Capturing toleration on social networks sites using internet-mediated research: June 30th Egyptian revolution case study

Received 29 September 2020
Revised 14 December 2020
15 December 2020
Accepted 18 December 2020

Noha A. Nagy, Amira S.N. Tawadros and Amal S. Soliman
Department of Socio-Computing, Faculty of Economics and Political Science, Cairo University, Giza, Egypt

Abstract

Purpose – This paper aims at understanding the dynamics underlying toleration as a complex social phenomenon and its pattern on Facebook during the June 30th revolution in Egypt. Thanks to the huge advances in ICT, internet-mediated research (IMR) has become one of the most prominent research methodologies in social sciences. Discussions on social network sites cannot be neglected in studying the dynamics complex and emerging social phenomena such as changes in public opinion, culture, attitudes and virtues.

Design/methodology/approach – To fulfill this aim, the researchers used web content analysis as a method inside IMR paradigm to analyze the discussions on Tamarrod's Facebook page in the period from June 30th to July 5th and to examine the emerging overall pattern of toleration.

Findings – The results show indications that toleration is inherent in the Egyptian culture, and that the Egyptian society still keeps its reputation as a highly tolerant society, even in crises periods where tensions are witnessed everywhere. Moreover, the results also show that the web content analysis process proposed in this study is highly reliable and valid.

Originality/value – The importance of the study lies in introducing a computational and empirical approach to analyze web content in a semi-automated way and proving its validity and reliability to study social phenomena such as toleration.

Keywords Computational social sciences, Internet-mediated research, Toleration, Web content analysis, June 30th Egyptian revolution

Paper type Research paper

1. Introduction

Toleration is such a complex term that it is difficult to precisely define and measure it. Whether a virtue or an attitude, toleration can be seen as a normative concept that relates to the cultural norms in any society (Forst, 2003). There are numerous stimuli affecting the level of toleration in any society and in turn be affected by toleration, these include religion, education, culture and political atmosphere. Accordingly, there are religious, political, racial,

Journal of Humanities and Applied Social Sciences
Vol. 4 No. 3, 2022
pp. 215-235
Emerald Publishing Limited
2632-279X
DOI 10.1108/JHASS-09-2020-0162

cultural and general prospects to approach toleration (Sullivan *et al.*, 1981; Golebiowska, 1995; Abrahamson and Carter, 1986; Tuch, 1987; Boutros, 1998; Carter, 2005; Mccabe, 2010).

Although toleration and tolerance are two nouns derived from the same verb, "to tolerate," they have different meanings. Tolerance sometimes refers either to the meaning of indifference, where there is no disagreement component, or endurance, where there is no power to take or not to take the decision of toleration (Cohen, 2004). Inspired by Cohen's (2004) definition, toleration can be considered as a situation where a person refrains (intentionally) from interfering with an opposed other while he/she has the power to interfere. In this study, we use the term "toleration" instead of tolerance.

Oxford online dictionary defines Toleration as "the practice of tolerating something, in particular differences of opinion or behavior" (Oxford online dictionary, 2014).

Moreover, toleration occurs when difference or diversity is present because it is only when confronting diversity that our acceptance of others is truly tested (Witenberg, 2002). Thus, toleration requires diversity in specific contexts, and according to the source of diversity, toleration is viewed as religious, political, ethnic, racial, national, civic, social, cultural and sexual (European University Institute, 2013; Cranston, 2006; Tan, 1998; Al-Khalil *et al.*, 1992).

We need to consider two important aspects to understand toleration: First, toleration is related to the standards and cultural norms in a given society, i.e. it is a culture-dependent concept (Forst, 2003; Müller, 2005). Second, the term has different meanings in different languages. In Arabic, the word "toleration" originates from the verb "to permit," "to ease" and "to step down" in a situation where there are differences or disputes with others to signify good manners, implying that toleration is a virtue that signifies respect, reverence and politeness. On the other hand, the English origin of "toleration" is derived from the Latin verb "tolerate" that is "to endure." Endurance holds a negative meaning of toleration, as it holds a sense of suffering.

Toleration requires acceptance while disapproving. This intermediate position between acceptance and opposition makes toleration a puzzling attitude (Scanlon, 2003). The analysis of toleration is mostly attitudinal, where toleration is considered as an attitude or virtue of individuals. Studies found are more conceptual and qualitative than empirical. Numerous studies examine toleration in political theory as a liberal concept in democratic regimes.

Moreover, toleration:

> [. . .] is acceptance of and respect for people with different values, beliefs and cultural backgrounds than one's own accompanied by a willingness to allow others to maintain and express their values, beliefs and culture.

A person practicing toleration "will show empathy for others and a diminished response to their differences" (Moore and Walker, 2011). Thus, to be able to measure toleration, it is important to have a controversial issue that raises the grudge and disapproval among opponents.

Boutros (1998) proposed a procedural definition of political toleration, she described political toleration as the willingness of accepting the different others (different groups or different views) with the confession or the endorsement of their full rights to practice their political and civil rights.

However, one cannot deny toleration in general – political and religious toleration in particular – is to some extent puzzling. Referring back to the paradox of tolerance, raised by some philosophers such as Bertrand Russel and Karl Popper, unlimited tolerance may lead to the extinction of toleration in itself.

In other words, if a tolerant society chooses to extend the concept of toleration to everyone, including the intolerants in that society, the intolerant behaviors and beliefs of Neo-Nazis and groups such as ISIS and Al-Qaeda would be accepted as part of that society. This eventually leads to the propagation of hate speech and intolerant beliefs more and more, and therefore, the death of toleration in that same society (Popper, 2012).

Therefore, not all intolerance is negative, however, this study does not focus on the negativity or positivity of toleration as a virtue. In this study, we focus only on proposing a new methodology to measure toleration on social media through content analysis and internet-mediated research (IMR).

