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Do men and women differ in privacy? Gendered privacy and (in)equality in the Internet

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ABSTRACT

This paper investigates how personal privacy behavior and confidence differ by gender, focusing on the dimensions of online privacy data protection and release. A hierarchical regression analysis of cross-sectional survey of a national sample (n = 419) revealed that men and women differed on the level of privacy protection; however, gender had no direct effect on the extent to which data release was exercised. Additionally, gender had a positive association with confidence in privacy protection, but not in the dimension of release. Our study suggests that the gender may affect subjective well-being of online privacy and potentially exacerbate the disparity rooted in socialization of gender. Implications of the findings are discussed in light of Internet access, skill and effort required for building and maintaining privacy, and the important role played by gender in indicating the need for gender-sensitive policy awareness.

1. Introduction

Theorists have hailed the Internet as a tool of empowerment that reduces the inequality in various domains of civic life (Anderson, 2007; Negroponte, 1996). Skillful uses of the Internet lead to a narrowing gap between the "haves" and the "have-nots". However, scholars (Boyd & Hargittai, 2010; DiMaggio, Hargittai, Neuman, & Robinson, 2001; Hargittai & Shafer, 2006) have also raised a concern that the digitalization of personal data may bring about a persistent gender gap. In fact, many scholars (Park, Campbell, & Kwak, 2012) have worried whether the Internet can fully function as an equalizer in the domain of information privacy. The less skillful users can be inadvertently excluded from the benefit of Internet as they cannot efficiently avoid data pitfalls, whereas those who are aware of a wide range of privacy issues may effectively manage personal data. Importantly, the gender difference in privacy skills will be an important factor that determines how benefits of Internet will differ by diverse social groups (Hargittai, 2002). In other words, gender may be a dividing line that might hinder the equal engagement in the full domain of Internet.

Our study is motivated to address this issue by investigating whether Internet user behavior, in the privacy data protection and release, differs by gender. Whether digitally competent citizenship in online privacy systematically leaves out female users is a critical question. That is, gender differences in managing privacy—especially, when women are less skillful in effectively handling personal data—can reinforce socially-constructed gender bias by replicating rather than eradicating societal disparity. We define privacy as one's ability to control the release of personally identifiable data in the context of institutional practices. Despite the concern about the information skill disparity in the digital data environment, however, little has been known about the gender difference within the domain of institutional privacy protection. Time is ripe for elaborating the presence or absence of the gender gap via systematic inquiries.

2. Theorization

2.1. Gendered privacy and technology

The notion that the personal privacy in the Internet can be 'gendered' suggests many propositions. For one, privacy may mean a different functioning norm to men and women because females are more sensitive in establishing private boundaries. Other proposition may be put forth to the extent to which women have been socialized differently through established social institutions such as schooling to reinforce the disparity embedded in social structure (Gramsci, 1982). This context of socialization (DiMaggio et al., 2001; Howard & Jones, 2004) is particularly useful in understanding why there may exist a privacy gender gap. In other words, men and women beyond their biological differences tend to grow up in

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different social and institutional environments that tend to incubate different skill sets.

A dominant concern for scholars examining Internet inequality in most of the earlier studies has been on the potential gender disparity in Internet access (Ono & Zavodny, 2003). At least in the U.S., however, gender inequalities in online access diminished recently. Yet this does not mean equality in user competence and skill (Hargittai, 2002; van Deursen & van Dijk, 2014). Foremost, a simple binary distinction between the use of the medium and the non-use do not consider factors beyond connectivity. Offline gender inequalities also persist in the U.S. across income, education, and employment status. Important differences, especially in terms of data protection and release, may lie in how attitudes to the Internet and the sophistication of skill differ by gender, taking into account socializing factors that may be relevant for understanding how different groups are equipped to manage personal privacy (Hargittai & Shafer, 2006; Hargittai & Litt, 2013).

In this vein, Internet privacy may make gender disparity salient. On the one hand, data management skill in mediated environments can potentially favor male users who may be more skillful in various privacy tasks related to Internet technicalities (i.e., technical behaviors in data protection). On the other hand, the intrinsic privacy concern regarding underlying data exposure may – or may not – render women more likely to exercise privacy skills that are more socially-pertinent to a private–public boundary setup (i.e., social behaviors in data protection). Those with lower skills in their engagement with Internet privacy will be trapped in a cycle of disparity and may not be in shape to succeed online that requires increasing privacy skill levels.

