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## The impact of mobile communication uses on civic engagement: moderating effects of exposure to politically diverse and weak-tie networks

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**Abstract:** Based on a nationally representative survey (N = 1,540) of mobile phone users, this study investigates how diverse types of mobile phone use relate to exposure to different political and social views (i.e., crosscutting exposure), attributes of people's discussion network (i.e., weak-tie contacts), and civic engagement. Results indicate that using mobile phones for informational and expressive purposes is closely linked to exposure to diverse viewpoints through mobile communication and engagement in civic affairs. Recreational use of the mobile phone has a statistically significant link to crosscutting exposure. Further, both crosscutting exposure and weak-tie contacts moderate the association between mobile phone use for informational and recreational purposes and civic engagement. In a three-way interaction, crosscutting exposure and weak-tie contacts moderate the relationship between informational mobile phone use and civic engagement.

**Keywords:** mobile phone; civic engagement; crosscutting exposure; weak ties.

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## 1 Introduction

The mobile phone, the fastest diffusing medium ever (Jensen, 2013), is an integral part of today's human society, affecting diverse aspects of civic life (Campbell and Kwak, 2011; Huang, 2016; Martin, 2014). The mobile phone is prominently used in promoting social issues, social causes, and political campaigns (Murray, 2017). Despite some efforts to understand the civic potential of the mobile phone, only recent studies have delved into the effects mobile communications may have on civic life (e.g., Campbell and Kwak, 2010a, 2010b; Martin, 2016).

Drawing upon the *crosscutting exposure* thesis (Huckfeldt et al., 1995; Mutz, 2002b), this study examines the role of the mobile phone in civic engagement, which is defined as voluntary activity aimed at addressing social and/or community issues that are beneficial to the collective well-being (Gil de Zúñiga and Valenzuela, 2011; Verba et al., 1995). Exposure to dissonant viewpoints is a fundamental building block of democracy because it develops a civic mindedness of mutual understanding and tolerance (Habermas, 2006; Park and Kaye, 2017).

Concerning the impacts of digital media on crosscutting exposure, two competing hypotheses provide fairly different predictions. One hypothesis posits that individuals are more likely to avoid dissonant perspectives on the internet (Sunstein, 2001; van Alstyne and Brynjolfsson, 2005), while the other hypothesis predicts that internet-based digital media will enable individuals to encounter more diverse views (Bimber, 2004; Papacharissi, 2002). To date, there has been little research about whether types of mobile phone use have any significant link to crosscutting exposure. Thus, this study first tests the competing hypotheses about crosscutting exposure in the context of mobile communication. Particularly, this study focuses on how certain mobile phone activities (i.e., information seeking, social interaction, and recreation) predict crosscutting exposure because distinctive types of media use often lead to differing political consequences (Wojcieszak and Mutz, 2009).

This study also investigates the moderating role of crosscutting exposure and weak ties. Given that exposure to disagreement triggers greater cognitive action (Levine and Russo, 1995), it is likely that crosscutting exposure plays a moderating role in the association between mobile phone use and civic engagement. In addition, this study examines how weak ties relate to mobile phone use, crosscutting exposure, and civic

engagement, considering that the number of weak ties in one's regular conversation network is a crucial motivator of civic engagement (Gil de Zúñiga and Valenzuela, 2011; Son and Lin, 2008).

Taken together, this study develops a model to measure the interconnections among mobile phone use, citizens' levels of crosscutting exposure, people's mobile phone contacts as a proxy for weak-ties connection, and their civic engagement. To this end, this study analyses original survey data from a national sample of South Korean adults gathered in 2014. Findings will contribute to extending the understanding of interplays between mobile phone use, crosscutting exposure, and civic engagement, posing significant ramifications to the future of democracy.

## 2 Literature review

### 2.1 Mobile communication and crosscutting exposure

Democratic theory has long considered *crosscutting exposure* an essential component of a healthy and pluralistic democracy (Habermas, 2006; Gil de Zúñiga, 2015). Recent empirical research demonstrates that exposure to dissimilar viewpoints has several tangible benefits: increasing familiarity with the rationales of opposing views (Park and Kaye, 2017), fostering political tolerance (Mutz, 2002a; Price et al., 2002), more careful scrutiny of alternative perspectives (Delli Carpini et al., 2004; Mendelberg, 2002), and developing an ability to differentiate among ideologically distinct attitudes (Gastil et al., 2008). In short, most studies on exposure to dissonant viewpoints indicate pro-civic consequences.

Despite considerable scholarly effort during the last two decades, the relationship between digital media use and crosscutting exposure is not conclusive. Broadly, two theoretical arguments have been proposed. One argument suggests that people use the increased control provided by digital media to selectively expose themselves to like-minded others and ideologically consonant information, avoiding exposure to political difference (e.g., Iyengar and Hahn, 2009; Ksiazek et al., 2010). For example, one study found that Twitter users are less likely to be exposed to cross-ideological content, because the ability to build their own networks can result in politically homogeneous clusters (Himmelboim et al., 2013).

Another argument is that internet use contributes to deliberative democracy by increasing people's exposure to dissimilar viewpoints through the weakening of social boundaries and the bridging of geographical divides (Brundidge, 2010; Kim, 2011). This argument places considerable weight on the new opportunities offered by digital media. Social networking sites users are more likely to encounter crosscutting perspectives (Kim, 2011; Kim et al., 2013). This is because the various features of these platforms create opportunities for inadvertent exposure. For example, people may be exposed to more heterogeneous populations, hyperlinks, and interactive communication applications.

One concern in this area is that prior studies have focused on media users' political predispositions – partisanship or ideology (e.g., Mutz, 2002b; Stroud, 2010) – to explain encountering or avoiding crosscutting viewpoints. However, exposure to or avoidance of dissimilar information can take place regardless of party preference. For example, many

people check tweets regularly via their mobile phones during an election campaign, mainly because Twitter provides recent updates of the campaign in real-time, rather than because Twitter provides information aligned to their political orientation. In other words, Twitter use is motivated not only by an effort to find support or avoid challenges, but also by a reflection of their personal interest in or curiosity for the campaign (Gil de Zúñiga and Valenzuela, 2010). Additionally, people may not avoid dissonant information when they think that information might be useful for future decisions or engagement in discussion with others (Pingree, 2007). Therefore, the odds of encountering dissonant information may be more contingent upon types of mobile phone use than upon the political predisposition of a mobile phone user.

Another concern is that different types of media exercise different impacts on crosscutting exposure. The mobile phone offers multiple layers of communication (Huang, 2016; Ishii, 2006; Ling, 2008), suggesting that it may have different implications for crosscutting exposure compared with other media. One striking characteristic of the mobile phone is multimodality (Leander and Vasudevan, 2009); the mobile phone adopts a variety of media at one place, including television, radio, social networking services, and so forth. This medium is also distinct from others in that it allows users to seamlessly weave interactions with both strong and weak ties (Rainie and Wellman, 2012; Bachmann and Gil de Zúñiga, 2013). Thus, the mobile phone offers a greater opportunity to meet diverse information than other media (Lee and Kwak, 2016). At the same time, the mobile phone is the most 'private' medium in human history, by which some users communicate mostly with close-knit ties (Gergen, 2008). Indeed, some scholars argue that many people now live in floating worlds of friends and family members, due to the anytime – anywhere affordances of mobile communication (Gergen, 2003; Ishii, 2006). Therefore, focusing on *why* and *how* people use their mobile phone instead of *how often* they use their mobile phone will better capture the subtle relationship between the mobile phone and crosscutting exposure.