The paper proceeds as follows: Section 2 reviews some attempts to measure toleration through literature and review the uses of IMR in studying toleration, Section 3 introduces the research methodology that is used in this study as well as the main steps the researchers took to computationally and empirically measure toleration on social network sites (SNS). Section 4 discusses the main findings of applying this methodology as well as the validation of these results. Finally, Section 5 concludes the study and pave ways for further research using IMR web content analysis in the field of social sciences.

2. Literature review

Although most of the studies on toleration focus on understanding the concept of toleration; defining its conditions and its relevance to political theories; and setting limits to this desirable behavior, several studies attempt to measure the level of toleration in any society.

Toleration indicators were created from survey studies of political tolerance (Gibson and Bingham, 1982; Sullivan *et al.*, 1981) to measure and quantify how people accept minorities through asking questions such as whether they accept that the most disliked group to be allowed to hold public demonstrations or not (European University Institute, 2013).

An alternative approach for measuring the level of toleration in a society uses content analysis of observational data. Mukherjee *et al.* (2013), for instance, presented a model to classify, on real time, participants in online forums into tolerant vs intolerant ones and to investigate how disagreement affects tolerance in a quantitative manner through text analysis.

Researchers most commonly use survey studies to create indicators of toleration within a particular context. For example, in measuring and quantifying political toleration, survey questions may include whether the individual would accept allowing their most disliked minorities to hold public demonstrations. (European University Institute, 2013).

An alternative approach to quantifying toleration is the use of analysis of textual content (Boutros, 1998; Mukherjee *et al.*, 2013).

In their study "Real-World behavior analysis through a social media lens" Abbasi *et al.* (2012) used a large amount of data collected from Twitter, blogs, Facebook and news sources (such as Reuters) to investigate if human behavior in the real world can be understood by analyzing social media data. The data collected is related to Arab Spring events almost for all of the countries involved in the revolutions. The study showed that in most cases social media is a "good tool for estimating attitudes and further research is needed for predicting social behavior."

The internet provides a large-scale data source for social science research and a medium of research. The internet and SNS can provide publicly available, low-cost and instantaneous substantial amounts of data (Hookway, 2008). In particular, the characteristics of SNSs are the stimulant for advocating their use as a source of data collection in social science. For online social networks, internet studies have developed in two main directions: understanding social and behavioral patterns on the internet and analyzing the online social networks (Dutton, 2013; Peng *et al.*, 2013).

Additionally, social science research can use the internet as a data source through conducting online surveys, interviews, experiments and content analysis (Chen *et al.*, 2015; Ackland, 2013). When a research uses internet as the primary source from which data is gathered, we can call it "Internet-Mediated Research" *(IMR)* (Fielding *et al.*, 2008).

Martensen *et al.* (2018) used IMR to investigate how today's new type of opinion leaders, "Citizen Influencers" (CIs) and persuade their followers by exploring which characteristics contribute to their persuasiveness. This study conducted both a longitudinal netnographic study of ten CIs and their user-generated content and six focus groups with followers of specific CIs on Instagram.

Nagi *et al.* (2020) proposed a research methodology that pursues a quantitative approach in the analysis of toleration using IMR. This methodology adopts *Web Content Analysis* based on Internet data collected from SNS.

This paper uses Boutros (1998) procedural definition of political toleration and adjusts the categories of toleration defined in her study. In addition, the study adopts the methodology proposed by Nagi *et al.* (2020) to use IMR and web content analysis to study toleration on SNS. Mixing these two studies together and applying them to a real-world data extracted from Facebook, this empirical study provides an evidence of the capability of IMR in general, and web content analysis in particular to study a complex social phenomenon such as "Toleration."

3. Research methodology

Making use of the advantages of IMR in general, and web content analysis in particular, we can study and measure toleration in a certain society through *Facebook* discussions. The algorithm used in this study consists of the following steps:

3.1 Step 1: sampling

To measure toleration, it is important to have a controversial issue that raises the grudge and disapproval among opponents. Thus, the researchers chose the revolution of 30th June 2013, where the controversial issue is ending Morsi's rule.

A Facebook page was selected, namely, "Tamarrod" (Insurgency Move) Page, to reflect the proponents of the two political directions: anti-Morsi (pro-revolution) and pro-Morsi (anti-revolution). The choice of this page in the analysis of toleration is based upon three criteria: First, this page participated in the dispute of cutting off Morsi through public posts (Main criteria). Second, this page has many followers (+700,000 Facebook followers). And third, this page has a political affiliation that was an influential part of the dispute during this period. In addition, proponents of both directions exist on this webpage.

3.2 Step 2: data extraction

Data is extracted from all posts and comments collected from the selected page in the period (June 27 to July 3).

Events timeline during the selected period are as follows:

- *27th of June:* The Muslim Brotherhood President Mohamed Morsi delivered a long-televised speech in which he threatened that polarization reached the stage that it could threaten the country. At this time, people's anger at the regime of the Muslim Brotherhood was growing and the signature campaign of Tamarrod (rebel) that was formed to demand an end to Morsy's rule was taking the country by storm. Shortly after, several sporadic protests broke out in a number of governorates between the loyalists of the regime and those that had an issue with it;

- *28th of June*: Clashes between Pro- and Anti-Morsi Protestants in Alexandria;
- *29th of June:* An officer was killed in Al-Arish;
- *30th of June*: The revolution erupted against Morsi's regime with the aim of ending his rule. Millions of protestants gathered in front of the presidential palace and in many squares all over the country demanding early presidential elections. On the other hand, Muslim Brothers (Pro-Morsi regime) gathered in Rab'aa and Nahda squares;
- *1st of July:* The minister of defence "Abd El Fattah El Sisi" announced a grace period of 48 hours for the regime to meet the demands of the people;
- *2nd of July*: In defiance to the military's announcement, Morsi made his final TV appearance and made visible of his intentions to adhere to his presidential mandate stipulated in the Constitution. Severe clashes and disputes occurred between the Egyptian people (against Morsi) and Muslim Brothers (Pro Morsi) in the surroundings of Cairo University, as well as in Alexandria, leading to many deaths; and
- *3rd of July:* The minister of defence met with the leaders and heads of all political, religious and youth forces in Egypt; The political forces put a roadmap for Egypt after Morsi's regime; and then the minister of defence announced the end of Morsi's rule and the roadmap; the president of the Supreme Constitutional Court, "Adly Mansour" took over the reins until the holding of an early presidential election.

