International Journal of Communication 17(2023), 2003–2023 1932–8036/20230005

A Cross-Country Study of Comparative Optimism About Privacy Risks on Social Media

HICHANG CHO
National University of Singapore, Singapore

MIRIAM METZGER
University of California, Santa Barbara, USA

SABINE TREPTE
University of Hohenheim, Germany

ELMIE NEKMAT
National University of Singapore, Singapore

People exhibit comparative optimism about privacy risks, believing that they are personally less vulnerable to privacy threats than their average peers, and yet comparative optimism about privacy threats can lead to reckless online behaviors. However, little is known about (a) to what degree comparative optimism about privacy is culturally robust or variable and (b) under which conditions such optimism is mitigated or intensified. We collected survey data from three countries (n = 501, 545, and 433 from Germany, Singapore, and the United States, respectively) about users' perceived privacy risks on social networking sites (SNSs). Results showed that comparative optimism about privacy is prevalent in all three countries, but its levels vary across countries. Specifically, comparative optimism was highest in the United States. Individual-level factors such as indirect experience of privacy risks, engagement with privacy-protection behaviors, and SNS usage predicted the extent of comparative optimism experienced. Culture predicted the magnitude of comparative optimism but did not moderate the relationships between those individual-level factors and comparative optimism, indicating that the theoretical relationships observed in this study are robust.

Keywords: comparative optimism, optimistic bias, privacy, privacy risks, social networking site, social media

Hichang Cho: cnmch@nus.edu.sg
Miriam Metzger: metzger@ucsb.edu
Sabine Trepte: sabine.trepte@uni-hohenheim.de
Elmie Nekmat: elmie@nus.edu.sg
Date submitted: 2022-06-07

Comparative optimism refers to people's tendency to believe that they are personally less vulnerable to negative events than are their average peers (Weinstein, 1980). Comparative optimism can be problematic because it may result in perceived self-invulnerability, hindering the adoption of self-protective measures (Dillard, Midboe, & Klein, 2009). Studies have demonstrated the presence of comparative optimism in perceived privacy risks among social media users (Metzger & Suh, 2017). Because people think that others are highly susceptible to privacy risks but underestimate their own chances of experiencing the risks, social media users experience high societal-level privacy concerns but do not take necessary prevention actions (Metzger, Flanagin, & Nekmat, 2015).

However, research has rarely examined variations in comparative optimism about privacy risks in different populations despite studies that suggest comparative optimism is culturally influenced (Gierlach, Belsher, & Beutler, 2010). Furthermore, privacy studies have shown that privacy perceptions and behaviors are culturally shaped and varied (Trepte et al., 2017). However, uncertainty remains about to what degree comparative optimism about privacy risks is robust or variable across different countries. It remains to be seen whether cross-national differences in the field of privacy also occur with regard to comparative optimism. In addition, most studies have focused on a limited set of antecedents or demonstrating the prevalence of comparative optimism (Helweg-Larsen & Shepperd, 2001). As a result, conditions under which comparative optimism is magnified or mitigated remained underspecified (Vieites, Ramos, Andrade, Pereira, & Medeiros, 2021).

The aims of this study are, first, to test the robustness of comparative optimism about privacy risks by evaluating cross-country variations in comparative optimism. Specifically, we examine the degree to which people in three countries (Germany, Singapore, and the United States) exhibit comparative optimism about information privacy risks in social media (e.g., Facebook). The three-country samples were chosen because they represent different regions (Europe, Asia, and North America) with varying national cultures (e.g., individualism vs. collectivism), and they are generally similar in other aspects such as economic development, information and communications technology (ICT) environments, and education levels (World Economic Forum, 2019).

Second, we aim to provide insights into when and how comparative optimism can be moderated vis-à-vis our investigation of both macro-level (i.e., country) and individual-level antecedents (i.e., privacy-related experiences and beliefs). Identifying predictors is essential for theory building and specification because it allows for the investigation of multiple mechanisms involved in comparative optimism about privacy risks. We also test the interaction effect between macro- and individual-level factors to examine the extent to which the research model and hypotheses proposed in this study are culturally robust or variable. Investigating cultural/national differences would help determine whether research findings or theoretical concepts derived from a specific country are generalizable to other countries. It would also inform whether (or when) culture-specific versus universally applicable interventions are needed to address problems related to comparative optimism about privacy risks, such as overconfidence in privacy control or underestimation of privacy threats. Practically, we can gain useful insights about how to reduce comparative optimism (and thus encourage adaptive privacy actions in social media) by examining conditions under which it is magnified or mitigated. As Harris, Middleton, and Joiner (2000) noted, "while demonstrations of

optimistic bias are plentiful, successful attempts at eliminating the bias (debiasing) are rare" (p. 235). We suggest that the specification of its antecedents would be the first step to achieving this goal.

Comparative Optimism and Privacy Risk

Researchers have used different terms to describe comparative optimism, namely optimistic bias, unrealistic optimism, and comparative-risk judgments (Helweg-Larsen & Shepperd, 2001; Weinstein, 1980). Previous studies have shown that comparative optimism often results from cognitive biases (e.g., egocentric bias) but can also reflect the assessment of one's behavior and capacity to a certain degree (Harris & Hahn, 2011). Hence, we use comparative optimism because it refers to comparative-risk judgments that are both unrealistic and realistic.

Comparative optimism has been explained by egocentric bias and ego-enhancement motivation. Individuals, motivated by ego-enhancement needs, make risk judgments in a self-serving way by underrating their own vulnerability to risk while comparing themselves with others who are more at risk (Weinstein, 1980). Egocentric bias occurs because self-referent information is vivid, easily accessible in memory, and thus more diagnostic in judgments and decision-making. Consequently, people spontaneously overweight their own actions and characteristics relative to those of others. Coupled with ego-enhancement motivation, egocentrism makes people perceive their actions, lifestyle, and personality to be more advantageous than those of the average others, and this positive self-view leads to comparative optimism (Kruger & Burrus, 2004).

Privacy Risks and Comparative Optimism in Social Media

Online privacy risks refer to the access, use, and sharing of personal information by unauthorized third parties (Malhotra, Kim, & Agarwal, 2004). Privacy risks are more diverse and unpredictable in social media because privacy violations are caused by both unknown third parties (e.g., marketers and hackers) as well as one's own linked "friends." In social media, multiplex social networks (e.g., friends, colleagues, families) that used to be discrete in the offline contexts are often collapsed into one large network (Marwick & boyd, 2014). Thus, personal information intended for closed, small social circles can now easily spill over to unintended audience groups in social networking sites (SNSs). Moreover, one's actions in social media (e.g., tagging a group photo in SNSs) can reveal information about somebody else to known or unknown audiences. In such a "networked" privacy environment, information is often collectively owned and managed, and each social media user has limited control over what friends, acquaintances, or institutions do with the interlinked information.

