j.cognition.2014.11.040> (2015).
24. Jarick, M. & Bencic, R. Eye contact is a two-way street: arousal is elicited by the sending and receiving of eye gaze information. *Front. Psychol.* **10**, 262. <https://doi.org/10.3389/fpsyg.2019.01262> (2019).
25. Risko, E. F., Richardson, D. C. & Kingstone, A. Breaking the fourth wall of cognitive science: Real-world social attention and the dual function of gaze. *Curr. Dir. Psychol. Sci.* **25**(1), 70–74. <https://doi.org/10.1177/0963721415617806> (2016).
26. Hall, E. T. *The Hidden Dimension* (Doubleday, 1966).
27. Watson, O. M. *Proxemic Behavior: A Cross-Cultural Study* (Walter de Gruyter GmbH & Co KG, 2014).
28. Argyle, M., Cook, M. & Cramer, D. Gaze and mutual gaze. *Br. J. Psychiatry* **165** (6), 848–850. <https://doi.org/10.1017/S0007125000073980> (1994).
29. Sue, D. W. & Sue, D. Barriers to effective cross-cultural counseling. *J. Couns. Psychol.* **24** (5), 420–429. <https://doi.org/10.1037/0022-0167.24.5.420> (1977).
30. Hawrysh, B. M. & Zaichkowsky, J. L. Cultural approaches to negotiations: Understanding the Japanese. *Int. Mark. Rev.* **7**(2), 1530. <https://doi.org/10.1108/EUM000000001530> (1990).
31. McCarthy, A., Lee, K., Itakura, S. & Muir, D. W. Cultural display rules drive eye gaze during thinking. *J. Cross-Cult. Psychol.* **37**(6), 717–722. <https://doi.org/10.1177/0022022106292079> (2006).
32. McCarthy, A., Lee, K., Itakura, S. & Muir, D. W. Gaze display when thinking depends on culture and context. *J. Cross-Cult. Psychol.* **39**(6), 716–729. <https://doi.org/10.1177/0022022108323807> (2008).
33. Akechi, H. et al. Attention to eye contact in the west and east: Autonomic responses and evaluative ratings. *PLoS One* **8**(3), e59312. <https://doi.org/10.1371/journal.pone.0059312> (2013).
34. Uono, S. & Hietanen, J. K. Eye contact perception in the west and east: A cross-cultural study. *PLoS ONE* **10**(2), e0118094. <https://doi.org/10.1371/journal.pone.0118094> (2015).
35. Gobel, M. S., Chen, A. & Richardson, D. C. How different cultures look at faces depends on the interpersonal context. *Can. J. Exp. Psychol.* **71** (3), 258–264. <https://doi.org/10.1037/cep0000119> (2017).
36. Blais, C., Jack, R. E., Scheepers, C., Fiset, D. & Caldara, R. Culture shapes how we look at faces. *PLoS ONE* **3**(8), e3022. <https://doi.org/10.1371/journal.pone.0003022> (2008).
37. Haensel, J. X. et al. Culture modulates face scanning during dyadic social interactions. *Sci. Rep.* **10**(1), 1958. <https://doi.org/10.1038/s41598-020-58802-0> (2020).
38. Haensel, J. X., Smith, T. J. & Senju, A. Cultural differences in mutual gaze during face-to-face interactions: A dual head-mounted eye-tracking study. *Vis. Cogn.* **30**(1–2), 100–115. <https://doi.org/10.1080/13506285.2021.1928354> (2022).
39. Senju, A., Vermetti, A., Kikuchi, Y., Akechi, H. & Hasegawa, T. Cultural modulation of face and gaze scanning in young children. *PLoS One* **8**(8), e74017. <https://doi.org/10.1371/journal.pone.0074017> (2013).
40. Hasler, B. S. & Friedman, D. A. Sociocultural conventions in avatar-mediated nonverbal communication: A cross-cultural analysis of virtual proxemics. *J. Intercult. Commun. Res.* **41**(3), 238–259. <https://doi.org/10.1080/17475759.2012.728764> (2012).
41. Sorokowska, A. et al. Preferred interpersonal distances: a global comparison. *J. Cross-Cult. Psychol.* **48** (4), 577–592. <https://doi.org/10.1177/0022022117698039> (2017).
42. Sorokowska, A. et al. Affective interpersonal touch in close relationships: a cross-cultural perspective. *Pers. Soc. Psychol. Bull.* **47** (12), 1705–1721. <https://doi.org/10.1177/0146167220988373> (2021).
43. Burgoon, J. K., Buller, D. B., Hale, J. L. & de Turck, M. A. Relational messages associated with nonverbal behaviors. *Hum. Commun. Res.* **10**(3), 351–378. <https://doi.org/10.1111/j.1468-2958.1984.tb00023.x> (1984).
44. Kerr, F., Wiechula, R., Feo, R., Schultz, T. & Kitson, A. Neurophysiology of human touch and eye gaze in therapeutic relationships and healing: A scoping review. *JBI Evid. Synthesis* **17** (2), 209. <https://doi.org/10.1112/JBISIRIR-2017-003549> (2019).
45. Scherer, S. E. & Schiff, M. R. Perceived intimacy, physical distance and eye contact. *Percept. Mot. Skills* **36**(3), 835–841. <https://doi.org/10.2466/pms.1973.36.3.835> (1973).
46. Croy, I. et al. COVID-19 and social distancing: a cross-cultural study of interpersonal distance preferences and touch behaviors before and during the pandemic. *Cross-Cult. Res.* **58** (1), 41–69. <https://doi.org/10.1177/10693971231174935> (2024).
47. Triandis, H. C., Bontempo, R., Villareal, M. J., Asai, M. & Lucca, N. Individualism and collectivism: Cross-cultural perspectives on self-ingroup relationships. *J. Pers. Soc. Psychol.* **54**(2), 323–338. <https://doi.org/10.1037/0022-3514.54.2.323> (1988).
48. Schaller, M. & Park, J. H. The behavioral immune system (and why it matters). *Curr. Dir. Psychol. Sci.* **20** (2), 99–103. <https://doi.org/10.1177/0963721411402596> (2011).
49. Fincher, C. L. & Thornhill, R. Parasite-stress promotes in-group assortative sociality: The cases of strong family ties and heightened religiosity. *Behav. Brain Sci.* **35**(2), 61–79. <https://doi.org/10.1017/S0140525X11000021> (2012).

