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Facebook is no "great equalizer": A big data approach to understand gender differences in Facebook liking practices concerning civic engagement

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Abstract

Facebook is expected to facilitate more equal participation in civic engagement across genders and countries. With the use of a big data tool (Wisdom), we explored gender disparities in various *Facebook liking practices* concerning expressions of civic engagement among 21,706,806 Facebook users in ten countries across Asia, Africa, the Americas, and Europe. We observed distinct patterns with regard to civic and political expressions on Facebook, with males drawn more toward politically and information-oriented liking practices as compared to females. Moreover, females (aged 13–28 years) in Europe and the Americas are more likely than males to support humanitarian aid and environmental issues on Facebook. This latter finding was not evident in Asia and Africa, where males are more active in liking all forms of civic expressions on Facebook. In conclusion, this study shows that the gender differences in civic engagement that exist offline to a large degree are replicated and reinforced on Facebook.

Keywords

Facebook, likes, civic engagement, cross-country perspective, gender expression, big data

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Civic engagement—"the degree to which people become involved in their community" (Quan-Haase & Wellmann, 2004, p. 135)—is a key feature of functioning democracies (Putnam, 2000; Valenzuela, Park & Kee, 2009). Gender equality related to civic engagement is therefore clearly essential in the sense that it secures human rights and social justice for all genders (United Nations, 2002). Nevertheless, research on offline civic engagement has revealed a significant gender difference weighted against women (Burns, 2007; Curran et al., 2014; Verba, Burns & Schlozman, 1997). Research also indicates that women are "information poor" because of the disabling effects of the

digital exclusion of women (Törenli, 2006), known as the “gendered digital divide” (Kennedy, Wellman & Klement, 2003).

Interestingly, online communication is a rapidly growing force in civic engagement (Rainie, Smith, Schlozman, Brady, & Verba, 2012) and expected to equalize the power relationship between the sexes (Herring, 2003). In particular, extensive research by various scholars indicates that social media, such as Facebook and Twitter, could be useful tools in closing this gendered divide (Ali, 2011; Xenos, Vromen & Loader, 2014). Xenos et al. (2014) label social media as “the great equalizer” that transforms existing patterns of social inequality by lowering the threshold for civic engagement for all people. Despite the potential for more equal participation among women and men and the increasing importance of social media sites, such as Facebook, to spread political ideas and promote community interaction on civic topics (Haciyakupoglu & Zhang, 2015; Warren, Sulaiman & Jaafar, 2014; Xenos et al., 2014), few studies have been able to demonstrate a description of the actual level of gender differences in various forms of civic expressions on Facebook or if this form of engagement only replicates offline civic engagement. Many of these Facebook studies have been incomplete because of a limited scope in sample sizes as well as in the number of countries investigated (Caers et al., 2013).

In this study we take a broader scope than previous Facebook research by looking into how any gender disparity is distributed across a range of countries in various forms of civic and political expressions reflected in their different Facebook liking practices, for example, their liking practices concerning politicians (i.e., *Barack Obama* fan page), political information (i.e., *PolitiFact* fan page), or humanitarian pages (i.e., *Amnesty* and *International Red Cross* fan pages). Paxton, Kunovich and Hughes (2007) recommend a broad approach comparing women's participation across countries. This might help us achieve a fuller understanding of the participation and power structures between genders in society and the nature of their interaction in a cross-country perspective. Defined in this context, we understand gender with reference to social and cultural group differences between males and females and how people choose to identify themselves as female or male when they sign up to Facebook.

Additionally, we introduce a new method for studying Facebook users that allow data collection from a large sample of Facebook users across ages and countries, by applying a big data analytic tool called Wisdom. More specific, this tool enabled us to extract data on the liking practices on Facebook (Facebook like button) from an extensive sample; we investigated 21,706,806 Facebook users in several different countries across four continents (Africa, Asia, the Americas, and Europe).

In this paper we define civic engagement on Facebook as “action in response to societal needs, in the form of supportive, deliberative, and collaborative practices in social media” (Brandtzaeg, Følstad & Mainsah, 2012, p. 67). In particular, the present study focuses on *supportive practices*, understood as expressions of civic engagement involving easy-to-use features similar to the Like button on Facebook. By identifying the preferences and frequency of choices for Facebook likes, we gauge the extent to

which men and women actively select different types of expressions of civic engagement (Gil de Zúñiga, Molyneux & Zheng, 2014) in a cross-country perspective.

People use different forms of social media on the basis of the gratifications those media fulfill (Quan-Haase & Young, 2010); this is the case also in regard to civic engagement (Hacıyakupoglu & Zhang, 2015). However, this study approach relies solely on Facebook and Facebook likes. There is a strong rationale for these choices: First, Facebook is in a category by itself on the Internet, being the largest social media site in the world owing to its over 1.3 billion active users (Statista, 2014). Internet users spend a large amount of their time online on Facebook. Facebook users in the US, for example, spend around 40 minutes each day using Facebook (Techcrunch, 2014). Facebook is also an important site to express civic issues by the use of different communication means (Brandtzaeg & Haugstveit, 2014; Gil de Zúñiga et al., 2014; Warren et al., 2014). Moreover, Facebook has been found to be more efficient and trustworthy for civic engagement compared to other social media, for example, by Gezi protesters in Turkey (Hacıyakupoglu & Zhang, 2015),

Second, the Like button, introduced by Facebook in 2009, is the most commonly used feature on Facebook (Eranti & Lonkila, 2015). Likes are used for several different purposes, including sports, entertainment, social interaction, and civic expressions. Facebook likes have therefore been shown to be reliable predictors of a variety of attributes, such as happiness, ethnicity, religious and political views, sexual orientation, and a spectrum of personality traits (Kosinski, Stillwell & Graepel, 2013). It has also been suggested that the growing importance and use of Facebook likes might affect people's social awareness to participate in new forms of civic engagement and, therefore, create opportunities for collective action (Brandtzaeg & Haugstveit, 2014).

Our big data approach (i.e., lots of digital data combined with new storage and processing technologies) can help media and communication studies to gain a more accurate identification of user behavior on Facebook. In addition, the approach provides an opportunity to leverage the knowledge of liking practices in different types of civic issues on Facebook and thus has the potential to improve both accuracy and scope over existing traditional methods, such as survey questionnaires. Despite this, research on large amounts of data extracted from Facebook has been limited. In this study, we therefore contribute to the increasing need for a broader scope in Facebook user studies (e.g., Caers et al., 2013) by the use of big data analytics recording Facebook likes data.

In the following, we first define and discuss the concept of civic engagement in social media and how civic engagement is related to Facebook likes. Second, we offer an explanation of the gender divide in civic engagement both offline and online and consider related theory. Third, we explore possible gender differences empirically, taking a cross-country perspective on different types of Facebook liking practices concerning civic expressions. We find that there exists a large gender difference. Contrary to the expectations that social media is a "great equalizer," we conclude that gender differences evident offline in relation to civic engagement are mirrored in

Facebook. Finally, we discuss these results, limitations, and implications for both research and practice.

Theoretical background and definitions

Civic engagement and Facebook likes

As highlighted by Eranti and Lonkila (2015) the Like button on Facebook has important political implications and uses. A Pew study (Rainie et al., 2012) found that 38% of social media users in the USA have liked or promoted material related to politics or social issues. Supporting a petition or a cause on Facebook by liking it requires less time and effort than joining a demonstration on the street (Jugert, Eckstein, Noack, Kuhn, & Benbow, 2013). The ease of expressing civic engagement on Facebook might therefore lead to more equal involvement and less gender differences concerning expressions of civic engagement (Xenos et al., 2014). Similarly, Eranti and Lonkila (2015) suggest that the Like button may play a role in the dispersion of civic engagement and lower the threshold for online participation with offline consequences.

