AI & SOCIETY (2026) 41:6151–6169
https://doi.org/10.1007/s00146-026-02858-5

REVIEW

Who lets AI take over? Cross-national variation in willingness to delegate socially important roles to artificial intelligence

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Received: 8 September 2025 / Accepted: 4 January 2026 / Published online: 12 February 2026

Abstract

Delegating socially significant roles to artificial intelligence (AI) is an emerging reality, yet little is known about how publics evaluate this transfer of responsibility across contexts and countries. This study applied a structural model to a large cross-national dataset (30,994 individuals in 35 countries) to test how cognitive appraisals, affective dispositions, and contextual factors jointly shape willingness to delegate socially important roles of companionship, mental health advisor, doctor and teacher to children to AI. The results revealed a robust hierarchy of delegation preferences, with companionship most frequently entrusted to AI, followed by mental-health advisor, teacher, and doctor. Cognitive appraisals emerged as the strongest predictors: trust in online information was consistently the most powerful driver across all roles, while optimism and life satisfaction made smaller but reliable contributions. Affective dispositions played narrower, domain-specific roles, with anxiety shaping delegation in teaching and mental health, and loneliness linked only weakly to companionship. Women were less willing than men to delegate across all roles, with the gender gap largest in medicine and education, and strikingly invariant across cognitive and affective predictors. Beyond these, national baselines diverged by nearly 30 percentage points even after adjusting for these predictors demonstrating the independent influence of country context. Our findings show that willingness to delegate socially important roles to AI follows a robust hierarchy and reflects the combined influence of cognitive appraisals, affective dispositions, and contextual factors. A key implication is that delegation roles to AI must be understood as both a personal and a societal orientation, requiring attention to the interplay between these layers.

Keywords Technology acceptance · Artificial intelligence · Delegation of social authority · Cross-countries · Psychosocial factors

1 Introduction

Artificial intelligence (AI) is now embedded in decisions that carry social responsibility, such as welfare assessment, healthcare triage, legal decision support, university teaching and feedback, and public-health guidance (OECD 2024; World Health Organization 2024). These are not mere efficiency upgrades; they reallocate social authority from human professionals to algorithmic systems. Such a transfer of authority raises questions not only whether people trust

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AI, but whether they are willing to delegate socially significant roles to it.

Most studies of public perception approach this issue through the lens of trust, which is understood as beliefs that systems are competent, predictable, and norm-conforming (Lee and See 2004). Research shows that trust consistently predicts adoption and acceptance across healthcare, education, and other domains (Zawacki-Richter et al. 2019; Gillespie et al. 2025). Yet acceptance and delegation are not equivalent. Acceptance asks whether people will use AI (Davis 1989) while delegation requires ceding authority in roles involving empathy, judgement, or interpersonal care. In such roles, individuals may acknowledge that an AI is technically capable yet still resist allowing it to act as a doctor, teacher, or advisor (Steyvers and Kumar 2024). This distinction makes it necessary to move beyond narrow trust-based models towards a broader account in which reflective evaluations, affective dispositions, and sociocultural context jointly shape the willingness to delegate the roles to AI.

The reflective route is well established in technology-use theories. The Technology Acceptance Model and its extensions argue that people intend to act when they believe a system is easy to use. The Theory of Planned Behaviour specifies that these intentions follow from expected outcomes and perceived control (Venkatesh et al. 2012; Ajzen 1991). Trust models complement this by identifying perceived competence, predictability, and integrity as prerequisites for reliance (Lee and See 2004). Delegation builds on this reflective pathway but extends it: individuals must judge not only whether a system is reliable, but whether it can competently occupy a socially meaningful role and produce outcomes acceptable in a relational or ethical sense (Gößwein and Liebherr 2025).

Two factors are particularly salient in this reflective dimension—trust in online information and life optimism. Trust in online information extends confidence beyond the AI system to the informational environment it depends on. Research shows that trust in information quality shapes behaviour even more strongly than trust in providers and that, in digital contexts, perceived information credibility predicts acceptance of automated advice ((Kuen et al. 2023; ; Pan and Chiou 2011)). Thus, willingness to delegate socially significant roles depends not only on trust in AI systems but also on trust in the broader online information environment from which they draw their output (Ziller et al. 2025). Life optimism reflects a generalised positive expectancy consistent with the expectancy-value logic of behavioural theories, where action depends on both the desirability and perceived attainability of outcomes (Wigfield and Eccles 2000). As a stable tendency to anticipate favourable results across life domains (Carver and Scheier 2014), optimism provides a cognitive orientation that motivates action when valued goals seem achievable. Evidence shows that optimism promotes openness to innovation, resilience under uncertainty, and proactive engagement with new technologies (Luthans et al. 2007). Accordingly, optimistic individuals are more likely to expect benefits, tolerate risks, and accept the uncertainties inherent in delegating authority to AI. positioning life optimism as a key cognitive appraisal in understanding delegation decisions.

Yet, reflective appraisals alone cannot explain delegation in domains that demand empathy, relational presence, or social sensitivity. Someone may believe an AI system is competent, but still hesitate to let it provide therapy, teach children, or offer companionship—roles where interpersonal meaning outweighs technical efficiency. In these contexts, the willingness to cede authority is filtered through affective needs as much as rational judgements. Dual-process theories emphasise that behavioural intentions arise from both reflective reasoning and affective pathways (Evans and Stanovich 2013), and research on human-AI interaction confirms that emotional dispositions often determine whether people feel comfortable with AI in social roles (Steyvers and Kumar 2024). In this context, anxiety as an affective disposition toward uncertainty and potential threat can magnify the stakes of delegation. On one hand, anxious individuals may lean on AI to reduce uncertainty, treating it as a stable, predictable authority (Parasuraman and Riley 1997). On the other, the same anxiety can intensify fears of opacity and loss of control, producing resistance to handing over socially consequential decisions (Dietvorst et al. 2015).

Anxiety is often linked with loneliness, though the two do not operate in the same way. Whereas anxiety amplifies the sense of risk in delegation, loneliness relates more to the search for connection and can shape openness to AI in social roles through different pathways, creating a motivational pull toward social surrogates. Evidence shows that lonely individuals are more likely to anthropomorphise technology, experience stronger perceptions of social presence, and accept AI as a relational partner (Christoforakos and Diefenbach 2023). This makes loneliness particularly relevant for understanding delegation in companionship or care contexts, where the function is explicitly social. Life satisfaction, by contrast, captures broader affective orientation. High life satisfaction is associated with openness to innovation and trust in institutions (Hinks 2024), but it also predicts greater caution about privacy and security (Deutrom et al. 2022), producing an ambivalence that can either encourage or inhibit delegation. These dispositions matter precisely because delegation in socially significant roles is not about performance alone; it is about whether individuals' emotional states align with the prospect of handing over authority in domains where human qualities are valued. Anxiety, loneliness, and life satisfaction, therefore, may provide critical leverage points for explaining when rational trust in AI

is sufficient to support delegation, and when affective needs will override it.

Contextual factors are also critical for understanding delegation, because decisions to cede authority take shape within social norms and institutional settings rather than in isolation. Interactionist and person-in-context perspectives emphasise that behavioural intentions emerge from the interplay between individual dispositions and broader environments (Adams and Marshall 1996). In socially significant roles, two dimensions of context are especially salient: gender and national background, both of which can shape expectations of care, authority, and responsibility. For instance, gender differences consistently appear in attitudes toward AI. Men are more inclined to evaluate AI in terms of technical performance and objectivity, which translates into higher acceptance of algorithmic decision-making (Waelen and Wieczorek 2022). Women, by contrast, place greater weight on ethical, emotional, and relational implications, especially in contexts involving children or patients where empathy and oversight are central (Russo et al. 2025). Cross-national variation can further condition willingness to delegate. Acceptance of AI differs systematically across societies, reflecting variation in exposure to digital infrastructures, prevailing beliefs about authority, and levels of institutional trust (Rahman et al. 2025; ; Liebherr et al. 2025). In societies where institutional trust is strong, delegating to AI may be seen as a legitimate extension of governance, whereas in contexts marked by scepticism toward institutions, the same delegation may appear unacceptable (Laux 2024). Cross-national comparisons show that cultural norms shape how personal traits such as life optimism, anxiety, or loneliness translate into intentions, confirming that delegation cannot be explained by universal predictors alone (Brauner et al. 2024).

