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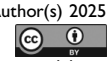
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The effect of religiosity and cultural conservatism on digital privacy concerns: A comparative longitudinal study of five Arab countries

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Abstract

This study examines the influence of religiosity and cultural conservatism on digital privacy concerns (DPC) among internet users from five Arab countries. Across four waves (2017–2022), in-person and telephone interviews captured responses from 18,160 adults in Saudi Arabia, Tunisia, Lebanon, Qatar, and the United Arab Emirates (UAE). We fitted random-intercept multilevel regressions that nest individuals within country-by-wave clusters, allowing the slope of religiosity to vary across these clusters. We hypothesized religiosity would positively predict DPC, and results confirmed that. This study also hypothesized that the positive relationship between religiosity and DPC would be stronger among respondents reporting higher cultural conservatism, though this hypothesis was not supported. Instead, religious and progressive respondents reported greater DPC than other respondents, suggesting that religious progressives, living as they do in culturally conservative locales, may experience tension between religious and progressive beliefs, which leads to heightened DPC.

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Digital privacy, religiosity, social identity, conservatism, survey, longitudinal, Middle East, Arab countries, expatriates

Introduction

In today's world, internet is an integral part of our lives. According to the World Bank (2024), in 2024, 68% of the world's population was using the internet. Other reports suggests there are 5.24 (64%) billion social media users worldwide (DataReportal Meltwater, 2025; Petrosyan, 2025). Individuals use the internet for a variety of purposes, including but not limited to information search, socializing, access to public and private services, and learning and education (Blank and Groselj, 2016). The availability of such a large number of individuals online attracted businesses toward digital environments, using it for marketing, consumer interaction and sales. According to one estimate, trading activities such as shopping on social media will reach US$1.2 trillion globally by 2025 (Accenture, 2025). While at one end, individuals share a wide array of data, including personally identifiable information such as names, addresses and social security numbers, businesses automatically collected more nuanced data points like browsing history, location data and online behaviors (Duus et al., 2022; Liu, 2020). In several cases, not only are these data points collected without the explicit knowledge or consent of the individuals (Yi and Chen, 2022), but also they were shared with third parties for the sake of providing tailored services (Vallina-Rodriguez and Sundaresan, 2017). The situation is further exacerbated by data breaches and privacy violations occurring due to incidents such as *Cambridge Analytica* (Isaak and Hanna, 2018), as well as the increasing sophistication in data analysis techniques, making individual personal lives increasingly transparent to corporations, government and even malicious actors (Kersten and Lotze, 2020). This situation is creating privacy concerns among individuals using the internet and information communication technologies. We refer to such privacy concerns as digital privacy concerns (DPC), denoting the rights and expectations of individuals to proper handling and usage of personal information, communication and conduct within digital environments such as social media, internet browsing, online applications and gaming (Bélanger and Crossler, 2011).

Studies show that DPC can result in abandoning or looking for alternative services (see, for example, Brown, 2020; Dahabiyeh et al., 2024; Shome et al., 2024), which is detrimental to the existence of digital environments, especially social media applications. Consequently, researchers have not only proposed privacy management practices for individuals (Bandara et al., 2021) but also examined the role of DPC in forming these practices using various theoretical frameworks such as the privacy calculus theory (Dinev et al., 2006), antecedent–privacy concerns–outcomes (Smith et al., 2011), models like the enabler–inhibitor (Farooq et al., 2024a) and migration framework (Dahabiyeh et al., 2024), and norms (McDonald and Forte, 2020), which contribute to more nuanced understandings of digital privacy management.

Prior literature suggests that individual privacy management is a complex process (McDonald and Forte, 2020; Palen and Dourish, 2003), dialectic and dynamic, and involves more than mere withdrawal from people or situations (Palen and Dourish, 2003). Along with these studies, other work highlights the roles of norms driven by culture, community and religion in security and privacy (for example, McDonald and Forte, 2020; Renaud and Dupuis, 2023: Rifat et al., 2021). Apart from the complexity involved in privacy management, the existing body of privacy literature has been criticized as either narrowly focused in terms of sample (Farzand et al., 2025) or overall West-centric (Ashraf et al., 2023; Haque et al., 2019; Mustafa et al., 2023; Rifat et al., 2021). The narrowly focused approach involves collecting data from one country and considering implications for a broader user base across the world (for example, Dahabiyeh et al., 2024; Hasan et al., 2023). The West-centric literature takes a pragmatic approach; that is, it focuses on technical decisions and settings users may or may not employ to better safeguard their privacy, which may be too narrow for non-Western regions and which offers less of an emphasis on psycho-social variables that may influence privacy attitudes and behaviors (Farooq et al., 2024a; Farzand et al., 2025; Rifat et al., 2021).

In response to the above criticism, researchers have started studying privacy conception and management in non-Western contexts, for example, South Asia and the Middle East, predominantly Muslim-majority countries, by incorporating relevant factors in the given context. South Asian research highlighted religion's role in understanding socio-cultural norms and values in privacy (Farooq et al., 2024a; Farzand et al., 2025; Mustafa et al., 2023; Rifat et al., 2021, 2022). Others have studied the prevalence of religion, such as Quranic citations, in social media discourse (Abokhodair et al., 2016) and examined the effect of religion, norms, trust and personal identity on privacy behaviors and conceptualizations in Arab Gulf countries (Abokhodair, 2017; Abokhodair et al., 2017; Abokhodair and Vieweg, 2016; Faisal and Alsumait, 2011). Abokhodair et al. (2016) maintained that digital privacy in Arab Gulf countries is often supported by social media users with Quranic citations or justifications. They also note that privacy in some Arab countries is a communal asset, not understood only in the context of one's own digital security, something that lends weight to the current study's use of social identity theory (SIT) to elucidate relationships between religiosity and DPC. While these studies provide some understanding of privacy conception and management evidence from non-Western Muslim societies, methodological design limitations restrict the findings from being generalized for populations within a single country or region. These limitations are studying privacy individualistically (for example, Rath and Kumar, 2021) and utilizing a cross-sectional design to collect data (for example, Mustafa et al., 2023; Rifat et al., 2021; Rifat et al., 2022). To deal with these limitations and in line with the existing work using religion as a lens to understand privacy attitudes (see above), the current research uses a longitudinal research design to understand the relationship between religiosity and privacy concerns at the individual and societal levels in multiple Muslim-majority countries. In addition, we also considered culture by considering societal culture as a moderator. We used SIT as a theoretical framework to understand the interplay of religiosity, cultural factors and privacy concerns. Data ($N = 18{,}160$) were

collected in four waves through face-to-face and telephonic interviews from Saudi Arabia (KSA—"Kingdom of"), Lebanon, Tunisia, Qatar and the United Arab Emirates (UAE) in multiple waves from 2017 to 2022, and a multilevel analysis was conducted. The study finds support for a relationship between religiosity and privacy concerns but renders some unexpected results regarding the moderating role of cultural conservatism.

This manuscript is structured as follows. The related work section describes the digital privacy environment and research in Arab countries. The theoretical background section details SIT, justifies its application in the current study and develops the hypotheses for the study. The conceptual model is provided at the end of that section. The method section provides details of data collection, sampling design, sample characteristics, measures and analysis details. The findings section narrates the outcomes of the study in the form of descriptive findings and the results of hypothesis testing. Theoretical insights, limitations and future work directions are in the discussion.