2.1.1. Privacy in the two dimensions

Goffman (1965) defined privacy as a central component of everyday interaction in human lives. His underlying concern was the individual ability to be able to reveal self and selves selectively. In this vein, however, it is important to note that there are the mixed empirical findings with regards to gender difference. A study by Turow, Feldman, and Meltzer (2005) found that privacy skill may not be at par between men and women But there is also evidence that suggests the gender difference may not be particularly salient in highly interactive social network sites – such as Facebook (e.g., Boyd & Hargittai, 2010) or Twitter (e.g., Humphreys, 2011) – because female users are more inclined to privacy control in a confined and close interpersonal relationship. As some of studies reported contradictory findings, we do not have conclusive evidence yet with regards to the gender difference in terms of (1) release and (2) protective dimension of Internet privacy behavior and confidence.

In the institutional context of personal data collection and surveillance, there has been a conspicuous absence of the empirical work investigating the gender difference in perceived privacy confidence and behavior. Nevertheless, we find a fundamental premise of this work in the statement made by Hargittai and Shafer (2006). They said, "The extent to which human capital is fostered, employed, and recognized is profoundly social and has often been examined along the gender lines" (p.434). This is an important insight that addresses how socialization process in education, organizations, or occupational settings often biases against women and affects the development of competence among women. As the socialization of gender guides men and women into different paths of choices and values, they may make different decisions in information environments (Lally, 2002). The early studies (e.g., Fisher, 1994), which examined the development of telephone use in the U.S., also documented the subtle social construction of gender by which to harness different roles in the use of new technology.

One line of the literature focuses on how much individuals are concerned about privacy, with the gender as one of the contributing factors to attitudinal difference (e.g., Sheehan, 1999; Westin, 1998). Another line of studies focuses on the ability to manage the private–public boundaries and the disclosure of personal data in the use of social networks, including participation in civic and political activities (Acquisti & Gross, 2006; Hogan, 2010; Lewis, Kaufman, & Christakis, 2008). These lines of research are becoming increasingly concerned with the two related but discrete aspects of privacy management – one defined as 'release of data' and the other as 'protective measures'. In other domains, the studies point out that men are more likely to show high confidence (Torkzadeh & Van Dyke, 2002). Women, on the contrary, tend to display less confidence in tech related activities (Schumacher & Morahan-Martin, 2000). However, we do not know how such differences would play out for privacy confidence, with a paucity of empirical findings regarding privacy from a national sample.

This warrants further investigation. First, in examining digital competence, we need to assess both the positive (i.e., protect) and the negative (i.e., release) assessment of information competence – as prior inquiries (e.g., Park et al., 2012) focused on the one dimension in the exclusion of the other. Second, unlike prior studies that solely focused on attitudinal concern, it is important to investigate the level of confidence associated with personal data behavior (Hargittai & Shafer, 2006). Finally, analytically, predictive multivariate models will advance understandings of various social conditions that may contribute to gender (dis)parity. In short, the understanding of digital competence related to Internet privacy must be refined within the existing social context of gender (see Fisher, 1994).

2.2. The present study

The analysis presented in this study strives to contribute to the understanding of privacy behavior through the lens of gender parity. Conceptually, it is valuable to theorize Internet privacy in the digital divide debate by bridging the two fields that already moved beyond the concern about online access. For that purpose, privacy may be regarded as a process constitutive of data protection as well as release as privacy-related online activities are one of the most prominent skills that help define one's digital wellbeing. The discussion also has to be linked to a consideration of online abilities in related social contexts such as age and marriage (Kennedy, Wellman, & Klement, 2003; Lally, 2002), i.e., to what extent the additional social statuses of age and marriage disrupt or encourage the existing gender dynamics.