Bringing these elements together, the structural model in Fig. 1 conceptualises willingness to delegate socially significant roles to AI as the outcome of three interrelated components. First, reflective cognitive appraisals capture deliberate evaluations of reliability and expected outcomes, represented by trust in online information and life optimism. Second, affective dispositions reflect emotionally grounded orientations shaping comfort with AI in social roles, represented by loneliness, generalised anxiety, and life satisfaction. Third, contextual factors recognise that delegation decisions are shaped by broader environments, with gender and national context influencing both overall openness to AI and the strength of links between cognitive or affective traits and intentions to rely on it. The model, therefore, specifies a pathway from cognition and affects to intention, conditioned by demographic and cultural context, providing a framework for testing which factors best explain variation in willingness to delegate socially important roles to AI in this study.

The present study applies the structural model to a large cross-national dataset to test how cognitive appraisals, affective dispositions, and contextual factors jointly predict willingness to delegate socially significant roles to AI. To capture the breadth of this phenomenon, we examine four domains where delegation has immediate social consequences: mental health advisor, teacher for children, medical advice, and companionship. These domains vary in their degree of technical versus relational demands, allowing us to assess whether the same predictors generalise across contexts or operate differentially. The study is guided by four research questions: (RQ1) To what extent, and with what domain-specific variation, are individuals willing to delegate socially significant roles to AI? (RQ2) How do cognitive appraisals and affective dispositions contribute to predicting this willingness? (RQ3) What

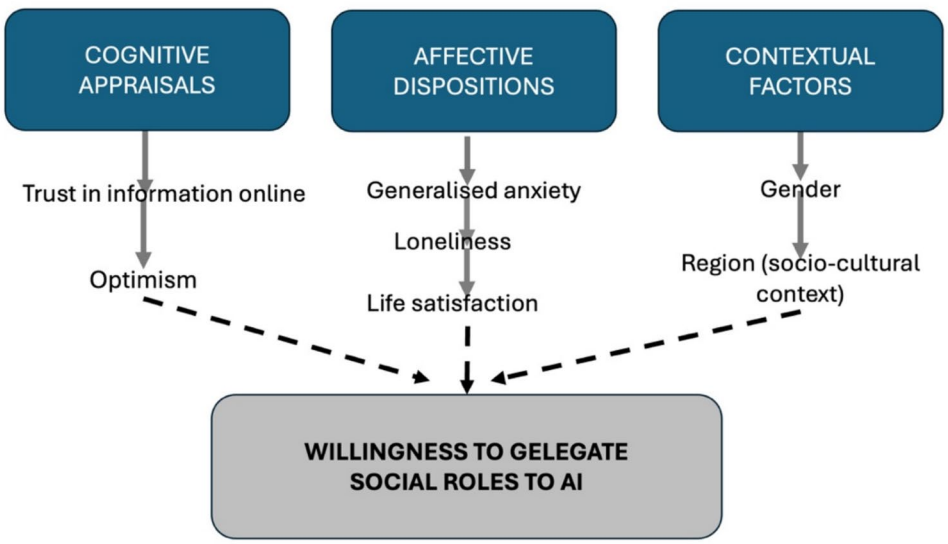

Fig. 1 Structural model of predictors influencing willingness to delegate socially significant roles to AI

role does gender play in shaping delegation preferences? (RQ4) Do cross-national contexts moderate willingness to delegate across the four roles?

Building on the proposed structural model, we expect the relative influence of cognitive, affective, and contextual factors to vary across domains of delegation.

In mental health support (H1), affective dispositions should be particularly salient. Conversational agents can reduce anxiety and depression and promote engagement (Fitzpatrick et al. 2017). Yet, concerns about safety and algorithm aversion persist (Miner et al. 2019). Accordingly, we predict that loneliness and generalised anxiety will strongly predict willingness to delegate in this domain, with anxiety exerting opposite effects depending on perceived trust in online information.

In teaching children (H2), reflective cognitive appraisals, especially trust in information quality and reliability, should dominate. Teaching is a sensitive domain involving not only accuracy and privacy but also developmental appropriateness and socialization (Venkatesh et al. 2012). Institutional safeguards are limited: fewer than 10% of educational institutions worldwide have explicit AI policies (UNESCO 2023). At the individual level, women, particularly in caregiving roles, express stronger reservations about child-facing technologies, citing risks to safety, privacy, and autonomy (Livingstone and Blum-Ross 2020). Thus, trust in information should be decisive for delegation, moderated by regional governance and gendered risk perceptions.

In medical advice (H3), cognitive predictors are expected to be central. Delegating diagnostic or treatment roles to AI depends on trust in data quality, explainability, and system validation. Patients prefer human or hybrid arrangements over AI-only solutions (Riedl et al. 2024), and physicians remain enthusiastic but concerned about accountability and de-skilling (Blease et al. 2019). Consequently, informational trust should be the strongest predictor of willingness to delegate in medical contexts, while life optimism may condition this process: optimistic individuals expect favourable outcomes and downplay risks, increasing openness to AI as a supportive "second opinion" (Ploug and Holm 2023). In companionship (H4), affective dispositions are predicted to dominate. Loneliness consistently predicts openness to AI companions, with meta-analyses showing that robots and conversational agents significantly reduce loneliness (Abdi et al. 2022). Pilot programmes such as ElliQ demonstrate improved connectedness but also risks of dependency and displacement of human contact (Broadbent et al. 2024). We therefore expect loneliness to be the primary driver of delegation in companionship, with anxiety and life satisfaction further shaping whether individuals seek or resist AI as a social surrogate.

2 Methodology

2.1 Sampling and data

This study is based on data from the 2023 wave of the Global Digital Wellbeing Survey, conducted by SYNC Digital Wellbeing Programme of Ithra Cultural Centre in Saudi Arabia (https://sync.ithra.com/), in collaboration with PSB Insights (https://www.psbinsights.com/), a global analytics consultancy. Designed to inform global perspectives on digital engagement and its psychosocial correlates, the survey formed part of SYNC's broader initiative to monitor and promote digital wellbeing across diverse populations. The 2023 survey cycle marked a substantial expansion in both scale and scope compared to earlier waves, encompassing a globally representative sample of 35,018 internet-using adults aged 18 and over, drawn from 35 countries across multiple regions.

Data were collected online between July 26 and August 29, 2023, using a stratified random sampling method designed to achieve demographic balance. The sampling strategy accounted for key variables such as age, gender, and geographic distribution to ensure that each national sample reflected population diversity (see gender and age distributions per country in Supplementary Material 1). To ensure linguistic and cultural accessibility, the survey was professionally translated and back translated into relevant local languages. The study was reviewed and approved by King Abdul Aziz Center for World Culture's research ethics committee (IRB202371, 23.05.2023).

2.2 Measurements

2.2.1 Willingness to delegate socially significant roles to AI

Participants' willingness to delegate socially meaningful responsibilities to artificial intelligence was assessed using four statements covering distinct domains: mental health, education, medical advice, and companionship. Respondents indicated their agreement with each statement using a four-point ordinal scale: *strongly disagree*, *somewhat disagree*, *somewhat agree*, and *strongly agree*. The statements included: "I would use an AI provided service such as a chatbot to talk through a minor mental health challenge," "I would let my child be taught by an AI generated school teacher," "I would let myself be diagnosed by an AI generated doctor," and "I would use an AI generated companion to support me in day-to-day tasks." The mental health statement addresses the growing use of AI chatbots in emotional support contexts. The education statement reflects developments in AI-assisted teaching and

instructional delivery. The medical statement specifically concerns AI-driven doctor advice, a domain where accuracy and trust are critical. The companionship statement refers to AI agents designed to provide practical assistance and social presence.

2.2.2 Generalised anxiety

Generalised anxiety symptoms were assessed using the Generalised Anxiety Disorder 7-item scale (Spitzer et al. 2006), a widely used self-report measure designed to assess symptom severity in population-based studies. Participants were asked how often they had been bothered by each symptom over the past two weeks, with response options ranging from *not at all* (0) to *nearly every day*. The total score ranges from 0 to 21, with higher scores indicating greater levels of anxiety. The GAD-7 has demonstrated strong internal consistency, good diagnostic validity, and sensitivity to change across diverse populations and settings (Moreno-Montero et al. 2025). The internal consistency of the DAS-7 scale ranged between Cronbach's alpha of 0.86 and 0.94 across countries (Supplementary Material 2).

2.2.3 Loneliness

Loneliness was measured using the 3-item short form of the UCLA Loneliness Scale (Hughes et al. 2004), a brief and validated instrument designed to assess perceived social isolation. Participants were asked how often they experienced each statement, using a three-point response scale: *hardly ever* (1), *some of the time* (2), and *often* (3). The total score ranges from 3 to 9, with higher scores indicating greater feelings of loneliness. The scale captures core dimensions of subjective social disconnection and the 3-item version has demonstrated strong correlation with the full 20-item UCLA Loneliness Scale and has been shown to be reliable and suitable for large-scale surveys (Hughes et al. 2004). In the present study, this scale showed Cronbach alpha ranged between 0.65 and 0.89 across countries (Supplementary Material 3).