In order to understand the role of liking practices concerning civic engagement and gender disparities, we need to understand what we mean by civic engagement in relation to Facebook likes. Yet, there is much confusion in the literature about how we should understand, measure, and define civic engagement on social media. Valenzuela et al. (2009) discuss this topic in-depth and conclude that there is a need for more innovative measures and knowledge concerning new forms of online-mediated civic engagement.

Does the action of liking civic and political pages on Facebook reflect civic engagement or is it only an expression that could be used as a proxy? Liking a civic page on Facebook is only one click away, which means that many such likes might be episodic and supporting only a one-time event; as such this may only include a partial view of the multifaceted understanding of civic engagement described in the literature. Hence, the ease of liking a Facebook social or civic action page has frequently aroused a discussion of whether or not it is real civic engagement or only an expression of civic engagement (Brandtzaeg & Haugstveit, 2014; Eranti & Lonkila, 2015; Gil de Zúñiga et al., 2014) or a typical expression of slacktivism (Christensen, 2011).

The older literature on participation in online communities by Kollok (1999) and Mathwick (2002) suggests that online participation implies engaging in activities that require time and effort, something that the Facebook liking practices do not gauge at all. Liking a page on Facebook does not necessarily imply a subsequent interaction with the page that has been liked. On the other hand, more recent Facebook research indicates that Facebook likes in regards to civic and humanitarian causes represent a meaningful act, where people engage in liking based on the desire to actively help and contribute and a motivation of social responsibility (Brandtzaeg & Haugstveit, 2014).

Based on the previous discussion and as mentioned in the Introduction, in this study we understand civic engagement as an action in response to societal needs that

involves easy-to-use features similar to the Like button on Facebook as *supportive practices* (Brandtzaeg et al., 2012). These supportive practices are expressions of civic engagement and must be seen as different from participation in civic engagement. Yet, these expressions in social media can help people to take real-world actions (see Gil de Zúñiga et al., 2014). For example, Vitak et al. (2011) have found that liking political content on Facebook links to more resource-intensive forms of political participation.

Current and earlier attempts on researching social media use and civic engagement have to a large degree relied on traditional scales of civic and political engagement in offline settings, such as voting or if people have worked or volunteered for nonpolitical or political groups (Quan-Haase & Wellman, 2004; Valenzuela et al., 2009; Wellman, Quan-Haase, Witte, & Hampton, 2001). Most of these studies have not measured how civic engagement is expressed on social media but rather how traditional means of offline civic engagement links to usage of the Internet or social media usage. Studies going beyond traditional scales have typically used surveys, in which the user reports "belonging to either civic or political groups in Facebook" (Valenzuela et al. 2009) or "posting or sharing thoughts about politics" in social media (Gil de Zúñiga et al., 2014). However, few studies have used big data analytics to measure expressions of civic engagement on Facebook.

Facebook liking, as a measure in the present study, is slightly different from being a member of a Facebook group or posting and sharing content on Facebook. The Facebook like button is used by Facebook users to express their association with online content (Kosinski et al., 2013), such as specific comments, pictures, wall posts, status, or fan pages (Gil de Zúñiga et al., 2014). Facebook likes, therefore, involve multiple practices that indicate specific expressions and meanings (Brandtzaeg & Haugstveit, 2014; Eranti & Lonkila, 2015). Thus, from the perspective of behavioral measurement or big data analytics, Facebook likes are said to be a relative basic digital record of human behavior that can be used to estimate a wide range of people's attributes (Kosinski et al., 2013), such as preferences related to humanitarian causes (Brandtzaeg & Haugstveit, 2014) and political expressions (Eranti & Lonkila, 2015).

Against this background, differences in Facebook likes practices might be interesting in the perspective of gender equality and civic expressions since everyone, in theory, can easily participate in such supportive practices by pushing the Like button.

Gender and civic engagement offline

When it comes to civic engagement in the offline sphere, such as voting and membership in political and civic groups, Robert Putnam (2000) found that men, to a considerable degree, dominated offline civic and political participation. Arneil (2003), however, did not support Putnam's findings, claiming that civic and political participation among women has increased over the last few decades as society has become more inclusive of women. Putnam was also criticized for ignoring evolving patterns of participation in society that fall outside traditional associations or

conventional institutional structures (Bennett, 2012), as is often true for online civic engagement (Haciyakupoglu & Zhang, 2015; Warren et al., 2014; Xenos et al., 2014).

The research on offline civic engagement undertaken by Verba et al. (1997), demonstrating that women are less politically interested, informed, and efficacious when compared to men, is still highly influential in this debate. More recent research also finds that men score significantly higher on interest in politics, knowledge of politics, and consumption of news media (Burns, 2007; Dalton, 2008; Paxton et al., 2007), while women are more likely to affiliate with organizations that deal with humanitarian aid and education (Verba et al., 1997) or more social movement-related forms (Hooghe & Stolle, 2004).

Gender and civic engagement online

The research findings on gender and civic engagement online are more ambiguous than the gender differences that are observed offline. The reason for this is the limited scope of samples with regard to age and cross-cultural perspectives (e.g., Caers et al., 2013). There is also a lack of more particular research exploring whether or not Facebook is a "great equalizer" in regard to gender disparities and expressions of civic engagement.

On a general level, use of new technologies finds that males and females differ significantly in their attitudes toward their technological abilities (Brandtzaeg et al., 2011; Hargittai & Shafer, 2006). The observed gender gap in this domain can partly be explained by inequalities in Internet access and usage, leading to "information poverty" where women often fall behind (Inglehart & Norris, 2003); this suggests that the Internet could ultimately deepen existing divides (Norris, 2001). Hence, to some extent, the theory of the digital divide (Norris, 2001, p. 28) offers a framework for examining gender differences in civic engagement online.

Interestingly, the typical characteristics of the gendered digital divide may be in flux since research suggests that more women than men use Facebook in the USA (Duggan & Brenner, 2013) and in Northern Europe (Brandtzaeg, 2012). Although women communicate more frequently on Facebook than men in some regions of the world, the research points to large gender differences, both in usage of Facebook and in terms of the topics discussed (Laudone, 2012; Wang, Burke & Kraut, 2013). From these studies, it appears that women are more likely to comment on personal issues and maintain social connections over Facebook, while men are more likely to post comments on societal or civic topics.

The studies that have examined the gender difference in online civic engagement have reported mixed findings, which may have been the effect of both the type of civic engagement and the age of participants. Some studies have reported stereotypical findings, confirming, for instance, that online civic engagement is replicating offline trends, at least in the case of adolescents (Cicognani, Zani, Fournier, Gavray & Born, 2012). Other studies have found that older girls (over the age of 16) have higher chances of visiting civic websites (Livingstone, Bober & Helsper, 2005). A study targeting adults found that men in general use Twitter more extensively to find political news

(Abraham, Mörn & Vollman, 2010). Similarly, in a British study on blogging, male bloggers are found to be more opinion focused, while female bloggers write in a more personal diary-like way (Pedersen & Macafee, 2007).

As the studies above demonstrate, it is important to consider age when seeking to understand the differences in expressions of civic engagement online among males and females. We could also expect that gender differences are less significant among the younger people known as the Millennials. For example a survey from 2013 found that more than two-thirds of Millennials believe gender no longer defines a person as it once did (Cassandra Gender Report, 2013). Millennials are also found to be early adopters of social media and are often seen as more familiar with the use of social media for the purpose of civic engagement than older generations (Smith & Gallicano, 2015). Despite the importance of age, most studies of civic engagement on Facebook have targeted relatively small samples of teenagers or younger adults, often US college students (Baumgartner & Morris 2010; Valenzuela et al. 2009; Vitak et al., 2011). A recent survey of peer-reviewed articles on the subject of Facebook between 2006 and 2012 (Caers et al., 2013) confirms the limited scope of this research in terms of both sample size and number of countries included in these studies. To this extent, the picture of online civic engagement among older versus younger and male versus female Facebook users is still unclear from a comparative cross-country perspective.