This study's conceptualizations of digital privacy and DPC

There may be varying ways people in different cultures define privacy, express its virtues or protect it, but the desire for some level of privacy is, to a person, universal. "Every teenager wants privacy. Every single last one of them, whether they tell you or not, wants privacy" (pseudonymous internet commenter "Waffles," quoted in Marwick and Boyd, 2014: 1051). You can replace "teenager" in that quote with "human being," and it would ring no less true. The quote mentions generalized privacy, but the desire for at least some semblance of *digital* privacy, admittedly, does differ among persons; otherwise, our study would be unnecessary. In the current paper, we operationalize DPC as the fear of being surveilled by companies. Therefore, we adapt a definition of privacy concern in the current study from literature on the right to freedom from surveillance capitalism (Zuboff, 2023): fear of having one's online movements monitored, as well as data tracked and stored, by companies for corporate interests. Appropriately, we define digital privacy more broadly using language from, alas, a corporate firm that works to protect digital privacy at both individual and organization levels: "Digital privacy is the ability of an individual to control and protect the access and use of their personal information as and when they access the internet" (Husain, 2023).

With that, we move to discuss privacy impediments and concerns in the Arab countries under study.

Related work

Digital privacy environments in the five countries

A paradox among Arab countries is that they are, at once, highly similar (in matters such as language and the dominant religion, Islam, for example) and markedly different (in aspects such as their colonial histories, economies, climate and geography). None of the countries in the current study are democratic, including Tunisia, which under Kais Saied has removed many of the country's democratic-supportive officials and judges

and weakened its democratic institutions (Yerkes and Alhomoud, 2022), though 2022 was a year in which many countries, not just those in the Arab region, around the world were backsliding into authoritarianism, and yet the countries differ dramatically regarding social, political and civil rights. So, too, do digital privacy environments in the countries share important similarities and distinctions.

The Stevens Institute of Technology (2023) ranks internet privacy in 70 countries, including all countries in the current study except Qatar, based on criteria like levels of government surveillance online, internet service providers' (ISPs) ability to monitor users and restrictions on sending encrypted and anonymous information. Of the countries in the current study, Tunisia (31) and Lebanon (36) rank the highest, while the UAE (59) and KSA (66) are near the bottom of the list. Of course, the United States surveils its citizens, often with the help of ISPs and telecom carriers (see Boghosian, 2013), likely more than most countries in the world. And the world's most surveilled cities are not in the Arab region, but in China, the UK (London) and India (Statista, 2021).

WhatsApp voice and video calls (as well as calls on services like Skype and Facebook Messenger) are blocked in Qatar, the KSA and the UAE (Barrington, 2020), which provides increased revenue to the countries' telecommunication providers but also lets governments in the countries and internet providers themselves surveil and record customers' phone calls. Again, this is not something unique to the Arab region; WhatsApp and other Voice over Internet Protocol (VOIP) calls are banned in numerous countries. Nonetheless, there is evidence that users utilize a variety of privacy enhancement technologies, such as a virtual private network (VPN), to circumvent government blocking of WhatsApp calls in these countries (Ahmed and Nanath, 2021; Flinders, 2023, march 9). Furthermore, in the above-said countries, there are alternative applications such as Botim that provide similar services as WhatsApp (ITP.NET, 2023). WhatsApp calls, and the encryption they afford, are not blocked in Tunisia, but that country has backslid on digital privacy under President Saied; in just one example, 70% of Tunisians who qualify for food subsidies must submit sensitive personal data to the government online, including personal health details (Kadhi, 2023). The Lebanese government announced a monthly tax on WhatsApp calling, which ignited the largest protests in the country in years and forced the government to not only drop the tax (Al Jazeera, 2019) but to also make other meaningful concessions.

Note that while the dependent variable in the current study assesses respondents' fear of companies checking what they do online, ISPs in the countries often have close or direct ties to government(s). Qatar's Ooredoo corporation is government-owned, and the company is also one of the main ISPs in Tunisia, as is the UAE company Etisalat. Lebanon has only two internet providers, the duopoly of Alfa and Touch, which are government-controlled (Göransson et al., 2020), and while using a VPN in Lebanon (or Tunisia) is not illegal, slow internet speeds in Lebanon and the high comparative cost of mobile data in the country can limit VPN use. Of course, telecommunication regulations exist in most countries around the world, and regulators are charged with, well, regulating communication. It is not our intent to demonize countries in the Arab region or to insinuate that such regulations do not occur elsewhere. Additionally, regulation for

commercial interests is more common than regulation for government interests in most countries, and this is true in the Arab region as well.

Along with the KSA, the UAE may be the nation in the current study that monitors its population the most. In the UAE, using a VPN for non-approved purposes, including VOIP calling but also to merely keep one's internet protocol (IP) address private, draws a minimum fine of US$136,000 and prison time. The UAE has used the Israeli NSO Group's spyware program Pegasus to hack phones of dissidents and journalists both at home and abroad and has, very likely, also hacked phones in the UK prime minister's office (Farrow, 2022). The Pegasus spyware was also installed on the phone of the wife of journalist Jamal Khashoggi four days after he was killed by Saudi operatives, according to Amnesty International (2021). The countries studied here differ regarding the ability of residents to safeguard their privacy, which may contribute to differences in attitudes about digital privacy among the countries.

Digital privacy in Arab countries

In many countries in the Arab region, privacy, especially privacy within the family (see Al-Nakib, 2016), has been described as heightened compared to conceptions of privacy elsewhere. High levels of concern about ingroup privacy from outgroup exposure have been documented in countries like Qatar (Fromherz, 2017) and Kuwait (Al-Nakib, 2016). SIT, discussed in greater detail below, is then highly relevant to the current study, as the framework examines ingroup bias at the expense of trust of outgroup individuals. Attitudes about digital privacy affect online behaviors. Concerns about digital privacy, for example, are negatively associated with adopting e-health services in Egypt (Azeez and Van der Vyver, 2019), smart homes in Jordan (Albayaydh and Flechais, 2022) and vaccine passports in Morocco (Bennacer et al., 2022).

Heightened privacy concerns among people in Arab countries may also lead to lower penetration rates for social media platforms with dubious reputations for protecting privacy. For example, in 2019, 50% of Emirati respondents in a national survey said they use Facebook, a figure that dropped from 70% in 2017 (Dennis et al., 2019); in Qatar, just 30% of nationals said they use Facebook. Facebook penetration in Arab countries has likely dropped for many different reasons, but, as elsewhere, in Arab countries, Facebook may have become less popular due to the rise of other platforms, such as TikTok, which started gaining market share globally in 2019 and then exploded in 2020 with the onset of the pandemic. But again, privacy may be a motivator in our countries under study. In the same Dennis et al. study, 3% of Emiratis and 12% of Qataris said Facebook was the social media platform that affords the most privacy, while 48% of Emiratis and 50% of Qataris named WhatsApp (Dennis et al., 2019). Twenty-eight percent of Emiratis said they had either changed social media platforms or stopped using a platform to better protect their digital privacy, and 33% of Qataris said the same.

Despite many of their linguistic, religious, historical and cultural similarities, Arab countries are not one attitudinal bloc, and research often reports distinct differences between Arab nations (Gregorian, 2003), including the Arab countries in the current study. For example, when nationals in seven Arab countries were asked whether privacy

concerns have led them to change their social media use, the percentages of respondents who answered in the affirmative ranged from 17% in Lebanon to 37% in the KSA (Dennis et al., 2019).

Nor do correlates of concern about digital privacy in Arab countries necessarily align with significant predictors in other parts of the world. Martin et al. (2019), for example, found that being young, having a high income and identifying as culturally progressive were not positively associated with respondents' concerns about online surveillance of their activity, even as such relationships have been observed in several western countries. There are also differences between how nationals and expats in some Arab countries view digital privacy. One study found that Pakistani and Indian nationals in Qatar and the UAE were more concerned about digital privacy threats than Qataris or Emiratis were (Martin et al., 2020).

