The influence of privacy concern on AI adoption - a meta-analysis of studies in the age of ChatGPT

Short Paper

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Abstract

The 2022 release of ChatGPT set records for the fastest-growing user base and signaled the start of an AI boom. Today, AI is changing the way people perceive computers, as users are regularly reminded of the potential benefits that it will bring. As privacy concerns may be subjective and evolve over time, we examine the extent to which privacy concerns influence AI adoption in our current environment. Through a systematic review, we meta-analyze the relationship (n=6440), finding that privacy concern has a significant moderate negative influence on AI adoption (r=-0.32). We also find that studies are homogeneous, with a consistent influence on AI adoption. Our research establishes a current baseline of this relationship and will inform researchers of the expected effect and provide a reference point for future studies. Future work may include a deeper investigation into the usage contexts and the instruments used to measure privacy concern.

Keywords: artificial intelligence, behavior, ChatGPT, meta-analysis, privacy concern, adoption, usage.

1 Introduction

The meteoric rise of AI in recent years has changed the way people interact with and perceive computers. Sparked by the ease of use and low cost of conversational agents, notably OpenAI's ChatGPT in late 2022, there is a drive to integrate AI into all aspects of business and personal life. A recent survey of tech decision makers revealed that 95% were considering investments into AI technologies (EY 2024), with potential for applications in broad areas including sales and marketing, customer operations, and software development (Chui et al. 2023).

Such uptake is not without risks. Privacy concerns are an enduring issue in digital environments, and as the scope and pervasiveness of their usage increase, so too do these risks. When using applications that gather personal information or make inferences from such data, a balance needs to be struck between the benefits of using these applications and any potential associated risk. Application usage, which involves Collection, Processing (in the form of aggregation or identification), and Dissemination of data, all have privacy implications (Solove 2005). Most concerningly, these are also tasks in which AI tools are increasingly being applied.

2 Privacy Concern

Information privacy, as originally defined by Westin (1968), refers to an individual's right to control who accesses and shares their personal information, and under what circumstances. Over time, research in this area has shifted focus to information privacy concerns, which are a person's subjective beliefs about how fairly their data is being handled (Malhotra et al. 2004). This raises a unique challenge for research, as these subjective concerns can be influenced by a range of factors outside of the actual data handling practices in question.

Two influential models, CFIP (Smith et al. 1996) and IUIPC (Malhotra et al. 2004), offer frameworks for understanding information privacy concerns. From these models, six key dimensions of privacy concerns emerge: data collection practices, control over information collected, unauthorized secondary use, improper access, errors, and awareness of privacy practices. Generally, individuals' privacy concerns negatively impact the acceptance of technology (Malhotra et al. 2004; Smith et al. 1996) and reduce the intention to use online services (Belanger et al. 2002). However, as this relationship is driven by subjective beliefs, the link is by no means universal, and examples of conflicting findings can be seen in the literature, especially where there is a perceived benefit to the user, such as in the case of online social networks (Tufekci 2008).

Analyzing the societal impact of AI involves weighing its perceived risks against its benefits. Floridi et al. (2018) highlight AI's dual nature: it offers remarkable chances for efficiency and innovation but also poses diverse risks, from algorithmic biases to existential threats. Though the discipline of AI has had a 70-year history, it has only recently become of interest to the public. The massive surge in interest around generative AI in particular signaled the growing interest in AI outside of the technical sphere (Qi et al. 2024). Estimates suggest that within just 2 months of launch, ChatGPT reached 100 million monthly active users (Hu 2023). AI had well and truly moved from being a specialized technical topic to a consumer good. User perceptions are not universally positive, however, in a meta-analysis of social media data in the months after ChatGPT was released, Leiter et al. (2024) highlighted that opportunities were also accompanied by threats, especially from an ethical perspective. Furthermore, research has shown that users' security and privacy concerns evolve over time (Ali et al. 2025). Thus, in this manuscript, we examine the influence of user privacy concerns on AI adoption in a contemporary setting, specifically in the current period of AI boom. Our results establish a current baseline of the magnitude and direction of this relationship and provide a reference point for future studies on AI adoption.