The aforementioned characteristics of social media have implications for comparative optimism. On the one hand, a lack of personal informational control in social media may mitigate the illusion of control, leading to reduced comparative optimism. On the other hand, the heightened uncertainty and complexity of privacy control on social media might also increase comparative optimism when the state of uncertainty facilitates users' dependency on cognitive biases. For example, people under uncertainty are susceptible to egocentric bias because self-referent information is spontaneously assessable and perceived to be more reliable (Todd, Forstmann, Burgmer, Brooks, & Galinsky, 2015). Despite such unique characteristics,

relatively little research has examined comparative optimism in the context of social media (Metzger & Suh, 2017). As such, we examine it using a cross-country study and identify both macro- and individual-level factors that alter the extent of comparative optimism experienced.

Cross-Country Variations in Comparative Optimism

Several studies provide evidence of people in different cultures displaying differing magnitudes of comparative optimism. People in western cultures (e.g., North America) display more comparative optimism compared with those from eastern cultures (e.g., Asia) (Gierlach et al., 2010; Heine & Lehman, 1995). Cultural variations in comparative optimism can be attributed to varying levels of self-defense and self-enhancement mechanisms that protect our sense of self-identity and promote self-worth (Heine & Lehman, 1995). Comparative optimism allows people to protect their self-image by perpetuating the belief that they are more competent and thus less likely to be victims. Markus and Kitayama's (1991) self-enhancement hypothesis argues that different cultures value different aspects of the self, with individualistic cultures emphasizing an independent construal of the self that draws a clear line between the self and others, and collectivistic cultures emphasizing an interdependent sense of self that hinges on the interrelatedness of the individual with others. In individualistic cultures favoring autonomy and self-efficacy, comparative optimism might be utilized to bolster the independent self by promoting the notion that one is a capable individual (Heine & Lehman, 1995). Based on the earlier discussion, compared with people from countries ranking high in collectivistic cultures (e.g., Singapore), those from individualistic cultures (e.g., the United States, Germany) are more likely to exhibit comparative optimism because of their focus on self-enhancement and the distinction between the self and other.

Studies show that social media users' privacy-related perceptions and behaviors vary substantially across cultures. Specifically, users from collectivistic cultures primarily use SNSs to maintain existing relationships (Kim, Sohn, & Choi, 2011), such as social contacts who are close ties or in-group members. In contrast, users from individualistic cultures usually maintain various online social networks (Kim et al., 2011) and feel more in control over their disclosure (Krasnova & Veltri, 2010). Therefore, heterogeneous social networks (and thus heightened perceived distance between the self and others) and feelings of personal information control among individualistic users may lead to increased comparative optimism. Taken together, previous studies suggest cross-country differences in privacy perceptions and behaviors as well as comparative optimism. Hence:

H1a: Individuals in all three countries will display comparative optimism about privacy risks in SNSs.

H1b: The magnitude of comparative optimism will vary across cultures such that the U.S. sample (representing a high level of individualism) will exhibit the highest level of comparative optimism, followed by the German sample (a moderate level of individualism) and the Singapore sample (a lower level).

Individual-Level Antecedents of Comparative Optimism of Privacy Risks

Other than the macro-, country-level factor, several psychological factors can reduce or increase comparative optimism. In general, greater comparative optimism is found in people who display happier

moods and perceive that events are under personal control, as well as when the comparative target is distant from the self (Helweg-Larsen & Shepperd, 2001).

In this study, we focus on four factors specifically related to privacy and social media user experience: self-efficacy beliefs about privacy risks, prior privacy risk experience, privacy-protection behavior, and social media use. First, self-efficacy beliefs have been shown to be the most significant predictor of comparative optimism (Helweg-Larsen & Shepperd, 2001), as well as privacy perception and behavior (Cho, Rivera-Sánchez, & Lim, 2009). However, it is unclear whether self-efficacy beliefs operate as a functional mechanism to manage one's privacy in social media. As noted earlier, because of the networked nature of social media, privacy is not solely based on personal choice or control. It is thus worthwhile to reexamine the role of social media users' perceived control and efficacy beliefs in SNS contexts. We explicate three additional factors that can affect comparative optimism in social media. Specifically, we evaluate to what degree prior risk experience, privacy-protection behaviors, and SNS usage affect comparative optimism. By examining those additional factors that are central to privacy but have been unexplored in previous literature, we aim to extend our understanding of how comparative optimism may manifest in the context of social media.

Self-Efficacy Beliefs About Privacy Control

Self-efficacy beliefs refer to one's confidence in one's abilities to organize and execute the action required to produce given attainments (Bandura, 1982). In the context of social media privacy, self-efficacy enables users to believe they can manage personal information safely (Cho et al., 2009). Paradoxically, efficacious individuals reveal more personal information and make online friends because of the belief that they are at less risk compared with others (Metzger et al., 2015). This is especially so when, because of egocentric bias, individuals overestimate their capacity to cope with negative events while underrating that of the average other, leading to comparative optimism. Previous studies show that self-efficacy increases optimism (Metzger et al., 2015). Similarly, Yu and Luo (2018) found that self-efficacy beliefs and dispositional optimism are positively correlated. Hence, we predict:

H2: Self-efficacy beliefs about privacy control will be positively related to comparative optimism about privacy risks on Facebook.

Prior Experiences With Privacy Risks: Direct (Personal) and Indirect Risk Experiences

Personal (or direct) prior experience refers to the degree to which an individual has personally experienced privacy risks. Personal prior risk experience enables people to imagine themselves in the victim role because of the cognitive availability of the prior experience (Helweg-Larsen & Shepperd, 2001). According to the availability heuristic, people overestimate the future likelihood of an event that they have personally experienced because the memory of personal experience is vivid and easily accessible (Tversky & Kahneman, 1973). This "drastically undermines a person's illusion of immunity and safety, transforming them into feelings of vulnerability" (Perloff, 1983, p. 51). As such, personal experience with risks makes people perceive they have no more control than others over future recurrences and are equally likely to experience unwanted risks (Helweg-Larsen & Shepperd, 2001). Hence, it is predicted that:

H3: Personal prior experience with privacy risks in social media will be associated with less comparative optimism.

In addition, individuals can experience negative events indirectly through their social networks. This is especially important in the social media context because others' experiences with privacy breaches are highly visible in social media. In general, hearing about the privacy violations of others triggers perceptions of others' vulnerability, thus adding greater weight to others' susceptibility over one's own (Metzger & Suh, 2017). Although prior studies have consistently documented the effect of direct (personal) prior risk experience on comparative optimism (Helweg-Larsen & Shepperd, 2001), less is known about the relationship between indirect risk experience and comparative optimism (Metzger & Suh, 2017). To gain a more precise understanding of the influence of indirect experiences on comparative optimism, we distinguish between two types of indirect experiences: the experience through close social ties and remote/weak ties.