By using longitudinal, or multi-wave, data, we control for time in the current study. In our age of screens, concerns about digital privacy could change significantly in a relatively short period due to a war (or in the case of Qatar, a blockade imposed by neighboring countries; Ulrichsen, 2020), a crackdown on political activists in a given country, device hacking (as in the case of Israeli company NSO and its Pegasus hackware used by autocratic regimes in the Arab region; Bajak, 2024) or other factors. Thus, the current study makes use of multi-year data from the five countries under study. As we will see, controlling for time added to the current study, as changes in privacy attitudes were observed in the data from some countries.

Religiosity in Arab countries

The dominant religion in Arab countries, including those studied here, is Sunni Islam, though the proportions of populations in Egypt, Jordan and Lebanon that are Christian are substantial (CIA World Factbook 2024). Sunnis outnumber roughly 9:1 the other major Islamic sect, Shiites, a majority of whom are in Iran. The groups diverged following the death of Prophet Mohammed (PBUH) in 632 C.E., which created disagreement about who should lead the people of Islam; Sunnis thought one among a number of devout Muslims could take up the mantle, while Shiites felt only a blood relative of Mohammad was acceptable. Conflict between Sunni and Shiite Islam extends to the current day, largely between Sunni Saudi Arabia and Shiite Iran. Sunnis place less of an emphasis on religious hierarchy in Islamic leadership, and they do not revere non-prophet clerics as saints, which Shiites do (Chuck, 2016).

Moreover, religion plays a pivotal role in shaping individuals' norms, thoughts, opinions, beliefs, decision-making processes, moral standards, socialization and attitudes, either directly or indirectly (Choi, 2010; Fam et al., 2004), particularly in the Islamic context. The Quran repeatedly demonstrates an admirable respect for both privacy rights and concerns, stating, for example, not only that people should avoid spying on others or entering the home of another person without their knowledge but also that Muslims should even avoid entering their own house suddenly or furtively—a major show of consideration and respect for the other residents in the domicile (Hayat, 2007). In a unique way, this can relate to digital privacy, as not being surprised by other residents in one's

home should help preserve one's sense of privacy to use their digital devices in ways they may wish to keep to themselves.

Muslims in conservative religious communities in Bangladesh frequently cite Islamic principles in discussing privacy-protective measures, with a particular emphasis on how such habits preserve privacy among both themselves and other members of their ingroup —and, critically, respondents describe privacy preservation not only as a social obligation within their communities but also as a pious action pleasing to God (Rifat et al., 2021). Islamic conceptualizations of digital privacy are not at odds with evaluations of privacy in many other parts of the world; indeed, some legal frameworks from Europe and elsewhere form the basis for some internet privacy policies in some Arab countries (Caruana and Cannataci, 2007).

Theoretical background and hypotheses

SIT

SIT offers a conceptual framework for understanding intergroup communication and behaviors (Tajfel and Turner, 1986). SIT explains an individual's sense of belonging to a group and the associated feelings with his or her membership. It posits that individuals categorize themselves into groups for social identification, fostering a sense of belonging. The pursuit of positive emotions from this group membership, referred to as the "ingroup," is a key aspect according to SIT. People tend to view their ingroup more favorably than other groups, or "outgroups," thereby cultivating positive sentiments, and pro-ingroup sentiment is associated with anti-outgroup bias. Research on SIT has observed that "[G]roup members are prone to think that their own group [is] superior to other groups" (Brown, 2000: 747). This pro-ingroup bias can create bias against outgroups and their members (Hogg and Terry, 2000). Such biases can range from negative beliefs and attitudes about outgroups to baseless and irrational assumptions, prejudice and discrimination (Hogg and Terry, 2000). SIT has proven its application in different contexts, including non-Western ones; Lebanese who identify strongly as Arab tended to assign the United States a "barbarian" moniker, as opposed to "ally," "imperialist" or "enemy" (Alexander et al., 2005). Ingroup and outgroup identification has also been able to predict young adults' perceptions toward police in Arab countries (Fakih and Khayat, 2022), and trust in internet-based technologies such as online voting (Farooq et al., 2024b; Warkentin et al., 2018).

Social identity, that is, ingroup affinity, has been shown in previous research to be associated with attitudes about digital privacy and online surveillance. Reimer and Johnson (2023) found in a survey of 1204 U.S. citizens that respondents reported stronger support for scrutinizing the personal online information of outgroup members (non-U.S. citizens) than other U.S. citizens. SIT (Tajfel and Turner, 2004) holds that people are biased toward their ingroups, such as one's religious community, and that pro-ingroup biases are associated with anti-outgroup bias. The more time people spend with their ingroup—such as at religious observances, the main explanatory variable in the current study—the more concern they should express about digital privacy, or the potentially

prying eyes of outgroup members. Some research has found, for example, that the less people use digital media, the more concerned they are about their digital privacy—young, heavy users of technology are less concerned about their digital privacy than are older, less digitally connected tech users (Zhong et al., 2024), though some of that has to do with gaps in digital literacy, in addition to usage amounts—and the more time someone is spending in person with associates in their ingroup, the less time they have to spend using digital media. And activities at religious observances—such as collective prayer and incantation, singing, standing and sitting or kneeling at the same time—are meant to foster connectivity with other in-group members and foster feelings of belonging and solidarity (Haidt, 2024). Time with one's ingroup(s) fosters belonging and cohesiveness, but it can also generate suspicion toward outgroup members.

Additionally, to better position the current study in the context of non-Western culture, we also examine the influence of cultural conservatism on the relationship between religiosity and DPC, and we hypothesize that respondents' level of cultural conservatism will strengthen the positive correlation between religiosity and DPC.

In the current study, DPC are measured as the extent to which respondents worry about companies monitoring what they are doing online. Companies, specifically major tech companies, possess more data about internet users than any other entities (Christian, 2023) and are, at once, both protectors of users' privacy and potential threats. The study's main explanatory variable, attending religious observances (with ingroup members), should be associated with increased wariness about outgroup encroachment on digital privacy, based on the premises of social identity processes. Indeed, as Abokhodair et al. (2016) noted, privacy in Muslim societies is often viewed as a communal, not just an individual, asset worth preserving. SIT is an appropriate and instructive theoretical framework in the current study not only because of the anticipated positive association between religiosity and DPC (see Baazeem and Qaffas, 2020) but also because the moderating variable of interest in the study, cultural conservatism, is itself a measure of ingroup–outgroup comparison; it asks respondents how they identify, "compared to most people in this country," on a scale of very culturally progressive to very culturally conservative.

While there are not many multinational, empirical studies of social identity processes in Arab countries, the research that does exist finds differences among Arab countries, as well as differences between Arab subregions. One study of ingroup and outgroup biases among college students in the KSA and the United States, for example, found that Saudi students exhibited stronger ingroup favoritism and anti-outgroup bias than did U.S. participants (Al-Zahrani and Kaplowitz, 1993). Intra-regionally speaking, Jones et al. (2021) found support for SIT, as well as classical sexism, among Saudi men—but not among Qatari, Lebanese, Tunisian or Emirati men, who, in a controlled survey experiment, rated a male journalist covering a hypothetical corruption scandal more expert than a female journalist covering the same scandal. However, in another survey experiment in Qatar, Shockley and Gengler (2020) found strong evidence of social identity dynamics, as Qataris expressed interest in voting for a candidate based on the aspirant's sectarian ties, while the actual qualifications of candidates had no bearing on vote preference.

In respect to extant work, the current study's contributions to research on social identity and digital privacy are its longitudinal, multinational examinations of the influence of ingroup religious ties to concerns of outgroup digital surveillance in five Arab countries —countries and cultures understudied in prior research. The following subsections expand on this thinking and provide a rationale for the two hypotheses.