Early Internet studies (e.g., Howard & Jones, 2004) that examined general online-skills consistently found that age is associated with variations of online skills, as younger users often lead the adoption and the use of new technologies. We cannot be conclusive about the effect of age, given the skill level difference among different age-cohorts (see Hargittai & Hinnant, 2008). However, it is reasonable to suspect that the female users, especially those older users, may not possess privacy skills that are at par with those by men. This is particularly so because there is a lack of social support available to the older Internet-user group (e.g., Freese, Rivas, & Hargittai, 2006). When it comes to marriage status, we also posit its potential interactive relationship with gender. The issue can be potentially important to investigate because at least for women, marriage and the associated duties such as childbearing or increased housework can offset any positive effects of Internet access itself (see Freese et al., 2006). Another way of saying this is that the marital status may exacerbate the gender difference because women are socially-expected to carry disproportionately-large housework burdens in their roles (Kessler & McRae, 1982).

Because people's mistakes with personal information may significantly hamper the Internet use for health, social and political information-seeking, it is important to examine the equipment of such skills in the context of associated social stratifications – as it may display in the interactive relationships with age and marital status Internet use by itself does not incubate gender (in)equality, as much as one's confidence and ability to manage personal privacy efficiently. The investigation of how gender disparity pans out on the Internet privacy will inform us of subtle social construction (Fisher, 1994), warranting systematic re-examination beyond simplistic stereotypical perceptions against women (Correll, 2001; DiMaggio et al., 2001).

2.2.1. Research questions

Consistent with the prior discussion, the present study asks two research questions. The main inquiry of the current study is reflected in the first question regarding the main gender effect. Second, we propose the interactions between gender and other significant social contexts. In assessing the gender differences, a summary of the proposed questions follows:

RQ1.1: Are there any gender gaps in privacy behavior in data protection and release?
RQ1.2: Are there any gender gaps in privacy confidence in data protection and release?
RQ2: Do the gender differences interact with (1) age and (2) marriage status?

3. Methods

3.1. Sample characteristics

The analyses were based on a national probability sample of 419 Internet users (age 18 and older). The Knowledge Networks (KN) recruited the respondents in 2008, using random-digit dialing. The participants were asked to complete an online survey, which took about 10–12 min to complete. The original sample size was 456, with a completion rate of 69% (456 completed out of 663 contacted) and the item validity check reduced the final data set to 419 responses. The demographic distributions of our sample were not much different from those of the general population as reported in the 2010 U.S. Census Bureau's American Community Survey (ACS). In both data sets, the median education level for those 25 or older was some college. Household income (the median in the ACS and the current study was $50,000–74,999 and $60,000–74,999, respectively), gender (female in the ACS and the sample was 52.4% and 53.6%) and age (the median age for those 18 or older in the ASC and the current study was 45–54 and 47, respectively) resembles the profiles of the general population.

We also compared the participants' characteristics with those of the 2009 FCC broadband Internet user sample. Here some of the limits in our sample deserve careful attention. First, age and income levels in our study's sample were slightly higher than in the 2009 FCC sample. Also, non-Hispanic white users made up 77% of our sample. While this was close to the figure in the FCC broadband Internet user sample (76%), this number remained higher than that in the 2010 US Census report (72.4%). Thus the readers should be guided with caution about the extent to which we can generalize this study's findings.

3.2. Measures

3.2.1. Privacy protection and release

One of the main goals in our study was to investigate the presence or absence of the gender gap in the privacy behavior and related confidence in the two dimensions of (1) data protection and (2) release. The dimension of data protection was elaborated into (a) social and (b) technical behaviors in data protection as intertwined in daily Internet uses (Hargittai & Litt, 2013; Litt, 2013; Marx, 2003; Park, 2013a, 2013b, for "sociotechnical" capital). Respondents were asked to report the extent to which they were involved in each of the information control behaviors on a 6-point scale, ranging from *never* to *very often*. Eight items ($M = 25.04$, $SD = 9.36$; range, 1–48) were used to create a composite index for the social behavior ($\alpha = .80$). For the technical behavior, we measured four items ($M = 13.07$, $SD = 5.10$; range, 1–24) and later combined them into a composite index ($\alpha = .70$), modified from the extant literature (Acquisti & Gross, 2006; Litt & Hargittai, 2014; Pew Internet, 2007) (see the items in Table 1). The dimension of personal data release was detailed into the two binary items: (a) display ad click-in ($M = 0.32$, $SD = 0.46$; range, 0–1) and (b) exchange opt-in ($M = 0.70$, $SD = 0.45$; range, 0–1). For display ad click-in, the respondents were asked whether they have ever clicked on an online display advertisement to learn about products or services. For exchange opt-in, they were also asked whether they have ever exchanged personal data for free reward such as discount or gift.