50. Fernández, I., Carrera, P., Sánchez, F., Paez, D. & Candia, L. Differences between cultures in emotional verbal and non-verbal reactions. *Psicothema* **12**, 83–92 (2000).
51. Barbosa Escobar, F., Velasco, C., Motoki, K., Byrne, D. V. & Wang, Q. J. The temperature of emotions. *PLoS ONE* **16**(6), e0252408. <https://doi.org/10.1371/journal.pone.0252408> (2021).
52. Parker, P. M. & Tavassoli, N. T. Homeostasis and consumer behavior across cultures. *Int. J. Res. Mark.* **17**(1), 33–53. [https://doi.org/10.1016/S0167-8116\(00\)00006-9](https://doi.org/10.1016/S0167-8116(00)00006-9) (2000).
53. Arend, M. G. & Schäfer, T. Statistical power in two-level models: A tutorial based on Monte Carlo simulation. *Psychol. Methods* **24**(1), 1–19. <https://doi.org/10.1037/met0000195> (2019).
54. Adler, N. E., Epel, E. S., Castellazzo, G. & Ickovics, J. R. Relationship of subjective and objective social status with psychological and physiological functioning: Preliminary data in healthy, White women. *Health Psychol.* **19**(6), 586–592. <https://doi.org/10.1037/0278-6133.19.6.586> (2000).
55. Levtov, R. G., Barker, G., Contreras-Urbina, M., Heilman, B. & Verma, R. Pathways to gender-equitable men: Findings from the international men and gender equality survey in eight countries. *Men Masculinities* **17**(5), 467–501. <https://doi.org/10.1177/1097184X14558234> (2014).
56. Wu, M. Y. *Hofstede's Cultural Dimensions 30 Years Later: A Study of Taiwan and the United States* (2006).
57. Hofstede, G. *Culture's Consequences: International Differences in Work-Related Values* (SAGE, 1984).
58. Hofstede, G. *Culture's Consequences: Comparing Values, Behaviors, Institutions and Organizations Across Nations* (SAGE Publications, 2001).
59. Kowal, M. et al. Predictors of enhancing human physical attractiveness: Data from 93 countries. *Evol. Hum. Behav.* **43**(6), 455–474. <https://doi.org/10.1016/j.evolhumbehav.2022.08.003> (2022).
60. Kim, J. H. Multicollinearity and misleading statistical results. *Korean J. Anesthesiol.* **72**(6), 55–569. <https://doi.org/10.4097/kja.19087> (2019).
61. R Core Team. *R: A Language and Environment for Statistical Computing*. <https://doi.org/10.32614/R.manuals> (R Foundation for Statistical Computing, 2026).
62. Johnson, S. & Miller, A. A cross-cultural study of immediacy, credibility, and learning in the U.S. and Kenya. *Commun. Educ.* **51**(3), 280–292. <https://doi.org/10.1080/03634520216514> (2002).
63. Maran, T., Furtner, M., Liegl, S., Kraus, S. & Sachse, P. In the eye of a leader: Eye-directed gazing shapes perceptions of leaders' charisma. *Leadersh. Q.* **30**(6), 101337. <https://doi.org/10.1016/j.leaqua.2019.101337> (2019).
64. Coutrot, A., Binetti, N., Harrison, C., Mareschal, I. & Johnston, A. Face exploration dynamics differentiate men and women. *J. Vis.* **16**(14), 16. <https://doi.org/10.1167/16.14.16> (2016).