Religiosity and DPC. Individuals' religious beliefs and affiliations can affect attitudes, motivations and behaviors. Cohen and Hill (2007) noted that religion affects morals, thoughts, judgments, attitudes and behaviors. Indeed, religion evolved for this purpose; after human beings settled on permanent, agricultural homesteads, some 10,000 years ago, religious systems were useful in creating rules and order based on an externally enforced morality. That is, religion is meant to affect attitudes and behaviors, both in physical worlds and in virtual ones. Individual attitudes and behaviors are connected to religious beliefs (Foxall, 1994). Religion significantly influences social norms and molds diverse behaviors, affecting individual conduct, group dynamics, communities, organizations and families (Choi, 2010; Fam et al., 2004; Tarakeshwar et al., 2003). Religion has been found to influence social values, such as support for corporate social responsibility (Ramasamy et al., 2010), perceptions of risk (Miller and Hoffmann, 1995) and privacy perceptions (Alhouti et al., 2016, Baazeem and Qaffas, 2020).

According to Khraim (2010), religion holds significance as a core cultural determinant due to its broad presence and profound impact on human behavior, attitudes and values, both socially and individually. It stands as a fundamental element in social behavior (Berger, 1961). Religious values and beliefs influence human norms and behaviors in various ways, including shaping public opinions, interpersonal interactions, product usage and other aspects of daily activities. Regarding social media, religious norms impact user behavior beyond the avoidance of explicit content or eschewing illegal activity. Religion may affect individual online privacy behaviors —what to share and with whom, as well as interactions with strangers (Baazeem, 2020). Social media use itself may lead to issues with religious guidelines and expectations of privacy (Vitell, 2009).

Religiosity has been found to shape a range of personal behaviors, for example, healthy behavior (Amonini and Donovan, 2006), sustainable behavior (Minton et al., 2015), ethical behavior (Arli and Tjiptono, 2014), risk aversion behaviors (Frank and Kendall, 2001) and digital privacy perceptions (Baazeem and Qaffas, 2020). Persons who report high religiosity tend to be more risk-averse than individuals low in religiosity and also tend to take more actions to protect their digital privacy (Baazeem and Qaffas, 2020; Goles et al., 2008). Highly religious users are less likely to be involved in actions detrimental to their privacy, such as consuming pirated media than persons low in religiosity (Casidy et al., 2016).

Based on research on both SIT and the way religiosity affects online behaviors and attitudes related to privacy, we hypothesize the following:

H1: Respondents with higher levels of religiosity will report greater DPC.

Cultural conservatism and social orientation in the Arab region

Cultural conservatism is an ideology that values preserving traditional cultural values and resisting changes perceived as disruptive while prioritizing heritage, religious values and family structures (Jost et al., 2003). Cultural conservatism can influence social orientation and conformity to social norms, create ingroup and outgroup separation, promote traditional family values, sustain social hierarchies and limit social change. Studies have indicated that in societies with higher levels of cultural conservatism, individuals tend to report greater religiosity (Arikan and Ben-Nun Bloom, 2019; Collins, 2013; Malka et al., 2012; Novis-Deutsch et al., 2022), as cultural conservatism often emphasizes preserving traditional values, including long-standing religious practices and guidelines. In such environments, social norms and institutions tend to support and reinforce religious adherence. The measure of cultural conservatism in the samples utilized in the current study is an ingroup–outgroup assessment and asked respondents, relative to "most people in [their] country" of residence, how they self-identify on a scale of very culturally conservative to very culturally progressive.

Political conservatism and progressivism, as conceptualized in Western countries, do not have a direct corollary in the Arab region, and, thus, respondents in the current study were not asked about conservatism as a political ideology. Rather, respondents were posed a question about cultural conservatism, which translates well into Arabic both literally and conceptually (see Martin et al., 2018). Research on cultural and social conservatism from the Arab region suggests the construct is conceived similarly to that in research in Western locales (see Kposowa and Aly Ezzat, 2019).

Religious beliefs rooted in cultural conservatism can influence social norms regarding privacy (Ekmekci and Arda, 2017). Individuals may prioritize privacy in alignment with their cultural and religious norms, viewing it as a means to protect their personal information and maintain modesty in digital spheres (Vieweg and Hodges, 2016). Individuals in conservative societies may approach digital platforms cautiously due to concerns about the impact of modernization on traditional values (O'Hara, 2020). This heightened sense of privacy can stem from a desire to protect against potential negative influences on their cultural and religious identity.

The Arab region—Arab-majority countries of the Arab peninsula, the Levant, and North Africa—is characterized by high levels of both religiosity and cultural conservatism (Touzani et al., 2016). The two are intertwined, influencing various aspects of life in the region (Moghadam, 2009). While the influence of religiosity and cultural conservatism is pervasive, it is important to note that the Arab region is not homogeneous and there are variations in both religiosity and conservatism across countries and in population sub-groups within countries (Spierings, 2017).

Yet the potential impact of high religiosity on DPC within culturally conservative societies is understudied. This is an important area of exploration, as the interplay between these factors may significantly influence how individuals in the region perceive digital privacy. Given the unique contexts of the Arab region, the multinational and longitudinal data in the current study provide an excellent opportunity to study the effect of cultural conservatism on the relationship between religiosity and DPC. Moreover, just as SIT predicts a positive association between religiosity and DPC, so, too, does the

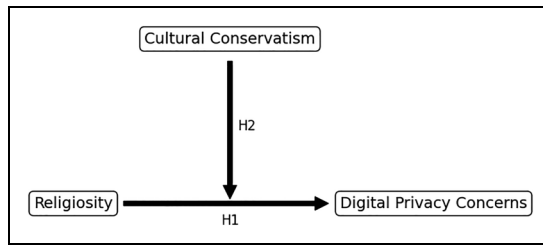

Figure 1. Conceptual model of the study.

moderating variable of cultural conservatism used in the current study relate directly to respondents' social identity, because it includes an explicit ingroup–outgroup comparison, by asking respondents where they identify on a range of very culturally progressive to very culturally conservative "compared to most people in this country." To this end, we hypothesized the following:

> **H2:** The positive association between religiosity and DPC will be significantly stronger in individuals with high levels of cultural conservatism than in individuals with low levels of cultural conservatism.

Accordingly, the conceptual model is shown in Figure 1.

Method

Sampling design and data collection

We used a multi-wave longitudinal data collection design ($N = 18{,}160$) in five Arab countries: Saudi Arabia (KSA), Tunisia, Lebanon, Qatar and UAE. Data were collected during 2017, 2018, 2019 and 2022, with The Harris Poll,[1] a famous data collection forum providing quality data from 1956, commissioned for fieldwork. The first three waves of data collection (2017–2019) were completed in respondents' households in in-person interviews, except in Qatar, where telephone interviewing was conducted, as household surveying in Qatar is limited. Covid precluded household sampling in 2020 and 2021, and the research was paused. In 2022, surveys were conducted in all countries by telephone and random-digit dialing.

Researchers used multi-stage random probability sampling of households, and interviews were conducted with members of the general population aged 18 years and older. In all countries, samples included both citizens and expatriates. The questionnaire was available in Arabic and English in all countries and also in French in Tunisia and Lebanon. Excluded respondents were visitors with no residence permits, prisoners, persons unable to understand the questions, individuals in years/countries where telephone interviewing was not conducted, farmers and residents in restricted migrant housing units. Interviewers in each country were citizens of that country and fluent in the relevant languages. Respondents were not compensated for participating.

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Table 1. Sample characteristics showing gender, age, educational level and region of origin of participants from five countries.