Drawing upon the above reasoning, this study concentrates on examining how types of mobile phone use predict crosscutting exposure, controlling for political interest and ideology in the analysis. For instance, information-focused uses are likely to result in encountering more diversity on the mobile phone than on other media. In contrast, relation-focused use will meet less diversity on the mobile phone than on other media. Depending on specific types of mobile phone use, the odds of meeting dissonant viewpoints may vary significantly.

Accordingly, this study focuses on the interconnection of mobile phone usage types and exposure to dissimilar viewpoints. Based on previous literature in this area (Campbell and Kwak, 2010a, 2010b, 2011; Chan, 2015; Lee et al., 2014), this study examines how the following three usage types relate to crosscutting exposure and civic engagement:

- 1 *information seeking and expression* about news and public affairs
- 2 *sociability* with family and friends
- 3 *personal recreation*.

A factor analysis supports such categorisation (Table 1).

**Table 1** Confirmatory factor analysis of mobile phone use items

| <i>Item</i>  | <i>Informational use</i> | <i>Relational use</i> | <i>Recreational use</i> |
|--|--------------------------|-----------------------|-------------------------|
| Went online to read opinions of others regarding social issues             | 0.880                    |                       |                         |
| Accessed news  | 0.869                    |                       |                         |
| Called others to discuss social matters                                    | 0.858                    |                       |                         |
| Used text/instant messages to discuss social matters                       | 0.816                    |                       |                         |
| Called friends or family just to be social                                 |                          | 0.718                 |                         |
| Used text/instant messages to interact with friends or family to be social |                          | 0.712                 |                         |
| E-mailed friends or family to be social                                    |                          | 0.745                 |                         |
| Went online to share content that is entertaining                          |                          |                       | 0.845                   |
| Browsed web just for fun   |                          |                       | 0.804                   |
| Went online for games and other forms of entertainment                     |                          |                       | 0.823                   |

Notes: N = 1,530. Standardised factor loadings.  $\chi^2 = 569.21$ ;  $p < 0.001$ ;  $df = 18$ ; RMSEA = 0.044; CFI = 0.953; TLI = 0.968.

Individuals seek and obtain different gratifications when they use mobile phones (Campbell and Kwak, 2011). *Informational use* of the mobile phone, defined as using mobile phones to gather and discuss content about news and public affairs (Campbell and Kwak, 2011), can help users encounter heterogeneous viewpoints or information not frequently found in their immediate circle (Wilken, 2011). Research shows that people select news on social media based on social endorsement cues provided by other users, rather than partisan cues aligned with their political orientation or partisanship (Messing and Westwood, 2012). Similarly, people who use mobile phones for information seeking are exposed to information that their acquaintances or co-workers endorse, as well as information that resonates with their preferences. In this process, informational uses of mobile phones can increase opportunities for users to come in contact with dissimilar views, despite their selective preferences for attitude-consistent messages (Kim et al., 2013).

H1 Use of the mobile phone for informational and expressive purposes is positively related to crosscutting exposure.

*Sociability*, or *relational use* refers to mobile phone use to manage close-tie relationships (Lee and Kwak, 2016; Ling, 2008). Relational use remarkably stands out in mobile communication because it lowers the threshold for interaction with a select group of others (Ling, 2008). Particularly, mobile communication allows ‘perpetual contact’ with close ties virtually at any time and place (Katz and Aakhus, 2002), which may lead to small and like-minded clusters (Gergen, 2008). Consequently, individuals who use mobile phones mainly for relationships with like-minded and close-knit ties may insulate themselves from others or those who hold dissimilar views (Ling, 2008; Wilken, 2011).

H2 Use of the mobile phone for relational purposes is negatively associated with crosscutting exposure.

*Recreational use* refers to using mobile phones primarily for distraction or personal entertainment (Kwak et al., 2011). Although recreational media users do not intentionally seek differing viewpoints, they often meet information from various sources while enjoying entertainment (Stroud and Muddiman, 2012). For example, when surfing the web for fun, mobile phone users can accidentally meet diverse, sometimes dissonant, information because the lowered sense of social presence experienced through the mobile phone may reduce the social risks and potential negative effects of exposure to dissenting views (Stromer-Galley, 2000). Wojcieszak and Mutz (2009) found that apolitical online group activities were more likely to contribute to exposure to crosscutting perspectives. Building upon the above reasoning and literature, the current study hypothesises:

H3 Use of the mobile phone for personal recreation purposes is positively related to crosscutting exposure.

## *2.2 Crosscutting exposure and civic engagement*

This study also examines how exposure to differing viewpoints via the mobile phone relates to civic engagement. In this study civic engagement is conceptualised as citizens' voluntary civic actions that are not political in nature but are directed toward solving community problems as a main objective (Verba et al., 1995). The underlying rationale guiding this definition is that individuals' civic behaviours do not seek to influence the government or political institutions, but rather aim to foster community life and citizenship via charity donations, voluntary work for non-political groups, or taking part in community projects. Being involved in civic associations and volunteer work not only helps develop civic skills but also fosters trust in others, thereby enabling collective action to address social needs (Adler and Goggin, 2005).

The association between crosscutting experiences and civic engagement has been a subject of debate for decades. The debate has revolved around two conceptual frameworks. One stream of research claims that divergent viewpoints deter participation because the cross-pressures of conflict and inconsistency (with one's previously held beliefs) drive people in opposite directions, diminish interest, foster ambivalence, and discourage turnout (Huckfeldt et al., 2004; Mutz, 2006).

Mutz (2002a), for example, demonstrated negative effects of network heterogeneity on political participation because of 'cross-cutting pressures'. She explained that individuals entrenched in politically heterogeneous social networks steer clear of politics out of the desire not to threaten the harmony of their social relationships. Also, meeting heterogeneity may create greater ambivalence about political actions, discouraging decisive political action (Mutz, 2002a). However, little empirical evidence has been found to support the cross-pressures hypothesis.

Another stream of research has demonstrated positive impacts as the result of encountering differences on civic engagement (Huckfeldt et al., 2004; Price et al., 2002; Scheufele et al., 2004). Discussion with diverse people usually results in network members having to compromise between different viewpoints, motivating these individuals to re-evaluate the issues where conflict occurs (Knight and Johnson, 1994). Exposure to disagreement is also likely to produce greater cognitive activity (Levine and Russo, 1995), forcing individuals to learn about alternative perspectives and to reflect more carefully on what they already know, thereby enhancing political knowledge and

understanding (McPhee et al., 1963). Increased political knowledge is positively related to increased political participation (Ikeda and Boase, 2011).

The contrasting camps have one argument in common: crosscutting exposure plays a substantial role in connecting media use to one's civic awareness and triggering the individual's civic consciousness. Social capital theory posits that interaction with socially and politically heterogeneous people positively affects political efficacy (Putnam, 2000), which is a precondition of civic engagement. Put differently, crosscutting exposure may play a supplemental – although not primary or direct – role in civic engagement. Therefore, it is reasonable to expect that in certain situations crosscutting exposure may interact with mobile phone use, triggering civic engagement.