Similar to direct prior experience, indirect risk experience through "close" others is likely to reduce comparative optimism. Social identity theory suggests that when individuals perceive belonging to a social group (often consisting of close others), they feel the life experiences of fellow group members as shared and mutually applicable (Turner, 1981). Thus, close others' negative experiences feel more personally relevant, increasing their perception of self-vulnerability and thereby lowering comparative optimism.

In contrast, individuals may perceive the experiences of "distant" people as adverse events that occurred to a prototypical other whose life experiences are distinct from the self (Helweg-Larsen & Shepperd, 2001). This stems from individuals' use of the "representativeness" heuristic, which assigns "others" to particular categories (Tversky & Kahneman, 1973). If individuals do not perceive themselves to fit the stereotype, the representativeness heuristic prompts the conclusion that these "other" people's experiences will not occur to them (Weinstein, 1980). Therefore, indirect experience through remote/distant others is likely to increase comparative optimism.

The aforementioned studies suggest there is a need to distinguish between the two different types of indirect prior experience and examine their distinct effects on comparative optimism. Hence, the following hypothesis is posited:

H4a–b: Hearing about close people's prior negative privacy experiences (H4a) will be associated with lower comparative optimism, whereas hearing about strangers' prior negative privacy experiences (H4b) will be associated with higher comparative optimism.

Privacy-Protection Behaviors

Privacy-protection behaviors refer to privacy-preserving actions. In the context of SNSs, these activities include visibility control (i.e., visibility of profile information), information-sharing control (i.e., limiting post, like, or comment visibility), and privacy-protection strategies. Privacy-protection behaviors create the belief that risks are under control, leading to reduced perceived personal vulnerability and increased comparative optimism. Protective actions prompt people to underestimate the challenges of sustained control implementation, which results in a belief that they can enact risk-reducing practices better

than others (Klein & Kunda, 1993). This belief heightens with an egocentric bias, where individuals are less likely to be aware that others also carry out risk-reducing actions (Kruger & Burrus, 2004). Moreover, egocentric bias suggests that people perceive their preventive behaviors as being more advantageous even when they acknowledge that others can and do carry out preventive actions because people overemphasize their own behaviors relative to the actions of others (Vieites et al., 2021). Together, the literature suggests that people's engagement in privacy-protection behavior may inflate comparative optimism. Hence,

H5: Users' engagement in privacy-protection behaviors, such as visibility control (H5a), information-sharing control (H5b), and privacy-protection strategies (H5c), will be positively associated with comparative optimism.

Social Media (SNS) Usage

Finally, social media usage is added to our research model because this variable is central to privacy perceptions and behaviors in the context of social media (Metzger et al., 2015). Social media use is associated with increased engagement and information-sharing experiences with other users (e.g., tagging, sharing). As such, extensive social media use may result in the feeling that one's privacy cannot be fully controlled, thus heightening perceived vulnerability to privacy risks. Previous studies have shown that prolonged internet usage is associated with higher levels of privacy concerns (Cho et al., 2009). A longitudinal study (Tsay-Vogel, Shanahan, & Signorielli, 2018) also showed that perceived privacy threats increased for heavy social media users but remained stable for light users, indicating that extensive social media usage can increase perceived vulnerability to privacy risks. Moreover, extensive use of social media (e.g., Facebook) also increases the likelihood that one has experienced a privacy violation, reducing the illusion of control and self-invulnerability (and thus reduced comparative optimism). Hence, we predict:

H6: Social media usage will be negatively associated with comparative optimism.

Interaction Between Macro-Level Factors and Individual-Level Factors

In sum, our research hypotheses predict the main effects of a macro-level factor (i.e., culture; H1b) and individual-level factors (H2–H6) on comparative optimism about social media privacy risks. We also examine the degree to which culture moderates the theoretical relationships between the antecedents and comparative optimism specified in H2–H6. Culture influences the sensitivity of personal values and beliefs when people make decisions; for example, individualists have an independent view of the self that emphasizes personal control, self-confidence, and self-reliability (Markus & Kitayama, 1991). Because individualists' beliefs and behaviors "are organized and made meaningful primarily by reference to one's own internal repertoire of thoughts, feelings, and action" (Markus & Kitayama, 1991, p. 227), factors related to personal control (e.g., self-efficacy beliefs) or personal experiences (e.g., prior risk experiences, privacy-protection behavior) may have a greater impact on comparative optimism in individualistic cultures (e.g., the United States, Germany) than in collectivist cultures (e.g., Singapore). To our knowledge, however, no prior studies have examined hypotheses about the moderating role of cultures concerning comparative optimism. Therefore, we explore the following research question. In doing so, we examine the degree to

which the theoretical relationships predicted in our hypotheses and research model are culturally robust/generalizable or variable/specific.

RQ1: Does culture moderate the relative effects of the individual-level antecedents on comparative optimism about privacy risks, and if so, how?

Method

Sample and Data Collection

Data for this study were collected from Facebook users through an online survey. Facebook was chosen as a study context because it is among the most popular social media. We collected data from Germany, Singapore, and the United States to ensure that our research model applies to both Eastern and Western cultures and to three regions (Asia, Europe, and North America). According to Hofstede's national culture indices, the United States scores 91 on individualism (the highest among 81 countries), whereas Germany scores 67 (moderately individualistic) and Singapore scores 20 (collectivistic culture). Recruitment was done by professional agencies and crowdsourcing via Norstat, Qualtrics, and MTurk. In Singapore and Germany, quotas were set on age, gender, and education level to ensure that the sample is representative of the general Singaporean/German Facebook user population in terms of these demographic characteristics and that samples match the U.S. sample. To be able to take part, participants needed to be above the age of 18 (Germany and the United States) or 21 (Singapore) and have a Facebook account. As an incentive, participants from Germany and Singapore were rewarded by the panel agencies through the collection of points or small amounts of money (less than US$5). In the United States, participants were paid the recommended wage of US$6 per hour for MTurk workers at the time of data collection.

A total of 1,617 people (n = 501, 600, and 516 from Germany, Singapore, and the United States, respectively) participated in the survey. After filtering out unreliable responses detected through two attention-check items, the final sample consists of 1,479 Facebook users (n = 501, 545, and 433 from Germany, Singapore, and the United States, respectively). The ratio of females was 56.3% (n = 282) in the German sample, 48.6% (n = 265) in the Singapore sample, and 58.4% (n = 253) in the U.S. sample. The mean age was 36.78 (SD = 11.69) for the German sample, 36.92 (SD = 12.37) for the Singapore sample, and 37.76 (SD = 11.52) for the U.S. sample. The majority of the German sample (n = 191, 38.1 %), the Singapore sample (n = 164, 30.1%), and the U.S. sample (n = 170, 39.3%) had a bachelor's degree.

We used the same survey questions in the three countries. An English version was used in the United States and Singapore, and a German version was employed in Germany. A back-translation approach was done to ensure consistency across the survey questionnaires in different languages. It took about 13 minutes to complete the survey.