3.2.2. Privacy confidence

Confidence was operationalized into the two items that correspond to each of data protection and release. For the data protection dimension, we asked on a 6-point scale the extent to which users were assured of her/his own data protection ability that is, data protection confidence ($M = 3.08$, $SD = 1.25$; range, 1–6). The wording for this item was: "Overall I am confident that I can protect my privacy online." For the data release dimension, we asked on a 6-point scale to the extent to which users were concerned about her/his data release – that is, data release concern ($M = 4.72$, $SD = 1.32$; range, 1–6). The wording was: "I am very concerned about threats to my personal privacy in today's information society." Here a distinction can be made into the negative and positive self-assessment of one's data privacy confidence in each dimension. On the one hand, a user can have little self-assurance in the assessment of information ability corresponding to the data protection. On the other hand, the person may see few perceived concerns related to online personal data release (cf. Baek, 2014).

3.2.3. Control variables

Gender was the variable of primary interest. For control, the two types of variables were employed: (1) Internet access and (2) socio-demographics. First, for Internet access variables, three items measured online experiences in daily routines as they were related to differentiated uses of the Internet (Hargittai & Hsieh, 2010; Park, 2013a, 2013b): (a) the minutes of daily Internet use ($M = 297.51$, $SD = 303.54$), (b) the number of years of experience with Internet ($M = 11.06$, $SD = 4.41$) and (c) the number of Internet access locations for each respondent on a 6-point scale (1 = one, 6 = more than six) ($M = 2.32$, $SD = 1.31$), adapted from Hargittai and Hinnant (2008). For socio-demographic variables (Rice & Katz, 2003), the four measures of income (19 categories, $M = 12.70$, $SD = 3.50$), education (4 categories, $M = 2.97$, $SD = 0.93$), age ($M = 46.34$, $SD = 16.24$), and marriage status (high for married, 32.5%) were used.

3.3. Analytical strategies

Analysis of this study proceeded as follows. First, descriptive data identified the overall gender differences in Internet access and the privacy skill. Second, Ordinary Least Squares multivariate regression analyses proceeded from (1) a bivariate relationship, (2) a model that adds socio-demographics, and (3) a full model that adds Internet access variables. This specification helps tease out

Table 1
Individual items of social and technical behaviors.

	M	*SD*
Social behavior (6-point scale, alpha = .80)		
Stopped visiting particular websites because you fear they might deposit unwanted program on your computers	3.21	1.85
Given false or inaccurate email address or fake name to websites because of the privacy concern	2.54	1.73
Decided not to make an online purchase because you were unsure of how information would be used	3.42	1.72
Chose not to register on a website because it asked you for personal information to get into the site	4.28	1.63
Complained to a consumer or government agency about marketing practices of particular websites	1.50	1.07
Asked a website to remove your name and address from any lists used for marketing purpose	3.51	1.82
Asked not to share your personal information with other companies	3.58	1.97
Used an email address that is not your main address, in order to avoid giving a website real information about yourself	2.89	1.97
Technical behavior (6-point scale, alpha = .70)		
Cleared your web browser history	3.49	1.81
Used filters to block or manage unwanted email	4.56	1.90
Erased some or all of the cookies on your computer	3.68	1.90
Used software that hides your computer's identity from websites you visit	1.41	1.48

Table 2
Gender difference in Internet access and privacy behavior.