Evidence of the direct association between informational use of mobile communication and civic engagement is solid (Martin, 2016; Campbell and Kwak, 2011; Kwak et al., 2011). In addition, several studies suggest that encountering 'diverse' information expands opportunities to learn about civic issues, positively influencing the level of confidence in one's ability to understand public issues (Ardèvol-Abreu et al., 2017; Putnam, 2000). Enhanced civic competence can eventually result in increased civic engagement. Similarly, Scheufele et al. (2004) found that encountering political heterogeneity promotes individuals' political participation by motivating them to gain political knowledge through news consumption. Therefore, it logically follows that meeting diversity through informational uses of the mobile phone will be beneficial to triggering involvement in civic affairs.

H4 Crosscutting exposure has a moderating effect on the association between mobile phone use for informational and expressive purposes and civic engagement.

Keeping relationships only with close-knit people may have a negative influence on social connections (Granovetter, 1982) because it promotes alienation from open discussions with others, ultimately strengthening selective sociality (Gergen, 2008; Ling, 2008). However, under certain conditions relational use of the mobile phone may result in increased civic engagement (Campbell and Kwak, 2010a). For example, a person's casual chatting with friends and family does not prevent the person from disseminating political information by sparking up a conversation about public issues (Gil de Zúñiga et al., 2016). Relationship maintenance also offers models of social behaviour that people can emulate in civic life and motivates them to consider the broader issues of their community. This study asserts that such a positive scenario could become more plausible with the help of crosscutting exposure, because diverse information is likely to offer substantial opportunities to learn about and participate in public affairs. At least one study offers empirical support this idea. In that study, crosscutting discussion and strong homogeneity in the mobile phone interact with each other to predict increased political participation (Lee and Kwak, 2016).

H5 Crosscutting exposure has a moderating effect on the association between mobile phone use for relational purposes and civic engagement.

Research shows that recreational uses of traditional media (e.g., Besley, 2006) and the internet (e.g., Cho et al., 2003) do not contribute to civic engagement. However, non-civic activities such as spending time with people and getting to know other individuals offer "a natural setting for public discussion by lowering the barriers of psychological and social influences" [Gil de Zúñiga et al., (2016), p.535].

The current study expects that crosscutting exposure will influence the association between recreational use of mobile phones and civic engagement because encountering diversity can broaden the scope of attention to civic affairs beyond personal or recreational interests (Hurtado and DeAngelo, 2012). In other words, crosscutting exposure may help dispel the proposed troublesome link between recreational use of mobile phones and civic engagement. Thus, this research poses:

- H6 Crosscutting exposure has a moderating effect on the association between mobile phone use for recreational purposes and civic engagement.

### *2.3 Moderating role of weak ties between mobile phone use and civic engagement*

This study also aims to contribute to the literature about mobile phone use in civic life by examining the role of weak ties, which has a positive association with civic engagement (e.g., Gil de Zúñiga and Valenzuela, 2011; Son and Lin, 2008).

Rainie and Wellman (2012) argue that the mobile phone empowers people by propagating a new form of ‘networked individualism’, which is characterised by readily available information and perpetual links with a diverse array of people – both strong and weak ties. If people have frequent contacts with weak ties in addition to avid demand for information, they have a greater probability of being recruited to participate in civic or community events (Kotler-Berkowitz, 2005). Expanded weak ties can also provide information and resources that individuals do not find in their immediate environment of relatives and close friends. Expanded weak ties can provide a variety of information that stimulates learning about civic issues, even to those who use their mobile phone for relational and recreational purposes. On the other hand, as weak ties shrink, the likelihood of getting involved in the civic process is reduced because fewer weak ties provide less opportunity to get in contact with those who hold different viewpoints. Based on the above reasoning and literature, the following is posed:

- H7 The number of weak-tie contacts via the mobile phone has a moderating effect on the association between mobile phone use (informational, relational, and recreational) and civic engagement.

### *2.4 Weak ties and crosscutting exposure*

An individual’s strong, homogeneous ties function as a basis for repeated exposure to agreeable beliefs and values (McPherson et al., 2001). To the contrary, weak ties provide information and resources that individuals do not find in strong-tie connections (Valenzuela et al., 2011). In the civic realm, the strength of weak ties lies in the provision of diverse information (La Due Lake and Huckfeldt, 1998; Wellman, 1997). This line of reasoning implies that weak ties and crosscutting exposure in mobile communication are correlated.

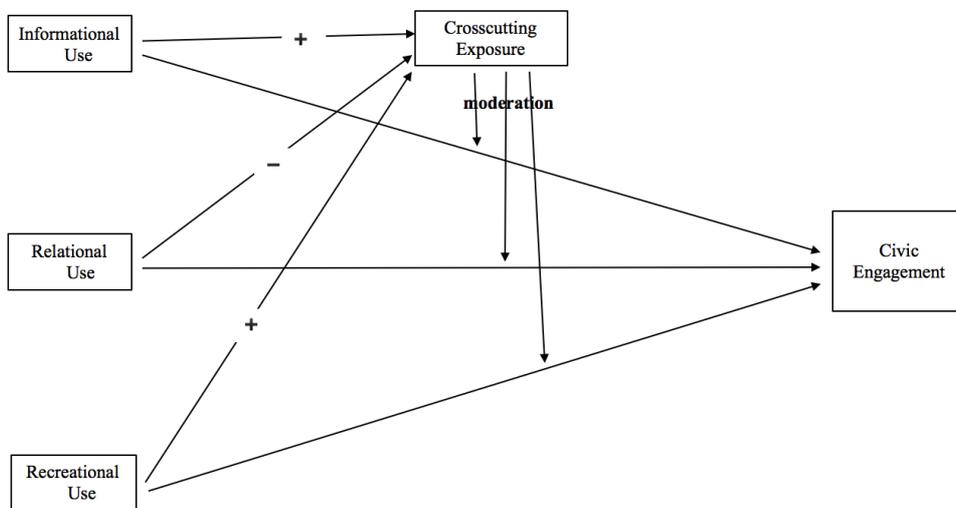
- H8 The number of weak-tie contacts and crosscutting exposure via the mobile phone are positively related.

This study expects statistically significant interaction (moderation) effects between mobile phone use and crosscutting exposure in predicting civic engagement (H4, H5, and

H6). In addition, research shows that weak ties provide non-redundant, diverse information that stimulates learning and offers new opportunities of mobilisation (Gil de Zúñiga and Valenzuela, 2011; La Due Lake and Huckfeldt, 1998). Therefore, it is likely that crosscutting exposure and weak ties make a synergistic impact on civic engagement. Given that little empirical evidence exists regarding the possible interaction effect, this study poses the following research question:

RQ1 How do weak-tie contacts influence the association between mobile phone use (informational, relational, and recreational), crosscutting exposure, and civic engagement?