Measures

All variables were adapted from prevalidated measures, and 5-point scale, 7-point, or 9-point Likert scales were used. Online appendix A reports all items employed in this study and descriptive

statistics and reliability of measures (see https://www.dropbox.com/s/kysp57vkrcet6s9/Online%20Appendix%20A.docx?dl=0).

Comparative Optimism

This variable was measured in two ways because previous studies have suggested the cons and pros of different ways of assessing it (e.g., Harris & Hahn, 2011). A direct measure of comparative optimism was assessed by a single-item scale adapted from Weinstein (1980). Each respondent answered a 9-point comparative-risk question that asked, "Who would you say is more likely to have a negative privacy experience as a result of using Facebook … you or an average Facebook user?" (1 = self much more likely, 5 = equally likely, 9 = comparison group much more likely). An indirect measure of comparative optimism was assessed by two items that measured personal (or target) risk estimate ("How likely do you feel you are to have a negative privacy experience as a result of using Facebook?" and "How likely do you feel a typical user is to have a negative privacy experience as a result of using Facebook?"), respectively. The difference between peer-risk and personal-risk estimates, if positive, indicates comparative optimism (Harris & Hahn, 2011).

Self-Efficacy Beliefs About Privacy Control

This variable was assessed by a 5-item scale (Cronbach's α = .91) adapted from Cho, Lee, and Chung (2010). A sample item includes: "I feel confident in my ability to protect myself using Facebook's privacy setting."

Prior Experience (Direct)

Prior experience with privacy risks was assessed by a 4-item dichotomous scale (1 = yes, 0 = no) borrowed from Metzger and Suh (2017). Respondents indicated whether they had personally experienced four types of negative privacy experiences (e.g., been really embarrassed by something on Facebook, had a stalker, lost a friendship, anything else) as a result of using Facebook. A summative scale was created to indicate the overall level of personal prior risk experience.

Prior Experience (Indirect)

Indirect experience was assessed by two items adapted from Metzger and Suh (2017). Close others' prior experience was assessed by asking participants, "How much have you heard about anyone close to you having a negative experience from using Facebook?" Typical (distant) others' prior experience was assessed on the same scale with the question, "How much have you heard about other people (either in person or in the news media) having a negative experience from using Facebook?" Correlation between the two types of indirect experience was $r = .642$ ($p < .001$).

Privacy-Protection Behaviors

Three types of privacy-protective behaviors were assessed using items from Metzger and Suh (2017). *Use of privacy-protection strategies* (α = .77) measured the degree to which individuals engaged in

various privacy-protection strategies, which was assessed by a 10-item scale (e.g., "I untag pictures or delete wall or timeline posts if necessary"). *Profile visibility control* is the degree to which an individual restricted the audience size for their posts using Facebook's privacy preference settings. A single-item question was employed with the five options reflecting possible privacy settings pertaining to profile visibility on Facebook (ranging from "1 = I never changed the default settings or selected any other privacy settings on Facebook" to "5 = I have customized my privacy settings to share information with only certain individuals"). *Information disclosure control* (α = .81) refers to the extent to which individuals control information disclosure, assessed by a five-item scale (e.g., "I have only provided minimal information about myself in my Facebook profile," "When I have something to say, I like to share it on Facebook").

Social Media (Facebook) Use

This variable was measured by asking respondents to indicate the amount of time they spent per day on Facebook (M = 2.55, SD = 1.92 in Germany; M = 3.59, SD = 4.17 in Singapore; M = 2.07, SD = 2.4 in the United States).

Results

Baseline Hypothesis and Cross-National Comparison

We tested the baseline hypothesis (H1a) that predicted the presence of comparative optimism about privacy risks. We utilized both direct and indirect measurements of comparative optimism to ensure its robustness regardless of measurement type. First, using the indirect measure of comparative optimism, pairwise *t*-tests were conducted to examine whether personal-risk judgments and target (i.e., peer/typical other) risk judgments were statistically different. We also used the direct measure of comparative optimism and ran one-sample *t*-tests using the midpoint ("equally like": 5) as the test value. Table 1 shows the results. The difference between self- and peer-risk judgments was significant in all three-country samples. Effect size assessed by Cohen's *d* was .23 (Germany), .32 (Singapore), and .41 (the United States). Also, the direct measures of comparative optimism were significantly higher than the midpoint in all three-country samples: Cohen's *d*: .49 (Germany), .34 (Singapore), and .79 (the United States). Hence, H1a was supported.

Table 1. Comparative Optimism Across Three Countries.

	Indirect Measure of Comparative Optimism		
Country	Personal-risk estimate *M* (*SD*)	Target-risk estimate *M* (*SD*)	*t*-value (*df*)/Effect size^
US	3.75 (1.51)	4.46 (1.53)	7.92 (372)***/.41
Germany	3.78 (1.40)	4.14 (1.11)	4.79 (446)***/.23
Singapore	3.63 (1.36)	4.04 (1.21)	7.15 (486)***/.32
	Direct Measure of Comparative Optimism		
	M (*SD*)	*t*-value (*df*)/Effect size^	
US	6.31 (1.66)	16.43 (432)***/.79	
Germany	5.98 (2.01)	10.91 (500)***/.49	
Singapore	5.60 (1.74)	7.99 (544)***/.34	

Notes. ***p < .001. ^Effect size was assessed by Cohen's *d*.

H1b predicted that there would be significant differences in comparative optimism across countries. First, a one-way ANOVA was conducted using the direct comparative optimism measure, comparing the scores in Germany (M = 5.98, SD = 2.01), Singapore (M = 5.60, SD = 1.74), and the United States (M = 6.31, SD = 1.66). The results showed that the differences in comparative optimism were significant (F = 18.87, p <.001, η^2 = .25). Post hoc tests for pairwise comparisons showed that each country sample was statistically different from the other.

Second, the indirect measure of comparative optimism was used to check if the cross-national differences could be replicated. We also explored whether the differences were because of changes in the personal-risk estimate or target-risk estimate. Repeated measures ANOVA was conducted using risk estimation target (self vs. peer) as a within-subject measure and country as a between-subject measure. The results showed that both estimation target (F = 136. 06, p <.001, Cohen's f = .32) and country (F = 6.02, p = .002, Cohen's f = .09) had a significant main effect on risk judgments. The interaction between estimation target and country was also significant (F = 6.24, p = .002, Cohen's f = .09).