Explanations of gender differences in civic participation

Traditional explanations of gender differences in civic engagement have stressed the role of structural social factors (e.g., parental roles, work status) differentially affecting men's and women's opportunities and resources for participation (e.g., time available to men and women for engagement in civic affairs) (Cicognani et al. 2012). In this context, the theory of the stereotype threat (Steele & Aronson, 1995) offers a framework for examining how women and men are approaching civic engagement differently. This framework explains how gender-related behaviors can lead to self-fulfilling prophecies based on men and women's differing assigned roles in society. Some of these gender stereotypes are even said to be pancultural, which means that psychological characteristics associated with women and men are seen across many cultural groups and countries (Williams, Satterwhite & Best, 1999). We also find that gender equality varies greatly in different countries (Inglehart & Norris, 2003), as documented in the Gender Gap Index in the Appendix (Table A2). The interchangeable activity in online civic engagement between genders may, therefore, differ considerably among countries.

Nevertheless, time, opportunities, status, and resources might not affect expressions of various forms of civic engagement through Facebook likes to the same degree. Presumably, and as stated in the Introduction, civic expressions on Facebook are more accessible and require fewer resources than offline activities. Facebook liking is considered to be one of the most common, easily conducted, and simple forms of activity on Facebook (Eranti & Lonkila, 2015). We know from previous research

(Brandtzaeg et al., 2011; Hargittai, 2010; Hargittai & Shafer, 2006) that demographic characteristics (such as gender), internet skills, and people's interests account for most of the variation in how people spend their time online. However, liking an object (comment, photo, video, page) on Facebook does not require any internet skills related to programming, collaboration, or competences in publishing of text, photo, or video. For this reason, the easiness and basic practices of likes on Facebook related to expressions of civic engagement may not be influenced by the same structural and normative constraints present in face-to-face interactions (Chan & Cheng, 2004). Structural factors refer to the lack of equal opportunities for people to be civically engaged continuously due to time issues or not being present in the physical context. Normative constraints refer to factors such as the social disapproval concerning status and power expectations within civic organizations or gender related that can be barriers to participation. Facebook requires significantly less time, money, and physical effort (Gil de Zúñiga et al., 2014) independently of traditional membership-based civic institutions (Bennett, Wells, & Freelon, 2011). Hence, time, opportunities, and resources might not affect civic engagement through Facebook likes to the same degree as offline activities (Jugert et al., 2013). Facebook, therefore, has the potential to facilitate more equal expressions of civic engagement across genders and countries (Gil de Zúñiga, Jung & Valenzuela, 2012).

Research questions

Our study addresses two main research questions:

- 1) Are there differences between females and males related to various types of liking practices concerning expressions of civic engagement on Facebook?
- 2) Are there gender and age differences in various types of liking practices related to expressions of civic engagement on Facebook from a cross-country perspective?

By answering these research questions, we aim to describe gender differences in online civic and political expressions on Facebook and whether or not there is a consistent gender gap in participation across age and countries in different types of liking behaviors concerning supportive civic practices. In this study we provide deeper insights into the distribution and usage of Facebook likes among men and women as a growing form of civic and political expressions on social media. We also reveal discuss if the gender gap identified in previous research in offline settings is replicated online on Facebook.

The study

We applied a comparative descriptive research design by the use of aggregated Facebook likes data to address the relationship between gender and the distinct types of civic engagement on Facebook. Facebook likes data are ideal for use in a cross-country comparative study as they constitute a language-independent measure; such a measure is expected to be more reliable than a language-based questionnaire because the ability

to translate questionnaires into different languages is a potential limitation (Kohn, 1989). A big data approach may also be more advantageous than sample-based surveys of what people think they did or might do as a means of understanding the complexity of online civic engagement practices (Hale, Margetts & Yasseri, 2013). The purpose of attitudinal research is usually to understand or measure people's stated beliefs, while the present study relies on the actual liking behavior concerning civic and political expressions. This distinction can be summed up by contrasting "what people say" (survey) versus "what people do" (behavioral analytics of big data).

The Facebook like data for this study were aggregated on August 15, 2013, from the big data tool Wisdom, when the total number of Facebook users in the Wisdom network was 21,706,806. These users opted to contribute their data anonymously to the Wisdom network. Wisdom users opted in for both personal and professional reasons as Wisdom hosts different kinds of consumer applications (see Wisdom Professional, 2013, for an overview). The Wisdom application requests user permission for these data to be shared. All user demographic data are based on the information disclosed by the users on Facebook (Wisdom Professional, 2013), and the Wisdom application provides a comprehensive demographic and geographic breakdown of Facebook users by gender, marital status, age, education, metropolitan or rural area, country, and language. Hence, this study is not based on a random sample but on the total population of the Wisdom sample.

The sex distribution in the sample is 52% male and 48% female. The mean age is 33 years (47% are between 13 and 28 years, 38% are between 29 and 45 years, and 14% are over 46 years). Of the participants in the sample, 40% are married, 78% have a college degree, and 80% live in urban areas. Further details of the sample are presented in Tables 1 and 2 (see Table A1).

Index reports integrated with Wisdom data enabled comparisons of the world demographic data from the UN for each country with the data of Facebook and Wisdom (Wisdom Professional, 2013, p. 9, Figure 2). The most notable difference is the mean age in the Wisdom sample (33 years) as compared to the Facebook world statistics (28 years). Data from the ten sample countries included in this study were compared with similar data relating to a real population and the real Facebook penetration (Table A1).

We use the following two samples, described below:

Sample 1: Facebook pages analyzed

First, we explored the age and gender distribution of likes across 18 selected civic engagement sites on Facebook. These Facebook pages and number of likes (globally, both on Facebook and in the Wisdom sample) as of August 15, 2013, are shown in Table 1, categorized by their core civic purpose: 1) political, 2) informational, 3) humanitarian, and 4) environmental.

GENDER DIFFERENCES IN CIVIC EXPRESSIONS ON FACEBOOK

Table 1.

Sample 1: Overview of Facebook pages covered in this study and their number of “likes” globally (at August 15, 2013) (N = 1,036,935).

Facebook page	Number of likes	Age in %			Mean age	N	Country with largest % of fans
		13–28	29–45	46+			
Political							
Barack Obama	36,565,700	50%	37%	13%	32	568,710	USA (63%)
We are all Khaled Said	337,391	51%	36%	13%	32	13,348	Egypt (35%)
The Syrian Revolution	767,270	51%	37%	10%	31	16,253	Egypt (24%)
Occupy Wall Street	419,833	34%	44%	21%	36	44,204	USA (77%)
<i>Diren Gezi Parkıf</i> (Resist Gezi Park)	653,317	42%	54%	4%	31	2,047	Turkey (44%)
Informational							
WikiLeaks	2,293,773	43%	33%	13%	33	137,212	USA (23%)
Wikipedia	1,283,891	65%	28%	7%	29	44,558	USA (24%)
PolitiFact	94,164	17%	43%	40%	43	7,979	USA (96%)
CNNPolitics	111,331	25%	36%	39%	42	9,886	USA (94%)
Al Jazeera Channel	4,149,340	59%	33%	8%	29	45,003	Egypt (24%)
Humanitarian							
Save the Children	506,530	37%	43%	20%	35	19,999	USA (42%)
International Red Cross	164,135	43%	40%	17%	34	5,457	USA (18%)
Plan International	33,561	49%	34%	17%	33	1,915	USA (11%)
Amnesty International	216,233	36%	43%	22%	36	6,995	USA (27%)
Environmental							
WWF	1,250,310	43%	41%	16%	33	38,005	USA (53%)
Greenpeace	1,369,147	41%	42%	17%	34	64,809	USA (20%)
The Rainforest Site	126,428	17%	41%	42%	43	8,525	USA (71%)
Friends of the Earth	27,437	27%	46%	27%	39	2,030	USA (25%)
SUM	49,223,371					1,036,935	

Notes: The last column shows that most of the pages are populated with a large percentage of Facebook users (fans) from the USA. The URLs of the different pages are provided in the appendix.