**Figure 1** Research model



### 3 Method

#### 3.1 Data collection

This study relies on online survey data collected from the residents of South Korea between 1 June and 30 June 2014. To assure the representativeness of the sample, data were collected using stratified quota sampling. Based on the 2012 voter registration data (about 41,300,000 registered voters) of the Korea Election Management Commission, this study selected 5,000 adults using a four-way cross-classification system to preserve representation (age  $\times$  gender  $\times$  education  $\times$  income). This stratified quota sampling differs from conventional probability sampling procedures, yet produces highly comparable data (Eveland and Shah, 2003). The target participants were provided the present survey's URL via e-mails. To increase the response rate, subjects were entered into a raffle for 10 \$20 gift cards, and two reminder e-mails (10 June and 20 June) were sent out. The invitation obtained 1,540 responses. The response rate was 30.8% (AAPOR RR3, 2011).

Demographic characteristics of the sample resemble the profiles of the population figures of South Korea (OECD, 2017; Statistics Korea, 2017), with respect to age (mean

age: 37.2 in the sample and 39 in the population) and education (two-year college degree: 45.9% in the sample and 45% in the population). The median household income of the population (KRW 412,000) is within the range of the sample median (KRW 4,000,001 ~ 5,000,000). The sample contains more females (51%) than the population (49%), but the difference is only 2% point. Such differences can be explained partially by the fact that the labour force participation rate for Korean women (53.1%) is lower than that of Korean men (74.5%) (Park and Cho, 2017). It is likely that Korean female adults who do not have jobs have more time to participate in surveys. Additionally, Smith (2008) suggests a theory that females tend to respond more actively to a request than males because females value characteristics consistent with connective selves, such as empathy or emotional closeness while males are more likely to place a high value on separative characteristics.

### 3.2 *Measurement*

#### 3.2.1 *Types of mobile phone use*

Eleven items were drawn from previous studies (Gil de Zúñiga et al., 2012; Leung and Wei, 2000; Wei and Lo, 2006). Respondents indicated during the last month how often they engaged in the following activities using their mobile phone on a five-point scale ranging from 1 (never) to 5 (very frequently). *Information/expression use:*

- 1 went online to read opinions of others regarding social issues
- 2 accessed news
- 3 called others to discuss social matters
- 4 used text/instant messages to discuss social matters
- 5 went online to express my opinions about social issues.

*Relational use:*

- 1 called friends or family to be social
- 2 sent texts or instant messages to friends or family to be social
- 3 e-mailed friends or family to be social.

*Recreational use:*

- 1 went online for games and other forms of entertainment
- 2 browsed web just for fun
- 3 went online to share content that is entertaining.

Before creating average items constructs, the authors tested the validity of categories by conducting a confirmatory factor analysis (CFA). Based on a three-factor model using Mplus, the results indicated that one item ('went online to express my opinions about social issues') had a low factor loading. Therefore, we removed the item. The analysis in Table 1 shows an adequate fit,  $\chi^2 = 569.21$ ;  $p < 0.001$ ; RMSEA = 0.044; CFI = 0.953; TLI = 0.968.

### 3.2.2 Crosscutting exposure

Following Kim (2011), this study asked respondents during the past three months how often they were exposed to socially or politically disagreeing messages on the mobile phone via:

- 1 texting (including instant messaging)
- 2 web searching
- 3 social media use.

The responses were coded on a four-point scale ranging from 1 (never) to 4 (regularly) ( $\alpha = 0.73$ ,  $M = 2.23$ ,  $SD = 1.02$ ).

### 3.2.3 Weak-tie contacts

Extending Gil de Zúñiga and Valenzuela's (2011) measure of weak-tie discussion, this study asked participants to estimate the number of non-family members, acquaintances or unfamiliar people with whom they communicated about social or political affairs via their mobile phone during the last two weeks ( $M = 4.29$ ,  $SD = 2.55$ ).

### 3.2.4 Civic Engagement

Relying on Gil de Zúñiga and Valenzuela (2011) and Zukin et al. (2006), the current study asked respondents during the past three months how frequently they participated in the following activities on a five-point scale ranging from 1 (never) to 5 (very frequently):

- 1 worked or volunteered for non-political groups, such as a community project
- 2 attended a meeting to discuss neighbourhood problems
- 3 raised money for a charity or participated in a run/walk/bike for charity
- 4 bought a certain product or service because I like the social or political values of the company
- 5 banned a product or service because I disagree with the social or political values of the company<sup>1</sup> ( $\alpha = 0.80$ ,  $M = 2.68$ ,  $SD = 1.25$ ).

As control variables, this study included age, gender, education, household income, political interest, political efficacy, political talk, and news exposure, all of which were found to influence civic engagement (Campbell and Kwak, 2011; Jennings and Zeitner, 2003; Shah et al., 2005).

Drawing upon Gil de Zúñiga et al. (2014b) and Campbell and Kwak (2011), *News Exposure* was measured by asking participants during the last week how often they consumed news about current events or public issues from:

- 1 network television
- 2 cable TV
- 3 daily newspapers

4 web-only newspapers

5 news aggregators (i.e., *Daum* news, *Naver* news) on a five-point scale.

Responses were combined into an additive index ( $\alpha = 0.71$ ,  $M = 2.45$ ,  $SD = 2.01$ ).

**Table 2** Descriptive statistics of variables

| <i>Variable</i>        | <i>Minimum</i>              | <i>Maximum</i>               | <i>Mean</i>                             | <i>SD</i> | <i>Cronbach alpha<br/>(<math>\alpha</math>)/Spearman<br/>Brown coefficient</i> |
|------------------------|-----------------------------|------------------------------|---|-----------|--|
| Age                    | 19                          | 64                           | 37.2                                    | 13.6      |  |
| Gender                 |                             |                              | Females: 51%                            |           |  |
| Education              | Middle<br>school or<br>less | Graduate<br>degree           | Median:<br>two-year college             |           |  |
| Household income       | KRW<br>2,000,000<br>or less | KRW<br>10,000,001<br>or more | Median: KRW<br>4,000,001 ~<br>5,000,000 |           |  |
| News exposure          | 1                           | 5                            | 2.45                                    | 2.01      | $\alpha = 0.71$  |
| Offline political talk | 1                           | 5                            | 2.13                                    | 1.28      | $\alpha = 0.78$  |
| Online political talk  | 1                           | 5                            | 2.49                                    | 1.39      | Spearman Brown<br>coefficient = 0.70   |
| Strength of party ties | 1                           | 7                            | 4.20                                    | 2.47      |  |
| Political efficacy     | 1                           | 5                            | 2.83                                    | 1.06      | $\alpha = 0.85$  |
| Political interest     | 1                           | 5                            | 2.85                                    | 1.53      |  |
| Informational use      | 1                           | 5                            | 2.69                                    | 0.97      | $\alpha = 0.80$  |
| Relational use         | 1                           | 5                            | 3.30                                    | 1.02      | $\alpha = 0.77$  |
| Recreational use       | 1                           | 5                            | 3.08                                    | 0.96      | $\alpha = 0.76$  |
| Weak-tie contacts      | 0                           | 20                           | 4.29                                    | 2.55      |  |
| Crosscutting exposure  | 1                           | 4                            | 2.23                                    | 1.02      | $\alpha = 0.73$  |
| Civic engagement       | 1                           | 5                            | 2.68                                    | 1.25      | $\alpha = 0.80$  |

*Political interest* was assessed on a five-point scale by asking respondents how much they are interested in political affairs ( $M = 2.85$ ,  $SD = 1.53$ ). *Strength of party ties* was measured on a seven-point scale ranging from 1 (very weak) to 7 (very strong) ( $M = 4.20$ ,  $SD = 2.47$ ). Following Craig et al. (1990), *political efficacy* was assessed on a five-point agree/disagree scale with the following three items:

- 1 I consider myself well-qualified to participate in politics
- 2 I feel that I have a pretty good understanding of the important political issues facing our country
- 3 I think that I am as well informed about politics and government as most people ( $\alpha = 0.85$ ,  $M = 2.83$ ,  $SD = 1.06$ ).