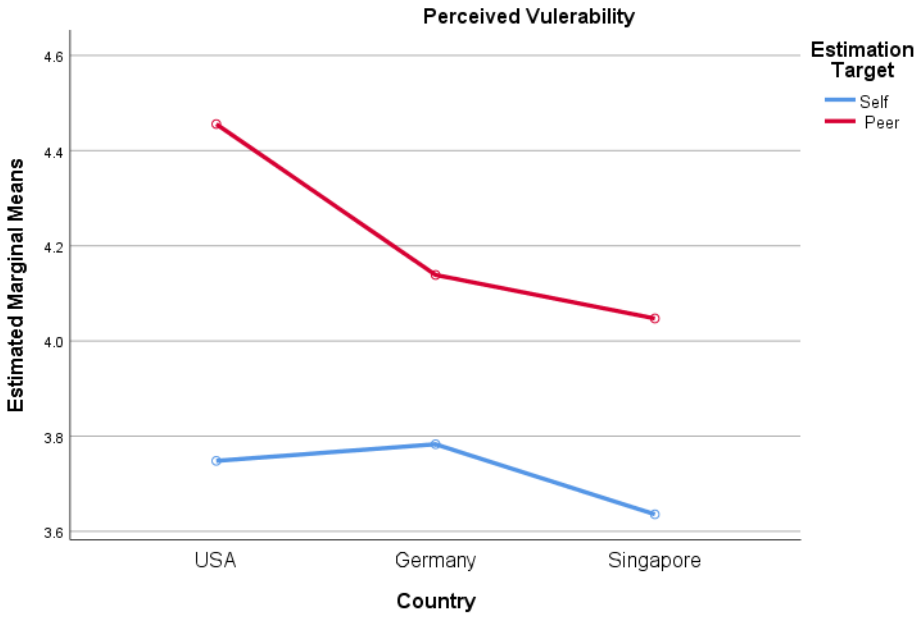

Figure 1. Interaction plot and cross-national comparisons of self-risk and peer-risk judgments.

Figure 1 shows the patterns; with reference to this, comparative optimism was observed in all three countries, given that self-risk versus target (peer)-risk judgments were significantly different. Notably, larger comparative optimism appears to be because of differential estimates about peer-risk rather than personal-risk estimates. Whereas personal-risk judgments are somewhat equivalent across countries, peer-risk judgments seemed to fluctuate across countries. A possible reason would be the high uncertainties and abstractedness of peer-risk judgments. Consistent with H1b, individuals in the United States displayed a significantly higher level of peer-risk judgments than did those in Germany and Singapore. It appears that

country-level differences observed in this study could be a result of exaggerated risk perceptions about peer (typical other), particularly among the U.S. participants. Given that the United States is a highly individualistic culture (individualism score = 91) than Germany (67) and Singapore (20), it might be that people high in individualism have a stronger tendency to distinguish between self and peer by perceiving that typical others are more at risk.

Antecedents of Comparative Optimism

Next, we examined H2–H6 and RQ1 to identify the predictors of comparative optimism and potential interactions between them. In the first step, age, gender, and education level were entered as control variables to control for potential effects of demographic differences (e.g., aging population) among the three countries. In the second step, self-efficacy beliefs about privacy control (H2), direct prior experience (H3), indirect prior experience through close others (H4a) versus distant others (H4b), privacy-protection behaviors (H5), Facebook use (H6), and country were entered as predictors of comparative optimism. In the third step, interaction terms between *z*-standardized individual-level antecedents and country were added. Note that for these regression analyses, we only used the direct measure of comparative optimism because of the well-known unreliability of using difference scores as a dependent variable in regression analyses (recall that the indirect measure was the difference between personal-risk and peer-risk estimates) (Edwards, 1995). Table 2 reports the results of the regression analyses. As Table 2 shows, the interaction effects entered in Model 3 were not significant. Therefore, we report the main effects of predictors using the results of Model 2 to avoid overspecification and in favor of parsimony and interpretability.

Table 2. Results of Hierarchical Regression Analyses for Predictors of Comparative Optimism.

	Model 1	**Model 2**	**Model 3**
	β	*β*	*β*
Control variables			
Age	.02	.01	.01
Gender	.01	−.03	−.02
Education[1]	.09***	.06*	.05*[3]
Predictors of comparative optimism			
Self-efficacy beliefs (SE)		.05	.08
Prior experience: self (PE_S)		−.01	−.01
Prior experience: Close others (PE_C)		−.10**	−.07
Prior experience: Distant others (PE_D)		.15***	.18**
Visibility control (VC)		.09***	.11*
Information control (IC)		.17***	.21***
Privacy-protection strategies (PS)		−.03	−.08
Social media usage (SM)		−.08**	−.08
Germany[2]		−.06*	−.06*
Singapore[2]		−.15***	−.15***

Interaction effects			
SE * Germany			−.04
PE_S * Germany			−.01
PE_C * Germany			−.05
PE_D * Germany			−.04
VC * Germany			.04
IC * Germany			−.01
PS * Germany			−.01
SM * Germany			−.03
SE * Singapore			−.02
PE_S * Singapore			.02
PE_C * Singapore			.01
PE_D * Singapore			−.02
VC * Singapore			−.08
IC * Singapore			−.07
PS * Singapore			.09
SM * Singapore			.04
R^2 (Adj. R^2)	.094 (.009)	.102 (.094)	.127 (.109)
R^2 change	.009	.093	.025
F for change in R^2	4.172**	14.673***	2.452**

Notes. [1]Education is operationalized as a binary variable: Baseline group is "below college degree."
[2]Country is a multicategorical variable: Baseline group is "the United States."
[3]*<.05, ** <.01, *** <.001.

Self-efficacy beliefs about privacy control were not significantly associated with comparative optimism, although the association was positive, approaching a marginal significance level (β = .05, p =.058). Hence, H2 was not supported. Direct (personal) prior negative experience was not significantly associated with comparative optimism (β = −.01, p =.683). Hence, H3 was not supported. As for indirect prior negative experience, the results showed that prior indirect experience via close others was negatively associated with comparative optimism (β = −.10, p = .003). In contrast, prior indirect experience via *distant others* was positively associated with comparative optimism (β = .15, p <.001). Hence, H4a and H4b were supported.

H5 predicted that users' engagement in privacy-protection behaviors, such as visibility control using privacy preference settings (H5a), information disclosure control (H5b), and privacy-protection strategies (H5c), would be positively associated with comparative optimism. The results show that visibility control (β = .09, p < .001) and information disclosure control (β = .17, p <.001) were positively associated with comparative optimism. Hence, H5a and H5b were supported. Privacy-protection strategies were not significantly associated with comparative optimism (β = −.03, p = .233). Hence, H5c was not supported.

As for H6, social media (Facebook) usage was negatively associated with comparative optimism (β = −.08, p = .003), lending support for H6. In addition, the results of regression analyses indicated significant

country-level differences (Germany: β = −.06, p = .034, Singapore: β = −.15, p <.001), confirming the results of H1b.

In sum, the results lend support for H1a, H1b, H4a, H4b, H5a, H5b, and H6. However, H2, H3, and H5c were rejected.