Our main aim in selecting these 18 different Facebook pages was to cover a representative range of types of political and civic activity globally, as they in principal are accessible to all people on Facebook. Data were chosen to be gathered from both recent and highly influential social movements, such as *We are all Khaled Said*, which played an important role in the Egyptian revolution (Iskander, 2011), and *Diren Gezi Parkıf* (Resist Gezi Park) in Turkey (Hacıyakupoglu & Zhang, 2015). In addition, we selected well-known global humanitarian organizations (e.g., Save the Children) and

GENDER DIFFERENCES IN CIVIC EXPRESSIONS ON FACEBOOK

environmental organizations (e.g., WWF), as well as important and recognized informational sources on politics and civic issues, such as Wikipedia, WikiLeaks, online news sites (such as Al Jazeera and CNN Politics), and the most popular politician in social media (in terms of followers and likes on Facebook)—Barack Obama. News media and information sites like these are sources that enable citizens to engage in participatory activities (Yoo & Gil de Zúñiga, 2014). The total sample of people liking these pages includes Facebook users from all over the world (see Table 1). The sample does not represent any particular country; however, as can be seen from the last column, most users are based in the USA, except a few dominated by people from Egypt or Turkey.

Sample 2: Countries analyzed

The selection of the ten sample countries (Table 2) was motivated by a desire to include countries characterized by low, medium, and high Facebook use as well as representing contrasting cultures from different parts of the world. In addition, these countries had diverse scores in both The Global Gender Gap Index 2012 and The Global Press Freedom Rankings 2013 (Table A2 in the Appendix).

This sample of contrasting nations (Kohn, 1989) made it possible to examine the distinct variations in civic engagement patterns on Facebook across different regions of the world, including Africa (Egypt), the Americas (the USA and Brazil), Asia (India), the Middle East (Iran), Northern Europe (Norway), Central Europe (the UK), Eastern Europe (Poland), Southern Europe (Spain), and a transcontinental country straddling Western Asia and Southeastern Europe (Turkey). Both Egypt and Turkey are of particular interest because social media tools were heavily used during the political protests in those countries in 2011 and 2013, respectively.

Table 2.

Sample 2: Distribution of the total sample by age, gender, college education, and urban residence in % for each of the ten selected countries (N = 8,528,408).

Country	Age group			Mean	Gender	College education	Urban residence
	13-28	29-45	46+		Female		
Norway	41%	43%	15%	33	49%	76%	82%
UK	53%	37%	10%	31	47%	75%	75%
Poland	68%	28%	4%	27	50%	80%	72%
Spain	34%	53%	13%	34	44%	78%	88%
Turkey	38%	49%	12%	34	38%	86%	93%
USA	44%	39%	17%	34	49%	79%	76%
Brazil	44%	44%	12%	32	50%	86%	92%
Egypt	66%	28%	6%	28	33%	85%	95%
Iran	53%	42%	5%	30	40%	87%	95%
India	68%	27%	5%	28	26%	90%	93%

Selection of civic-related psychographic profiles

In a comparative analysis, we used the ten different countries (described above) and the Facebook users' psychographic profiles, which describe users' typical civic engagement on Facebook. Profiling types of civic engagement is made possible by the fact that Wisdom assigns common profiles to Facebook users who have similar interests and activities. In this research, we focused on those users assigned to the two user groups "politics" and "social activist" as these describe central cases of civic engagement. These profiles are built from a clustering algorithm of the user's number of page likes as categorized by Facebook and applied by Wisdom (Wisdom Professional, 2013).

The *social activist* category denotes Facebook users who are fans of four or more pages relating to causes, nonprofit organizations, and nongovernmental organizations; these Wisdom categories are based on the Facebook categorization system. The *social activist* category can be applied to someone supporting humanitarian issues or women's rights, gay rights, black rights, religious rights, workers' rights, environmental concerns, and so on.

The *politics* category denotes Facebook users who are fans of four or more pages relating to political ideologies and politicians representing a variety of political parties across the left–right spectrum. Wisdom relies on Facebook's categorization system, for example, the Barack Obama page is categorized as "politics," and the same applies to all kinds of political parties across the political spectrum, from left to right.

Analysis

To respond to our research questions, we used a comparative approach, comparing the distribution of demographic variables relating to different types of civic engagement (political, informational, humanitarian, and environmental) on Facebook, without regard to causal hypotheses (Grimes & Schulz, 2002). This descriptive approach made it possible to group the data and to present the data in a more meaningful or expressive way in order to facilitate a simpler interpretation of the data concerning gender differences in a cross-cultural perspective. We selected the application Wisdom Professional that enables descriptive and comparative analysis of aggregated Facebook likes data across the Wisdom network as a whole (Wisdom Professional, 2013). The application enables a comparison of various user groups on Facebook based on which Facebook pages users like (e.g., Greenpeace, Barack Obama). This approach differs from "sentiment analysis," which monitors social networks for mentions; Wisdom enables analyzing the data liked by people in Facebook (See Figure A1)

To identify age differences in the liking practices, we broke the sample down into three age groups: 1) 13–28 years (young to young adult); this age group represents the Millennials that grew up in an electronic and increasingly online and socially

networked world. A recent survey also found that this age group considers gender identity to be a more fluid and flexible construct than past generations and, as such, makes it an interesting comparison with the two other age bands (Cassandra Gender Report, 2013); 2) 29–45 (adult); and 3) 46+ (middle aged and senior citizen). These three age groups are the banding applied in all tables and figures.

Since we have the entire Wisdom population in our data set, we know exactly how large the difference between the comparative subsamples is. In some cases, however, with differences less than 20% we used *t*-tests to determine any statistically significant effects for gender, with an alpha level of 0.01. We used both the digital divide framework (Norris, 2001, p. 59) and theory relating to gender-specific preferences (i.e., gender stereotypes) to interpret the findings.

The Wisdom tool used in this study has established ethical guidelines for managing privacy issues. All data are anonymized, and the tool does not allow analyses of small subsamples that could lead to the identification of individual users.

Results

First we will present findings concerning study sample 1 regarding different Facebook pages and civic engagement (Figures 1 and 2). Next, we will present findings concerning sample 2, comparing gender differences among countries and with respect to the two types of engagement—social activists (Figure 3) and politics (Figure 4).

Sample 1: Politics and informational pages

The results in Figure 1 present gender distributions for the five politics-related pages and the five informational pages. Figure 1 clearly shows that males in all three age groups were more active than females in terms of liking these two categories of Facebook pages; the exception was the *Diren Gezi Parkı* protest in Turkey, where 61% of those in the youngest age group were female. The reverse effect was seen in the large gender difference in likes for the Syrian (*Syrian Revolution*) and Egyptian (*We are all Khaled Said*) protest pages, where only 20–30% of Facebook likes were from females. In the *Occupy Wall Street* pages, there was a similar gender pattern, where approximately 30% of women showed their support as compared to 70% men (regardless of age group).