This study also controlled for *offline* and *online political talk*, which are closely related to civic engagement (Nisbet and Scheufele, 2004). Drawing upon Gil de Zúñiga et al.

(2014b) and Pan et al. (2006), offline political talk was measured on a five-point scale by asking during the last two weeks how often respondents talked about politics face to face or over the phone with:

- 1 friends
- 2 family
- 3 acquaintances ( $\alpha = 0.78$ ,  $M = 2.13$ ,  $SD = 1.28$ ).

Online political talk was assessed on a five-point scale by asking respondents during the last two weeks how often they talked about politics:

- 1 on a web site
- 2 via an e-mail (Spearman Brown coefficient = 0.70,  $M = 2.49$ ,  $SD = 1.39$ ).

**Table 3** Partial correlation among mobile phone usage types, crosscutting exposure, weak-tie contacts, and civic engagement

|                         | 1 | 2    | 3     | 4       | 5       | 6       |
|-------------------------|---|------|-------|---------|---------|---------|
| 1 Informational use     | - | 0.05 | -0.01 | 0.17*** | 0.06    | 0.22*** |
| 2 Relational use        |   | -    | 0.06  | 0.03    | 0.06    | 0.04    |
| 3 Recreational use      |   |      | -     | 0.12*   | 0.10*   | 0.05    |
| 4 Crosscutting exposure |   |      |       | -       | 0.25*** | 0.10*   |
| 5 Weak-tie contacts     |   |      |       |         | -       | 0.15*   |
| 6 Civic engagement      |   |      |       |         |         | -       |

Notes: Cell entries are partial correlation coefficients, controlling for age, gender, education, income, news exposure, political interest, political efficacy, strength of party ties, offline political talk, and online political talk. \* $p < 0.05$ , \*\*\* $p < 0.001$ .  $N = 1,505$ .

### 3.3 Data analysis

To test the research question and hypotheses, a series of hierarchical ordinary least squares (OLS) regressions were run in which the independent variables were entered in the model in blocks. To test moderation effects (H4, H5, H6, H7, and RQ1), interaction terms were created. To prevent the potential problems with multi-collinearity between interaction terms and their components, all of the variables were centred before being used to create interaction terms (Aiken et al., 1991).

## 4 Results

This study expected a positive association between informational use and crosscutting exposure (H1) and between recreational use and crosscutting exposure (H3). Both hypotheses received support ( $\beta = 0.21$ ,  $p < 0.001$ ;  $\beta = 0.09$ ,  $p < 0.05$ , respectively). But use of the mobile phone for relationship maintenance had a negative, though insignificant, association with crosscutting exposure (H2,  $\beta = -0.02$ ).

**Table 4** Results of hierarchical regression predicting civic engagement

|                               | <i>Crosscutting exposure</i><br>( <i>N</i> = 1,518) | <i>Civic engagement</i><br>( <i>N</i> = 1,505) |
|-------------------------------|---|--|
| Control variables             |   |  |
| Age                           | -0.05   | 0.05   |
| Gender (0 = male, 1 = female) | 0.03  | 0.04   |
| Education                     | 0.05  | 0.07   |
| Household income              | -0.03   | 0.04   |
| News exposure                 | 0.11*   | 0.12**   |
| Offline political talk        | 0.13**  | 0.11*  |
| Online political talk         | 0.15***   | 0.09*  |
| Strength of party ties        | -0.07*  | 0.08*  |
| Political efficacy            | 0.15***   | 0.23***  |
| Political interest            | 0.10*   | 0.28***  |
| <i>R</i> <sup>2</sup>         | 5.6%  | 9.8%   |
| Mobile phone use              |   |  |
| Informational use             | 0.21***   | 0.17***  |
| Relational use                | -0.02   | -0.04  |
| Recreational use              | 0.09*   | -0.02  |
| Inc. <i>R</i> <sup>2</sup>    | 12.5%   | 11.2%  |
| Weak-tie networks             |   |  |
| Weak-tie contacts             | 0.26***   | 0.11*  |
| Inc. <i>R</i> <sup>2</sup>    | 4.5%  | 3.5%   |
| Crosscutting exposure         |   |  |
| Crosscutting exposure         |   | 0.13**   |
| Inc. <i>R</i> <sup>2</sup>    |   | 6.1%   |
| Total <i>R</i> <sup>2</sup>   | 22.6%   | 30.6%  |

Notes: Cell entries are standardised coefficients. \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ .

In terms of the direct relationship between mobile phone use and civic engagement, only informational use had a positive link ( $\beta = 0.17$ ,  $p < 0.001$ ), while relational use and recreational use had null associations ( $\beta = -0.04$ ;  $\beta = -0.02$ , respectively). As shown in Table 5, the interaction effect between informational use and crosscutting exposure is significant (H4,  $\beta = 0.09$ ,  $p < 0.05$ ), meaning that those who use mobile phones frequently for information seeking and expression are more likely to engage in civic affairs when they encounter more dissimilar viewpoints on their mobile phone. Also, the interaction effect between recreational use and crosscutting exposure was statistically significant (H6,  $\beta = 0.08$ ,  $p < 0.05$ ). Crosscutting exposure did not moderate the relationship between relational use and civic engagement (H5,  $\beta = 0.04$ ).

H7 (the moderation role of weak ties between mobile phone use and civic engagement) received support (Table 5). The relationship between mobile phone use and civic engagement was stronger among those who have greater weak-tie contacts,

regardless of usage types (informational use  $\times$  weak ties,  $\beta = 0.11$ ,  $p < 0.05$ ; relational use  $\times$  weak ties,  $\beta = 0.08$ ,  $p < 0.05$ ; recreational use  $\times$  weak ties,  $\beta = 0.09$ ,  $p < 0.05$ ).

H8 proposed a positive association between weak-tie contacts and crosscutting exposure, and this hypothesis was supported,  $\beta = 0.26$ ,  $p < 0.001$  (Table 4). The three-way interaction among mobile phone use, crosscutting exposure, and weak-tie contacts (RQ1,  $\beta = 0.11$ ,  $p < 0.05$ ) indicates that using the mobile phone for information/expression purposes is closely tied to greater involvement in civic affairs primarily among those who are exposed to diverse viewpoints and have wider weak ties on their mobile phone (Table 6).