Concerning RQ1, as noted earlier, none of the interaction effects was significant (see Model 3 in Table 2). Overall, the results showed that culture predicted the magnitude of comparative optimism about privacy risks (H1b), but did not moderate the effects of individual-level antecedents (RQ1), suggesting that theoretical relationships specified in H2–H6 should be culturally robust rather than culturally specific.

Discussion

The present study demonstrates the prevalence of comparative optimism about privacy risks in social media across three countries. Furthermore, it specifies the macro-level (cross-national differences) and individual-level factors (e.g., prior experience, privacy-protection behavior, social media usage) through which comparative optimism can be magnified or mitigated. Besides being one of the first empirical studies to examine comparative optimism about privacy risks at the multinational level, this study reports findings of significant theoretical and practical implications. In the following sections, we elaborate on several key findings and their implications for research and practice.

First, we find that Facebook users in all three countries have a strong tendency to display comparative optimism about privacy risks. Consistent with previous studies (Cho et al., 2010; Metzger & Suh, 2017), comparative optimism about privacy risks is found to be robust. Although a generalized optimism exists in all country groups, the findings also suggest comparative optimism about social media privacy risks is variable across countries and as such is context-dependent rather than invariant. Consistent with our hypothesis, users in the United States (highest in individualism) display the highest level of comparative optimism, followed by those in Germany (mid-level) and Singapore (lowest in individualism among the three countries). Specifically, people from individualistic cultures may harbor comparative optimism by exaggerating target-risk estimates, whereas this tendency decreases in less individualistic cultures. On the contrary, personal-risk estimates were almost identical across three-country samples. When making comparative-risk judgments, people appear to compare themselves with remote outgroup members with high-risk profiles. This downward social comparison coupled with the clear distinction between the self and target may be more likely to occur in individualistic cultures where people have stronger ego-enhancement needs and independent self-construal (Gierlach et al., 2010; Heine & Lehman, 1995).

Of course, cross-national differences observed in this study can be explained by macro-level factors other than the individualism-collectivism dimension. For example, the three countries (Germany, Singapore, and the United States) have different regulatory approaches to data privacy and the recognition of privacy as a fundamental human right. In addition, social norms surrounding privacy differ across cultures. For example, Europeans are protected by the General Data Protection Regulation (GDPR) that is omnipresent across their social media journeys. In contrast, people in the United States regard privacy norms as something that can be negotiated through social or legal contracts (Smit, Van Noort, & Vooryeld, 2014). If

privacy norms are stricter in Germany than in the United States, people in Germany are more likely to believe that other people are also well protected by law. Consequently, the difference between self and target-risk estimates will be smaller, resulting in a lower level of comparative optimism in Germany compared with the United States. Though individualism versus collectivism is a useful concept to account for the national differences observed in this study, as suggested by Masur et al. (2021), alternative explanations should also be considered when conducting comparative privacy research to broaden and enhance our understanding.

Despite the remaining questions, the present study demonstrates cross-national differences in comparative optimism, which highlights that privacy-related perceptions and judgments have historical, structural, and cultural roots. As suggested by Westin (1967), privacy "is a social, cultural and legal concept, all three of which vary from country to country" (p. 156). Therefore, comparative privacy research is critical to understanding the homogeneity of privacy norms within cultures as well as the diversity of privacy perceptions and behaviors across cultures. For researchers, this will help determine the applicability of research findings or theoretical concepts originated in a single context to other environments (e.g., non-Western cultures). Cross-cultural privacy research will also allow practitioners to identify populations at risk who are more vulnerable to unwanted effects of optimism, such as the illusion of control, self-invulnerability, and privacy apathy. The identification and description of structural differences through the comparative approach can inform us of when the customization of privacy policies, privacy interventions, or research models is needed and how they should be designed or implemented (Masur et al., 2021).

Second, the study specifies the conditions under which comparative optimism would be magnified or mitigated by investigating predictors that have been relatively underspecified or underexplored in previous studies. For example, this study distinguishes between three types of prior risk experiences (i.e., direct, indirect via close social ties, and indirect via distant ties), which were found to have different implications for comparative optimism. Indirect prior experience through distant others is a magnifier of comparative optimism. Consistent with previous literature, social media users appear to use cues in self-serving and egocentric ways. Hearing distant others experiencing negative privacy risks is likely to heighten target-risk estimates but has a minimal impact on personal-risk estimates because individuals perceive risks for generalized others as "not like me" because of psychological distance between self and the victims (Metzger & Suh, 2017). In contrast, indirect prior experience through close others is a reducer of comparative optimism, and direct (personal) experience has a nonsignificant association. It appears that people selectively use similar cues (prior negative experiences) in different ways depending on whether these cues serve their ego-enhancement needs and optimism. Overall, the findings demonstrate the importance of taking a granular, refined approach when examining the concept of prior negative experience in comparative optimism research. For example, if conceptually distinct constructs (e.g., indirect experience through close others vs. distant others) are lumped into a single construct (e.g., indirect negative experience), their differential effects may cancel out each other, resulting in the loss of predictive power.

People who engage in privacy-protection behaviors in social media are likely to have higher levels of comparative optimism. Consistent with previous literature (Harris & Hahn, 2011), social media users appear to perceive that their actions are more advantageous because of egocentrism. Although others' privacy-related actions are also highly visible in an interconnected, networked environment like social media

(Lewis, Kaufman, & Christakis, 2008), it appears that social media users still distinguish between the self and others and evaluate their own actions differently relative to the actions of others. To a certain degree, the findings also suggest comparative optimism is realistic, given that this perception is based on the assessment of one's own behavior and capacity (Harris & Hahn, 2011; Metzger & Suh, 2017). We note that our cross-sectional study design is not suitable for testing the extent to which comparative optimism is determined by egocentric bias, realistic judgments, or both. Future research should employ alternative approaches to specify the exact mechanism(s) underlying the positive association between privacy-protection behavior and comparative optimism observed in the present study.

Notably, we did not observe any significant interaction effects between culture and individual-level factors. The results are consistent with those from a meta-analysis that shows Hofstede's cultural dimensions do not moderate the relationship between privacy concerns and protective behavior and disclosure (Baruh, Secinti, & Cemalcilar, 2017). Overall, the findings suggest culture is a significant factor that induces mean-level differences in comparative optimism across countries. However, how comparative optimism is constructed through individual characteristics and experience is relatively similar across cultures. By conducting a multinational study, we verify the robustness of our research model and hypotheses, which future research can reuse when examining privacy and comparative optimism across cultures.