2.2.4 Life satisfaction

Life satisfaction was assessed using a single-item measure: *"Overall, how satisfied are you with your life?"*, rated on a scale from 1 (*not at all satisfied*) to 10 (*completely satisfied*). Despite its brevity, this measure has demonstrated good reliability and predictive validity, and has been widely used in large-scale international surveys, including *OECD Guidelines on Measuring Subjective Well-Being* (OECD 2013). Single-item life satisfaction measures are especially appropriate in large population-based studies where survey length must be balanced with breadth of content. Prior research has shown that this format yields responses that strongly correlate with multi-item scales such as the Satisfaction With Life Scale (SWLS), while maintaining construct validity (Cheung and Lucas 2014) (see details in Supplementary Material 4).

Life optimism about the future was assessed using a single-item measure: *"Overall, how optimistic are you about your future?"*, rated on a scale from 1 (*not at all optimistic*) to 10 (*extremely optimistic*). This approach is consistent with prior research in large-scale survey contexts, where single-item measures are commonly used to capture global expectations about personal life prospects (OECD 2019; Nießen et al. 2022). Empirical evidence suggests that life optimism is a largely unidimensional construct that can be effectively assessed with a single question (Carver and Scheier 2014) (see details in Supplementary Material 5).

2.2.5 Trust in online information

Trust in online information was measured using a single-item question: *"To what extent do you trust information you see online?"* Participants responded on a five-point scale ranging from 1 (*completely distrust*) to 5 (*completely trust*, with higher scores indicating lower levels of trust. This reverse-anchored format was designed to capture individual differences in the general credibility attributed to digital content. Although based on a single item, such global trust measures have been widely used in research on digital literacy, media credibility, and online behaviour, where they have demonstrated utility in predicting engagement patterns, susceptibility to misinformation, and reliance on algorithmically curated content (Metzger et al. 2015) (see details in Supplementary Material 6).

2.3 Data analysis

2.3.1 Data preprocessing

Participants who completed less than 50% of the survey ($N = 4024$; 11.49%) were excluded, leaving 30,994 individuals for analysis. Missing responses, showing 0–5.2% missingness across variables with no evidence of systematic bias and were imputed using Multivariate Imputation by Chained Equations (MICE). Five imputed datasets were created, modelling each variable conditionally on all others, and results were pooled using Rubin's rules (Rubin 1987). Density plots confirmed that imputed and observed values were closely aligned, supporting the plausibility of the imputations (Supplementary Material 7).

2.4 Prevalence calculation (RQ1)

We estimated willingness to delegate four roles (doctor, teacher, mental-health advisor, companion) to AI. (1) For each role, prevalence was defined as the proportion selecting *somewhat agree* or *strongly agree*. (2) Responses were numerically coded and weighted to reflect population representation. (3) Prevalence was calculated by country, with cross-national means derived from the 35-country average. (4) To compare roles while accounting for cross-national variation, we fitted a binomial regression with country fixed effects and clustered standard errors. (5) Pairwise contrasts used multiplicity-adjusted *p*-values, and role-specific predicted probabilities were reported with bootstrap confidence intervals. (6) A pooled Bayesian Beta-Binomial analysis served as a sensitivity check, yielding posterior means, credible intervals, and posterior probabilities for pairwise role comparisons.

2.4.1 Predictive contribution of cognitive, affective, and contextual factors

To assess the influence of cognitive, affective (RQ2), and contextual predictors on willingness to delegate, we fitted a weighted generalized linear mixed-effects model (GLMM) with a logit link and random intercepts for respondents and countries. This multilevel regression framework accounts for the nesting of repeated role judgements within individuals and individuals within countries.

Post-stratification survey weights ensured nationally representative estimates and were incorporated directly into model estimation so that both fixed and random effects reflected respondents' weighted contributions. The binary outcome indicated agreement (1) or disagreement (0) with delegating each role. Predictors included generalized anxiety, loneliness, trust in online information, life satisfaction, life optimism, and gender. Continuous predictors were standardized (z scores). Main effects and role × predictor interactions were modelled to allow cognitive, affective, and contextual influences to vary across domains. Predictor effects were expressed as odds ratios (ORs) with 95% bootstrap confidence intervals resampling countries. To aid interpretation, predicted probabilities were computed at − 1 SD, mean, and + 1 SD of each continuous predictor. Absolute differences between these probabilities were reported in percentage points (pp), representing changes on a 0–100% probability scale. Reporting in percentage points complements ORs by quantifying effect magnitudes in a more interpretable metric (e.g., a shift from 30 to 50% corresponds to a 20-pp increase).

2.4.2 Gender differences (RQ3)

Gender effects were tested by estimating gender contrasts within each role from the GLMM and probing delegating role × gender interactions to assess the moderation of psychosocial predictors. Results are reported as odds ratios with Holm-adjusted p-values.

2.4.3 Country-level variation (RQ4)

To capture cross-national heterogeneity, the primary GLMM included random intercepts for countries. Between-country variance (and SD) was used to quantify contextual variation, and country-specific empirical Bayes estimates (BLUPs) were exported for descriptive comparison. Inference on fixed effects accounted for clustering with (a) a country-level bootstrap in the GLMM and (b) two-way cluster-robust standard errors by participant and country in a population-average logistic regression (see robustness checks below). Country-level percentile bootstrap intervals were also computed.

2.4.4 Role-specific hypotheses (H1–H4)

Hypotheses were tested with an augmented GLMM that added targeted role-specific interaction terms. Random intercepts for respondent and country were retained. Post-estimation analyses included simple slopes at − 1, 0, and + 1 SD of moderators (or by gender where relevant), pairwise contrasts of slopes with Holm adjustment, and predicted probabilities at representative values, all implemented with the *emmeans* package.

2.4.5 Robustness checks

Two supplementary analyses tested the robustness of findings. To examine whether delegation reflects a single latent dimension, we estimated a MIMIC model with a latent factor of *general delegation* measured by the four binary role indicators. This factor was regressed on psychosocial predictors and gender using WLSMV estimation with survey weights and country-clustered standard errors. The model addressed two questions: (a) does willingness to delegate across roles reflect a common underlying disposition rather than role-specific artefacts? and (b) when delegation is modelled as a latent factor, do predictors show the same directional pattern as in the GLMM? Model fit was evaluated with CFI, TLI, RMSEA, and SRMR. To validate results under an alternative error specification, we fitted a population-average logistic regression using the *fixest* package. This model estimated average effects across respondents without random intercepts

and used two-way cluster-robust standard errors (participant and country). Nonparametric country-level bootstrap intervals were also computed.

3 Results

3.1 Cross-national prevalence of willingness to delegate roles to AI

Across countries, willingness to delegate the four roles (doctor, teacher, mental-health advisor, and companion) to AI varied substantially. On average, 75.7% of respondents were willing to delegate the role of companion to AI (SD 12.7; range 50.8–89.2%). The prevalence was lower for mental-health advisor at 60.6% (SD 16.2; range 33.0–85.9%), for teacher at 49.8% (SD 13.9; range 24.9–77.4%), and for doctor at 45.3% (SD 12.0; range 25.6–71.3%) (Fig. 2).