After selection of the period and page for the analysis, all posts and comments, with 10% error estimation, are collected using Microsoft Power Query [1] from the Tamarrod page in this period. The amount of data gathered exceeded 3,000 comments on 21 of posts collected from the 30th of June.

3.3 Step 3: data cleaning

Data cleaning includes organization of the excel sheets, deletion of unwanted data such as usernames and exclusion of irrelevant content. The irrelevant data included the following:

(1) Comments with *Errors*. Those included empty or incomplete comment. The non-textual comments (comments with links/videos/photos only) was added to this category. This category composed the least contribution to the irrelevant data (3.7%).

(2) Comments with *Ads* and *news casting*. Those included the comments that display information about oneself or about one's own page or about spreading a news.

(3) Comments with *patriotism*. Those include comments with praise to the country's institutions or to the Egyptian people without an indication of engagement to any party or opinion. It also included optimism or concern about the future of Egypt.

(4) Comments with *prayers* and praise to God without an indication of engagement to any party or opinion. This includes condolences for martyrs, glorification of God or supplications.

(5) Comments that are totally *outside context* including but not limited to: social tagging, welcoming friends, talking about personal stuff or commenting outside

context about abstract theories. This type composed the largest amount of irrelevant data (about 29% of the irrelevant data).

(6) Comments that are considered *spam*. Spam is unsolicited advertisement or unwanted content or request that include bulk messages or excessively posting for links or images or text to someone that the spammer does not know personally. Spam is dangerous because it is used to deceive people to convey their personal accounts or information for money or Facebook tokens (What is spam? | Facebook Help Center | Facebook, 2016). Following this definition and through the concept of flooding, the researcher has identified informally three levels of spam content that was found in data and defined as follows:

- Level 1: a hate speech or large length irrelevant comment that was duplicated in more than one Facebook page from two or more Facebook users;
- Level 2: a hate speech or large length irrelevant comment that was duplicated in same Facebook page from two or more Facebook users; and
- Level 3: a hate speech or large length irrelevant comment that was duplicated on the same day from two or more Facebook users.

Out of 3,005 comments, 61 comments were repeated 192 extra times and are considered spam. As Figure 1 shows, 82% of them are of type two and three at the same time, while the other 8% are of type two only. Level 1 spam is not apparent, as the data are gathered in one page. Only 29.5% (i.e. 18 comments) of the spam content was posted by anti-demonstrations. It can be noted as well that the most frequent spam comment was repeated over 21 posts in 28 comments and was posted by an anti-demonstrations group of discussants.

The cleaning phase was accomplished by removing irrelevant data (error rows, advertisements, and duplicates) and "spam." The data collected include 21 posts in 30th June and 3,005 comments over the posts, 36.7% of the comments are considered irrelevant and 1,902 only are relevant and can be tested for toleration. The comments range from June 30, 2013, to July 5, 2013.

3.4 Step 4: developing a codebook for web content analysis

In this step, the researchers explicitly illustrate the coding scheme for the coders. This is done by adding real data examples to clarify each indicator, illustrating guidelines on interpretations, applying the codebook on a portion of content several times, measuring the inter-coder reliability each time, making discussions about the conflict in the coding process between different coders, and finally, making refinements to the codebook accordingly.

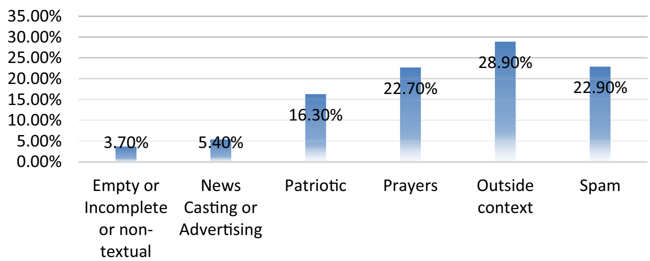


Figure 1.
Irrelevant comments

Four coders checked the objectivity of the codebook proposed in this study to measure the reliability of the coding process. Although multiple coding does not produce a complete replication of coding in qualitative studies, it is important to help the researchers pinpoint the deficiencies of the content analysis especially to determine the readability of the codebook; the objectivity and non-biasness of the interpretations; in addition to the clarity and the exclusiveness of the defined categories. Multi-coders also help in generating a stronger reliability in the results (Hruschka *et al.*, 2004; Barbour, 2001).

The coders received training as needed. Training was done once or twice or three times until the problem of toleration and the coding scheme is understood well and a sufficient inter-coder reliability, a Krippendorff's alpha (KALPHA) of 0.7 and higher for each variable, is maintained (Krippendorff, 1989; Krippendorff, 2013).

The codebook was refined three times. An explicit coding scheme was illustrated for the coders; real data examples were added to clarify each indicator and guidelines on interpretations were illustrated. Inter-coder reliability was measured several times to make sure that the coding process is objective, consistent and to ensure reproducibility of the results.

Inter-coder reliability measure gives an indication about the objectivity of the coding process. Without a good inter-coder reliability value, as an indicator for agreement among coders, the content analysis is useless. Moreover, the inter-coder reliability assesses the validity of the coding scheme.

The researcher used two conservative measures for reliability: KALPHA and Fleiss kappa. Both measures are suitable for the binary variables of the study and suitable for two or more coders. The measures also account for chances in coding by measuring the expected agreement by chance. The Fleiss kappa gave values that are approximately the values of the KALPHA.