3 Methodology

Data were collected for this study through a systematic literature review process. We followed the "preferred reporting items for systematic reviews and meta-analyses" (PRISMA) guidelines (Moher et al. 2015) as these are one of the most well-established protocols for this type of research. The articles in this study were discovered via a Scopus database search conducted in April 2025. The search queries included the following terms: "*privacy concern*", "*AI*", and either of "*acceptance*", "*adoption*", "*use*", "*intention*", or "*behavior*". We limited the search in this instance to journal and conference articles written in English and excluded other reviews that do not provide primary data.

Evidence of the impact of the AI boom was immediately apparent in the search results. The earliest results found were from 2018, with just two results for the entire year. However, in late 2022, ChatGPT was making headlines and bringing AI into the spotlight, sparking an exponential rise in research papers on the topic. We found that 83% of all papers we discovered on this topic were published from 2023 onwards – the age of ChatGPT, as illustrated in Figure 1.

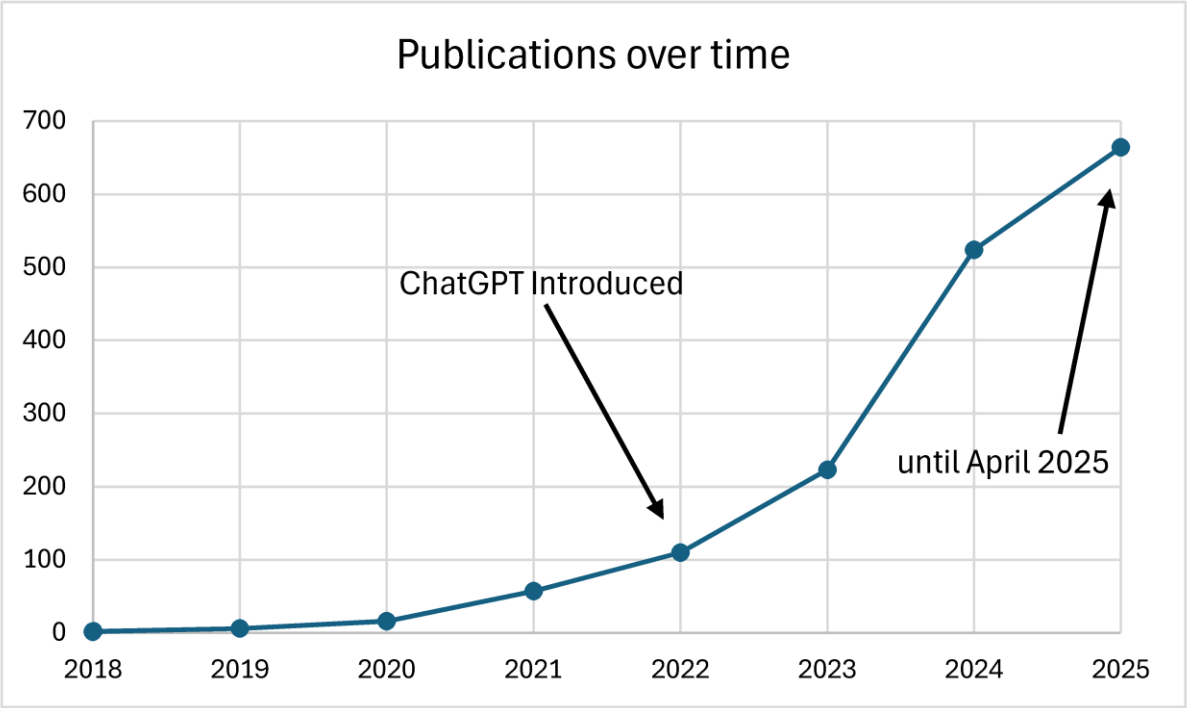

Figure 1. Publications over time

4 Results

As AI is currently the subject of significant discussion and media attention, public perceptions and views are evolving. As such, we seek to understand contemporary views on privacy, particularly in relation to modern tools and applications. We scoped our publication time range to include only recent (post ChatGPT release) articles from 2023 onwards. Interestingly, though this is a relatively recent time window, this criterion captured the majority of all published work on the topic - 553 papers in total.