To test whether these observed differences in cross-national prevalence were robust after accounting for variation between countries, we used a fixed-effects regression model. The model produced predicted probabilities of willingness to delegate, which can be interpreted as country-adjusted prevalence estimates. These estimates closely matched the descriptive averages: 75.8% for companion (95% CI 72.2–79.3%), 60.6% for mental-health advisor

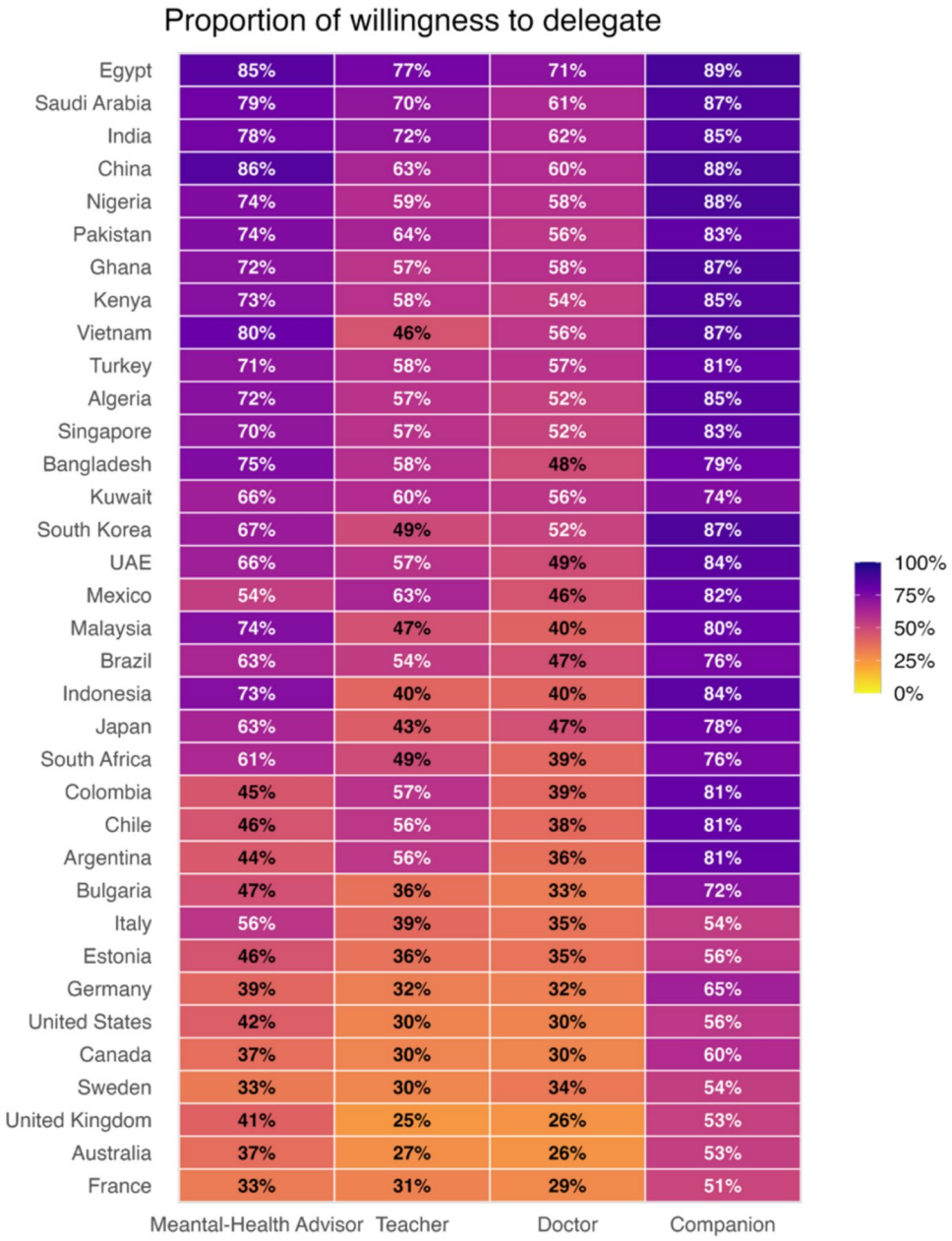

Fig. 2 Cross-national prevalence of willingness to delegate roles to AI. Percentages are weighted to reflect national samples. Countries are ordered from highest to lowest prevalence of delegation to AI as a companion

(56.1–65.0%), 49.9% for teacher (45.2–54.5%), and 45.1% for doctor (40.6–49.7%). In absolute terms, willingness to delegate to a companion was 30.6 percentage points higher than to a doctor, 25.9 points higher than to a teacher, and 15.5 points higher than to a mental-health advisor.

Pairwise contrasts from the fixed-effects model confirmed that willingness to delegate differed significantly between roles. Delegation to AI as a companion was substantially more prevalent than delegation as a doctor [odds ratio (OR) 4.20, 95% CI 3.64–4.86, $p_{holm} < 0.001$], as a teacher (OR 3.43, 95% CI 2.97–3.96, $p_{holm} < 0.001$), or as a mental-health advisor (OR 2.14, 95% CI 1.80–2.54, $p_{holm} < 0.001$). Willingness to delegate a mental-health advisor role to AI was also higher than a doctor (OR 1.96, 95% CI 1.72–2.25, $p_{holm} < 0.001$) and higher than to a teacher (OR 1.60, 95% CI 1.31–1.95, $p_{holm} < 0.001$). Even the smallest contrast, between teacher and doctor, remained statistically significant (OR 1.23, 95% CI 1.09–1.37, $p_{holm} < 0.001$). Taken together, these results indicate a consistent hierarchy of willingness to delegate: companion > mental-health advisor > teacher > doctor.

As a robustness check, we also conducted a Bayesian sensitivity analysis. This analysis produced posterior mean prevalences and 95% credible intervals of 76.3% (75.9–76.8%) for companion, 61.3% (60.7–61.8%) for mental-health advisor, 50.5% (50.0–51.1%) for teacher, and 45.8% (45.2–46.4%) for doctor, providing near-certainty for the same ordering observed in the fixed-effects model.

3.2 Predictive contribution of cognitive appraisals and affective dispositions

The multilevel logistic regression explained a substantial proportion of the variation in willingness to delegate. Nakagawa's R^2 values showed that fixed effects alone accounted for 14.3% of the variance (marginal R^2), while the full model, including country- and respondent-level random intercepts accounted for 58.5% (conditional R^2). Intraclass correlations suggested strong clustering (ICC_adjusted = 0.52). A comparison with a baseline multilevel model including only role as a fixed effect showed that adding cognitive, affective, and demographic predictors reduced the country-level variance from 0.75 to 0.54 on the log-odds scale, corresponding to an approximately 28% reduction in between-country variance.

3.2.1 Cognitive appraisals

Trust in online information was the strongest and most consistent predictor. A one-SD increase in trust increased the odds of delegation by 66% for doctor (OR 1.66), 61% for teacher (OR 1.61), 59% for a mental-health advisor (OR 1.59), and 48% for a companion (OR 1.48). These corresponded to absolute probability gains of 24.1 percentage points for doctor (30.4% → 54.5), 23.4 points for teacher (38.2% → 61.6), 20.1 points for mental-health advisor (56.7% → 76.8), and 8.8 points for companion (82.0% → 90.8). Life optimism showed smaller but reliable positive effects across all delegation roles (ORs 1.12–1.37), yielding probability increases of 5–11 percentage points across roles (Supplementary Material 8).

3.2.2 Affective dispositions

Life satisfaction was significant for teacher (8.2 points) and doctor (7.2 points) but negligible elsewhere. Loneliness was uniquely associated with delegation in the companion role (OR 1.07), but the corresponding change was minimal (0.2 points from − 1 SD to + 1 SD). Generalised anxiety showed small positive associations for teacher (OR 1.14; 6.4 points) and mental-health advisor (OR 1.13; 5.5 points), with negligible effects for doctor and companion (see Supplementary Material 8 for details).

Taken together, these results show that cognitive appraisals, especially trust in online information and life optimism to a lesser extent, are the primary drivers of willingness to delegate all four roles to AI, with affective dispositions playing smaller, domain-specific roles.

To further examine predictions beyond the main effects of cognitive and affective dispositions, we tested specific moderation hypotheses by including targeted interaction terms corresponding to our hypotheses: (a) anxiety × trust in the mental health advisor role, (b) trust × gender in the teacher role, (c) trust × optimism in the doctor role, and (d) loneliness with additional contributions from anxiety and life satisfaction. The results of this analysis are summarized in Table 1.

3.3 Gender and delegation differences

Across the four delegation roles, women were consistently less likely than men to delegate responsibilities to AI. Odds ratios from gender contrasts indicated significantly lower willingness among women for doctor (OR 0.55), teacher (OR 0.58), mental-health advisor (OR 0.70), and companion (OR 0.69) (Table 2).

Predicted probabilities illustrated these gaps. For example, in the doctor role, the predicted probability of delegation was 49.3% for men versus 34.8% for women, a gap of 14.5 percentage points. In the teacher role, the gap was even larger (56.7% vs. 43.0%, 13.7 points). Smaller but still significant gender differences were observed for mental-health advisor (71.3% vs. 63.6%, 7.7 points) and companion (89.0% vs. 84.7%, 4.3 points) (Table 2).