65. House, R. J., Hanges, P. J., Javidan, M., Dorfman, P. W. & Gupta, V. *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies* (SAGE Publications, 2004).
66. Inglehart, R. & Baker, W. E. Modernization, cultural change, and the persistence of traditional values. *Am. Sociol. Rev.* **65**(1), 19–51. <https://doi.org/10.1177/000312240006500103> (2000).
67. Norenzayan, A. & Shariff, A. F. The origin and evolution of religious prosociality. *Science* **322**(5898), 58–62. <https://doi.org/10.1126/science.1158757> (2008).
68. Markus, H. R. & Kitayama, S. Culture and the self: implications for cognition, emotion, and motivation. In *College Student Development and Academic Life* (Routledge, 1998).
69. Matsumoto, D., Kudoh, T., Scherer, K. & Wallbott, H. Antecedents of and reactions to emotions in the United States and Japan. *J. Cross-Cult. Psychol.* **19**(3), 267–286. <https://doi.org/10.1177/0022022188193001> (1988).
70. Uchida, Y. & Kitayama, S. Happiness and unhappiness in east and west: Themes and variations. *Emotion* **9**(4), 441–456. <https://doi.org/10.1037/a0015634> (2009).
71. Hamamura, T. Are cultures becoming individualistic? A cross-temporal comparison of individualism-collectivism in the United States and Japan. *Pers. Soc. Psychol. Rev.* **16**(1), 3–24. <https://doi.org/10.1177/1088868311411587> (2012).
72. Ogihara, Y. Temporal changes in individualism and their ramification in Japan: Rising individualism and conflicts with persisting collectivism. *Front. Psychol.* <https://doi.org/10.3389/fpsyg.2017.00695> (2017).
73. Kim, S.-Y. Examining 35 years of individualism-collectivism research in Asia: A meta-analysis. *Int. J. Intercult. Relat.* **100**, 101988. <https://doi.org/10.1016/j.ijintrel.2024.101988> (2024).
74. Santos, H. C., Varnum, M. E. W. & Grossmann, I. Global increases in individualism. *Psychol. Sci.* **28**(9), 1228–1239. <https://doi.org/10.1177/0956797617700622> (2017).
75. Matsumoto, D., Yoo, S. H. & Nakagawa, S. Culture, emotion regulation, and adjustment. *J. Personal. Soc. Psychol.* **94**(6), 925–937. <https://doi.org/10.1037/0022-3514.94.6.925> (2008).
76. Oyserman, D., Coon, H. M. & Kemmelmeier, M. Rethinking individualism and collectivism: Evaluation of theoretical assumptions and meta-analyses. *Psychol. Bull.* **128**(1), 3–72. <https://doi.org/10.1037/0033-2909.128.1.3> (2002).
77. Prinsen, J. et al. Direct eye contact enhances mirroring of others' movements: A transcranial magnetic stimulation study. *Neuropsychologia* **95**, 111–118. <https://doi.org/10.1016/j.neuropsychologia.2016.12.011> (2017).
78. Andersen, P. A., Hecht, M. L., Hoobler, G. D. & Smallwood, M. Nonverbal communication across cultures. In *Handbook of International and Intercultural Communication* 2 edn., 89–106 (Sage, 2002).