Abstracts of all papers were read to assess basic inclusion criteria, and to minimize type II error if there was any doubt then the full text was reviewed regardless. We reviewed the full text of 117 papers, ultimately including 14 studies that presented the required statistical data. Included studies were reviewed by two members of the research team to ensure robustness. Studies included in our review consider adoption or usage intention at the individual level, where behavior or usage intention is the dependent variable, and are summarized in Table 1. Our first finding was that although we had targeted broad keywords for both usage behavior and intentions, the actual studies all examined usage intentions as the dependent variable. Though studies were often based on established models (e.g., TPB) where the correlation between intention and behavior has been established, it is still necessary to interpret our findings in the context of this finding. Privacy studies have previously revealed a disconnect between intentions and behaviors, the so-called "privacy paradox" (Smith et al. 2011), and it remains to be seen whether this will be observed in the domain of AI usage.

Study	Authors	Correlation	n
1	Lee et al. (2023)	-0.28	269
2	Hong and Cho (2023)	-0.28	418
3	Dean et al. (2024)	-0.459	519
4	Du et al. (2024)	-0.33	577
5	Jo (2024)	-0.323	273
6	Moon (2024)	-0.68	220
7	Shi et al. (2024)	-0.492	536
8	Shi et al. (2023)	-0.443	400
9	Song et al. (2023)	-0.249	576
10	Xie et al. (2024)	-0.252	275
11	Hong (2025)	-0.12	993
12	Hong and Cho (2025)	-0.322	418
13	Hong and Cho (2025)	-0.161	444
14	Kalisz (2025)	-0.1	522

Table 1. Study Correlations and Sample Size

5 Meta-Analysis

Our meta-analysis adopted the Pearson correlation coefficient r as the effect size. These values were extracted from correlation matrices and adjusted using Fisher's Z transformation (Borenstein et al. 2021) to ensure comparability of the effect sizes. Following this, the mean effect sizes, confidence intervals, H index, I2, and Q statistics are calculated. Publication bias was assessed using a Funnel plot, and the calculation of a fail-safe N enabled us to evaluate the robustness of the findings. Meta-analysis was carried out using R Studio (R Development Core Team 2010) and the meta-essentials package (Suurmond et al. 2017).

Most studies have a reasonably large sample size, ranging from 220 to 993 responses. Such sample sizes are more common in modern research, especially as reviewed papers used online distribution of surveys. Survey platforms such as Amazon MTurk and Prolific Academic have made it relatively easy for researchers to obtain hundreds of responses. On the other hand, the caveats about the use of survey panels and self-report data apply here (Hays et al. 2015).

5.1 Forest Plot

Our meta-analysis is based on 14 studies with a total sample size of 6440. The forest plot (Figure 2) enables us to visualize effect sizes and confidence intervals in a single image. Rows 1-14 are numbered according to the studies shown in Table 1, and Row 15 represents the overall relationship in the data set. We observe that all studies report a negative correlation between privacy concern and adoption intention. Thus, no studies cross the vertical line of null effect illustrated with 0.00 correlation in the figure. As any study that crosses the line of null effect does not show a statistically significant result, this is an interesting observation.