We first examined whether gender differences in willingness to delegate varied by levels of cognitive appraisals and affective dispositions. Predicted probabilities from

Table 1 Summary of hypothesis tests on predictors of willingness to delegate roles to AI

Role	Hypothesis expectation	Findings (ORs, contrasts)	Supported or not
Mental health advisor (H1)	Anxiety moderated by trust	Anxiety was a positive predictor of delegation across all levels of trust (ORs = 1.09–1.18). However, its effect weakened as trust increased: the slope OR was 1.18 at low trust, 1.13 at mean trust, and 1.09 at high trust. The anxiety × trust interaction was negative and significant (OR = 0.96, $p = 0.023$), indicating attenuation of the anxiety effect with higher trust	Supported (trust weakens anxiety effect)
Teacher (H2)	Trust dominant, gender moderates	Higher trust strongly increased delegation (probability from 40% at low trust to 60% at high trust). At every trust level, women were significantly less likely than men to delegate. No evidence of moderation: the female-male gap was stable across levels of trust	Supported
Doctor (H3)	Trust, optimism as moderator	Trust in online information was a strong and consistent predictor of delegation in the doctor role. Across optimism levels, higher trust was associated with greater willingness to delegate (OR = 1.79 at low optimism, OR = 1.66 at mean optimism, OR = 1.54 at high optimism). Although the slope of trust appeared somewhat attenuated at higher optimism, trust × optimism interaction tests were nonsignificant (all Holm-adjusted $p > 0.10$)	Partially (trust confirmed, no moderation)
Companion (H4)	Loneliness strongest predictor	Loneliness was significantly associated with delegation (OR = 1.07), but the effect size was minimal, corresponding to a predicted probability difference of less than 0.5 percentage points between low- and high-loneliness respondents. Generalised anxiety and life satisfaction were unrelated to delegation in this domain (all $p > 0.10$)	Weak effect

Results are based on augmented generalized linear mixed models (GLMMs) with role-specific interaction terms

Table 2 Predicted probabilities of delegation to AI by gender and role

Role	Men % [95% CI]	Women % [95% CI]	Difference (pp)	OR (95% CI)	*p* value
Companion	89.0 [86.3, 91.2]	84.7 [81.2, 87.7]	4.3	0.69 [0.65, 0.73]	< 0.001
Doctor	49.3 [43.2, 55.5]	34.8 [29.4, 40.6]	14.5	0.55 [0.53, 0.57]	< 0.001
Mental Health Advisor	71.3 [65.9, 76.1]	63.6 [57.7, 69.1]	7.7	0.70 [0.67, 0.74]	< 0.001
Teacher	56.7 [50.5, 62.7]	43.0 [37.0, 49.2]	13.7	0.58 [0.55, 0.60]	< 0.001

the GLMM showed that male–female gaps were highly stable across predictor levels: for example, in the doctor role the gap was 14.4, 14.5, and 14.6 percentage points at − 1 SD, mean, and + 1 SD of trust in online information; for the teacher role, 13.7 across all levels; for the mental-health advisor, 7.7 to 7.8; and for the companion role, 4.1 to 4.3 points. We then tested interactions comparing the male–female contrast at high (+ 1 SD) versus low (− 1 SD) levels of each predictor within each role (a difference-in-differences approach). Across all predictors and roles, estimates were effectively zero, 95% CIs included zero, and none remained significant after Holm correction (all $p_{(\text{holm})} > 0.10$). Thus, gender gaps in delegation were consistent regardless of trust in online information, life optimism, life satisfaction, generalized anxiety, or loneliness.

3.4 Country-level variation in willingness to delegate roles to AI

The primary GLMM included random intercepts for countries to capture between-country variation. The estimated variance was 0.541 (SD 0.736) on the log-odds scale, indicating that a notable share of variability in willingness to delegate roles to AI arises between countries rather than solely between individuals. This heterogeneity persisted after adjusting for all individual-level predictors (cognitive appraisals, affective dispositions, and gender), suggesting that contextual or cultural factors exert an independent influence. Country-specific deviations (empirical Bayes estimates, BLUPs) were also extracted and converted into adjusted probabilities. Holding all predictors at their

standardized means and fixing gender at the reference category (male), predicted willingness to delegate varied markedly across countries. The difference between the highest and lowest adjusted probabilities approached 30 percentage points, comparable to, or exceeding, the effects of the strongest individual predictors (Fig. 3).

3.5 Robustness of estimates across models

To evaluate whether willingness to delegate different roles to AI reflects a common underlying factor, we estimated a MIMIC model with a latent factor of "general delegation" measured by the willingness to delegate four roles (doctor, teacher, mental-health advisor, and companion).

The model showed excellent global fit: CFI = 0.962, TLI = 0.955, RMSEA = 0.034 (90% CI [0.030–0.038]), SRMR = 0.027. These values indicate that a one-factor solution provides a good approximation to the observed covariances, supporting the presence of a general delegation dimension. Standardized factor loadings were high and balanced across the four items: doctor = 0.82, teacher = 0.79, mental-health advisor = 0.76, companion = 0.74, all $p < 0.001$. This pattern suggests that all four roles contribute meaningfully to the latent construct and that none of the items dominates.

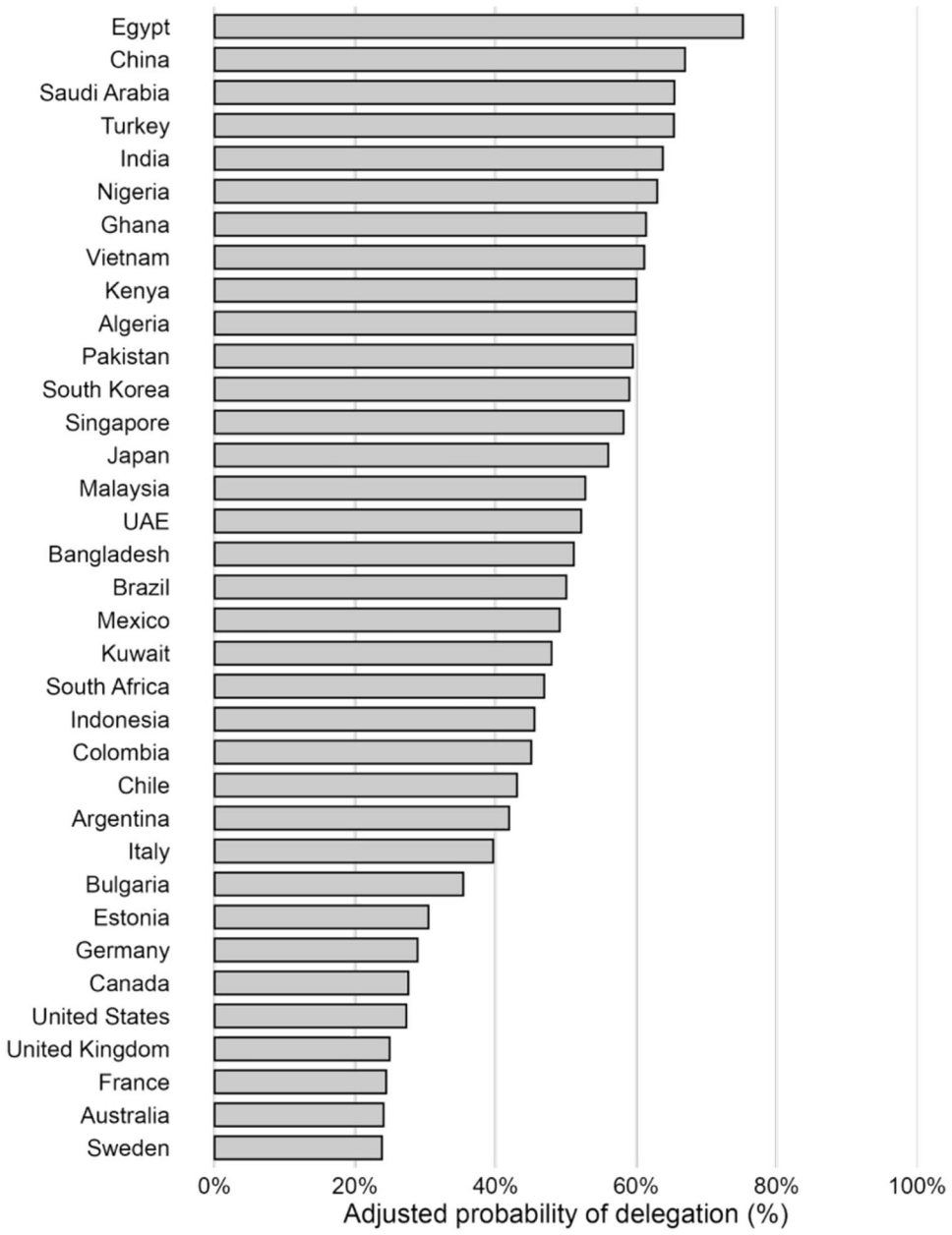

Fig. 3 Country-specific adjusted probabilities of willingness to delegate roles to AI. Bars represent empirical Bayes estimates (BLUPs) of country random intercepts. Estimates are adjusted for all individual-level predictors (cognitive appraisals, affective dispositions, and gender)

We next examined predictors of the latent "general delegation" factor. Trust in online information emerged as the strongest and most consistent predictor ($\beta = 0.42$, SE = 0.04, $p < 0.001$), indicating that a one-SD increase in trust was associated with substantially higher general willingness to delegate. Gender was also a robust predictor ($\beta = -0.31$, SE = 0.05, $p < 0.001$), with women consistently less willing to delegate than men across all roles. Smaller positive contributions were observed for optimism ($\beta = 0.09$, SE = 0.04, $p = 0.021$) and life satisfaction ($\beta = 0.07$, SE = 0.03, $p = 0.047$). By contrast, loneliness ($\beta = 0.02$, SE = 0.04, $p = 0.61$) and generalized anxiety ($\beta = 0.03$, SE = 0.03, $p = 0.32$) were nonsignificant.