Krippendorff's alpha (KALPHA) is considered the most reliable for most of the researchers. It can be used for any number of coders and any type of variable (nominal, ordinal, interval and ratio) with differences in the equation of the KALPHA. It can be used for small and large samples sizes, as well with incomplete data. However, the Fleiss kappa is suitable for more than two coders, it can be used only for binary or nominal variables.

After agreeing on the final codebook, the inter-coder reliability was also measured for the whole data set (the 3,005 units) using the two coders (S and N). The KALPHA and kappa range between 0.74 and 0.91 that is it ranges from the accepted explanatory level where tentative conclusions can be drawn to an always acceptable level and conclusions can be drawn. Concluding that the coding scheme is acceptable.

3.5 Step 5: defining categories of toleration

The researchers classify web content into tolerant or intolerant based on a set of categories adjusted from Boutros's (1998) categories. An adjudication board from Cairo University adjudicated Boutros's (1998) categories. The adjustments included: category renaming; addition of new subcategories; and explicitly arranging the subcategories such that each category includes three subcategories. The utilization of coders has helped the researcher to refine the codebook, as follows:

- The "Stereotyping" category was reorganized into subcategories such that the confusion between "stereotyping" and "no self-criticism" categories is resolved. In Boutros (1998), "stereotyping" category included: non-readiness to confess the probable validity of the different others' opinions whether implicitly or explicitly. The coders were confused about the content that is considered "non-readiness to confess" with the content that is considered "persistence to one's opinion." This description was removed from the "stereotyping" category to the "no self-criticism" category by merging it with the "persistence to one's opinion."

- There were cases in which content included questioning about the source of information or questioning about explanations of others' attitudes or options. The researchers have reported this as a tolerant indicator and added "not questioning" to the "lack of inspection" in the "stereotyping" category. A questioning personality is considered a non-stereotyping personality.
- There was content that included a "joy at other's misfortune." That is to be happy and joyful when the different other is in trouble because of his opinions or actions. The coders and the researchers have reported this content as an intolerant sub-indicator in the "no self-criticism" category. The joy at others' misfortune is an attitude that indicates the persistence and the unacceptance of the different other even if he/she is in need.
- Real examples from the data itself were added to the codebook to clarify the meaning of the categories and subcategories.

Figure 2 includes the categories and indicators with the above modifications.

3.6 Step 6: building a toleration index

The researchers suggest two following operational definitions for measuring toleration:

(1) A strict definition: in the strict definition, any keyword can be categorized in any category and can only exist (takes value 1) or not exist (takes value 0). If, for example, a comment includes more than one personal insult, this does not affect toleration. The strict definition only counts the "existence" of an indicator without taking into consideration the number of times it is used in any given comment. And the textual content that is not classified in any category with an affirmation or negation is considered a non-relevant textual content and is omitted from the analysis (i.e. pure acceptance and rejections are not counted).

(2) An extended definition: in the extended definition, the frequency of repetition in each category is counted. Thus, a category exists according to the frequency of insults (i.e. three insults are not like one insult in a content. Three insults show a more intolerant attitude). However, the textual content that is not classified in any of the categories with an affirmation or negation is included in the analysis as tolerant behavior, as the user had the chance to be intolerant but decided not to.

In this study, the researchers apply a strict definition. Toleration index was created using *Principle Component Factor Analysis* from the predefined five categories. This can be mathematically represented as follows: $\boldsymbol{int = f\,(p, r, s, c, d)}$, $t = \boldsymbol{1 - int}$

where *int* is the intoleration index; *t* is the toleration index; *p* is the existence of a personal insult in the content; *r* is the existence of a religious insult in the content; *s* is the existence of a stereotyping content; *c* is the existence of persistence and non-self-criticism in the content; and *d* is the existence of denial of the different others' rights in the content.

The toleration index, being the compliment of the in-toleration index, should be set such that it lies between zero and one where zero is the minimum and one is the maximum toleration level that a person can get from all indicators.