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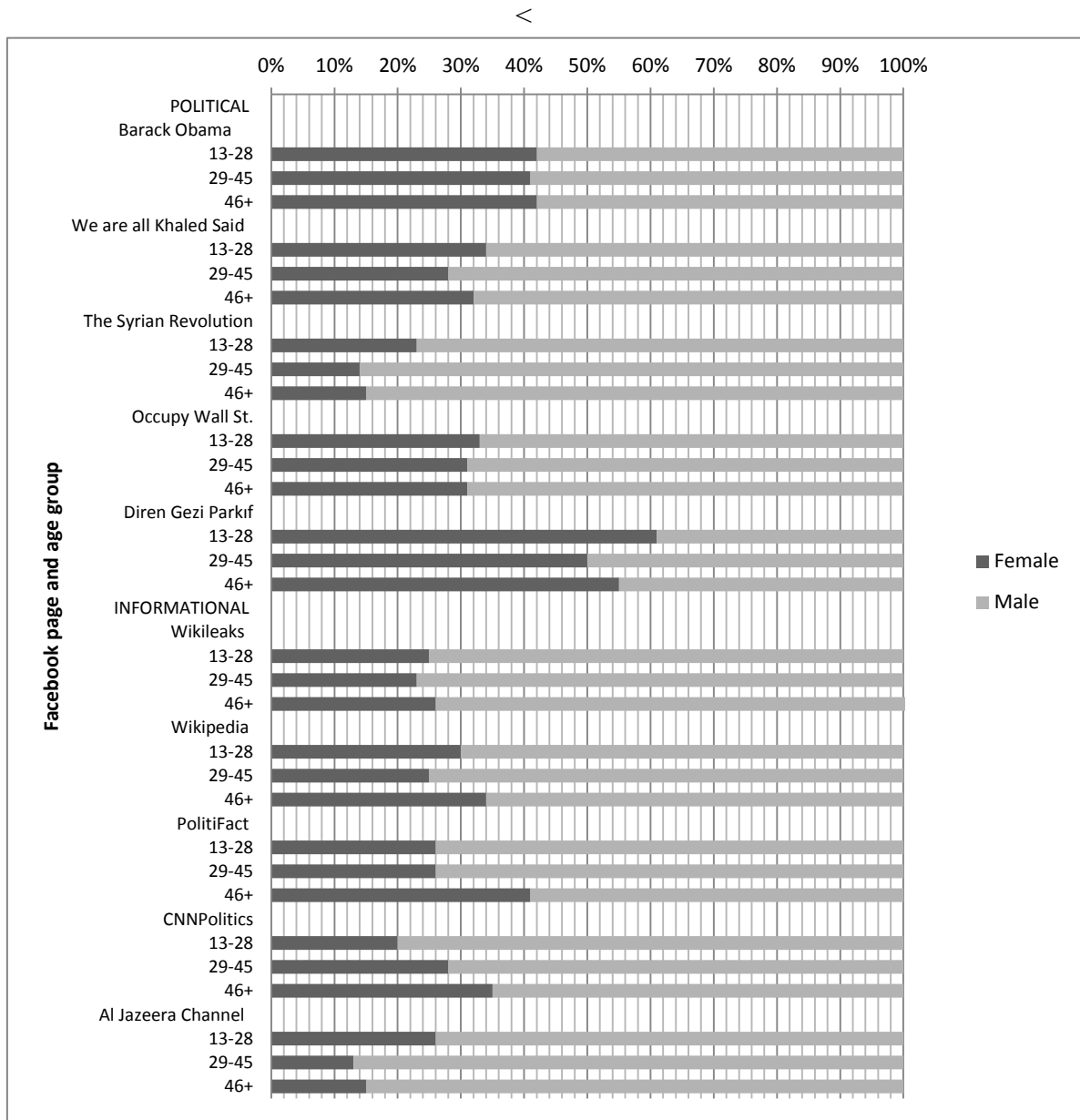


Figure 1. Gender difference (%) in likes of political and informational Facebook pages across three age groups ($N=1,036,935$). Note: Sample characteristics are provided in Table 1 (Sample 1).

This gender-divided pattern was also clear in the five informational pages. More men were found to like Facebook pages relating to both political information (e.g., *Political Fact*, *CNN Politics*) and informational facts (e.g., *Wikipedia*), regardless of age. Among the Millennials, only 25% of women liked *Political Fact*, 29% of women liked *Wikipedia*, and *CNN Politics* was liked by only 20% of all females.

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Sample 1: Humanitarian and environmental pages

Figure 2 shows the gender difference for the four humanitarian pages and the four environmental pages.

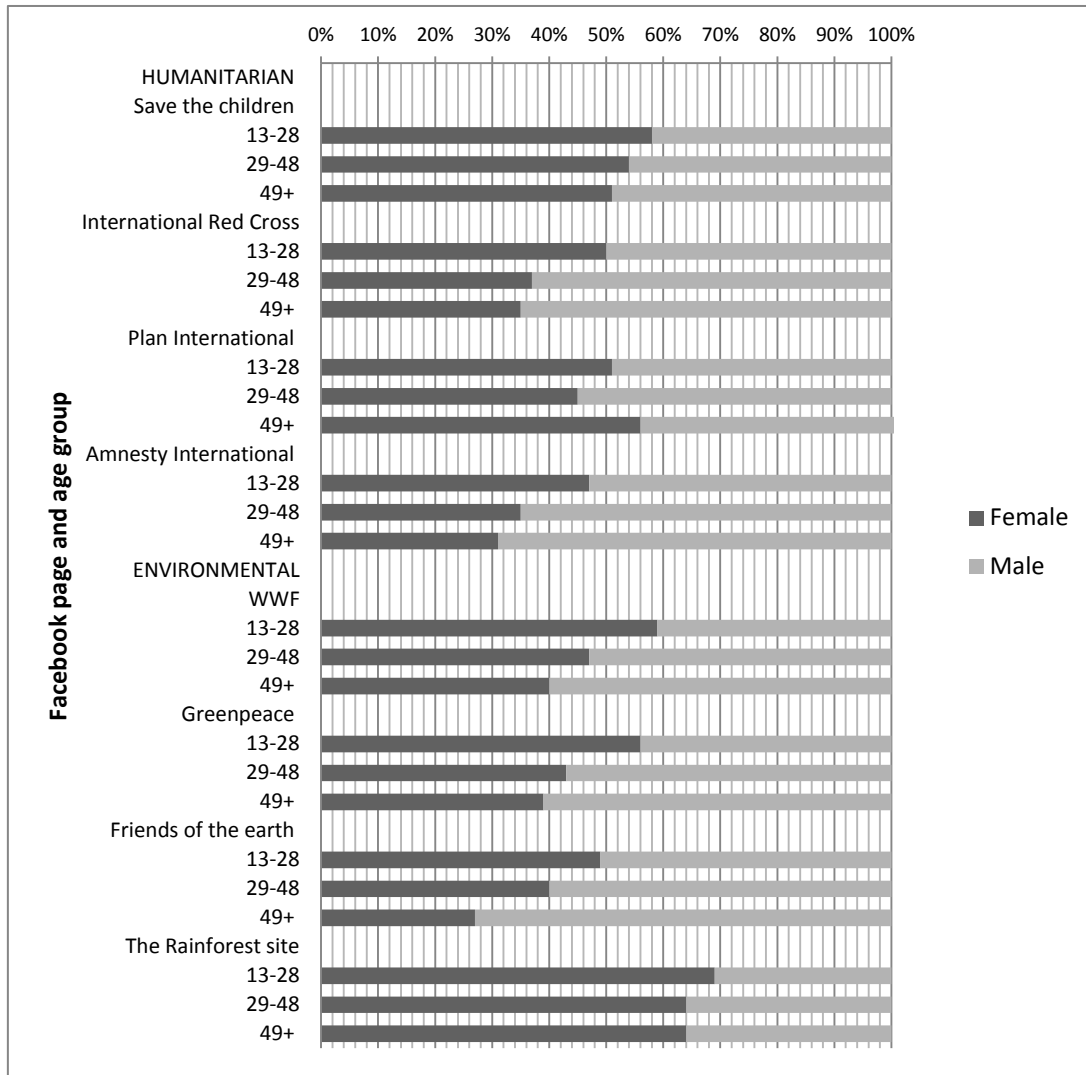


Figure 2. Gender difference (%) in likes of humanitarian and environmental Facebook pages across three age groups ($N=1,036,935$). *Note:* Sample characteristics are provided in Table 1 (Sample 1).