Overall, delegation tendencies across roles share a substantial common core shaped primarily by trust and gender, with smaller contributions from optimism and life satisfaction. Although the GLMM focused on domain-specific heterogeneity and the MIMIC model captured a general latent disposition, both approaches converged on the same pattern: trust and gender effects generalize across domains, whereas loneliness and anxiety act as domain-specific influences.

To assess stability, we compared the multilevel GLMM with population-average (PA) logistic regressions using two-way cluster-robust standard errors (participant and country) and country-level bootstrap confidence intervals. Estimates from both approaches were nearly identical. The hierarchy of delegation roles (Companion > Mental-health advisor > Teacher > Doctor) was replicated with trust in online information remained the strongest positive predictor, optimism effects were positive but modest, and women consistently showed lower willingness to delegate (Table 3). Across GLMM bootstrap and PA cluster-robust intervals, the direction, magnitude, and significance of predictors were consistent, confirming that findings are robust to alternative model specifications.

By contrast, the PA model did not identify robust contributions of loneliness, anxiety, or life satisfaction. In the two-way cluster-robust specification, the coefficients for generalised anxiety (logit = 0.021, SE = 0.018, OR = 1.02, 95% CI [0.98, 1.06], $p = 0.23$), loneliness (logit = 0.011, SE = 0.014, OR = 1.01, 95% CI [0.98, 1.04], $p = 0.41$), and life satisfaction (logit = 0.008, SE = 0.012, OR = 1.01, 95% CI [0.98, 1.04], $p = 0.51$) were all statistically nonsignificant. Country bootstrap percentile confidence intervals for these predictors similarly included the null (OR = 1.00), confirming the absence of stable general effects.

These results indicate that the population-average (PA) framework, which captures overall effects across all roles, supports the conclusion that only trust in online information, optimism, and gender are robust, general predictors of delegation. In contrast, affective dispositions (anxiety, loneliness) and life satisfaction do not generalise across roles but operate as role-specific influences. Taken together, the robustness checks show that the observed associations are not dependent on modelling strategy or error specification: the direction, significance, and rank order of effects

Table 3 Comparison of key predictors of delegation across GLMM and population-average models

Parameter	GLMM OR [95% CI] (country bootstrap)	PA OR [95% CI] (cluster-robust)	PA OR [95% CI] (country bootstrap)
Teacher vs health (baseline)	0.53 [0.49, 0.59]	0.67 [0.57, 0.78]	0.67 [0.63, 0.73]
Doctor vs health (baseline)	0.39 [0.37, 0.44]	0.55 [0.49, 0.63]	0.55 [0.54, 0.60]
Companion vs health (baseline)	3.26 [3.07, 4.30]	2.15 [1.85, 2.51]	2.15 [2.02, 2.55]
Trust (per + 1 SD)-health baseline	1.59 [1.50, 1.63]	1.38 [1.32, 1.44]	1.38 [1.31, 1.44]
Optimism (per + 1 SD)-health baseline	1.27 [1.23, 1.30]	1.32 [1.21, 1.45]	1.32 [1.25, 1.39]
Female vs male-health baseline	0.70 [0.66, 0.76]	0.77 [0.72, 0.82]	0.77 [0.72, 0.79]
Trust × (teacher vs health)	1.01 [0.95, 1.06]	1.01 [0.97, 1.05]	1.01 [0.97, 1.05]
Trust × (doctor vs health)	1.04 [1.03, 1.07]	1.03 [0.99, 1.07]	1.03 [1.00, 1.05]
Trust × role (companion vs health)	0.93 [0.90, 0.96]	0.96 [0.92, 1.01]	0.96 [0.95, 0.99]
Optimism × (teacher vs health)	0.98 [0.92, 0.99]	0.98 [0.92, 1.04]	0.98 [0.95, 1.01]
Optimism × (doctor vs health)	0.88 [0.85, 0.91]	0.92 [0.87, 0.96]	0.92 [0.88, 0.94]
Optimism × (companion vs health)	1.08 [1.00, 1.06]	1.07 [1.01, 1.13]	1.07 [1.03, 1.09]
Gender (female vs male) × (teacher vs health)	0.82 [0.77, 0.89]	0.89 [0.84, 0.95]	0.89 [0.86, 0.95]
Gender (female vs male) × (doctor vs health)	0.78 [0.69, 0.85]	0.87 [0.81, 0.94]	0.87 [0.82, 0.94]
Gender (female vs male) × (companion vs health)	0.97 [0.88, 1.08]	0.95 [0.89, 1.02]	0.95 [0.89, 1.01]

GLMM OR [95% CI] (country bootstrap): Odds ratios with percentile bootstrap confidence intervals, accounting for clustering by country. PA OR [95% CI] (cluster-robust): Odds ratios with two-way cluster-robust standard errors (participant and country). PA OR [95% CI] (country bootstrap): Odds ratios with percentile bootstrap intervals from resampling countries. Loneliness, anxiety, and life satisfaction did not reach significance in the PA framework

are consistent across GLMM and PA models, and country-bootstrap intervals align closely in both frameworks.

4 Discussion

The delegation of socially important roles to artificial intelligence is no longer a theoretical prospect but an emerging reality across societies. Despite this, evidence on how people evaluate such delegation and the factors that influence it has remained limited. In this study, we applied our proposed structural model, which situates willingness to delegate at the intersection of cognitive appraisals, affective dispositions, and contextual factors. Drawing on data from 35 countries, we examined how these factors are associated with delegation across different roles and tested role-specific hypotheses concerning trust, optimism, anxiety, loneliness, and life satisfaction. In doing so, the study provides comparative insights into the psychological and cultural factors that contribute to global variation in the delegation of socially significant roles to AI.

4.1 Cross-national patterns of willingness to delegate socially significant roles to AI

Our findings demonstrate that individuals are not equally willing to delegate socially important roles to AI. A consistent hierarchy emerged across countries, with companionship most often entrusted to AI (~76%), followed by mental-health support (~61%), then a teacher for children (~50%), and finally a doctor (~45%). This gradient supports previous work and suggests that delegation is differentiated by the perceived nature of the role.

The particularly high willingness to delegate companionship to AI may reflect broader sociocultural dynamics in how people conceptualize social relationships. From a social compensation perspective, individuals may turn to artificial agents when human companionship is scarce or difficult to sustain, with AI offering a low-barrier alternative to alleviate loneliness. Recent research provides empirical evidence for this trend by demonstrating that AI companions can reduce feelings of loneliness comparably to human interaction, at least over short periods, especially when they evoke feelings of being "heard" and emotionally mirrored (Broadbent et al. 2024). The COVID-19 pandemic likely accelerated this receptivity. Social isolation during the pandemic triggered loneliness worldwide (Palgi et al. 2020), and technologies designed for connection saw rapid uptake as substitutes for face-to-face interaction (Chin et al. 2023). The post-pandemic context may therefore have left a lingering openness to technology-mediated companionship, particularly given that AI companions are perceived as non-judgmental, always available, and emotionally responsive (Chaturvedi et al. 2023). This becomes especially relevant with the rapid expansion of large language models (LLMs), which are increasingly capable of sustaining human-like conversations, adapting to individual user preferences, and providing companionship experiences (Yankouskaya et al. 2025a; b). Yet, the meaning of *companionship* in relation to AI remains contested. Current interpretations range from functional, task-oriented assistants that help with daily routines (Turunen et al. 2011) to emotionally responsive agents designed to reduce loneliness or simulate intimacy (Skjuve et al. 2021). Because our survey item did not specify a particular form of companionship, responses may have captured a wide range of interpretations, potentially inflating willingness-to-delegate rates. Disentangling these meanings represents an important direction for future research, particularly in the context of conversational AI and large language models, where companion-like qualities (e.g., empathy or responsiveness) directly influence how willing people are to have AI as a companion.