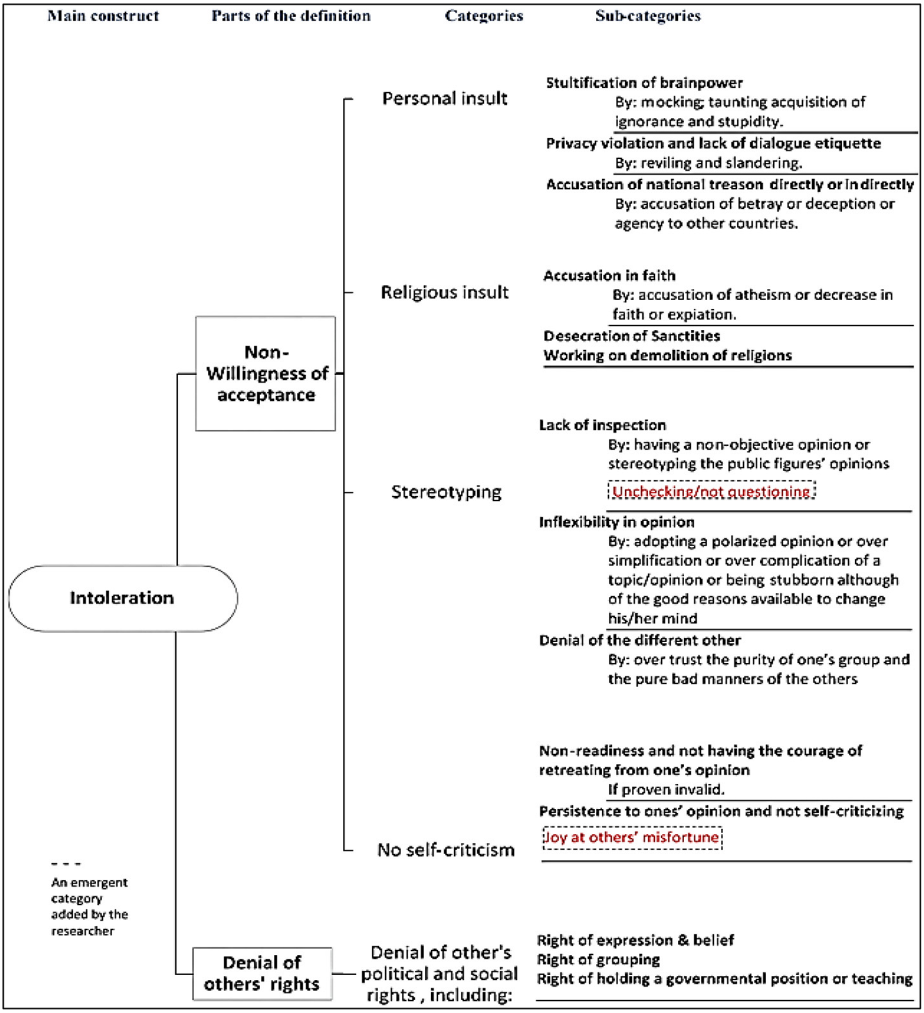


Figure 2.
An illustration of the defined categories of intoleration based on Howaida Botrous's study (1998)

4. Main findings of the web content analysis

4.1 Descriptive statistics

Out of 24 million Egyptian users on Facebook, 66% are male and 34% are female (Facebook, January 2016). The data collected from "Tamarrod" page also shows a similar distribution of gender where 63% of the data are male and 35% are female, whereas gender is not specified for 2% of the data, as shown in Figure 3. The gender distribution of the Egyptians on Facebook is collected in January 2016, where the data collected about Tamarrod page is collected earlier in January 2015. Thus, the 2% of unknown gender may or may not be Egyptians. The 2% may also include Egyptians that have not yet filled their gender status or Egyptians that have set their gender information as private.

The gender distribution in the data is also close to the internet gender distribution in the Arab region which is, on average, a ratio 2:1 of male to female users compared to almost 1:1

globally. It should be noted that the internet gender distribution is not similar to the actual distribution as for Egypt the ratio is about 1:1 (CAPMAS, 2014; Mourtada and Salem, 2011; Competitive Intelligence, n.d).

Moreover, as Figure 4 shows 85% of the data collected are pro-revolution and 15% are anti-revolution. The classification (pro vs anti) was done manually according to the keywords of agreement or disagreement that clearly show the user's affiliation to each group. After irrelevant data exclusion and data cleaning, the percentage of anti-revolution increased to be about 19.7% while 80.3% are considered pro-revolution.

The five factors or categories of intoleration were measured in the extracted web content, Figure 5 shows their frequency distribution. The most frequent category was the personal insult, and the least was the religious insult. Personal insult exists in 40% of the data, whereas stereotyping exists in about 32% and the least apparent category is the religious insult only in 4.36% of the data.

It should be noted that according to the strict definition that the researchers used, the pure agreement/disagreement category should not be included in the analysis of toleration. Although this category constitutes 26.3% of the data and 95.6% of its existence is because of pure agreement while only 4.4% were because of pure disagreement, it was not important in this study's analysis of toleration, as in the data it is a linear combination of the other

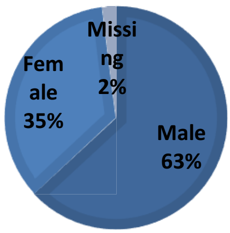


Figure 3.
Gender distribution in the full dataset

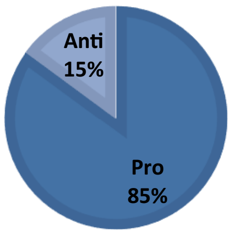


Figure 4.
Group distribution in the full dataset

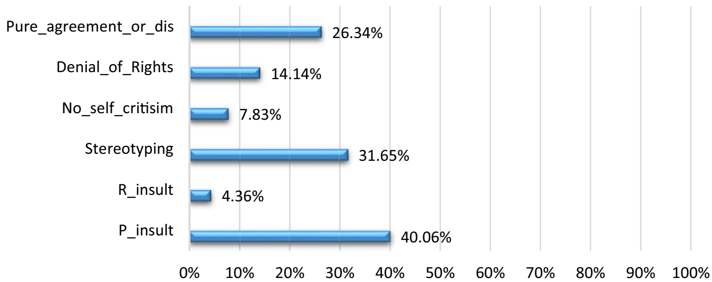


Figure 5.
Categories distribution

categories and significantly ineffective in the composition of the toleration index. Results show a significant correlation between the pure agreement/disagreement category with all the other categories, proving that it cannot be put in the factor analysis. It existed only if all the other categories did not exist. But this is not a general rule and other researchers may find it beneficiary to include in their analysis. Although this category was removed from the composition of the factor analysis, the comments with pure agreement/disagreement were not omitted from the total comments and are counted as the maximum toleration reachable.

Each category, of the five main categories, includes subcategories that help in the coding process. Figures 6–10 show the frequency distributions of the subcategories within each of the five main categories. It could be noted that 46.9% of the personal insult was because of stultification of brainpower; 37.4% was because of privacy violation insults; and 15.7% was because of insults that included an accusation of national treason.