	Women		Men	
	Mean	*SD*	Mean	*SD*
Internet Experience (years)	10.72	4.28	11.47	4.54
Internet Daily Use (min)	334.48	330.24	254.79	263.90
Autonomy	2.31	1.34	2.34	1.29
Data Protection: Technical Behavior	12.19	5.23	14.08	4.75
Data Protection: Social Behavior	24.78	9.76	25.33	8.90
Data Release: Online Display Ad	0.35	0.479	0.29	0.458
Data Release: Exchange Reward	0.66	0.473	0.71	0.451

the precise gender effect in a realistic assessment that controls a multitude of social and technological contextual variables. This also reduces the possibility of biased estimates of gender effect due to endogeneity. Henceforth, we do not interpret the coefficients of control variables; instead, hierarchical regression analyses, which allow step-by-step specifications of control blocks, would be more suitable for interpreting demographics as the main predictors. Finally, the interaction terms among gender, age, and marriage status were created for the final equations. The variables were standardized prior to entry to reduce potential problems of multicollinearity. For the data release dimension, logistic regressions were employed for the binary variables.

4. Results

4.1. Descriptive data

Table 2 reports the descriptive findings with regards to the gender difference in (1) Internet use/access and (2) privacy behavior of data protection and release. The results show the interesting but subtle patterns of differences between men and women. In the Internet use and access, there existed no conspicuous gender gap, although it was found that women spent more time online than men (334.48 min for women; 254.79 min for men, daily use). In the gender divide, however, became manifest in the two dimensions of data protection. For instance, women reported on average that they were less engaged than men in the technical behavior of data protection (12.19, for women; 14.08, for men). In the dimension of data release, it was found that women tended to click more on display ads (0.35, for women; 0.29, for men). The gender gap in this release dimension was far from conspicuous, however, as men were more engaged in exchanging personal data for reward (0.66, for women; 0.71, for men).

4.2. Regression analyses

In RQ1, we asked the gender differences in Internet privacy protection and release as well as in the related confidence. The analyses – (1) the bivariate regression, (2) the model that adds socio-demographic variables, and (3) the model that includes all covariates – teased out the subtle patterns of gender disparity found in descriptive analyses, while taking into account potential influences of other variables. Table 3.1 shows significant sizable effects of gender in the technical behavior of data protection in all three regression models (RQ1.1). That is, while there was no gender effect in the social aspect, the gender disparities consistently manifest in favor of men in the privacy protection that involves technicality ($\beta = -.185$, $p < .001$). The privacy assurance ($\beta = -.138$, $p < .001$) did not attenuate when socio-demographics and Internet access variables were added. Overall, the substantial effect of the gender remains intact in this technical dimension of privacy protection, not mediated by confounding variables such as (1) education and income and (2) the levels of Internet access.

Overall findings for the data release display no significant gender effect (RQ1.2) (see Table 3.2). In terms of privacy concern and data release via a display ad click, there was no gender difference. However, the significant impact of gender in the final model for exchanging personal data ($\beta = -.458$, $p < .05$) shows that men were more likely to be tied to online access experience that was related to the data exposure. To put it differently, men's release behavior was more likely than women to be mediated through online access experiences.

RQ2 explored the interactions between gender, age and marriage status, controlling for all main variables. The results illustrate subtle patterns in which existing social conditions facilitate the gender role in discrete dimensions of Internet privacy. We found the two significant interactions in the dimension of data protection: (1) gender and marriage in the technical skill ($\beta = -.368$, $p < .05$) and (2) gender and age in the privacy assurance ($\beta = -.395$, $p < .10$). In the dimension of data release, the gender significantly interacted with marriage ($\beta = -.548$, $p < .01$, for the perceived privacy concern). In the case of age, the interactive patterns were found in both measures of data release: click on display ad ($\beta = -.027$, $p < .10$) and exchange data for reward ($\beta = -.036$, $p < .01$).

To demonstrate the important nuances of interactive relationships, we plotted interaction patterns in Fig. 1, using standard coefficients in the final equations after controlling all prior blocks. For graphic representation, the combination of 1 (*high*) and 0 (*low*) was assigned to each of the four groups (e.g., Campbell & Kwak, 2010; Park, 2013a, 2013b; Valentino & Sears, 2005). Thus, the values in Fig. 1 does have no intrinsic or substantial meaning (as in coefficients that represent slopes); yet again, its visualization gives us the values with which to compare and inspect the four different points. Figs. 1.1 and 1.2 (the privacy protection) show that in terms of the technical behavior, women were less likely to be equipped than men and this disparity, particularly among those who were married, exacerbates to a great extent. In terms of age, the confidence gap between men and women magnifies among the younger users, while women's confidence remains low regardless of age. The interactive pattern is reversed in the dimension of data release (see Figs. 1.3 and 1.4). That is, women were more inclined to reveal personalized data when they were older, suggesting that the age exacerbates the gender gap in this dimension. In the dimension

Table 3.1
OLS multivariate regression: gender effect on privacy behavior of data protection.