Females were slightly more active than males in liking humanitarian organizations that focus on the welfare of children, such as *Plan International* and *Save the Children*, but the gender differences were smaller than for those for politics and informational-related pages. For example, more females (58%) than males (42%) in the 13–28 age group

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Millennials liked *Save the Children* on Facebook. Conducting a one-sample *t*-test between percentages, we found a significant effect for gender, $t(299999) = 88.78$, $p = .000$, with females receiving higher scores than males. More men than women supported *Amnesty* and *International Red Cross*, and the gender differences extended across all age groups.

Findings from one sample *t*-tests found a significant effect for gender related to three out of four environmental Facebook pages: *WWF* $t(480339) = 126.82$, $p = .000$, *Greenpeace International* $t(654807) = 114.42$, $p = .000$, and *The Rainforest Site* $t(4331) = 46.75$, $p = .000$. proposes that females among the Millennials are significantly more engaged in the environment than males. But, in the two older age groups, adult males were more supportive toward three out of four environmental Facebook pages.

Sample 2: Cross-country perspective on civic engagement

Figure 3 shows the gender difference from a comparative cross-country perspective based on Wisdom's *social activist* profile category.

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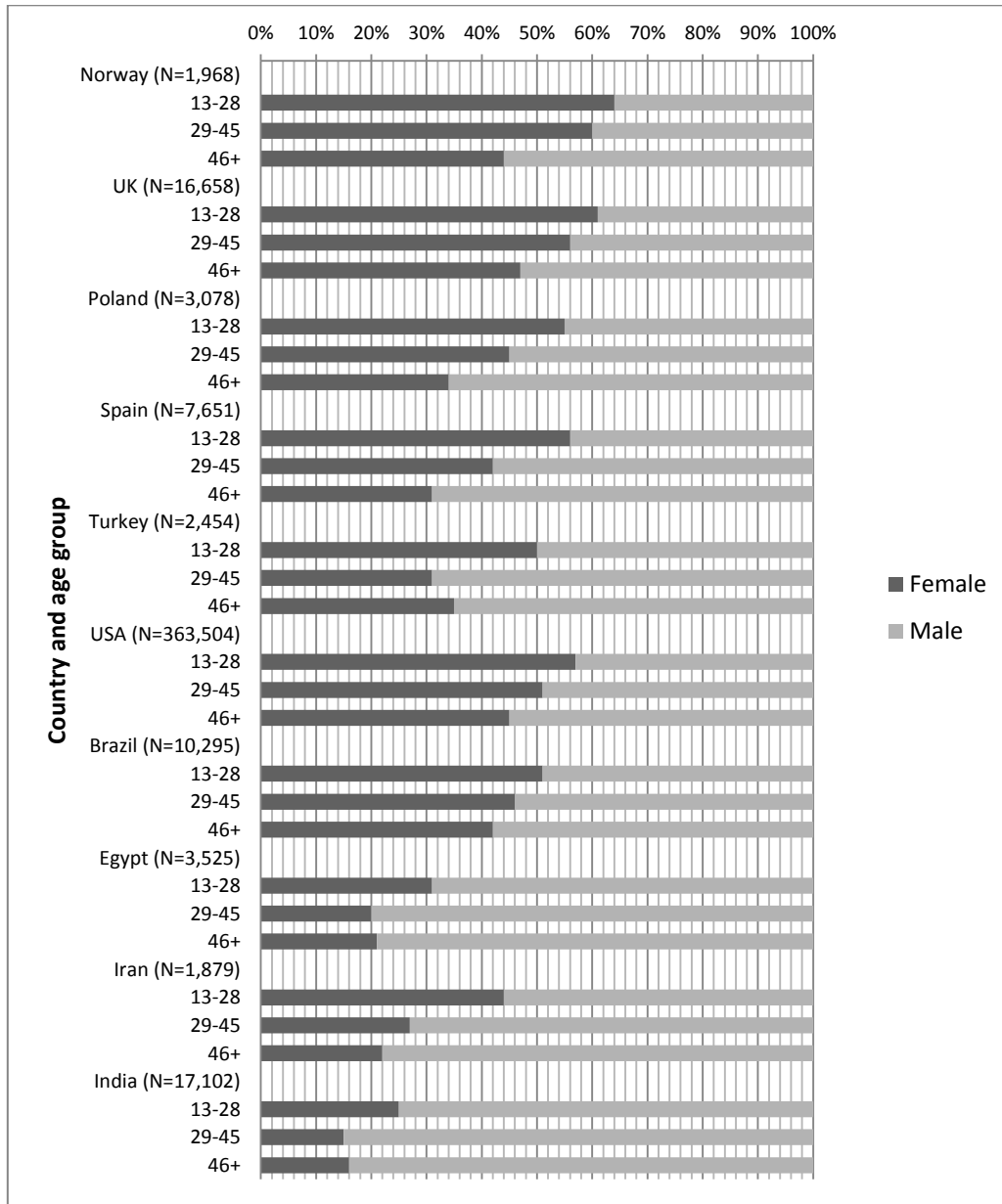


Figure 3. Gender difference (%) among Facebook users classified as “social activists” across three age groups in the ten sample countries (Sample 2/N = 8,528,408).

In both the USA and all the European countries in this study, more than 50% of Facebook users in the 13–28-year age band with a *social activist* profile were female, whereas females in this age band in Iran, Egypt, and India showed much lower engagement with the issues falling under this psychographic profile. The gender difference in Turkey and Brazil was surprisingly small among Millennials, as these countries fell short on the Global Gender Gap Index (Table A2). In general, younger women or Millennials (in the age range 13–28 years) appeared, on average, to be more likely to support a cause or group on Facebook than women in the two older age groups.

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Figure 4 displays gender differences from a comparative cross-country perspective based on Wisdom's *politics* classification. Generally speaking, the gender distributions here clearly differed from data for the *social activist* category detailed in Figure 3. Figure 4 confirms the results presented in Figure 2; compared to males, females seemed less interested in political civic engagement. Even Western countries, such as Norway, the USA, and the UK, known for more advanced gender equity, were no exception, with relatively low percentage scores.