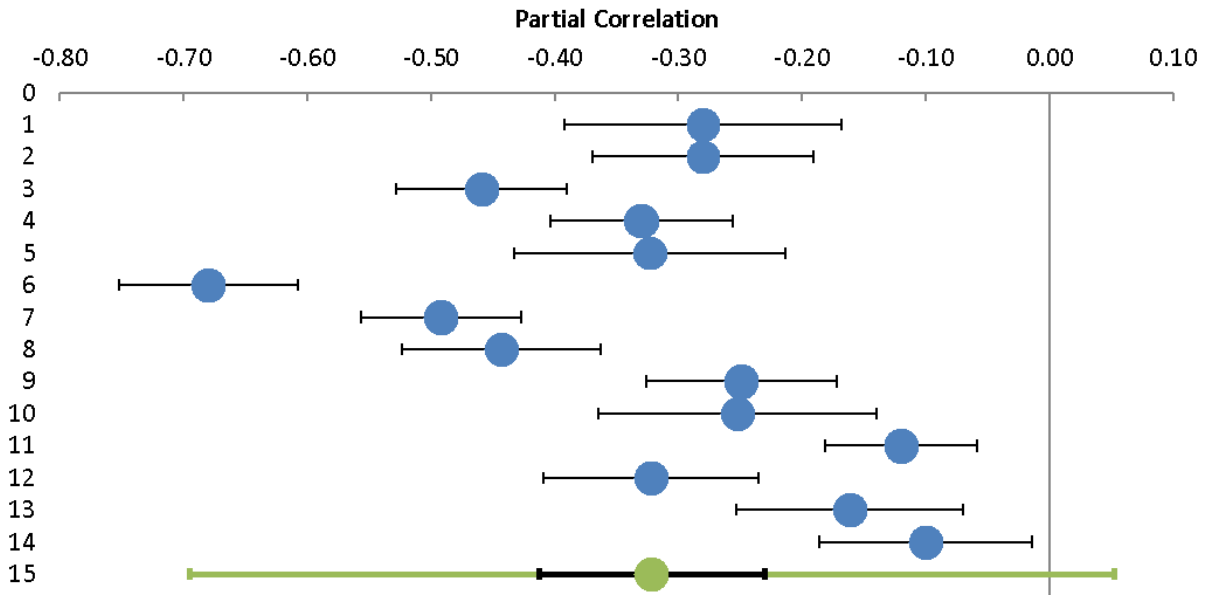

Figure 2. Forest Plot – Study Effect Size and Correlation Confidence Interval (CI)

5.2 Significance of Relationship

We calculated the mean correlation coefficient between privacy concern and AI adoption intention across these studies to be -0.32. Next, we estimated 95% confidence intervals. This provides us with the probability that a population parameter will fall between a set of values. If the confidence interval contains the value of zero, then we cannot conclude that there is a significant link between the factors being evaluated. Furthermore, the width (difference between low and high values) of the confidence interval shows us how stable the results are. The 95% CI for this meta-analysis is between -0.23 and -0.41. As this is negative and does not include the value of zero, it confirms that there is a significant relationship between privacy concern and AI adoption. The two-tailed p-value for this association is $p<0.0.1$, demonstrating that the relationship under consideration meets the threshold to be considered statistically significant. Furthermore, the range of values is quite narrowly grouped around the mean (-0.32), showing that the observed effect sizes are relatively stable. We conclude that there is a moderate and statistically significant relationship between privacy concern and adoption intention. These results are summarized below in Table 2.

N	K	Mean Effect Size	95 CI Lower	95% Upper	CI	95% Prediction Lower	95% Prediction Upper
6440	14	-0.32	-0.41	-0.23		-0.70	0.05

Table 2. Statistical Results Summary

5.3 Heterogeneity and Publication Bias

If there is heterogeneity in a meta-analysis, it may be difficult to draw strong conclusions about any perceived links. Therefore, we tested for heterogeneity through several statistical means. Cochran's Q (1954) is commonly used to indicate whether heterogeneity is present. We found a Q value of 9.12 with $p>0.05$, indicating that heterogeneity is not an issue in our data set. We further verified this result by conducting the I^2 test, which indicates the magnitude of any possible heterogeneity. We found that the I^2 test also indicated that there was no significant presence of heterogeneity in the data set. To ensure that publication bias was not an issue in our analysis, we calculated the Fail-safe N statistic (Rosenthal 1979) and generated a Galbraith plot to confirm the reliability of our findings. The generally accepted threshold for the Fail-safe N statistic is 5k+10, where k is the number of manuscripts. Our calculated Fail-safe N value of 155 significantly exceeds this norm, indicating no publication bias in our meta-analysis. The Galbraith plot further supports this conclusion, as all data fall within the upper and lower

bounds of the regression slope. This absence of publication bias affirms the validity and reliability of our results.