The willingness to delegate the role of mental-health advisor to AI was also comparatively frequent. Across countries, this tendency likely reflects AI's perceived advantages: it reduces the social costs of disclosure, circumvents barriers to accessing care, and provides support continuously. This aligns with the Unified Theory of Acceptance and Use of Technology (UTAUT), where performance expectancy, price value, and peer norms significantly drive adoption (Venkatesh et al. 2012). Recent narrative syntheses confirm AI's strength lies in delivering personalised, scalable, and consistent mental-health support—precisely the features that bridge structural gaps in service delivery (Broadbent et al. 2024).

Interestingly, delegation declines sharply for roles requiring formal expertise, such as medical doctors and teachers. These are high-stakes domains in which errors can have serious consequences, ethical expectations are stringent, and accountability rests heavily on the advisor. From a behavioural perspective, this pattern aligns with algorithm aversion theory, which holds that people tend to resist algorithmic or AI judgments in consequential or emotionally complex contexts, favouring human experts even when algorithmic performance is comparable (Burton et al. 2020). Notably, educators and physicians themselves increasingly adopt AI to enhance efficiency yet remain hesitant to cede professional authority or responsibility (Viberg et al. 2023). Their cautious acceptance in high-stakes fields reflects persistent concerns over accountability and transparency when AI assumes advisory or decision-making roles. Accordingly, the public's limited willingness to delegate such roles likely mirrors these same enduring concerns about accountability, transparency, and professional expertise.

The cross-national scope of the study further revealed substantial heterogeneity in willingness to delegate

socially important roles to AI. Some countries, such as Egypt, displayed very high average willingness across roles, while others, such as France, showed much lower levels. While these contrasts resonate with broad cultural orientations, reducing them to collectivism versus individualism risks oversimplification. Recent research suggests that trust in institutions and governance may be a major driver of AI acceptance. For example, populations in parts of Asia, the Middle East, and Africa often report higher trust in state-led technological initiatives and perceive them as instruments of modernization and service expansion, which increases openness to AI delegation (Zhang et al. 2024). By contrast, publics in many Western countries display higher institutional skepticism, particularly toward opaque or high-stakes technologies, which tempers willingness to delegate (OECD 2021). Second, resource constraints and service bottlenecks in healthcare and education create stronger incentives to accept AI as a practical substitute in under-resourced contexts. Studies of digital health and AI in low- and middle-income countries show that populations are more willing to embrace technological supplementation when human provision is limited or uneven (Ciecierski-Holmes et al. 2022). Here, willingness to delegate may reflects pragmatism rather than enthusiasm: AI is valued as a tool to fill gaps rather than replace trusted professionals. Third, social stigma and disclosure dynamics differ cross-nationally. In settings where mental health or sensitive care is stigmatized, private AI-mediated support is perceived as safer, encouraging higher delegation in advisory or wellness roles (Olawade et al. 2024). By contrast, in Western Europe and North America, where destigmatization campaigns are more advanced and services more widely available, people may see less need to turn to AI for these functions. Finally, narratives of innovation and progress may also play an important role. In countries such as China, India and the Gulf states, AI is often presented as a means of overcoming development gaps or strengthening global competitiveness, and citizens tend to share in this vision of progress (Albous et al. 2025). In Western contexts, the public debate places greater emphasis on ethics, transparency and rights, encouraging people to concentrate on risks and accountability rather than on practical benefits (Kelley et al. 2021).

Taken together, the cross-national patterns observed here suggest that willingness to delegate socially significant roles to AI is not a simple path towards automation but reflects shared priorities and anxieties. People are more ready to use AI where it offers access, privacy, but hold back in areas where accountability and ethical responsibility matter most. This suggests that the limits of AI are set not just by technical ability or regulation, but by public views on which parts of human responsibility can be handed over to machines. These views are shaped by wider feelings of trust, worry and beliefs about AI, which act as the psychological lens through which people's willingness to delegate is formed.

4.2 Do cognitive appraisals, affective dispositions, and contextual factors differently associate with willingness for AI delegation across nations?

Our findings show that cognitive appraisals were substantially stronger predictors of willingness to delegate roles to AI than affective dispositions. Among these, trust in online information was the most consistent influence across all roles, increasing delegation in medical, educational, mental-health, and companionship contexts. This aligns with evidence that perceptions of informational trustworthiness are central to AI adoption in health care (Murray and Montague 2025), education (Nazaretsky et al. 2025), mental health (Petersson et al. 2025), and conversational systems (Hu et al. 2025). Yet, delegation extends beyond neutral adoption, it involves transferring responsibility to an agent that cannot be fully controlled. In this sense, trust operates as the decisive appraisal that enables reliance: once AI is judged trustworthy, individuals act on that belief even in sensitive domains where competence and accountability are critical (Hamm et al. 2024). Reliance, therefore, represents not a by-product of adoption but its behavioural consequence, translating informational trust into a willingness to hand over responsibility.

However, trust alone explains only part of the story. Even when AI is perceived as reliable, broader outlooks on the future shape whether delegation is seen as an opportunity or a threat. Here, life optimism becomes crucial. Optimism biases individuals toward favourable expectations and greater openness to new solutions (Dohmen et al. 2023), forming a complementary cognitive route alongside trust by permitting reliance, while optimism makes such reliance appealing. Their relationship is not purely additive. In the doctor role, higher trust consistently increased willingness to delegate, but this effect weakened slightly among more optimistic individuals. Although not significant, this attenuation suggests partial redundancy between the two appraisals, consistent with findings that optimism reduces sensitivity to perceived risk (Puri and Robinson 2007), narrowing the scope for trust to exert additional effects. In high-stakes contexts such as medical advice, optimism may soften doubts, but decisions still hinge primarily on informational trust.

The role of affective dispositions was weaker and more domain specific. Life satisfaction predicted delegation only in the teacher and doctor roles, increasing probabilities by about 8 and 7 percentage points. In such high-stakes settings, a generally satisfied outlook may act as a buffer such as positive evaluations broaden attention and encourage exploratory choices (Fredrickson 2001), while a sense of

resource sufficiency reduces threat salience (Alvaro et al. 2010). Together, these processes can make delegation feel more manageable when accountability and consequences are salient.

Loneliness, by contrast, predicted delegation only in companionship, and even then, minimally. Although stronger effects were expected given evidence that AI companions can reduce loneliness (Abdi et al. 2022), the concept of *companionship* likely carried diverse meanings, diluting its association with dispositional loneliness. This interpretive heterogeneity aligns with findings that *companionship* spans both instrumental and affective roles of AI agents (Andersson 2025), and that willingness to rely on such systems depends on which meaning is most salient.

Finally, generalised anxiety predicted greater willingness to delegate in mental-health and teaching roles, but this effect weakened when trust in online information was high. This pattern suggests two distinct routes to delegation: an affect-driven route, where anxious individuals offload responsibility to regulate uncertainty, and a credibility-driven route, where high trust makes affective motives less decisive. In socially evaluative contexts, delegation may help anxious individuals reduce accountability and fear of mistakes (Ayed et al. 2025). Yet when trust in information is strong, delegation is instead supported by credibility cues, consistent with evidence that trust signals can substitute for affective reassurance (Claggett et al. 2024). Theoretically, these findings fit dual-process and social-cognitive models, in which trust functions as a sufficiency cue shifting behaviour from affective to instrumental pathways (Houlihan 2018). Thus, while generalised anxiety amplifies delegation under uncertainty, high trust in online information appears to normalise delegation across levels of anxiety.

Taken together, these results show that willingness to delegate socially important roles to AI is not merely technology acceptance, but a distinct form of judgment involving a transfer of responsibility. Trust serves as a threshold condition for action, while optimism modulates its tone, tempering risk without replacing credibility. Affective dispositions matter most in domains marked by ambiguity (e.g., companionship) or evaluative pressure (e.g., teaching, mental health) but exert limited influence elsewhere. Overall, these findings support a layered cognitive–affective architecture, in which trust anchors delegation decisions, optimism refines their valence, and affective states exert selective, context-dependent effects.