	Internet data protection		
	Assurance	Technical	Social
Gender effect			
Bivariate (female = high)	−0.138** (.122)	−0.185*** (.494)	−0.029 (.922)
R^2	.01	.03	.00
Model Adding Socio-Demographics	−0.127** (.122)	−0.181*** (.492)	−0.033 (.916)
R^2	.04	.07	.04
Full Model Adding Internet Use/Access	−0.136** (.122)	−0.167*** (.469)	−0.042 (.878)
R^2	.09	.18	.15
Control variables			
Education	−0.055 (.071)	−0.002 (.269)	0.076 (.504)
Age	−0.030 (.004)	−0.136** (.016)	−0.151** (.029)
HH Income	−0.112* (.018)	−0.068 (.071)	−0.125* (.133)
Marriage	0.155** (.134)	0.066 (.514)	0.033 (.962)
Daily Internet use	0.104* (.062)	0.111* (.239)	0.213*** (.447)
Years of experience	0.137** (.065)	0.250*** (.250)	0.206*** (.469)
Autonomy	0.098* (.067)	0.148** (.250)	0.042 (.467)

Note: Entries are standardized regression coefficients. Coefficients for covariates are in the final models.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

Table 3.2
Logistic regression: gender effect on privacy behavior of data release.

	Internet data release		
	Concern	Online Ad	Exchange
Gender effect			
Bivariate	0.060 (.132)	1.292 (.212)	0.776 (.219)
Nagelkerke R^2	.00 (R^2)	.00	.00
Model Adding Socio-Demographics	0.063 (.132)	1.366 (.218)	0.763 (.223)
Nagelkerke R^2	.01 (R^2)	.05	.02
Full Model Adding Internet Use/Access	0.061 (.135)	1.296 (.225)	0.632* (.238)
Nagelkerke R^2	.02 (R^2)	.07	.14
Control variables			
Education	−0.005 (.079)	1.111 (.133)	1.083 (.145)
Age	0.109* (.004)	0.980** (.007)	1.024** (.008)
HH Income	0.031 (.021)	1.060 (.034)	1.047 (.034)
Marriage	−0.001 (.149)	0.848 (.246)	1.460 (.270)
Daily Internet use	0.040 (.069)	1.252* (.109)	2.520*** (.204)
Years of experience	0.056 (.072)	0.827 (.250)	0.887 (.130)
Autonomy	−0.074 (.074)	1.112 (.119)	1.191 (.142)

Note: Entries are odd ratios; entries for concern are coefficients in OLS multivariate regression. Odd ratios and coefficients for covariates are in the final models.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

of privacy release concern, we also see an interactive pattern in which women's awareness tends to be lower with marriage, while this interaction is reversed among men as men become more alert to potential privacy exposure when married.

5. Discussion

The extent to which privacy skill and confidence are fostered in the Internet is in essence social and can be constructed along the line of gender difference. The present study has attempted to understand how privacy remains 'gendered' in the Internet and the way this potentially influences people's abilities and the confidence related to personal privacy-related tasks in the bigger implications for social inequality. We found In the dimension of protection, that men were significantly better equipped than women with privacy technical sets, and that broader confidence in the privacy protective matter was also significantly associated with being a male. Nevertheless, this gender disparity displayed a divergent pattern as the significant difference between men and women was manifest only in the technical, not social, aspect of the privacy protection. Also in terms of data release, levels of skill difference between men and women did not reach significance, although the result indicated a negative direction in a specific opt-in behavior (thus, both men and women also tended to be oblivious to data release for reward exchange while men were technically more equipped). It is possible that certain types of privacy behaviors may be more 'gendered' than others, with levels of digital competency concentrated along the gender line. This is further supported by the finding that contrary to data protection, the dimension of data release was significantly mediated by online access and experiences in disfavor of men.