Stereotyping is the second most frequent category. Its existence is mostly because of the inflexibility in opinions and viewing things from a black-white perspective with no shades within (50.8% of the stereotyping). There have been many cases of rigidity in opinions that do not take into consideration the events around or the other people's perspectives. Lack of

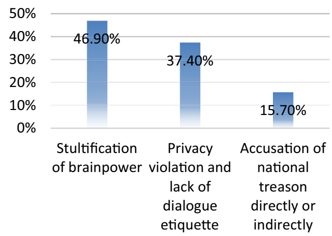


Figure 6. Personal insult subcategories distribution

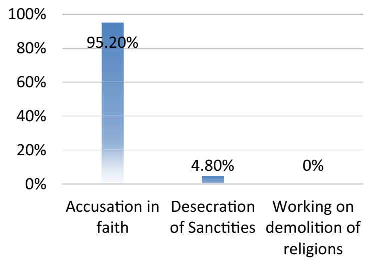


Figure 7. Religious insult subcategories distribution

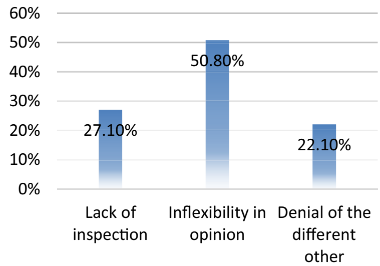


Figure 8. Stereotyping subcategories distribution

inspection and accuracy occurred in 27.1% of the stereotyping. There was an "echo" behavior and repetition of sayings without balancing the opinions and without inspection of the correctness of it. There were positive examples of inspection, some discussants asked for the source of information and sometimes condemned those who do not inspect and think on their own. The denial of the different other morally occurred in 22.1% of the stereotyping. This percentage signifies those who show the different as an unethical person while their proponents as pure moral.

There have been cases when discussants denied the civil and political rights of the different other by denying their right to express their opinions (40.6% of the denial category); or deny their right to hold a governmental job position or a teaching position (50%) and deny their right of grouping (9.4%).

Lack of self-evaluation is the second least frequent category. Its existence is hard to capture. However, there was some subindicators that can denote its existence. The most frequent is persistence to one's opinion with insistence even if proven invalid. This category includes content that shows no possibility of accepting the different other opinions neither show the possibility of having a wrong opinion. This composed 70.7% of the category; 26% of the lack of self-evaluation category was because of the joy at others' misfortune. While only 3.3% of it was because of the non-readiness of retreating from one's opinion.

The Egyptian society showed a strong respect to the religious affiliation in the data. It is the least frequent category. Furthermore, none has condemned religion or worked on demolition of religions. Whereas only 4.8% of the religious insult was because of desecration of sanctities. Most of the religious insult (95.2%) came from the attitude of accusation of atheism or decrease in faith or expiation.

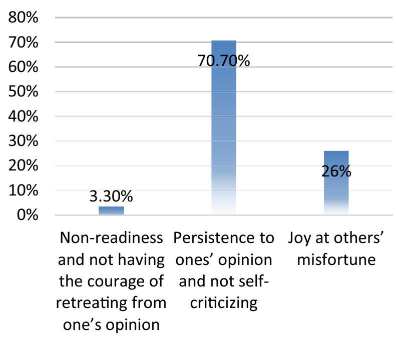


Figure 9.
Lack of self-evaluation subcategories distribution

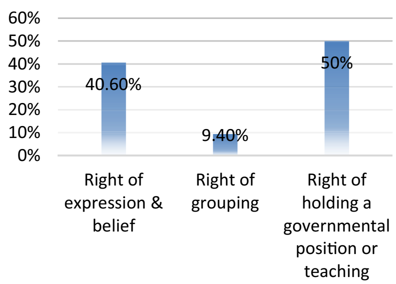


Figure 10.
Denial of others rights subcategories distribution

4.2 Toleration Index

Using "Principle Component Factor Analysis," the Toleration index is then composed of the five main categories (personal insult, religious insult, stereotyping, lack of self-evaluation and denial of the different others' rights). The *Toleration Index* is then computed as a function of the factors extracted from the data. Table 1 shows that average toleration for relevant comments in the sample is 83.4%, whereas the median of toleration is 89%.

Table 2 shows the relative increase in toleration caused by each of the five main categories. The "lack of self-evaluation" has the strongest effect on toleration index (45% of the variability in the toleration index is because of lack of self-evaluation category), whereas the "religious insult" has the weakest effect on toleration. Moreover, the relative increase in the variability in the toleration indicator that the Denial of the other's rights cause is 40.9%.

4.3 Toleration pattern analysis

To deal with the complexity of toleration as a social process, we need to understand its underlying dynamics by examining its pattern with time. Figure 11 shows that toleration is not normally distributed and is heavily skewed. This distribution is called "platykurtic" that is a distribution with lower boarder peak and thinner tails. The Kolmogorov–Smirnov test

	N	Min	Max	Mean	Std. dev.	Median
Toleration	1,902	0	1	0.834	0.15	0.888732

Table 1. Toleration index – descriptive statistics

	Adjusted R^2	R^2 change	Relative increase (%)
Lack of self-evaluation	0.452	0.453	45
Denial of the other's rights	0.637	0.185	40.9
Stereotyping	0.779	0.142	22.3
Personal insult	0.889	0.110	14.1
Religious insult	1.000	0.111	12.5