	KSA	Tunisia	Lebanon	Qatar	UAE
N	3779	2833	3662	3787	4099
Gender					
(% male)	54%	53%	49%	55%	4%
Age (mean/SD)	33.6/±10.7	33.7/±11.3	35.5/±13.2	33.9/±10.1	33.8/±9.7
Education level					
Basic	1.1%	6.3%	4.8%	4.0%	1%
Secondary	36%	47.9%	49.3%	28%	67.5%
Lower tertiary	58.1%	37.6%	37.2%	58.8%	91.6%
Higher tertiary	4.8%	8.6%	5.4%	9.3%	10.1%
Region of origin					
National	67.8%	94.6%	98.3%	24.1%	21.9%
Arab expatriate	15.5%	2.3%	1.6%	34%	30.7%
Asian expatriate	9.4%	0.4%	0.03%	29%	35.5%
Western expatriate	7.2%	1.6%	0.03%	11.5%	11.2%
Other	0.12%	1.2%	0.06%	1.4%	0.8%

Northwestern University in Qatar. Response rates by country in 2019 and 2022 were, respectively, as follows: Tunisia, 88% and 38%; KSA, 72% and 46%; Lebanon, 45% and 65%; Qatar, 57% and 57%; and UAE, 55% and 40%. While response rates fell in some countries from 2019 to 2022, this is likely due to the use of telephone interviewing in 2022 and because survey response rates tend to fall over time. Rates of response in our data far outstrip those typically obtained by researchers in Europe and North America, in many cases by a factor of two or three. Response rates for all countries across all years are in the Appendix.

Sample characteristics

Majorities of respondents across countries were men, except in Lebanon (see Table 1). The average age of respondents, ≤35.5 years in all countries, is reflective of young populations in Arab countries. Nearly all respondents in Lebanon and Tunisia were citizens of those countries, while two in three respondents in Saudi Arabia were Saudi nationals. In Qatar and the UAE, where there are more expatriates than citizens, 24% and 22%, respectively, were Qataris and Emiratis. Non-nationals in all countries were mostly persons from other Arab countries and South Asian countries. Tunisia had fewer respondents than other countries because only internet users provided data on our outcome variable, and Tunisia has lower internet penetration than the other countries.

Measures

Dependent variable: DPC. The outcome variable was measured by the item "I am worried about companies checking what I do online" on a 5-point Likert scale. The options to

answer this question include (1) "strongly disagree," (2) "somewhat disagree," (3) "neutral," (4) "somewhat agree" and (5) "strongly agree." Prior research has shown that Arab nationals express slightly more concern about companies than governments checking what they do online (Martin et al., 2019), so the outcome variable in the current study is the source of greater concern. Previous scholarship finds little to no difference in validity between multi-item indices and single-item variables when the single item/question is clearly worded (Anghelcev et al., 2022; Bergkvist, 2015; Bergkvist and Rossiter, 2007). Beyond this, however, corporate surveillance is likely the most common form of surveillance internet users endure from any single entity/entities (see Zuboff, 2023), and it may also be the kind of digital surveillance that consumers are most familiar with (think of the netizen who searches for a jewelry on Google and, moments later, in Facebook from the entirely different corporation Meta, is shown ads for the same kind of fashion accessories). Corporate surveillance is a massive team effort among commercially interested institutions and, unlike, say, most government surveillance, is evident in front of their very eyes. This means the statement "I am worried about companies checking what I do online" is all the more relevant to respondents and an easy item for them to respond to.[2]

Explanatory variable: religiosity. Religiosity was measured as personal motivation with the question "How often do you attend religious services?" The options for this question were (1) "never," (2) "less than once a year," (3) "about once or twice a year," (4) "several times a year," (5) "about once a month," (6) "2 to 3 times a month," (7) "nearly every week," (8) "several times a week" and (9) "once a day or more." Frequency of religious observances was used as the measure of religiosity for several reasons. First, the dominant religion in the countries under study, Islam, is a highly ritualistic faith, requiring adherents, for example, to pray five times daily, making an interval ratio measure of religiosity appropriate. Second, asking respondents about frequency of a behavior is less ambiguous than having respondents report, say, how religiously devout they are or feel. Lastly, not only has religious attendance been used in prior research to measure religious devotion (see Bergan and McConatha, 2001), including in the Arab region (see Tsunokai et al., 2019), it has also been found associated with variables at the core of SIT, such as bondedness with friends and family and trust in one's local community (Dunbar, 2021). Such research highlights that, in the current study, religious attendance is not only an appropriate measurement of religiosity but also a necessary control variable.

Moderating variable: cultural conservatism

"Compared to most people in this country, how would you describe yourself?" (1, "culturally very conservative"; 2, "culturally conservative"; 3, "neither"; 4, "culturally progressive"; and 5, "culturally very progressive"). The item was reverse-coded for clarity, yielding 5 (culturally very conservative). Political conservatism and liberalism may not mean the same thing in Arab cultures as they do in Western contexts, and, for that reason, a measure of cultural conservatism/progressivism is used instead. This measure has been fielded and validated in Arab countries in prior work (see Martin et al.,

2018); in that study, for example, in the UAE, progressivism was found to be positively associated with political efficacy. Additionally, while this would not be true of many non-Western languages, the words "conservative" and "progressive" have direct, parallel translations in Arabic. "Conservatives" in Arabic, *al-muhaafithoon*, literally means "those who preserve."

Other control variables

We also controlled for age, gender, education, aggregate level of religiosity and nationality/region of origin. Age was measured as a continuous variable; gender had two categories, male and female (though respondents could "prefer not to specify"); and education was categorized as basic (primary school or less), secondary (more than primary school and up to high school graduate), lower tertiary (some college and up to college graduate) and higher tertiary (graduate degree(s)). We took the average of individual responses to the level of religiosity within a country and year to create an aggregated level of religiosity. Nationality/region of origin had five categories: national of country, Arab expatriate (from another Arab-majority country), Asian expatriate (Central, South and East Asian nationals), Western expatriate (Americas and western Europe) and other.

Data analyses

Stata/MP version 18.0 afforded analyses. Given our cross-sectional pooled data, we used longitudinal hierarchical modeling or multilevel modeling for the data analysis with random intercept and random slope. Longitudinal hierarchical models let us consider the nested structure of the data. Individuals (level 1) were nested into countries and countries into years (level 2). The analysis also allowed us to use contextual variables in the models. Since the survey data were pooled and there was no unique individual identifier, we created a country-wave variable for the hierarchical model.

We used the likelihood ratio (LR) test to determine whether we should use a multilevel model and whether to use random slopes in the model. In step 1, we ran an empty variance-partitioning model to examine how much the variation in attitudes toward online privacy concerns was attributed to the country level. In step 2, we included individual-level religiosity to examine its effect on DPC, while in step 3, we controlled for gender, age, education and nationality/region of origin. In step 4, we controlled the effect of religiosity and cultural conservatism. Finally, in step 5, we used an interaction term between religiosity and cultural conservatism in the model and also allowed the slope to change by region of origin. We checked all the assumptions of a longitudinal hierarchical model. There was no consistent trending of DPC over time. The individual-level residuals were normally distributed, indicating no heteroskedasticity. There was no serial correlation or autoregression, and no intercept heterogeneity was found.[3]

Rim weighting helps to more closely align sample characteristics with those of a population (see Baxter, 2016) and was utilized in the current study. Weighting factors were gender by age, geography, and age by nationality. Weighting factors in each country are as follows: Lebanon, age and geography; Qatar, gender by age, age by nationality,

Table 2. Descriptive statistics of outcome variables and key predictors. Numbers indicate mean (SD).