No reported gender difference in the social behavior gives rise to nuanced insights. In one aspect, it can be that men tend to be skillful at various technical tasks (Schumacher & Morahan-Martin, 2000) related to Internet privacy. In another aspect, we can interpret that women may be as responsive as men to – or resort to – socially available modes of protection, while keen to exercise personal data management that is not necessarily intrinsically technical. The fact that there still exists the gender disparity in protective assurance suggests that at least this portion of gender difference may not be grounded in actual skill levels, but in self-perceived assessment.

This is in line with Hargittai and Shafer's (2006) work, which found that women are less likely to perceive themselves as competent than what their actual skill levels are, which may in turn negatively influence their ability to pursue benefits from the Internet in diverse domains (see Correll, 2001). In a similar vein, this study hints on a possibility that women's lower self-confidence of privacy protection ability may well affect the quality of their behaviors online and the types of data management to which they resort in the Internet. At least in the reported privacy data protection in the social aspect, it is possible that women may rate their skills lower than men do when there is in fact no significant difference. In this regard, no statistical difference in the release dimension of online display ads deserves further attention. First, this may well reflect the digital environment in which personal data release is an unavoidable prerequisite for the participation in diverse information domains regardless of gender. Second, on its flip side, this may also indicate that stereotypical understanding of a simplistic uniformed gender difference may not function at least in dealing with the issue of data release management and associated concern.

Finally, tests for the interaction effects shed additional light on these matters by revealing how the gender difference intersects with age and marriage status in subtle and distinctive ways. For instance, the interplay between gender and marriage suggests that marriage may tend to adversely affect women more than men in their preparation of technical skill. The disparity also appears to be reinforced when the age was taken into account, as women's confidence tends to be lower regardless of age, while the confidence gap magnifies when they are younger. Importantly, the privacy behavior of the older women tends to be more prone to data exposure, vulnerable to potential pitfalls frequently associated with display ad click-in or exchange opt-in. On the issue of privacy release concern, this interaction implies that the marriage status may not adequately provide the types of resources or attention necessary to be digitally-equipped particularly for women than for men.

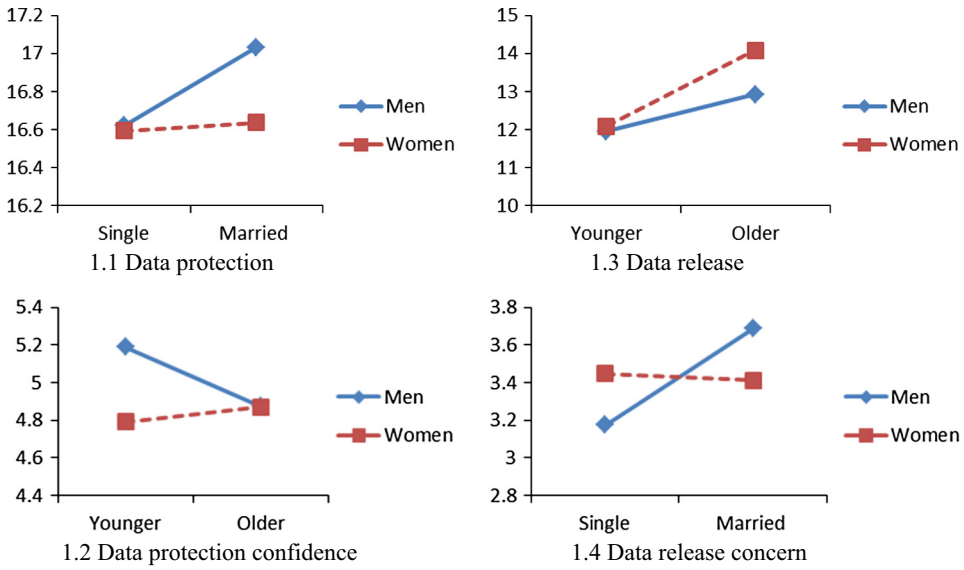

Fig. 1. Interplay between gender, age, and marriage.