6 Discussion

There is a moderate negative association between privacy concern and AI adoption intention. The direction of the association supported the observation of all 14 studies, given that they all concluded a negative association, ranging from weak (-0.1) to strong (-0.68). The majority (64%) of studies used data sets from the US or China but focused on different domains of AI. Although our results did not detect any heterogeneity of results, further comparative studies remain an interesting avenue for further work.

Studies originating from China have generally focused on the adoption intention of AI in various applications, including ChatGPT, healthcare, hotel service bots, and voice assistants. However, the papers originating from the US had more emphasis on the public health sphere. Regardless of the AI context, all studies exhibited negative associations between privacy concern and AI adoption intention. The association between privacy concern and AI adoption intention is slightly stronger in China (mean -0.35) compared to the US (mean -0.3), this could be due to cultural differences, and the types of applications that are used in each country, given US users are likely to use US developed applications such as ChatGPT whilst China blocks the use of US developed AI tools, and instead focuses heavily on their own AI tools such as DeepSeek. We further examined the privacy policies of these tools and found that there are differences in the scope and scale of collection in DeepSeek vs ChatGPT. The ambiguity of privacy policies and the level of understanding can also influence privacy perceptions and thus impact adoption.

Further evidence of the influence of cultural differences and norms arises from a deeper investigation of Kalisz (2025). This study reported the lowest correlations across our data set (-0.1), as it drew from the most culturally diverse data set from France, India, Germany, Poland, Ukraine, the UK, Belgium, the Netherlands, Belarus, and other locations. This is therefore an interesting area for ongoing investigation. Furthermore, different levels of adoption in industry, for example 50% in China vs 26% in France (Haan 2024), are highly likely to influence perceptions.

On the other hand, we found consistently strong associations in studies that consider generalized privacy concerns. The strongest association of -0.68 was in a study addressing generalized privacy concerns related to data leaks and the collation of personal data, as opposed to investigating specific applications or contexts (Moon 2024). Interestingly, another generalized study (Dean et al. 2024) also concluded a moderate association (-0.46) when examining general views on AI adoption intention.

Most of the studies utilized crowdsourcing survey tools, such as Mechanical Turk, Wenjuanxing, and Credamo, to capture user responses. The average association of AI adoption intention concerns in the studies that used crowdsourcing methods was moderate (mean -0.3), compared to a slightly stronger association (mean -0.4) when using targeted surveys. The targeted research approach could be susceptible to bias; however, both methods yielded similar outcomes, providing evidence in support of using crowdsourcing data collection methods.

7 Conclusion

This manuscript describes the results of a comprehensive meta-analysis of the link between privacy concern and AI adoption intention. We find that AI adoption intention is significantly influenced by users' stated privacy concerns. The next stages of our research are threefold. Firstly, longitudinal studies will discover how privacy perceptions change over time. As this remains an area with a highly active publication base, there is potential for a further meta-analysis after a 1-2 year time period to provide longitudinal data. Secondly, future work may unpack both the usage contexts and how the privacy concerns have been measured in prior studies. Though the general understanding of privacy is reasonably consistent, the means by which the measures were operationalized could have an impact on results. To this end, recent work reconceptualizing the notion of privacy in the age of AI (e.g. Menard and Bott 2025) may be invaluable. Thirdly, given our finding that all studies discovered in the review had considered adoption intention rather than actual behavior, there is a need for future work to gather empirical data on actual usage. This is especially pertinent as it will shed light on whether the privacy paradox is a factor in the context of AI. As we are dealing with an unprecedented influence of AI on all aspects of social and technological usage, this will continue to be a fast-moving field, and we hope that our findings may inform future work.