Table 2. The relative increase each category causes to the toleration index

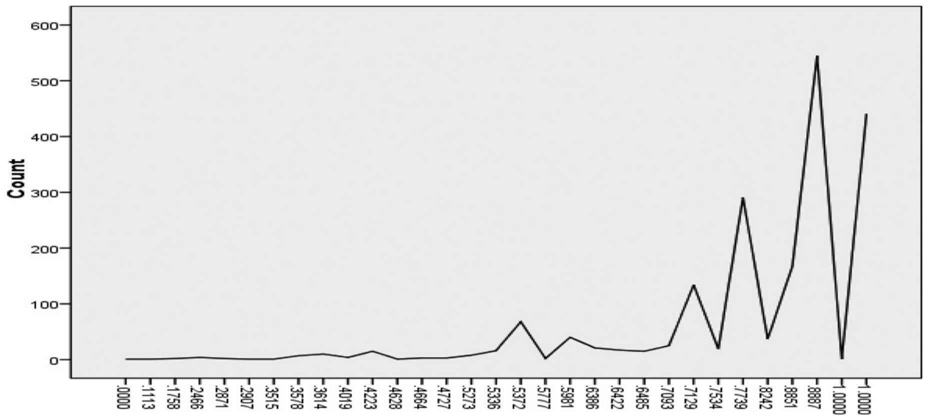


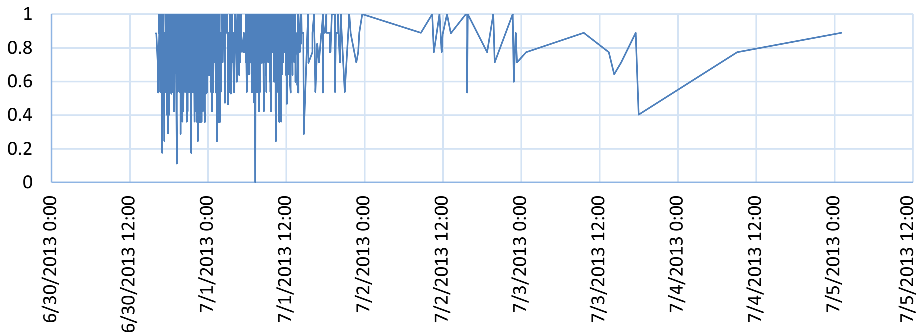
Figure 11. The frequency distribution of the toleration index

of normality is significant with p-value less than 0.05 and thus showing that data is not normally distributed.

Applying Wald–Wolfowitz runs test for randomness on the data, the test values are 0.8 for mean and 0.9 for median, which shows a significant autocorrelation in the toleration data and suggests that the distribution for the data can be a time series or a nonlinear model with time as the independent variable. In addition, Durbin–Watson statistic is 0.54 which is substantially less than 2, suggesting a positive serial correlation. Moreover, the autocorrelation function shows a stationary time series and no appearing seasonality. Stationarity means that the toleration trend is going around a certain value, whereas a non-seasonal time series is that where no pattern or trends can be found over a period of time or on seasons. This can be seen in Figure 12, which represents an instance of individual toleration levels with time.

Moreover, the toleration trend was analyzed through days, time intervals and per posts to understand the internal micro-level dynamics that led to macro-level toleration phenomenon.

The 30th June posts were gathered, each had various amounts of comments posted from 30th June to 5th July. Figure 13 shows that the 3rd of July has witnessed the least average



Notes: The toleration is computed using factor analysis. The figure shows a non-linear behavior. The min is 0.00000046289845 case: 767 at time point: July 1, 2013, 07:15:16 a.m

Figure 12.
Individuals toleration levels

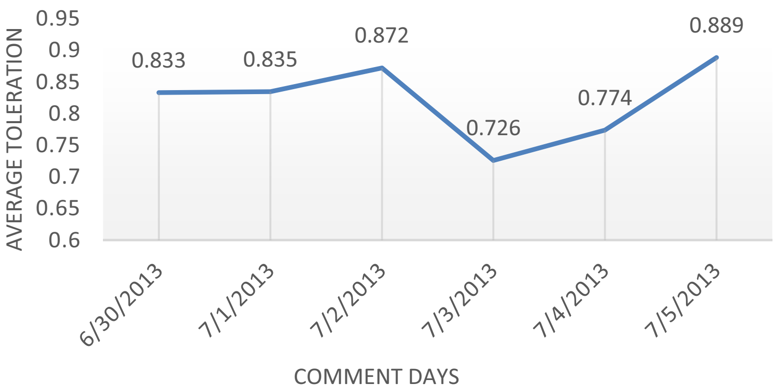


Figure 13.
Average toleration per day

toleration through the six days of analysis with an average toleration of ~0.73. This is low in comparison to other days but is still indicating a tolerant behavior. Two days after, the average toleration has increased returning to a value that is high and close to its value in the 2nd of July. However, ANOVA test shows that the difference in the mean toleration between different days is statistically insignificant denoting that there is no significant difference in toleration in the six days of analysis.

Dividing the sample's data into time intervals of half hours, the trend shows an oscillating behavior that oscillates around 0.87 in most of the time except for some time points, i.e. 48, 60 and 151 (July 1, 2013, 14:30 to 15:00, July 1, 2013, 20:30 to 21:00 and July 3, 2013, 18:00 to 18:30) where the toleration level decreases to 0.588, 0.537 and 0.402, respectively. And for the time points, 66, 87, 89 and 92 (July 1, 2013, 23:30 to 00:00, July 2, 2013, 10:00 to 10:30, July 2, 2013, 11:00 to 11:30 and July 2, 2013, 12:30 to 13:00), the toleration level increases to approximately reach the maximum toleration level attained. However, ANOVA test also shows that the difference in the mean toleration between different time intervals is statistically insignificant denoting that there is no significant difference between the average toleration in the different time intervals (Figure 14).

H1. Two or more means are different from the others.

The results show a p-value of 0.001, thus, we are 95% confident that the mean toleration for posts is not equal. In other words, we reject *H0* and accept *H1*, concluding that the mean toleration of all the posts is not the same. Post-hoc tests were performed to detect posts with substantially different mean toleration. The results show that Post no. (9) has a substantially different mean toleration than the other posts. Figure 15 shows that Post no. (9) has a very diverse behavior through the time points.

Furthermore, within Post 9, there is no significant difference between different groups' average toleration nor for the gender nor for the time intervals and nor for the comment toleration means in different days. Nothing can be interpreted about the reasons for this difference. The researchers suggest an analysis that takes into consideration the social network dynamics for further exploration.

4.4 Validation of the content analysis

In addition to reliability, a validation process for the content analysis was performed to understand whether the content analysis can be trusted. The validity was examined by checking on the group differences. The groups are identified that are expected to differ with respect to the gender and the group type (anti-revolution and pro-revolution).