	KSA	Tunisia	Lebanon	Qatar	UAE
Digital privacy concerns	3.5 (±1.2)	3.0 (±1.4)	3.0 (±1.3)	2.8 (±1.4)	3.0 (±1.4)
Religiosity	4.9 (±2.4)	3.6 (±2.5)	4.1 (±2.3)	4.7 (±2.6)	4.4 (±2.6)
Aggregate religiosity	4.9 (±0.9)	3.7 (±0.7)	4.1 (±0.3)	4.8 (±1.1)	4.4 (±0.5)
Cultural conservatism	3.4 (±1.1)	3.3 (±1.0)	3.0 (±1.1)	3.4 (±1.1)	3.1 (±1.2)
Aggregate cultural conservatism	3.3 (±0.2)	3.3 (±0.1)	3.0 (±0.1)	3.4 (±0.2)	3.3 (±0.1)

and geography; KSA, gender by age, age by nationality, and geography; Tunisia, age by nationality and geography; UAE, gender by age, age by nationality, and geography.

Findings

This study examined the relationship between religiosity and DPC, and the moderating and mediating effects of cultural conservatism on that relationship in five Arab countries, using survey data collected in four waves from 2017 to 2022. Given the richness of the datasets, we begin with descriptive results, followed by results of hypothesis testing.

Descriptive results

Averaged across all waves of data collection, the greatest average DPC was registered by respondents in Saudi Arabia (KSA), while there was parity among respondents in Tunisia, Lebanon and UAE (Table 2). Respondents in Qatar averaged the lowest DPC across survey waves. Religiosity scores were highest in the KSA and Qatar and lowest in Tunisia, while respondents in Qatar, the KSA and Tunisia reported the highest cultural conservatism scores.

A 5×4 factorial analysis of variance (ANOVA) for country and wave/year found a main effect for country, $F(4, 18{,}140) = 97.01$, $p < .001$, a main effect for wave, $F(3, 18{,}140) = 19.02$, $p < .001$, and a significant interaction term, $F(12, 18{,}140) = 63.47$, $p < .001$. Figure 2 shows the nature of the effects: the KSA and Tunisia showed significant net decreases in DPC, while the decrease in Lebanon was modest. Net DPC rose markedly in Qatar and more modestly in the UAE.

Results of hypothesis tests

H1 stated that religiosity would be positively associated with DPC in the five countries under study. Model 2 indicated a statistically significant and positive association between religiosity and DPC, so *H1 was fully supported*. For every one-unit increase in religiosity, there was a corresponding 2% increase in the unit of DPC (Table 3).

Gender, age, education and nationality/region were controlled in model 3. Gender and age did not significantly affect DPC, while education had a positive effect. Compared to

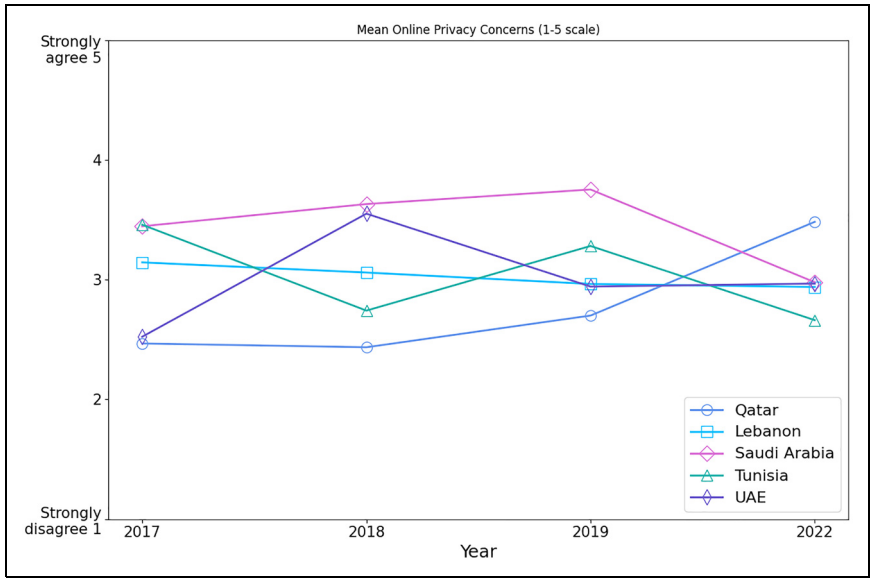

Figure 2. Means for "I am worried about companies checking what I do online." *Data not collected in 2020–2021 due to the pandemic.

basic education, people with secondary education expressed 28% higher DPC, those with lower tertiary education had 35% greater DPC than respondents at the basic level, and people with higher tertiary education had 40% greater DPC than the basic level. Model 3 found that Asian, Western and other expatriates reported greater DPC than did nationals of the five countries, but expatriates from other Arab countries did not exhibit the same difference. Asian expats, in particular, expressed greater DPC than nationals.

The highest predicted value of DPC by the level of religiosity was observed in the KSA in 2019 and 2018, and the lowest DPC by the level of religiosity was observed in Qatar in 2018 (Figure 3). Lebanon had the least variance in DPC by religiosity, whereas Qatar had the greatest.

H2 stated that among individuals with higher levels of cultural conservatism, the positive association between religiosity and DPC would be significantly stronger than among individuals lower in cultural conservatism. In fully adjusted model 5, we introduced an interaction term for religiosity and cultural conservatism, which was significant but *negative*, such that highly religious and conservative people reported lower DPC (see Table 2). It was religious progressives who reported greater DPC. Thus, *H2 was not supported*. Intra-country correlation analysis revealed that 19.3% of the variance in DPC was attributable to differences among the countries. This underscores the significance of country-level factors in understanding the dynamics of DPC in Arab countries.

To corroborate tests stemming from H1 and H2, we also ran a mediation analysis testing for a direct positive effect of religiosity on DPC and an indirect negative effect of

Table 3. Fully adjusted multilevel model results predicting digital privacy concerns (DPC).

	Model 1	Model 2	Model 3	Model 4	Model 5
Constant	3.076***	3.076***	2.623***	2.627***	2.599***
	(0.080)	(0.079)	(0.107)	(0.104)	(0.131)
Level of religiosity		0.022***	0.022***	0.022***	0.005
		(0.004)	(0.004)	(0.004)	(0.006)
Cultural conservatism			−0.044***	−0.044***	−0.039***
			(0.009)	(0.009)	(0.009)
Gender					
Male (*ref.*)					
Female			0.017	0.017	0.010
			(0.020)	(0.020)	(0.020)
Age (years)			0.001	0.001	0.001
			(0.001)	(0.001)	(0.001)
Education					
Basic (*ref.*)					
Secondary			0.289***	0.289***	0.282***
			(0.058)	(0.058)	(0.058)
Lower tertiary			0.352***	0.352***	0.362***
			(0.058)	(0.058)	(0.058)
Higher tertiary			0.405***	0.405***	0.359***
			(0.067)	(0.067)	(0.067)
Region					
National of country (*ref.*)					
Arab expatriate			−0.632*	−0.064*	−0.053
			(0.032)	(0.032)	(0.053)
Asian expatriate			0.260***	0.259***	0.241**
			(0.035)	(0.035)	(0.091)
Western expatriate			0.201***	0.200***	0.163
			(0.046)	(0.046)	(0.135)

(continued)

Table 3. Continued.