**Table 5** Interactions between mobile phone use and crosscutting exposure/weak-tie contacts

|  | <i>Civic engagement</i> |
|--|-------------------------|
| Prior blocks ( $R^2$ )                           | 30.6%                   |
| Informational use $\times$ Crosscutting exposure | 0.09*                   |
| Relational use $\times$ Crosscutting exposure    | 0.04                    |
| Recreational use $\times$ Crosscutting exposure  | 0.08*                   |
| Informational use $\times$ Weak-tie contacts     | 0.11*                   |
| Relational use $\times$ Weak-tie contacts        | 0.08*                   |
| Recreational use $\times$ Weak-tie contacts      | 0.09*                   |
| Inc. $R^2$                                       | 3.2%                    |
| Total $R^2$                                      | 33.8%                   |

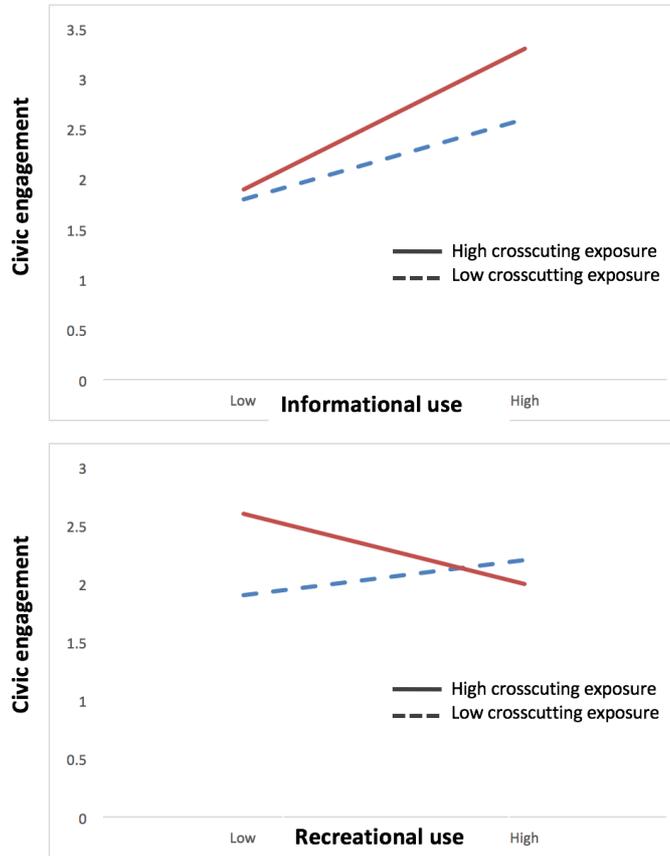
Notes: Prior blocks include age, gender, education, income, news exposure, political interest, political efficacy, strength of party ties, offline political talk, online political talk, informational use, relational use, recreational use, weak-tie contacts, and crosscutting exposure. Cell entries are standardised coefficients after controlling for prior blocks. \* $p < 0.05$ .  $N = 1,505$ .

**Table 6** Interactions between informational use, crosscutting exposure and weak-tie contacts

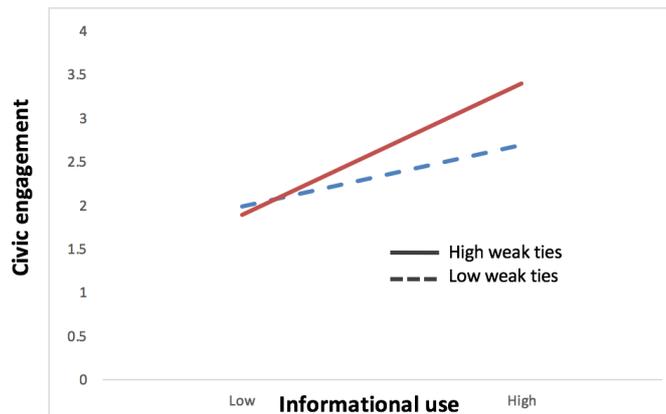
|   | <i>Civic engagement</i> |
|---|-------------------------|
| Prior blocks ( $R^2$ )  | 33.8%                   |
| Informational use $\times$ Crosscutting exposure $\times$ Weak-tie contacts | 0.11*                   |
| Relational use $\times$ Crosscutting exposure $\times$ Weak-tie contacts    | 0.02                    |
| Recreational use $\times$ Crosscutting exposure $\times$ Weak-tie contacts  | 0.03                    |
| Inc. $R^2$  | 0.8%                    |
| Total $R^2$   | 34.6%                   |

Notes: Prior blocks include age, gender, education, income, news exposure, political interest, political efficacy, strength of party ties, offline political talk, online political talk, informational use, relational use, recreational use, weak-tie contacts, crosscutting exposure, informational use  $\times$  crosscutting exposure, relational use  $\times$  crosscutting exposure, recreational use  $\times$  crosscutting exposure, informational use  $\times$  weak-tie contacts, relational use  $\times$  weak-tie contacts, and recreational use  $\times$  weak-tie contacts. Cell entries are standardised coefficients after controlling for prior blocks. \*\* $p < 0.01$ .  $N = 1,505$ .

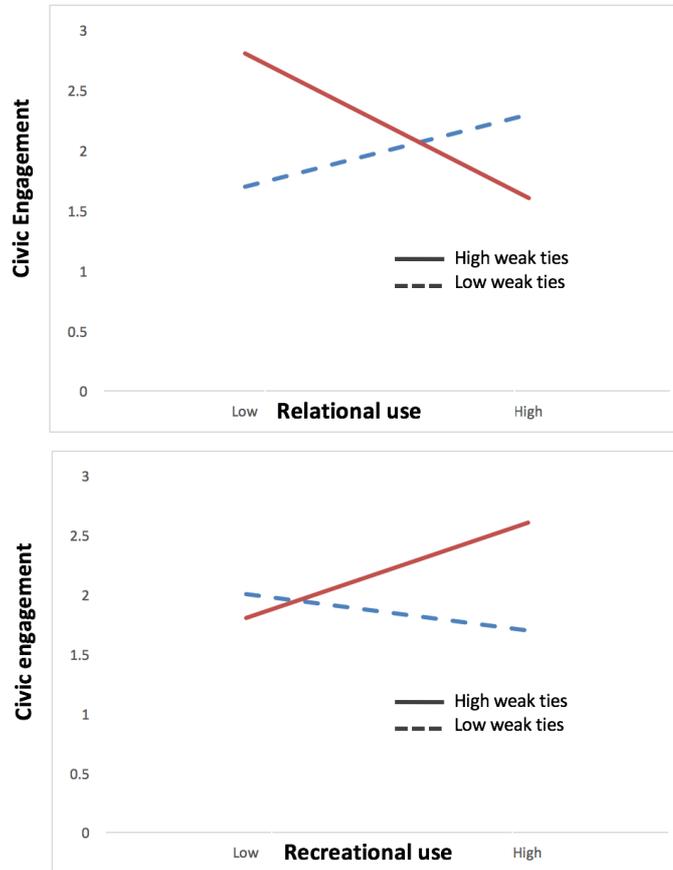
**Figure 2** The interaction between mobile phone use and crosscutting exposure in predicting civic engagement (see online version for colours)