A majority of hypotheses were supported in this study, but as in previous research on the subject (Metzger & Suh, 2017), the effect sizes were small. Also, a few predictors (e.g., self-efficacy beliefs, personal-risk experience) were found to be nonsignificant factors. However, this is not too surprising. If comparative optimism is based on fundamental human motivations (e.g., self-enhancement) or cognitive biases (e.g., egocentric bias), the effects of predictors, if any, would be relatively small. Previous studies have suggested that comparative optimism is generally resilient to change, withstanding many interventions designed to reduce it (Weinstein & Klein, 1995). In contrast, some studies (e.g., Rose, 2012) have reported limited success in debiasing comparative optimism by having people focus on attributes that could increase self-risks or by reducing the distinction between self and others (see Ludolph & Schulz, 2018, for a comprehensive review). Given the mixed findings from previous studies, we suggest that research should continue to examine significant predictors that can magnify or mitigate comparative optimism. By specifically targeting significant predictors, one can identify effective ways of countering potential problems associated with privacy comparative optimism, such as underestimation or overconfidence.

The findings also have a few practical implications. Most privacy research conceptualizes privacy as being under autonomous control (Krasnova & Veltri, 2010). Thus, many practitioners and policymakers have underscored the importance of providing individuals with diagnostic information to help them make the right choices and take the appropriate actions. However, the findings indicate that social media users appear to make comparative-risk judgments globally without reference to relevant information (e.g., direct prior negative experience) and/or heuristically without much contemplation or deliberation. We suggest that technology developers and policymakers should be fully aware of this strong tendency when developing privacy management policies and systems.

For example, the findings show personal-risk estimates were almost identical and culturally invariant regardless of different levels of target-risk estimates in the three countries' samples. In other

words, social media users appear to be resistant to adapting their personal-risk estimates irrespective of their perceived prevalence of privacy risks in society. The findings suggest that privacy policies or system designs that merely underscore the need to (or how to) prevent platform-level or societal-level privacy risks would not be very effective unless they adequately address the robust perception of self-invulnerability because of comparative optimism. For example, privacy policies, legislation, and system design should emphasize personal accountability in privacy actions or personal susceptibility to privacy risks.

We find that comparative optimism is prevalent but that its levels are higher in individualistic cultures than in collectivist cultures. This suggests that customizing privacy education or nudges to reduce comparative optimism may be more effective than a one-size-fits-all approach. For example, if people within individualistic cultures have high peer-risk judgments because of stronger ego-enhancement needs and independent self-construal, then privacy literacy efforts in such cultures should place greater emphasis on social privacy norms (e.g., how and the extent to which others protect their privacy in social media) to help reduce comparative optimism. There is a small but growing literature on customizing privacy education and in strategies to nudge users to make better privacy decisions. For example, Ziegeldorf Henze, Hummen, and Wehrle (2015) advance the concept of comparison-based privacy and develop a system architecture that supports users' privacy decision-making by allowing them to compare their sharing behavior to various comparison groups (e.g., what other users with the same profession or age are posting). Preliminary results show that the system is successful in nudging social media users away from harmful sharing behavior by pointing out their discrepancy with social norms from the comparison groups. This type of approach could be applied by system designers at the cultural level as well.

In another privacy-by-design approach, the social norms and moral preferences of how a collective of users shares their data are algorithmically "diagnosed" in the first step of using social media. Subsequently, in the second step, privacy is designed according to the values of this particular collective (Mosca, Such, & McBurney, 2020). Hence, the moral preferences of this collective are taken into account to develop "value-driven" agents for privacy decision-making (Mosca et al., 2020). This approach could also be used for cultural or even subcultural groups to align privacy by design with their specific patterns of use.

Limitations and Directions for Future Studies

There are a few limitations that suggest directions for future studies. First, this study is based on cross-sectional research. We measured Facebook users' past preventive actions (e.g., "I have provided some false information about me") and used it as a predictor of current comparative-risk judgments to establish the temporal precedence. Nonetheless, according to Klein and Kunda (1993), individuals engage in the biased reconstruction of their own past behavior patterns to maintain the belief that they were superior to their peers. Because this study is based on self-report measures and cross-sectional data, we cannot rule out such an alternative explanation.

Second, we focus on cross-country differences in comparative optimism, but this study collected data in only three countries. Though these countries may represent different regions (Asia, Europe, and North America) with varying levels of national cultures (e.g., individualism vs. collectivism), the data are limited in representing multiple cultures and nationalities. This is a common inherent problem of cross-

national studies. Therefore, we suggest that the findings reported in this study should be replicated and verified using more comprehensive and representative sampling strategies.

Finally, a few variables (e.g., visibility control) in this study were assessed by single-item measures. Although those variables are conceptually straightforward, we note that single-item measures can be potentially less reliable compared with multiple-item scales. We suggest that future studies should employ different approaches to assess the variables examined in this study.

Conclusions

Privacy has become one of the most important human rights issues in the information-saturated networked society. Though numerous surveys and reports have shown the public's growing concerns over ubiquitous surveillance and prevalent data breaches, many studies have also suggested that users exhibit privacy apathy and cynicism. Comparative optimism could be a useful construct through which we can understand this interesting phenomenon. We suggest that continued and concerted efforts should be made to achieve a comprehensive and systemic understanding of this emerging research area.

References

Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist, 37*(2), 122–147. doi:10.1037/0003-066X.37.2.122

Baruh, L., Secinti, E., & Cemalcilar, Z. (2017). Online privacy concerns and privacy management: A meta-analytical review. *Journal of Communication, 67*(1), 26–53. doi:10.1111/jcom.12276

Cho, H., Lee, J. S., & Chung, S. (2010). Optimistic bias about online privacy risks: Testing the moderating effects of perceived controllability and prior experience. *Computers in Human Behavior, 26*(5), 987–995. doi:10.1016/j.chb.2010.02.012

Cho, H., Rivera-Sánchez, M., & Lim, S. S. (2009). A multinational study on online privacy: Global concerns and local responses. *New Media & Society, 11*(3), 395–416. doi:10.1177/14614448081016

Dillard A. J., Midboe A. M., & Klein W. M. P. (2009). The dark side of optimism: Unrealistic optimism about problems with alcohol predicts subsequent negative event experiences. *Personality and Social Psychology Bulletin, 35*(11), 1540–1550. doi:10.1177/014616720934312

Edwards, J. R. (1995). Alternatives to difference scores as dependent variables in the study of congruence in organizational research. *Organizational Behavior and Human Decision Processes, 64*(3), 307–324. doi:10.1006/obhd.1995.1108

Gierlach, E., Belsher, B. E., & Beutler, L. E. (2010). Cross-cultural differences in risk perceptions of disasters. *Risk Analysis, 30*(10), 1539–1549. doi:10.1111/j.1539-6924.2010.01451.x

Harris, A. J. L., & Hahn, U. (2011). Unrealistic optimism about future life events: A cautionary note. *Psychological Review, 118*(1), 135–154. doi:10.1037/a0020997

Harris, P., Middleton, W., & Joiner, R. (2000). The typical student as an in-group member: Eliminating optimistic bias by reducing social distance. *European Journal of Social Psychology, 30*(2), 235–253. doi:10.1002/(SICI)1099-0992(200003/04)30:2<235::AID-EJSP990>3.0.CO;2-G