Taken together, the age on the one hand, and the marriage on the other, tend to manifest the disparities not easily discernible in the main gender differences. The important implication is that not all women operate in a uniform fashion when it comes to data privacy release and protection. Instead, social-demographic conditions, such as marriage and age, help facilitate the development of information skill sets so that there remain particular segments of women more vulnerable in discrete dimensions of digital engagement.

6. Theoretical reconsideration and policy implications

Men may remain ready to manage personal privacy more efficiently in the Internet than women because of their high self-assessed confidence and technical expertise. Yet this study's nuanced findings with regard to non-significant difference in the release dimension of people's abilities and related concern also enable us to expand our knowledge about the 'gendered' privacy in a much complex note. In addition, we see the interactive pattern of age and marriage status in contributing to reinforce the existing gender gap. Although this needs to be parceled out in the future research, at least the finding indicates that marriage and age may not necessarily serve particularly for women than for men in the development of Internet-related privacy behavior and confidence.[1] This is an important step in understanding the dynamics of difference between men and women in everyday online information privacy management. On the theoretical front, this study resonates the insights from studies of digital skill disparities (Kennedy et al., 2003; Park et al., 2012, 2013a; Park, 2014; van Deursen & van Dijk, 2014): Internet skill and confidence tend to favor socially privileged gender status to the extent existing social contexts foster particular gender roles in privacy.

In signaling the need for social and policy awareness, implications of the findings from this study are to be put in light of Internet access, the skill and effort required for building and maintaining privacy, and the important role played by gender in existing social contexts. At least in the U.S. context, the understanding of gender disparity has never gotten into the privacy-policy narratives, including the latest 2012 proposal by the Obama administration. Moreover, the Federal Trade Commission (FTC) in its continuous non-intervention stance has established no benchmark guidance as to the potential gap between men and women or its contribution to conceivable pitfalls in dealing with digitalization of personal data. Nor did the FTC recognize gender issues in its policy assumption of homogeneous user segments (see FTC, 2010, 2012; Park, 2011; Park & Jang, 2014).

The future research should investigate whether gender (dis)parity in the use of digital devices persists from the early child development or becomes pronounced with the progress of socialization. Theoretically, this sheds light on to the extent to which women have been socialized differently through established institutions (Gramsci, 1982) and how this process of socialization (DiMaggio et al., 2001; Howard & Jones, 2004) contributes to the creation of gender disparity. In other words, what this study has theoretically strived to test is the development of uneven gender identities associated with technology, as manifest in privacy behavior and confidence. In this vein, teens' skill sets in family environments in their early development of gender identities need to be investigated in light of parental influence and skill levels. Needless to say because this study only captured the self-reported skills, the in-depth observation in more realistic settings is also urgently needed along with the refinement of measures in both release and protection dimensions. Our study also used the binary measure of marriage, which did not capture how widowed, separated, and other many popular marriages and their classifications may play different roles. The improvement in this measure will be an important task in the future studies because the contemporary notion of marital status continues to evolve and reflect changing expectations. Lastly, social media data release as well as protection behavior in the use of Twitter and Facebook (e.g., Hargittai & Litt, 2013; Litt, 2013; Litt & Hargittai, 2014) must be examined through a type of field experiment among people of underserved communities, women, and combined.

In all, this study entails further empirical research that advances our understanding of how the various dimensions of privacy (dis)parities may affect broader participations in the Internet. At present, however, a forceful argument can be advanced for setting policy goals to enable women, particularly those who are older and occupied with household duties, to be equipped more

[1] The main effects of age are noteworthy, because the results indicate that while the younger users are more skilled at data protection, they are also reckless at releasing data through display ad click-in. The older users, on the other hand, appear more prone to exchanging data for personal reward. This should also raise a concern, because the older users are in fact more concerned than the younger users about data release.

competently. Policymakers should aware that female users may hesitate to resort to technical resources for data protection. Advanced research (Wasserman & Richmond-Abbott, 2005) has consistently indicated that women may not benefit from new technology as much as men and potentially be among the most disadvantaged user segments. Coupled with those findings, this study's findings reinforce the necessity of effective policy intervention, in the form of digital literacy programs, in responding to the low levels of digital privacy competence.

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