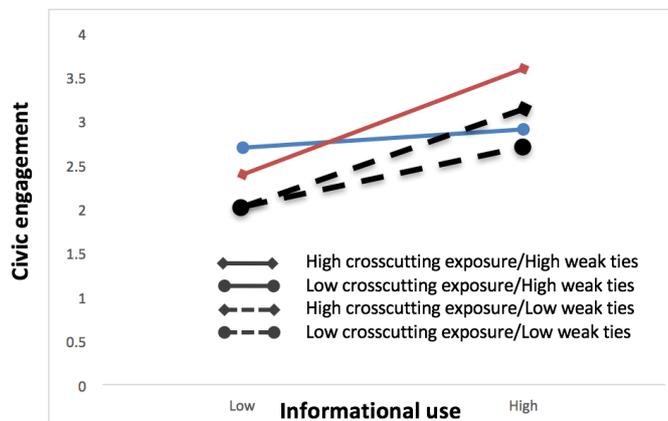
**Figure 3** The interaction between mobile phone use and weak-tie contacts in predicting civic engagement (see online version for colours)



**Figure 3** The interaction between mobile phone use and weak-tie contacts in predicting civic engagement (continued) (see online version for colours)



**Figure 4** Predicting civic engagement from the interaction between informational use and crosscutting exposure as moderated by weak-tie contacts (see online version for colours)



## 5 Discussion

The purpose of this study is to examine the role of crosscutting exposure regarding civic engagement in the context of mobile communication. Theories of deliberative democracy posit that exposure to dissonant viewpoints is critical in shaping democratic citizenship (Benhabib, 1992; Habermas, 1989). However, existing findings are divided as to whether contemporary digital media are positively related to crosscutting exposure, and whether crosscutting exposure has a significant link to civic engagement. Considering that the mobile phone is one of the most commonly used media for civic or political involvement (Campbell and Kwak, 2011; Martin, 2016), this study argues that examining what roles crosscutting exposure plays in connecting mobile phone use to civic engagement is a timely matter with significant theoretical and practical implications.

The current study makes four conceptual and methodological contributions to the crosscutting exposure theory. First, this study differs methodologically from prior studies that focused on political predispositions as a prime variable that explains exposure to or avoidance of crosscutting viewpoints (Galston, 2002; Mutz, 2002b; Stroud, 2010). Instead, this study is based on the fact that many mobile phone users encounter dissimilar information while they search for information because of their curiosity for, or necessity of, future political discussions (Pingree, 2007). It should also be noted that while people engage in recreational activities via their mobile phone, they accidentally come across dissonant viewpoints or information. Accordingly, besides political predispositions, this study considers mobile phone usage types as an important predictor of crosscutting exposure.

Indeed, the analysis demonstrates a positive association between informational and recreational uses of mobile phones and encountering diverse viewpoints. The positive link between informational use and crosscutting exposure is closely related to the fact that mobile phone users access news or information through keyword search tools or internet portals such as Google and Yahoo (Lee and Kwak, 2016). Such an approach allows mobile phone users to encounter more diverse information than when they consume news through traditional media. Also, information-seeking mobile phone users may not avoid encountering diversity because of the utility of dissonant information for future debate (Pingree, 2007). Always-on connectivity of the mobile phone make users feel the necessity of being prepared for conversations that may take place at any moment.

The positive association between recreational use of the mobile phone and crosscutting exposure can be partly explained by the *inadvertency thesis*, which posits that the changing structural boundaries of the contemporary online public sphere allow individuals to inadvertently expose themselves to differing opinions (Brundidge, 2010). People encounter unintended public affairs information while engaging in recreational activities using their mobile phone (Hwang and Shim, 2010). Informal associations via mobile communication encourage individuals to be receptive to information about public issues (Kwak et al., 2004). Considering that the mobile phone is a highly multimodal medium, one that possesses the characteristics of numerous other media and has become an indispensable tool in today's life, incidental exposure to dissimilar information may take place while users seek entertainment on their mobile phone.

However, the analysis shows no positive association between relational use of the mobile phone and crosscutting exposure. This is in part because communication with close-knit ties takes away the opportunity to encounter dissonant viewpoints.

Concentrating on communication with small networks and like-minded others may be an indicator of social ‘privatism’ – or a withdrawal into a more private world of family and friends (Fischer, 2005). This form of social withdrawal resonates with the proposition that intensive mobile communication among a small number of close friends and family members can lead to insularity (Habuchi, 2005; Ling, 2008) or monadic clusters (Gergen, 2008).

A second theoretical contribution of the current study is that it reveals nuanced mechanisms by which crosscutting exposure works between mobile phone usage types and civic engagement. Prior studies focused either on the relationship between general media use and crosscutting exposure or on the association between crosscutting exposure and civic engagement. Few studies considered all the three variables simultaneously.

The present study found that informational or recreational users are more likely to partake in civic activities such as volunteering for non-political groups and attending a meeting to discuss neighbourhood problems when they encounter diverse political views via their mobile phone. This finding indicates that crosscutting exposure plays a crucial role in raising mobile phone users’ awareness of civic matters. This outcome is meaningful for two reasons. First, given that digital media increasingly provide more diverse information and perspectives, their role as a civic engagement motivator deserves more attention than in any other time. Particularly, smartphones equipped with an increasing number of embedded media are expected to change the dynamics of civic engagement (Martin, 2016). Second, it should be noted that incidental exposure to dissonant information could be an important factor in explaining contemporary civic engagement. Passing time or entertainment seeking may end up engaging in civic matters through accidental encountering of dissimilar viewpoints, which broadens the scope of attention to civic affairs beyond personal interests (Hurtado and DeAngelo, 2012). Considering that many young adults of today are increasingly disengaged from the public process (Snell, 2010), this study’s finding suggests a practical and promising hope for the mobile phone’s role for democracy.

A third contribution of this study lies in the finding of the moderating role of weak ties. The number of weak-tie contacts moderated the impact of informational, relational, and recreational uses of the mobile phone on civic engagement. The analysis also found a three-way interaction effect; that is, the group of people who consume more information, encounter more diverse viewpoints and have larger weak-tie networks, are those who participate most actively in civic affairs.

Implied in the finding of the pro-social role of weak-tie connection is the benefit of having access to diverse groups of people and novel, non-redundant information. People with larger weak-tie contacts also have deeper understanding of civic affairs than people with smaller weak-tie contacts because large weak ties can offer more opportunities to develop civic consciousness (Gastil and Dillard, 1999; Klofstad, 2007). Son and Lin (2008) found that weak ties are more effective than strong ties for citizen engagement in civic activities. In addition, individuals who have more frequent contact with weak ties have more probabilities of being recruited to participate (Kotler-Berkowitz, 2005). Following these rationales, weak ties should reinforce the effects of informational use of the mobile phone on civic participation. It should be noted that weak-tie contacts played a significant moderating role even in relational and recreational uses of the mobile phone. Accordingly, the mobile phone, regardless of different usage types, can provide a meaningful opportunity to meet diversity and engage in civic processes if users have large weak-tie communication networks. The significant three-way interaction offers

evidence that when civic engagement is constructed through mobile communication, having a relatively large weak-tie network is an important trigger for the benefits of heterogeneity to play out in a constructive way.

Lastly, this study is one of the first attempts to examine how the crosscutting exposure theory can be applied to mobile communication. Researchers have investigated the relationship between mobile phone use and civic/political engagement (e.g., Kwak et al., 2011; Martin, 2016), but few studies treated crosscutting exposure as a major theoretical construct. Several studies probed the relationship between digital media use and crosscutting exposure, but they focused on either political use of social networking sites (e.g., Kim, 2011) or internet use in general (e.g., Brundidge, 2010). Surprisingly, few studies exist that examined the intertwined connections between mobile phone uses, crosscutting exposure, and civic engagement.