8 References

Ali, M., Arunasalam, A., and Farrukh, H. 2025. "Understanding Users' Security and Privacy Concerns and Attitudes Towards Conversational AI Platforms," *2025 IEEE Symposium on Security and Privacy (SP)*: IEEE, pp. 298-316.

Belanger, F., Hiller, J. S., and Smith, W. J. 2002. "Trustworthiness in Electronic Commerce: The Role of Privacy, Security, and Site Attributes," *The journal of strategic Information Systems* (11:3-4), pp. 245-270.

Borenstein, M., Hedges, L. V., Higgins, J. P., and Rothstein, H. R. 2021. *Introduction to Meta-Analysis*. John Wiley & Sons.

Chui, M., Hazan, E., Roberts, R., Singla, A., Smaje, K., Sukharevsky, A., Yee, L., and Zemmel, R. 2023. "The Economic Potential of Generative AI."

Cochran, W. G. 1954. "The Combination of Estimates from Different Experiments," *Biometrics* (10:1), pp. 101-129.

Dean, T. B., Seecheran, R., Badgett, R. G., Zackula, R., and Symons, J. 2024. "Perceptions and Attitudes toward Artificial Intelligence among Frontline Physicians and Physicians' Assistants in Kansas: A Cross-Sectional Survey," *JAMIA open* (7:4).

Du, H., Li, J., So, K. K. F., and King, C. 2024. "Artificial Intelligence in Hospitality Services: Examining Consumers' Receptivity to Unmanned Smart Hotels," *Journal of Hospitality and Tourism Insights* (8:11), pp. 55-78.

EY. 2024. "Ey AI Pulse Survey."

Floridi, L., Cowls, J., Beltrametti, M., Chatila, R., Chazerand, P., Dignum, V., Luetge, C., Madelin, R., Pagallo, U., and Rossi, F. 2018. "Ai4people—an Ethical Framework for a Good AI Society: Opportunities, Risks, Principles, and Recommendations," *Minds and machines* (28), pp. 689-707.

Haan, K. 2024. "Forbes 22 Top AI Statistics." from https://www.forbes.com/advisor/business/ai-statistics/

Hays, R. D., Liu, H., and Kapteyn, A. 2015. "Use of Internet Panels to Conduct Surveys," *Behavior Research Methods* (47:3), pp. 685-690.

Hong, S. J. 2025. "What Drives AI-Based Risk Information-Seeking Intent? Insufficiency of Risk Information Versus (Un)Certainty of AI Chatbots," *Computers in Human Behavior* (162).

Hong, S. J., and Cho, H. 2023. "Privacy Management and Health Information Sharing Via Contact Tracing During the Covid-19 Pandemic: A Hypothetical Study on AI-Based Technologies," *Health Communication* (38:5), pp. 913-924.

Hong, S. J., and Cho, H. 2025. "Extending and Testing Protection Motivation Theory in the Context of Covid-19 Contact-Tracing Technology: A Comparison of South Korea and the United States," *Health Communication* (In Press), pp. 1-14.

Hu, K. 2023. "Chatgpt Sets Record for Fastest-Growing User Base-Analyst Note," *Reuters* (12), p. 2023.

Jo, H. 2024. "From Concerns to Benefits: A Comprehensive Study of Chatgpt Usage in Education," *International Journal of Educational Technology in Higher Education* (21:1).

Kalisz, D. E. 2025. "Drivers of Artificial Intelligence Integrated Healthcare Applications. Patients' Perspective," *Technological Forecasting and Social Change* (216).

Lee, S., Moon, W.-K., Lee, J.-G., and Sundar, S. S. 2023. "When the Machine Learns from Users, Is It Helping or Snooping?," *Computers in Human Behavior* (138).