Heine, S. J., & Lehman, D. R. (1995). Cultural variation in unrealistic optimism: Does the West feel more vulnerable than the East? *Journal of Personality and Social Psychology, 68*(4), 595–607. doi:10.1037/0022-3514.68.4.595

Helweg-Larsen, M., & Shepperd, J. A. (2001). Do moderators of the optimistic bias affect personal or target risk estimates? A review of the literature. *Personality and Social Psychology Review, 5*(1), 74–95. doi:10.1207/S15327957PSPR0501

Kim, Y., Sohn, D., & Choi, S. M. (2011). Cultural difference in motivations for using social network sites: A comparative study of American and Korean college students. *Computers in Human Behavior, 27*(1), 365–372. doi:10.1016/j.chb.2010.08.015

Klein, W. M., & Kunda, Z. (1993). Maintaining self-serving social comparisons: Biased reconstruction of one's past behaviors. *Personality and Social Psychology Bulletin, 19*(6), 732–739. doi:10.1177/0146167293196008

Krasnova, H., & Veltri, N. F. (2010, January). Privacy calculus on Social Networking Sites: Explorative evidence from Germany and USA. In *Proceedings of 2010 43rd Hawaii International Conference on System Sciences (HICSS)* (pp. 1–10). Honolulu, HI: IEEE. doi:10.1109/HICSS.2010.307

Kruger, J., & Burrus, J. (2004). Egocentrism and focalism in unrealistic optimism (and pessimism). *Journal of Experimental Social Psychology, 40*(3), 332–340. doi:10.1016/j.jesp.2003.06.002

Lewis, K., Kaufman, J., & Christakis, N. (2008). The taste for privacy: An analysis of college student privacy settings in an online social network. *Journal of Computer-Mediated Communication, 14*(1), 79–100. doi:10.1111/j.1083-6101.2008.01432.x

Ludolph, R., & Schulz, P. J. (2018). Debiasing health-related judgments and decision making: A systematic review. *Medical Decision Making, 38*(1), 3–13. doi:10.1177/0272989X17716672

Malhotra, N. K., Kim, S. S., & Agarwal, J. (2004). Internet users' information privacy concerns (IUIPC): The construct, the scale, and a causal model. *Information Systems Research, 15*(4), 336–355. doi:10.1177/0272989X17716672

Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review, 98*(2), 224–253. doi:10.1287/isre.1040.0032

Masur, P. K., Epstein, D., Quinn, K., Wilhelm, C., Baruh, L., & Lutz, C. (2021, December 9). *A comparative privacy research framework*. Retrieved from https://osf.io/preprints/socarxiv/fjqhs/

Marwick, A. E., & boyd, d. (2014). Networked privacy: How teenagers negotiate context in social media. *New Media and Society, 16*(7), 1051–1067. doi:10.1177/1461444814543995

Metzger, M. J., Flanagin, A. J., & Nekmat, E. (2015). Comparative optimism in online credibility evaluation among parents and children. *Journal of Broadcasting & Electronic Media, 59*(3), 509–529. doi:10.1080/08838151.2015.1054995

Metzger, M. J., & Suh, J. J. (2017). Comparative optimism about privacy risks on Facebook. *Journal of Communication, 67*(2), 203–232. doi:10.1111/jcom.12290

Mosca, F., Such, J., & McBurney, P. (2020, May). Towards a value-driven explainable agent for collective privacy. In *Proceedings of the 19th International Conference on Autonomous Agents and Multiagent Systems* (pp. 1937–1939). Auckland, New Zealand: ACM.

Perloff, L. S. (1983). Perceptions of vulnerability to Victimization. *Journal of Social Issues, 39*(2), 41–61. doi:10.1111/j.1540-4560.1983.tb00140.x

Rose, J. P. (2012). Debiasing comparative optimism and increasing worry for health outcomes. *Journal of Health Psychology, 17*(8), 1121–1131. doi:10.1177/1359105311434051

Smit, E. G., Van Noort, G., & Voorveld, H. A. (2014). Understanding online behavioural advertising: User knowledge, privacy concerns and online coping behaviour in Europe. *Computers in Human Behavior, 32*, 15–22. doi:10.1016/j.chb.2013.11.008

Todd, A. R., Forstmann, M., Burgmer, P., Brooks, A. W., & Galinsky, A. D. (2015). Anxious and egocentric: How specific emotions influence perspective taking. *Journal of Experimental Psychology: General, 144*(2), 374–391. doi:10.1037/xge0000048

Trepte, S., Reinecke, L., Ellison, N. B., Quiring, O., Yao, M. Z., & Ziegele, M. (2017). A cross-cultural perspective on the privacy calculus. *Social Media+ Society, 3*(1), 1–13. doi:10.1177/2056305116688035

Tsay-Vogel, M., Shanahan, J., & Signorielli, N. (2018). Social media cultivating perceptions of privacy: A 5-year analysis of privacy attitudes and self-disclosure behaviors among Facebook users. *New Media & Society, 20*(1), 141–161. doi:10.1177/1461444816660731

Turner, R. J. (1981). Social support as a contingency in psychological well-being. *Journal of Health and Social Behavior, 22*(4), 257–367. doi:10.2307/2136677

Tversky, A., & Kahneman, D. (1973). Availability: A heuristic for judging frequency and probability. *Cognitive Psychology, 5*(2), 207–232. doi:10.1016/0010-0285(73)90033-9

Vieites, Y., Ramos, G. A., Andrade, E. B., Pereira, C., & Medeiros, A. (2021). Can self-protective behaviors increase unrealistic optimism? Evidence from the COVID-19 pandemic. *Journal of Experimental Psychology: Applied, 27*(4), 621–631. doi:10.1037/xap0000379

Weinstein, N. D. (1980). Unrealistic optimism about future life events. *Journal of Personality and Social Psychology, 39*(5), 806–820. doi:10.1037/0022-3514.39.5.806

Weinstein, N. D., & Klein, W. M. (1995). Resistance of personal risk perceptions to debiasing interventions. *Health Psychology, 14*(2), 132–140. doi:10.1037/0278-6133.14.2.132

Westin, A. F. (1968). *Privacy and freedom*. New York, NY: Athenaeum Publishers.

World Economic Forum. (2019). *Global competitiveness report 2019*. Retrieved from https://www.weforum.org/reports/how-to-end-a-decade-of-lost-productivity-growth

Yu, Y., & Luo, J. (2018). Dispositional optimism and well-being in college students: Self-efficacy as a mediator. *Social Behavior and Personality, 46*(5), 783–792. doi:10.2224/sbp.6746

Ziegeldorf, J. H., Henze, M., Hummen, R., & Wehrle, K. (2015). Comparison-based privacy: Nudging privacy in social media (position paper). In *Proceedings of The 10th DPM International Workshop on Data Privacy Management (DPM '15)* (pp. 226–234). New York, NY: Springer. doi:10.1007/978-3-319-29883-2_15