	Model 1	Model 2	Model 3	Model 4	Model 5
Other expatriates			0.372**	0.371**	0.014
			(0.125)	(0.125)	(0.214)
Aggregate level of religiosity				0.124	0.0041
				(0.940)	(0.079)
Aggregate level of cultural conservatism				−0.302	−0.200
				(0.368)	(0.339)
Level of religiosity × cultural conservatism					−0.010**
					(0.003)
Variance constant ($\sigma_\mu{}^2$)	0.125***	0.121***	0.131***	0.118***	0.422***
	(1.822)	(0.047)	(0.042)	(0.038)	(0.142)
Variance residuals ($\sigma_\epsilon{}^2$)	1.822***	1.819***	1.798***	1.798***	1.770***
	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)
Variance region of origin					0.0322***
					(0.011)
Intra-country correlation (ρ)	0.064	0.062	0.068	0.062	0.193
Log-likelihood	−31,272.3	−31,258.2	−31,100.1	−31,099.1	−30,979.0

Standard errors in parentheses.
*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

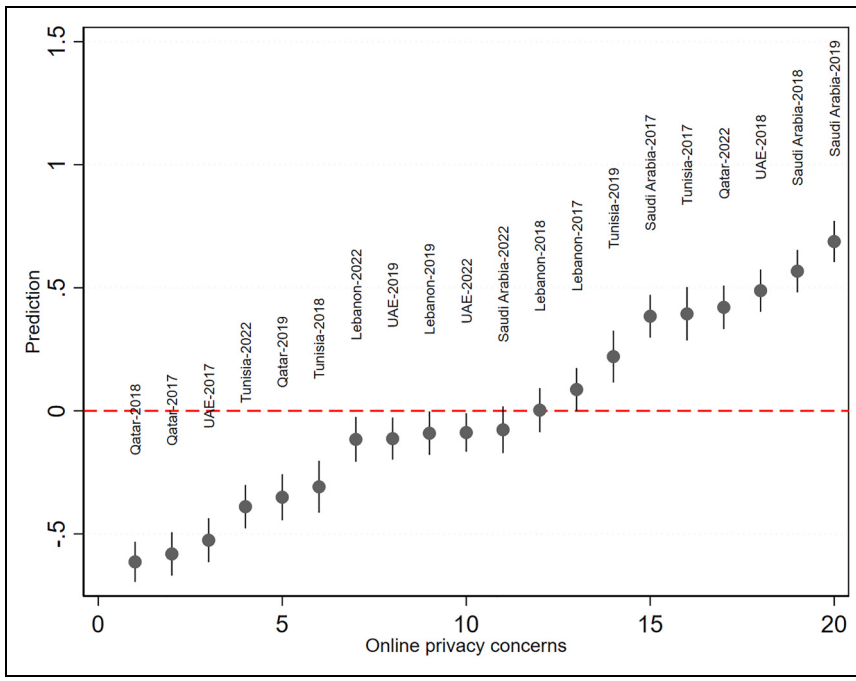

Figure 3. Digital privacy concerns (DPC) variance around the grand mean by country and year.

religiosity on DPC via the mediator conservatism, both of which were significant (direct $B = .196$, $p < .001$; indirect; $B = -.015$, $p < .001$). This affords more evidence that religious progressives hold greater concern about their digital privacy than religious conservatives. The mediation model is illustrated in Figure 4.

Discussion

This study utilized SIT to predict relationships between religiosity and DPC in five Arab countries and how cultural conservatism mediates those relationships.

Consistent with SIT, religious respondents—those connected to their religious ingroup, as religiosity was measured as the frequency of attending religious observances—reported greater concern for their digital privacy than respondents low in religiosity. SIT maintains that ingroup affinity is associated with skepticism toward outgroups; in this study, connectivity to respondents' religious ingroups was positively correlated with fear of digital monitoring by corporate outgroups. Privacy in Muslim cultures is often considered a communal, not just an individual, asset, and increased contact with one's religious community is particularly important in explaining motivations to safeguard privacy in digital spaces.

The current study afforded a particularly robust test of the social identity hypothesis, as respondents' level of social identification was not measured by noting their religious

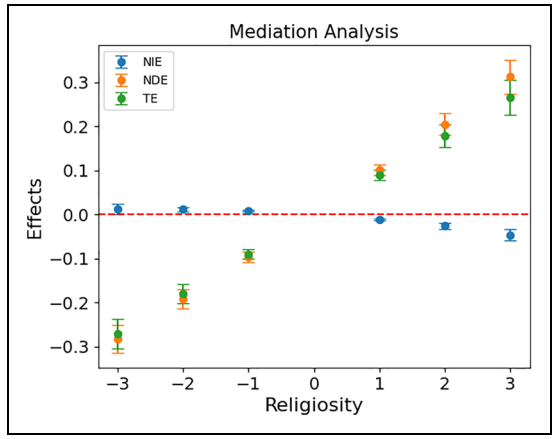

Figure 4. Mediation effects of cultural conservatism on digital privacy concerns (DPC). NIE: natural indirect effect; NDE: natural direct effect; TE: total effect.

ingroup membership or by asking them how strongly they identify as an ingroup member, but rather by asking them to report a more objective, behavioral criterion: how frequently they attend religious gatherings. The study's findings underscore that, even in studies of social identity processes in which the outcome variable is a perception of digital environments, it is still both possible and instructive to examine an analog behavior—frequency of ingroup contact—as a measure of ingroup association. Indeed, rarer in our age of screens, in-person contact with ingroup members may represent a particularly influential mode of ingroup connectivity. The current study measured social identity by assessing a social action among respondents. The study also serves as a reminder that individuals' offline behaviors and interactions can influence attitudes and perceptions of their digital lives and online environments.

Contrary to the study's second hypothesis, the joint effect of religiosity and conservatism on DPC was *negative*. Highly religious but progressive respondents, perhaps feeling the tension between their religiosity and cultural beliefs, harbor greater fear about companies monitoring their online activity. Mediation analysis showed that the association between religiosity and cultural conservatism was negative, which can perhaps be understood in light of how the variables were measured, respectively: frequency of attending religious observances and the self-assessment of conservatism compared *to other people in their country*. Self-identified progressives, then, were respondents who considered themselves more liberal than other people in their country (country *of residence*; something survey administrators made explicit).

Respondents high in religiosity have more contact with their religious ingroup and may rate themselves as slightly less conservative than other people they see at their religious observances, while less religious respondents, having less contact with others in a religious setting, may be less aware of abiding conservatism among other people in the country and thus deem themselves more conservative. Still, some Middle East scholars

have found that religiosity in Arab countries is not incompatible with progressive values. Martin et al. (2016) found that religiosity was associated with opposition to censorship in KSA, which they said may relate to the fact that Saudi mosques are places where rigorous debates occur and also where the government monitors and censors discussions.

We are unable to locate prior research specifically examining the interaction between religiosity and progressivism on concerns about digital privacy. However, the relationship between the former two variables and digital privacy have been studied separately. Aligning with our findings, prior research has observed positive associations between religiosity and privacy concerns, including in the context of the Arab region (Baazeem, 2020). Separately, research has found that liberalism/progressivism is associated with increased concerns about digital privacy (Bergström, 2015). In, say, a North American context, given the consistently observed, positive association between religiosity and conservatism (see again Malka et al., 2012), however, it may not follow that religiosity and progressivism combine to heighten concerns about digital privacy, as they have in the current study.

It is possible that this finding is unique to religiously conservative and more communal than individualistic societies. Or should religiosity and progressivism combine to increase concerns about privacy elsewhere, the reason for such an interaction could be different. Braunstein et al. (2019), for example, noted that some religious individuals engaging in social justice movements in the United States avoid using terms like "liberal," "left-wing" or "progressive" to describe themselves, perhaps to avoid alienating more conservative religious persons from participating in their movements, not, as may be the case in the Arab region, to avoid being revealed as holding progressive attitudes.

If we examine the global parallels and theoretical relevance, similar patterns emerge in other world regions. In the United States, liberals and libertarians express significantly higher privacy concerns than conservatives when the state collects personal data, indicating that surveillance worries intensify when the observer is viewed as an ideological outgroup (Nam, 2017). Across Europe, distrust centers on foreign "Big Tech," while domestic actors are perceived more leniently, suggesting that national identity influences who is considered a privacy threat (Engström et al., 2023). South Asian studies indicate that young adults carefully conceal information from parents and spouses but share freely with distant strangers, illustrating how close-knit ingroups can themselves become privacy outgroups (Ahmed et al., 2017). In sub-Saharan Africa, scrutiny from churches or mosques drives online self-censorship, and opposition activists report significant privacy fears under state surveillance (Stevens et al., 2023). Together, these cases reinforce our finding that privacy concern peaks when individuals navigate strong ingroup ties and progressive or vulnerable social positions—highlighting that digital privacy attitudes worldwide are best understood through the lens of ingroup trust and outgroup threat.