Leiter, C., Zhang, R., Chen, Y., Belouadi, J., Larionov, D., Fresen, V., and Eger, S. 2024. "Chatgpt: A Meta-Analysis after 2.5 Months," *Machine Learning with Applications* (16), p. 100541.

Malhotra, N. K., Kim, S. S., and Agarwal, J. 2004. "Internet Users' Information Privacy Concerns (Iuipc): The Construct, the Scale, and a Causal Model," *Information systems research* (15:4), pp. 336-355.

Menard, P., and Bott, G. J. 2025. "Artificial Intelligence Misuse and Concern for Information Privacy: New Construct Validation and Future Directions," *Information Systems Journal* (35:1), pp. 322-367.

Moher, D., Shamseer, L., Clarke, M., Ghersi, D., Liberati, A., Petticrew, M., Shekelle, P., Stewart, L. A., and Group, P.-P. 2015. "Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (Prisma-P) 2015 Statement," *Systematic reviews* (4), pp. 1-9.

Moon, S.-J. 2024. "Effects of Perception of Potential Risk in Generative AI on Attitudes and Intention to Use," *International Journal on Advanced Engineering Information Technology* (14:5), pp. 1748-1755.

Qi, W., Pan, J., Lyu, H., and Luo, J. 2024. "Excitements and Concerns in the Post-Chatgpt Era: Deciphering Public Perception of AI through Social Media Analysis," *Telematics and Informatics* (92), p. 102158.
R Development Core Team. 2010. "R: A Language and Environment for Statistical Computing." Retrieved 1 Jan, 2025, from https://www.r-project.org/
Rosenthal, R. 1979. "The File Drawer Problem and Tolerance for Null Results," *Psychological Bulletin* (86:3), pp. 638-641.
Shi, J., Lee, M., Girish, V. G., Xiao, G., and Lee, C.-K. 2024. "Embracing the Chatgpt Revolution: Unlocking New Horizons for Tourism," *Journal of Hospitality and Tourism Technology* (15:3), pp. 433-448.
Shi, Y., Lu, W., and Zhou, Y. 2023. "Reconciling the Personalization–Privacy Paradox Via Doctorbots: The Roles of Service Robot Acceptance Model Elements and Technology Anxiety," *Journal of Consumer Behaviour* (23:3), pp. 1446-1462.
Smith, H. J., Dinev, T., and Xu, H. 2011. "Information Privacy Research: An Interdisciplinary Review," *MIS Quarterly*, pp. 989-1015.
Smith, H. J., Milberg, S. J., and Burke, S. J. 1996. "Information Privacy: Measuring Individuals' Concerns About Organizational Practices," *MIS Quarterly* (20:2), pp. 167-196.
Solove, D. J. 2005. "A Taxonomy of Privacy," *University of Pennsylvania Law Review,* (154), p. 477.
Song, B., Xu, H., Hu, W., Li, Y., and Guo, Y. 2023. "How to Calculate Privacy: Privacy Concerns and Service Robots' Use Intention in Hospitality," *Current Issues in Tourism* (27:21), pp. 3401-3417.
Suurmond, R., van Rhee, H., and Hak, T. 2017. "Introduction, Comparison, and Validation of Meta-Essentials: A Free and Simple Tool for Meta-Analysis," *Research Synthesis Methods* (8:4), pp. 537-553.
Tufekci, Z. 2008. "Can You See Me Now? Audience and Disclosure Regulation in Online Social Network Sites," *Bulletin of Science, Technology & Society* (28).
Westin, A. F. 1968. "Privacy and Freedom," *Washington and Lee Law Review* (25:1), p. 166.
Xie, W., Yang, S., Li, Y., and Zhou, S. 2024. "Understanding Anthropomorphic Voice-AI Chatbot Continuance from a Human-AI Interaction Perspective," *Behaviour & Information Technology*, pp. 1-21.

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