79. Remland, M. S., Jones, T. S. & Brinkman, H. Interpersonal distance, body orientation, and touch: Effects of culture, gender, and age. *J. Soc. Psychol.* **135**(3), 281–297. <https://doi.org/10.1080/00224545.1995.9713958> (1995).
80. Rogers, S. L., Speelman, C. P., Guidetti, O. & Longmuir, M. Using dual eye tracking to uncover personal gaze patterns during social interaction. *Sci. Rep.* **8**(1), 4271. <https://doi.org/10.1038/s41598-018-22726-7> (2018).
81. Rogers, S. L., Guidetti, O., Speelman, C. P., Longmuir, M. & Phillips, R. Contact is in the eye of the beholder: The eye contact illusion. *Perception* **48**(3), 248–252. <https://doi.org/10.1177/0301006619827486> (2019).
82. Chen, T., Helminen, T. M. & Hietanen, J. K. Affect in the eyes: explicit and implicit evaluations. *Cogn. Emot.* **31** (6), 1070–1082. <https://doi.org/10.1080/02699931.2016.1188059> (2017).
83. Jongerius, C., Hessels, R. S., Romijn, J. A., Smets, E. M. A. & Hillen, M. A. The measurement of eye contact in human interactions: a scoping review. *J. Nonverbal Behav.* **44** (3), 363–389. <https://doi.org/10.1007/s10919-020-00333-3> (2020).
84. Singelis, T. M., Triandis, H. C., Bhawuk, D. P. S. & Gelfand, M. J. Horizontal and vertical dimensions of individualism and collectivism: a theoretical and measurement refinement. *Cross-Cultural Res.* **29** (3), 240–275. <https://doi.org/10.1177/106939719502900302> (1995).
85. Triandis, H. C. & Gelfand, M. J. Converging measurement of horizontal and vertical individualism and collectivism. *J. Pers. Soc. Psychol.* **74**(1), 118–128 (1998).
86. Pavic, K., Oker, A., Chetouani, M. & Chaby, L. Age-related changes in gaze behaviour during social interaction: An eye-tracking study with an embodied conversational agent. *Q. J. Exp. Psychol.* **74**(6), 1128–1139. <https://doi.org/10.1177/1747021820982165> (2021).
87. Deater-Deckard, K. et al. Within- and between-person and group variance in behavior and beliefs in cross-cultural longitudinal data. *J. Adolesc.* **62**, 207–217. <https://doi.org/10.1016/j.adolescence.2017.06.002> (2018).
88. Fischer, R. & Schwartz, S. Whence differences in value priorities? Individual, cultural, or artifactual sources. *J. Cross-Cult. Psychol.* **42** (7), 1127–1144. <https://doi.org/10.1177/0022022110381429> (2011).
89. Hester, N., Xie, S. Y. & Hehman, E. Little between-region and between-country variance when people form impressions of others. *Psychol. Sci.* **32**(12), 1907–1917. <https://doi.org/10.1177/09567976211019950> (2021).

Publisher's note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Authors and Affiliations

Agnieszka Sorokowska¹  · Marta Rokosz¹ · Marta Kowal^{1,2}  · Michał Misiak^{1,2} ·
Wojciech P. Malecki³ · Piotr Sorokowski¹ · S. Craig Roberts^{2,4}

✉ Agnieszka Sorokowska
agnieszka.sorokowska@uwr.edu.pl

¹ Institute of Psychology, University of Wrocław, ul. Dawida 1, Wrocław 50-527, Poland

² “Being Human” Scientific Excellence Incubator, University of Wrocław, Wrocław, Poland

³ Institute of Polish Philology, University of Wrocław, Wrocław, Poland

⁴ Division of Psychology, University of Stirling, Stirling, UK