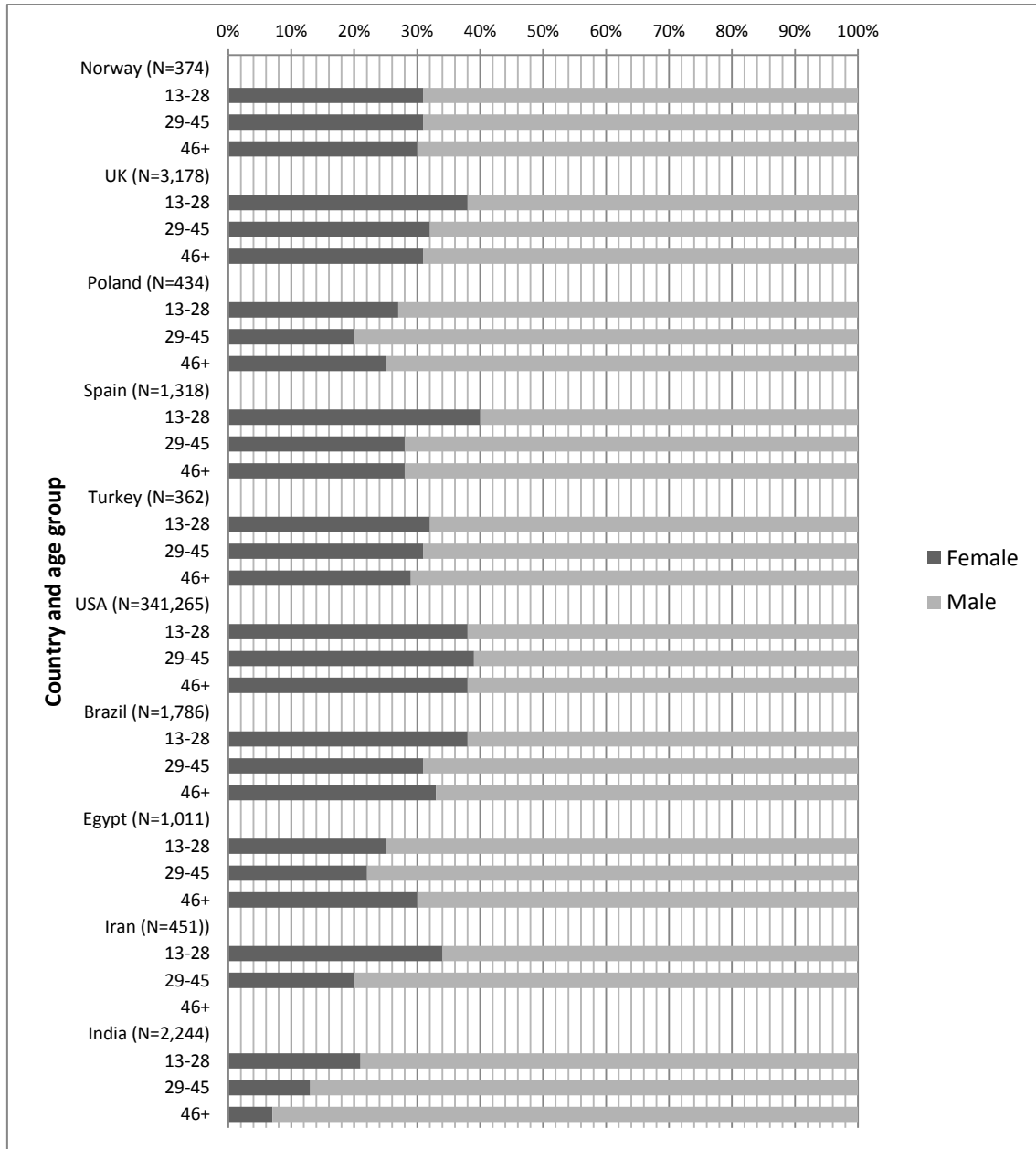


Figure 4. Gender difference (%) among Facebook users classified as interested in “politics” across three age groups in the ten sample countries (Sample 2/N = 8,528,408).

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In percentage terms, fewer Millennials females (13–28 years) in Norway (32%) were assigned a *politics* profile as compared to those in Brazil (38%) and Iran (34%). A two-sample *t*-test confirmed that younger females in Norway were significantly less $t(8184) = 3.90, p = .0001$ interested in politics compared to younger females in Brazil. However, a two-sample *t*-test comparing Norwegian younger females and Iranian younger females did not reveal a significant effect $t(198) = 0.29, p = .7689$.

Discussion

The results showed a fundamental relationship between Facebook civic engagement and gender across countries that previous research has not identified or addressed. The most striking finding was that men are more supportive of politically driven Facebook pages than women. Men are also more likely to support informational and factual Facebook sites, including *Wikipedia*. Females aged 13–28 years (Millennials), at least in Europe and the Americas, tend to focus more on causes related to children and the environment as compared to males of the same age, suggesting that the nature of online civic engagement does not significantly differ from that of real world civic engagement in terms of gender differences (Curran et al., 2014; Verba et al., 1997).

Irrespective of country, a greater proportion of males than females like the political Facebook pages (see Figure 5). This finding aligns with Curran et al. (2014), who investigated gender differences in relation to interest in politics in the offline sphere and found similar gender differences across cultures. Overall, and in line with the earlier literature on gender roles, gender differences in civic engagement offline, and the digital divide (e.g., Abraham et al., 2010; Inglehart & Norris, 2003; Laudone, 2012; Verba et al. 2001; Wang et al., 2013), our results showed that women use Facebook more for social activism whereas men use it more for informal and political reasons.

In comparing Western countries with Asian and African countries, we found a larger gender gap in the non-Western countries. Those non-Western countries also score lower in The Global Gender Gap Index and The Press Freedom Index (Table A2). In particular, Egypt and India exhibit a liking pattern that shows a very low civic presence on Facebook among young Millennial females (13–28 years) and among females in general. One possible explanation is that offline cultural norms exert an influence on how girls and women manage their online identity and activity on Facebook (Hajinejad, 2013). In many societies, women are also associated with the home and the family realm, while men are associated with the public sphere. Thus, a culture of gender equality is an important factor here (Inglehart & Norris, 2003, p. 31), as this may provide a climate in which online civic engagement becomes more interchangeable across genders.

Surprisingly, the gender gap seems to be somewhat wider in liberal countries with high gender equality, such as Norway, than in cultures associated with less gender equality, such as Iran and Brazil (Table A2 in the Appendix). This finding can be

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explained in part by the possibility that women using Facebook in countries in Brazil and Iran probably have a higher awareness of issues of access than in countries where, regardless of gender, both Facebook and higher education are taken as a given (e.g., in Norway, the USA, and the UK). Interestingly, Curran et al. (2014) also found that Norwegian women fell behind in offline political engagement when compared to women in countries with less gender equality. However, Williams and Best (1990) found that gender stereotypes were most differentiated in Western individualistic cultures.

Nevertheless, our data showed that women in nations ranking higher on the Global Gender Gap Index did score slightly higher than men as “social activists.” Our data might, therefore, indicate that a large proportion of both males and females in Western countries are interested in civic engagement but differ in their preferences or type of expressions in online civic engagement.

Our results also point to how important it is to break down expressions of civic engagement into different types of expressions when seeking to explain apparent differences based on age and gender. Age seems to have some influence on the type of civic engagement expressed by both genders on Facebook. In line with previous findings (Brenner & Smith, 2013), we found that the younger age group, the Millennials, falls more frequently under the social activist category. At the same time, we found that, across countries, the two older age groups are more information-oriented than those in the younger age group.

In conclusion, we did not find Facebook to be “the great equalizer” among women and men as suggested in the Introduction (Xenos et al., 2014), at least not with regard to expressions relating to politics and information where males still dominate. This challenges the assumption that online venues should be expected to equalize power relations between the genders (Herring, 2003), despite positive indications that female Millennials engage with environmental and child aid issues. Similar to Hargittai and Shaw (2013), we found that Facebook alone is unlikely to radically transform existing patterns in political expression or participation. Closing the digital divide in regard to politics and information remains a challenge for the present generation. Facebook does not appear to automatically redefine long-standing patterns of socialization and gender differences (e.g., Baron & Campbel, 2012).