That religious-progressive respondents reported greater DPC is compelling. In conservative societies, progressives who frequently attend religious observances possibly feel apprehension that their non-conservative attitudes and/or behaviors could be discovered if their digital privacy is compromised. Such individuals have frequent contact with members of a religious ingroup but, due to their progressive outlook, may feel out of place in that ingroup. Some progressives who frequently attend religious observances may feel

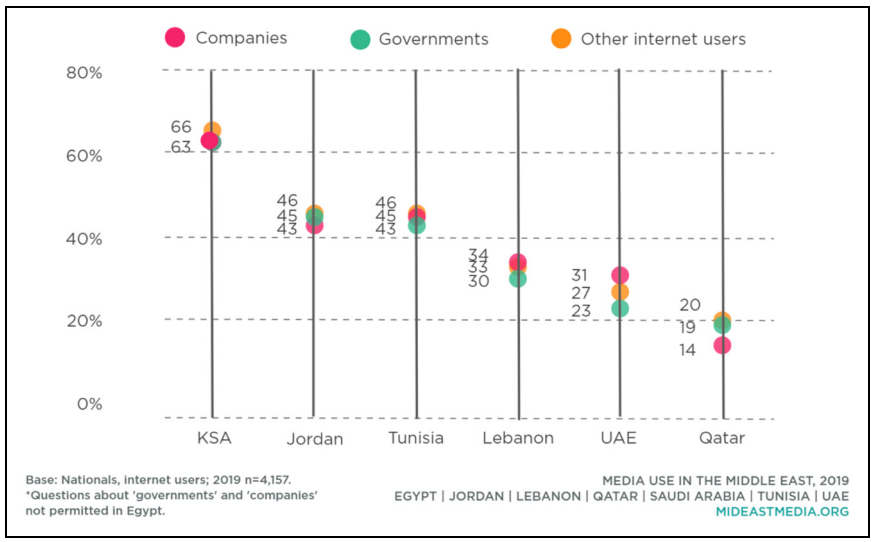

Figure 5. Concerns about digital surveillance in six Arab states (republished with permission). "% who worry about online surveillance by…" (Dennis et al., 2019).

compelled to do so by members of their other ingroups, such as family or friendship cohorts, despite maintaining a non-conservative worldview, and they may worry about members of such ingroups learning about their progressive perspectives.

The strongest predictor of DPC was country; DPC differed dramatically among countries, and the ordinal positions of countries differed across sampling waves, which highlights the importance of both multi-country and longitudinal analyses of attitudes about digital privacy. Figure 5 (published with permission) shows differences in concerns about digital surveillance in six Arab countries in 2019, and our data, likewise, convey significant variance across countries. Averaged across all sample waves, respondents in Saudi Arabia were the most concerned about digital privacy—apropos, as that country ranks near the bottom of nations worldwide in internet privacy (Stevens Institute of Technology, 2023). That respondents in Qatar and the UAE were among the least concerned about their digital privacy, though, at least averaged across all waves of data collection, may reveal that internet users in those countries are not concerned enough, given high levels of corporate surveillance in both countries.

While some are multinational, most prior studies of attitudes about digital privacy in Arab countries examine data from a single year (see again Martin et al., 2019). In the final two waves of data collection, before and after the pandemic onset, DPC decreased or were unchanged in all countries, except Qatar, which exhibited a dramatic increase in the year the emirate hosted the World Cup. The eyes of the world were on Qatar in 2022, and respondents in that country perhaps felt digital scrutiny that heightened sensitivity about their online privacy.

Despite presumptions of the influence of gender on attitudes in Arab countries, such as a belief that women are kept from public spaces and so are more concerned about their

online privacy, women did not report greater DPC than men. This challenge to gender stereotyping of Arab countries is in keeping with some prior research: only in one of seven Arab countries surveyed in 2019—Jordan—did more men than women say they publicly share photos or videos of themselves on social media platforms, and in three countries, including Gulf states Qatar and the UAE, more women than men said they publicly share images of themselves (Dennis et al., 2019). Age was also not significantly associated with DPC, which could be because Arab countries feature young populations with a narrower variance in age than countries in other regions. Education positively predicted DPC, as respondents with more formal education are perhaps more wary of threats that could compromise their digital privacy.

Results of the multi-wave study revealed variations in DPC by nationality/region of origin: Asian expatriates expressed greater DPC than nationals. This aligns with findings from Martin et al. (2020), who observed that Indians and Pakistanis living in Qatar and the UAE expressed greater worry about their digital privacy than Qataris or Emiratis. These variations may be explained by cultural differences (e.g. uncertainty avoidance to prioritize group harmony and conformity), the expatriate experience (e.g. processes of cultural adaptation and integration; living in different cultures makes one more vigilant) and sociopolitical factors, like government surveillance.

Limitations and subsequent work

Surveys from five countries across four waves offer sizable reach in any one study, and yet it is important to note that most Arab countries were not included in the current work. Therefore, we do not claim that the current study represents the entire Arab region. Additionally, the Arab Gulf (three countries) was overrepresented in the current research, compared to North Africa and the Levant (one country from each).

Some caveats common to survey research apply, such as limits of self-reports compared to direct measurement of respondent behavior. Furthermore, as human interviewers collected respondents' data in all years and across all countries, some respondents may have impression-management motivations to positively portray their behaviors and attitudes, particularly on a matter like religiosity in countries with high levels of religious identification. Of course, having live interviewers also provides methodological benefits in terms of higher response rates, question clarification and a greater ability to ensure respondents are who they say they are. Our study did not survey the same respondents over time. In future work, longitudinal panel studies following the same individuals could offer deeper insights into patterns of relationships between religiosity, cultural conservatism and DPC.

The measure used in the current study to assess religiosity and frequency of religious attendance has some limitations; for example, one can frequently attend religious events and rituals for social reasons or other motivations and yet not consider religion to be a core part of their identity. Islam, though the predominant religion in the countries investigated in the current study, is a ritualistic faith, one of the core requirements of which is for adherents to pray five times a day, perhaps making the frequency of religious observance an appropriate measure of religiosity. Still, future work might include

psychographic measures of religious identity in addition to behavioral indicators to better distinguish between behaviors and devoutness (Koenig, 2015).

In the context of SIT, it would be interesting if we could further our analysis on whether religious people are more supportive of corporations or governments monitoring nonreligious people in their country. Due to the unavailability of the information in our dataset, we could not do so; however, this can be an interesting investigation for future studies on the topic. Social media platforms are, of course, corporations, and some of them are the most lucrative companies in the world whose core business model is built upon surveillance capitalism. Future studies should include analyses of respondents' most-used platforms, like TikTok and other giants, to determine whether these are some of the companies they envision when asked about DPC.

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Ethical approval and informed consent statements

The data were collected by a third party, Harris Poll, which collects data only after obtaining informed consent.

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Declaration of conflicting interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Data availability

The data underlying this article and the Stata codes used for the analysis will be shared by the corresponding author upon reasonable request.

Notes

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Appendix

Table A1. Survey response rates for all years across all countries.

Countries	2017 (%)	2018 (%)	2019 (%)	2022 (%)
Lebanon	49	48	45	65
Qatar	37	58	59	57
Saudi Arabia	76	74	72	46
Tunisia	87	33	88	38
UAE	73	58	55	40