In addition to the four theoretical contributions, this study also has practical implications. The finding that informational and recreational use of the mobile phone is significantly associated with exposure to dissonant viewpoints has important implications for the mobile phone industry, educators, or civic organisations. For example, mobile phone developers may learn from this study about how certain embedded modes of communication or functions of the mobile phone could be beneficial for users to engage in the public process. Educators may consider utilising the mobile phone in courses about civic engagement and democracy. For governments, this study provides practical ideas about how the society can boost citizen engagement in civic and public affairs.

Although this research was conducted in one of the most wired countries on the planet, this study's findings may be generalised to other nations. As of 2016, the average number of mobile phone subscriptions per 100 people around the globe is 101.55 (The World Bank, 2017). Considering that the mobile phone is deeply integrated into our daily life across the world, this study's findings can be applicable to other societies.

### *5.1 Limitations and future research*

Several caveats invite us to be cautious when interpreting the findings. The nature of the cross-sectional data may not be well-suited for testing cause-effect relationships. To ensure causality among variables, a panel survey should be conducted. Another limitation lies in the need to consider more diverse types of mobile phone use, such as social utility, instrumentality (Wei, 2008), or convenience (Liu, 2009). Future research should also examine how mobile phone use interacts with a variety of network characteristics such as network diversity and how these characteristics influence civic engagement. Lastly, this study did not find a moderating effect of crosscutting exposure between relational use of the mobile phone and civic engagement, and a three-way interaction effect was observed only from the relationship between informational use of the mobile phone and civic engagement. Future research should take more fine-grained approaches to resolve such inconsistencies.

### *5.2 Conclusions*

Limitations notwithstanding, this study advances the theory of crosscutting exposure by illuminating how distinct types of mobile phone use are associated with people's level of exposure to dissonant viewpoints, the characteristic of their weak-tie phone contacts, and

the ways individuals engage in civic life. Informational and recreational uses of the mobile phone predicted crosscutting exposure. Crosscutting exposure moderated the relationship between mobile phone use (informational and recreational) and civic engagement, and weak ties moderated the association between all three modes of mobile phone use and civic engagement.

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**Notes**

- 1 Some authors argue that political consumerism is also a civic behaviour rather than just a political activity geared to influencing the government or political institutions (see Gil de Zúñiga et al., 2014a).

**Appendix**

**Table A1** Survey questions

*Age:* what is your age?

*Gender:* what is your gender? 1. Male 2. Female

*Education:* what is the highest degree or level of school you have completed?

1. Middle school or less
2. High school
3. Two-year college
4. Four-year college
5. Graduate degree

*Household income:* what was your total household income before taxes in 2013?

- |                               |                               |                                |
|-------------------------------|-------------------------------|--------------------------------|
| 1. KRW 2,000,000 or less      | 2. KRW 2,000,001 to 3,000,000 | 3. KRW 3,000,001 to 4,000,000  |
| 4. KRW 4,000,001 to 5,000,000 | 5. KRW 5,000,001 to 6,000,000 | 6. KRW 6,000,001 to 7,000,000  |
| 7. KRW 7,000,001 to 8,000,000 | 8. KRW 8,000,001 to 9,000,000 | 9. KRW 9,000,001 to 10,000,000 |
| 10. KRW 10,000,001 or more    |                               |                                |

*News exposure:* during the last week how often did you consume news about current events or public issues from (1) network television, (2) cable TV, (3) daily newspapers, (4) web-only newspapers, and (5) news aggregators (for example, Daum news, Naver news)?

1. Never
2. Rarely
3. Sometimes
4. Often
5. Very often

*Offline political talk:* during the last two weeks how often did you talk about politics face to face or over the phone with (1) friends, (2) family, and (3) acquaintances?

1. Never
2. Rarely
3. Sometimes
4. Often
5. Very often

*Online political talk:* during the last two weeks how often did you talk about politics on a (1) web site, and (2) over an e-mail?

*Strength of party ties:* how strong do you feel about your party ties if you are affiliated with or support any political party?

1. Very weak
2. Weak
3. Somewhat weak
4. Moderate
5. Somewhat strong
6. Strong
7. Very strong

*Political interest:* how much are you interested in politics?

1. Not at all 2. Little 3. Average 4. Much 5. Very much

*Political efficacy:* please indicate how much you agree with the following statements.

|   | <i>Strongly disagree</i> | <i>Disagree</i> | <i>Neither disagree nor agree</i> | <i>Agree</i> | <i>Strongly agree</i> |
|---|--------------------------|-----------------|-----------------------------------|--------------|-----------------------|
| I consider myself well-qualified to participate in politics   |                          |                 |                                   |              |                       |
| I feel that I have a pretty good understanding of the important political issues facing our country |                          |                 |                                   |              |                       |
| I think that I am as well informed about politics and government as most people                     |                          |                 |                                   |              |                       |

*Types of mobile phone use:* during the last month how often did you engage in the following activities via your mobile phone?

|  | <i>Not at all</i> | <i>Rarely</i> | <i>Sometimes</i> | <i>Regularly</i> |
|--|-------------------|---------------|------------------|------------------|
| <b>Informational use</b>   |                   |               |                  |                  |
| I went online to read opinions of others regarding social issues   |                   |               |                  |                  |
| I accessed news  |                   |               |                  |                  |
| I went online to share news  |                   |               |                  |                  |
| I called others to discuss social matters                          |                   |               |                  |                  |
| <b>Relational use</b>  |                   |               |                  |                  |
| I called friends or family to be social                            |                   |               |                  |                  |
| I sent texts or instant messages to friends or family to be social |                   |               |                  |                  |
| I e-mailed friends or family to be social                          |                   |               |                  |                  |
| <b>Recreational use</b>  |                   |               |                  |                  |
| I went online to upload entertaining content                       |                   |               |                  |                  |
| I went online for games and other forms of entertainment           |                   |               |                  |                  |
| I browsed the web just for fun                                     |                   |               |                  |                  |

*Crosscutting exposure:* during the past three months how often were you exposed to socially or politically disagreeing messages on your mobile phone via (1) texting including instant messaging, (2) web searching, (3) social media use?

1. Never 2. Rarely 3. Sometimes 4. Regularly

*Weak-tie contacts:* please estimate the number of non-family members, acquaintances or unfamiliar people with whom you communicated about social or political affairs via your mobile phone during the last two weeks.

*Civic engagement:* during the past three months how often did you participate in the following activities?

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|   | <i>Not at all</i> | <i>Rarely</i> | <i>Sometimes</i> | <i>Often</i> | <i>Very often</i> |
|---|-------------------|---------------|------------------|--------------|-------------------|
| I worked or volunteered for non-political groups, such as a community project                       |                   |               |                  |              |                   |
| I attended a meeting to discuss neighbourhood problems  |                   |               |                  |              |                   |
| I raised money for a charity or participated in a run/walk/bike for charity                         |                   |               |                  |              |                   |
| I bought a certain product or service because I like the social or political values of the company  |                   |               |                  |              |                   |
| I banned a product or service because I disagree with the social or political values of the company |                   |               |                  |              |                   |

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