What mechanisms lead to the gender differences in Facebook likes practices? First, men and women use social media and Facebook differently. In general, women tend to use social media more than men and for more social and expressive purposes, while men use it more for instrumental purposes (Brandtzaeg, 2012; Laudone, 2012; Wang et al., 2013). This usage difference might reflect the tendencies toward more expressions of social activism (i.e., child aid issues) among women compared to men that are leaning toward more informational and political expressions. These findings are consistent with pervasive stereotypes that associate women with feeling and men with thinking. Second, traditional explanations of gender differences in civic engagement, such as the role of structural social factors, might be valid for countries where women

fell low on The Global Gender Gap Index (2012) compared to European and American cultures in which traditional sex roles are minimized. Yet, this was not straightforward. Moreover, explanations derived from the theory of stereotype threat (Steele & Aronson, 1995) and shared expectations of men's and women's attributes and social behavior, might still yield valid mechanisms that are differentially affecting men's and women's opportunities and resources for participation and expression in civic issues. Similar to offline environments, traditional gender roles exist in social media; men conform to traditional expressions of masculinity and women conform toward traditional expressions of femininity when it comes to expressions of civic engagement.

Limitations and further research

This study has four limitations and implications for future research. First, some would argue that likes on Facebook are not an expression of actual civic engagement but rather an act of self-staging (Morozov, 2011). However, Vitak et al. (2011), and others described in the theoretical background of this paper have shown that liking political content on Facebook goes hand-in-hand with more resource-intensive forms of participation, such as involvement in a political organization. Facebook likes have also been shown to predict private traits and attributes (Kosinski et al., 2013). For these reasons, the chosen method of rating the distribution of civic-related Facebook likes may still prove more fruitful than traditional measures and sampling approaches. Nevertheless, future research should try to find additional measures that express civic engagement in Facebook and also explore innovative ways that they can be analyzed considering work with big data. This can help future research examine other practices beyond Facebook likes to gain a richer view of online civic expressions on Facebook.

Second, we have not investigated in any depth the causal relationships or other sociodemographic variables, such as education, that may play a role in the differences identified. Future research should try to take other sociodemographic variables into account. Moreover, building on the findings presented here, future studies may be able to explore the causal relationships between key variables of interest or may generate hypotheses that could be tested using more representative data sets and methods that might include qualitative interviews.

A third limitation of the study relates to Boyd and Crawford's (2012) views about the objectivity and accuracy of big data in general. There are many issues concerning the representativeness and reliability of this kind of aggregated sample data collected on Facebook. Yet, the Wisdom sample in this study has been proven to be very similar to the real Facebook population (see Table A1). Thanks to the big data approach, it was possible to investigate gender differences in civic engagement on Facebook in a cross-country perspective, which is rare. These gender differences are also of particular interest because this study is not based on self-reported gender differences but rather big data analytics of behavioral Facebook liking practices. Unfortunately, Wisdom was taken down as a big data service (as of February 7, 2015), which makes it hard for other researchers to replicate the findings. Yet, the firm

Microstrategy might get the Wisdom tool up and running in the future, which would make it possible to investigate how the expressions of civic engagement changes over time.

A final limitation is that this study has not addressed the relationship between Facebook and other media services or with offline civic participation. As there was a strong rationale for choosing Facebook as the sole research focus (see Introduction), we also realize that contemporary media systems are constantly interlinked with different online and offline channels for mediated communication (Moe & Larsson, 2013); further studies should therefore measure how people use several media in combination for the purpose of civic engagement (i.e., Hacıyakupoglu & Zhang, 2015). The interplay between online civic expressions and offline engagement should also be measured.

Conclusions

Our results from analyzing 21,706,806 Facebook users demonstrated that Facebook does not overcome existing offline gender disparities in the four types of expressions of civic engagement analyzed. In general, we found that males show more interest in politics and information, while younger females in particular are more concerned with child aid and environmental issues, although not in countries such as India, Egypt, and Iran, where gender differences militate against women in all the forms of online civic engagement investigated here. Surprisingly, even in liberal countries, such as Norway, segregation remains common in expressions of civic engagement in social media by women and men, suggesting that gender inequalities persist even after the achievement of basic rights and equality for women and the fact that women are heavier users of Facebook. Hence, the gender gap that exists in everyday life appears to be replicated and reinforced online. These results highlight that there is still a long way to go in order to allow women to take an active role in online civic engagement.

We believe that these results can help civic organizations, civic campaign planners, policy makers, and researchers understand how gender matters in relation to levels and kinds of civic and political expressions on Facebook, from both a country-specific and a more global perspective. This contributes to a broader understanding of gender differences in expressions on civic engagement in a cross-cultural perspective, also in the context of Facebook. Finally, the results and measurements of the big data analytics that we used in this study go beyond the limited samples used in many other studies on Facebook and may provide a foundation for further investigations and new research questions.

Acknowledgments

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Appendix

Table A 1.

Distribution of the real population and real Facebook penetration in each of the ten selected countries (N = 8,528,408).

Country	Facebook sample (N)	Real population	Real Facebook penetration (%)
Norway	41,806	4,691,849 (2011)	75% (May 5, 2013)
UK	436,791	63,047,162 (2012)	52% (Dec. 31, 2012)
Spain	183,059	47,042,984 (2012)	37% (Dec. 31, 2012)
Poland	75,079	38,415,284 (2012)	26% (Dec. 31, 2012)
Turkey	138,777	78,785,548 (2011)	39% (Dec.31, 2011)
USA	6,455,794	313,847,465 (2011)	53% (Sept. 30, 2012)
Brazil	583,277	193,946,886 (2012)	26% (Sept. 30, 2012)
Egypt	86,827	83,688,164 (2012)	15% (Dec. 31, 2012)
Iran	28,582	78,868,711 (2012)	29% (June 5, 2012)
India	498,416	1,205,073,612 (2012)	5% (Dec. 31, 2012)
Sum	8,528,408		

Source: Internet World Survey, 2013.

Table A2.

The ten sample countries and their rankings in The Global Gender Gap Index 2012 and The Global Press Freedom Ranking 2012.

Country	Rank: Gender Gap Index	Rank: Press Freedom Index
Norway	3	3
UK	18	29
Spain	26	36
Poland	53	22
Turkey	124	154
USA	22	32
Brazil	62	108
Egypt	126	158
Iran	127	174
India	105	140

Sources: The Global Gender Gap Index (2012) and The Global Press Freedom Index (2013).

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List of some of the most important Facebook page URLs that are investigated in this study:

Political

1. Barack Obama: <https://www.facebook.com/barackobama>
2. Syrian Revolution: <https://www.facebook.com/Syrian.Revolution>
3. Occupy Wall Street <https://www.facebook.com/OccupyWallSt>
4. We are all Khaled Said <https://www.facebook.com/elshaheed.co.uk>
5. Diren Gezi <https://www.facebook.com/geziparkidirensi>

Informational

1. Wikipedia: <https://www.facebook.com/wikipedia>
2. Wikileaks <https://www.facebook.com/wikileaks>
3. PolitiFact <https://www.facebook.com/politifact>
4. CNNPolitics <https://www.facebook.com/cnnpolitics>
5. Al Jazeera Channel <https://www.facebook.com/aljazeerachannel>

Humanitarian

1. Save the Children <https://www.facebook.com/savethechildreuk>
2. International Red Cross <https://www.facebook.com/RedCrossRedCrescent>
3. Plan International <https://www.facebook.com/planinternational>
4. Amnesty International <https://www.facebook.com/amnestyglobal>

Environmental

1. WWF <https://www.facebook.com/WWF>
2. Greenpeace <https://www.facebook.com/greenpeace.international>
3. The Rainforest Site <https://www.facebook.com/therainforestsit>
4. Friends of the Earth <https://www.facebook.com/foeint>

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Figure 1A. Example from how the Wisdom application displays analytical results.