4.3 Gender and cross-national differences in the willingness to delegate socially important roles to AI

In our study, the gender gap was large, consistent across roles, and strikingly stable across cognitive appraisals and affective dispositions. This suggests a baseline difference in willingness to delegate that is not simply a by-product of trust, optimism, anxiety, loneliness or life satisfaction. Two complementary explanations fit the evidence. First, research on risk perception has long shown that women report higher perceived risk and lower tolerance for potential harms, especially in domains involving health, safety and care (Gustafson 1998). In high-stakes roles like doctor and teacher, these sensitivities plausibly translate into lower willingness to hand decisions to AI, even when information is trusted. Second, technology adoption research consistently documents gender differences in AI use and attitudes. For example, large-scale surveys show that women are less likely than men to use generative AI across occupational and educational contexts (Carvajal et al. 2024). Beyond behaviors, attitudinal studies reveal that women tend to report lower AI knowledge, weaker positive attitudes, and stronger AI anxiety than men (Russo et al. 2025). Importantly, these differences persist even after controlling for trust and emotional responses, which echoes our finding that gender gaps remain stable across cognitive and affective predictors. Taken together, these results suggest that gender differences in willingness to delegate are not explained away by appraisals of trust or optimism, nor by affective dispositions such as anxiety. Instead, they appear to reflect more fundamental orientations to risk, responsibility and technological change, consistent with broader evidence of a durable gender gap in AI adoption.

Country-level analyses revealed substantial heterogeneity in willingness to delegate that could not be explained by individual trust, optimism, affective dispositions, or gender. Even after adjusting for these predictors, national baselines differed by nearly 30 percentage points, indicating a strong independent country-level influence. This suggests that delegation cannot be understood solely through psychosocial characteristics; it is also influenced by the institutional and cultural environments (Choung et al. 2024). Comparative research shows that when automated decision-making operates within transparent and accountable systems, public acceptance increases, whereas opaque governance amplifies scepticism (Yu and Li 2022). This aligns with our finding that national baselines remain distinct even after controlling for trust: citizens may trust information generally, but remain more or less willing to delegate depending on how credible and accountable their institutional context appears.

A second explanatory mechanism involves cultural tightness–looseness, or the degree to which societies enforce norms and sanction deviation (Sui et al. 2025). Tighter cultures tend to favour rule-bound coordination and formalised procedures, making AI-supported delegation feel more legitimate, whereas looser cultures prioritise individual discretion and are more resistant to ceding control (Gelfand et al. 2011). Countries such as Egypt, Saudi Arabia, India, and

China, which appear at the higher end of our adjusted probabilities, are often described as culturally tighter, characterised by strong norms and a preference for structured coordination (Gelfand et al. 2011). In these contexts, delegation to AI may align with expectations that decisions should follow formalised, rule-based procedures. Moreover, many of these states have framed AI as a tool for national modernisation and competitiveness, further strengthening public receptivity to AI-led solutions (Zhang and Dafoe 2019).

At the lower end are countries such as France, Sweden, and the UK, where willingness to delegate is markedly lower. These societies are typically looser in orientation, placing greater emphasis on individual judgement and professional autonomy (Gelfand et al. 2011). In such contexts, delegating socially significant roles to AI may be viewed as undermining personal responsibility and expertise. These publics are also more exposed to debates emphasising accountability, transparency, and rights, which may temper enthusiasm for AI delegation (Jobin et al. 2019).

The middle tier, including countries such as Mexico, Brazil, and South Korea, presents a more mixed picture in which high digital adoption coexists with persistent public caution. Studies of automated decision-making show that when governance frameworks are transparent and accountable, public acceptance of AI in sensitive domains rises; where institutional safeguards are weaker, willingness to delegate declines, regardless of personal trust (Araujo et al. 2020).

Finally, *domain framing* also matters. Studies show that publics respond differently depending on how AI is positioned: applications in healthcare and government are typically judged as more legitimate than those in commercial or entertainment settings (Helberger et al. 2020). If countries vary in how they frame and regulate AI across domains, then willingness to delegate will differ systematically, producing the between-country baselines we observed.

4.4 Strength, limitations and future directions of the present study

A central concern in modern science is whether reported effects are reproducible and not artefacts of specific models or samples (Open Science Collaboration 2015). This is particularly relevant in large-scale, cross-national research, where variation may stem from methodological artefacts as well as genuine differences. Triangulation across analytic approaches strengthens confidence in results: when findings converge across distinct frameworks, they are unlikely to reflect the assumptions of any single method (Steegen et al. 2016).

In our study, the hierarchy of delegation roles (Companion > Mental-health advisor > Teacher > Doctor) was highly consistent across analytic strategies. Fixed-effects regressions, Bayesian sensitivity analyses, and population-average logistic regressions all reproduced the same ordering and prevalence estimates. The MIMIC model further confirmed a common latent dimension of delegation, with balanced contributions across roles. Predictors of this *general delegation* factor mirrored those from role-specific GLMMs: trust in online information was the strongest and most consistent driver; gender differences were stable; and optimism and life satisfaction made smaller but reliable contributions.

The robustness checks clarified that affective dispositions were role-specific rather than general. Loneliness predicted delegation only in companionship, anxiety in mental health and education, and life satisfaction in medicine and teaching. This distinction between general drivers (trust, gender, optimism) and domain-contingent influences (affective dispositions) supports the validity of our findings. Although the study is cross-sectional and cannot establish causality, the convergence of results across models enhances the reliability of associations between willingness to delegate socially important roles to AI and cognitive, affective, and contextual factors.

Several limitations should be noted. First, within-country samples may not capture national diversity: urban, educated, and digitally literate groups are often overrepresented in online surveys, potentially inflating willingness to delegate. Second, the companionship measure was intentionally broad and likely interpreted variably, ranging from functional assistance to emotional intimacy, diluting links with loneliness. Third, additional contextual variables (e.g., religiosity, education, employment) were not included but may influence delegation. Fourth, while we do not claim formal theoretical status for the structural model proposed in the introduction, our findings provide empirical support for its structure and relevance. Finally, substantial between-country differences in willingness to delegate remain after accounting for individual-level cognitive, affective, and demographic factors. These differences cannot be explained in the present analysis because country-level predictors were not modelled, as the survey design and weighting strategy were not aligned with cross-national inference. Future research designed explicitly for cross-national comparison could address this by incorporating harmonised country-level indicators, including GDP per capita, democracy, indices, digital infrastructure, institutional trust, and AI policy environments, to explain cross-country variation in the delegation of social roles to AI. In addition, the survey could be complemented with a vignette-based design to improve cross-country comparability. Participants would be presented with short, standardised scenarios reflecting the four AI delegation motives and asked to indicate their response and briefly explain their reasoning. Using identical scenarios across countries would reduce variation in how motives and domains of use are interpreted, but scenarios must be carefully chosen to be sufficiently universal and familiar across contexts. In addition, expert-based

follow-ups could contextualise the findings. Small panels of local experts, or a Delphi-style process across country clusters, could be used to interpret results and identify key explanatory factors, such as social norms, trust, regulation, and institutional context, providing scalable qualitative insight.

5 Conclusion

Cross-nationally, willingness to delegate socially significant roles to AI is organised into a robust hierarchy of delegation preferences: roles tied to companionship and mental health support are more readily entrusted to AI than those demanding professional authority in teaching and medicine. This hierarchy demonstrates that delegation is not a diffuse attitude toward technology but a structured judgement about where responsibility can be transferred without undermining competence or accountability.

The structure of delegation rests on multiple layers. Trust in online information functions as the general foundation, enabling reliance across all roles. Life optimism adds a positive orientation but with smaller effects, while affective dispositions (life satisfaction, anxiety, loneliness) exert influence only in domains where ambiguity or evaluative pressure is greatest. Across delegation roles, women were consistently less willing than men to delegate them to AI. The gender gap was largest in teaching and medicine, smaller in mental health support, and smallest in. These gaps did not change with levels of trust, optimism, or affective dispositions, pointing to a stable divide in how men and women approach the transfer of responsibility to AI.

Willingness to delegate socially important roles to AI is not only an individual judgement but also influences by national contexts in ways that individual-level predictors cannot explain. A key implication is that delegation to AI must be understood as both a personal and a societal orientation, requiring attention to the interplay between cognitive, affective and contextual factors.

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s00146-026-02858-5.

Author contributions A.Y. study conceptualisation, data analysis, visualisation and writing first draft M.B.A. study conceptualisation, writing first draft M.L. study conceptualisation, results validation F.B. methodology development, design development, data curation, data validation G.X. study conceptualisation, validation of the results R.A. study conceptualisation, securing funding, oversight and leadership of the study All authors reviewed the manuscript.

Funding This publication was supported by NPRP 14 Cluster grant # NPRP 14 C-0916–210015 from the Qatar National Research Fund (a member of Qatar Foundation). The findings herein reflect the work and are solely the responsibility of the authors

Data availability Data, data analysis files and codes used for data analyses are available at OSF https://osf.io/45uzj/?view_only=b077ed8392d445e9aadfdfdcf8a5fcdb

Declarations

Conflict of interest The authors declare no competing interests.

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