With respect to gender, the analysis shows that males are more tolerant than females. The two groups were found to be significantly inhomogeneous and that there is a significant

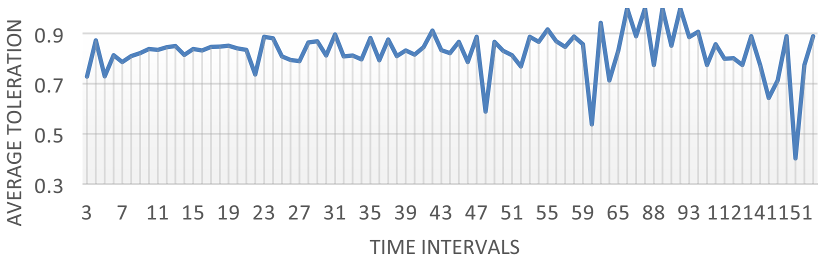


Figure 14. Average toleration per half-hour time interval

difference between the group variances, i.e. the obtained differences in variances are unlikely to have occurred based on random sampling from a population with equal variances. An independent samples *t*-test was performed with 0.05 significance level to test if the mean toleration between gender groups are the same. The *p*-value of the Welch's *t*-test (*t*-test when variances are unequal) is 0.35. We can conclude that at 5% level of significance, the data provide sufficient evidence that the mean toleration for males is different than for females. The differences between gender means are not likely because of chance. A point-biserial correlation coefficient for the gender and the toleration index shows a very weak inverse significant bivariate correlation. That is, on average, the mean toleration for males tends to be higher than that for females.

However, the difference is very small; the correlation is very weak; and the *t*-test's *p*-value is not trustworthy, as the variances are not equal and the sample size for each group differ. The non-parametric test Mann–Whitney *U* test can be used instead, to check if the difference is significant. The *p*-value is 0.08, thus, we can conclude that there is no significant difference between the two gender groups and the distributions of toleration for both genders are equal.

Further analysis was done to check if there is a different attitude over the Facebook discussions for different gender. The following was found:

- males tend to use personal insults more than females;
- there is no sufficient evidence that male participant's insult religiously more than females;
- males tend to stereotype more than females;
- both males and females do not review their opinions equally;
- females tend to deny the rights of the different more than males do; and
- females tend to reach the highest levels of toleration than males, as they significantly purely agree/disagree in discussions more than males do. However as mentioned before, we cannot reach a conclusion about the relationship between gender and toleration.

With respect to the person's situation from the revolution (anti or pro), using a *t*-test, there is a significant difference between the mean toleration of anti- and the pro-revolution groups. The anti-revolution group has a higher toleration on average than the pro-revolution group.

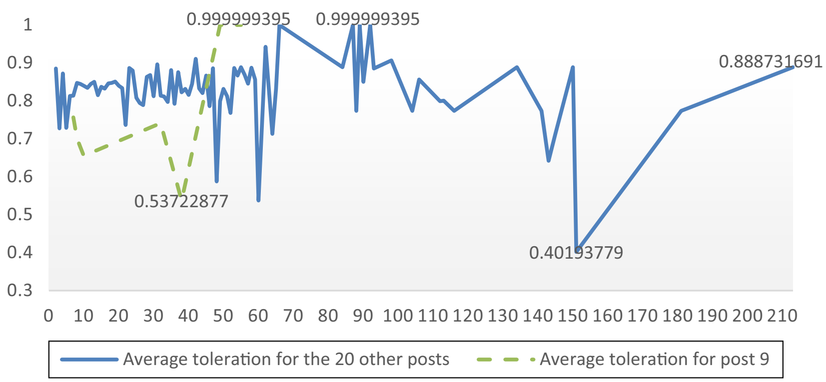


Figure 15.
The average toleration for Post 9 as compared to the average toleration for the 20 other posts

The result aligns with the logic that revolution is, by definition, an act to show inconvenience with the existing political regime.

Further analysis was done to check if there is a different attitude over the Facebook discussions for different groups. The following was found:

- anti-revolution group tend to insult the others personally more than pro-revolution group;
- anti-revolution group tend to insult the others religiously more than pro-revolution group;
- anti-revolution group tend to stereotype more than pro-revolution group;
- there is no real differentiation between the pro-revolution group and anti-revolution group according to self-evaluation;
- the pro-revolution group tend to deny the anti-revolution group's rights more than the anti-revolution group; and
- the pro-revolution group tend to show their opinion (pure agreement) without the appearance of any intoleration indicator than the anti-revolution group.

All the relationships examined are weak, yet significant relationships.

We can conclude that web content analysis can be trusted in terms of validity and reliability, as:

- the inter-coder reliability is found to be high and range between 0.7 and 0.9. Thus, we can indicate that classification process is somehow an objective method and that reproducibility is possible;
- the analysis is valid, as the results are consistent with previous research;
- the Facebook comments gathered show an oscillating toleration level through time;
- the toleration distribution is highly skewed to high toleration, indicating a tolerant society;
- although the researcher expected low levels of toleration because of the observed disagreements in the society and the lack of restrictions on free speech over the web. The web content analysis shows a high toleration among Egyptians; and
- the toleration trend has shown a different mean toleration for Post 9.

5. Conclusion and further research

As previously mentioned, toleration is one of the most complex social phenomena in any given society, this is because its different definitions in different contexts; its buzzling nature whether it is a value (virtue) or behavior, and what is the linkage between these two concepts; and the paradox concerning unlimited toleration and whether it is positive or negative.

Because of its complexity, we need a systemic paradigm to understand toleration. The most suitable methodology to study such a complex system is to generate them computationally through computer models that can simulate the micro-level dynamics in a society and how these micro-level dynamics generate macro-level phenomena. However, to build a computational model of toleration in a given society, we need first to understand and mimic the individual-level behaviors in that society. This study can be viewed as a necessary initial step toward building and validating a computational model of toleration in societies.

During the revolution of 30th June 2013, there was a high level of online participation in the political discourse in Egypt on Facebook, especially on Tamarrod's movement page, the initiator of the revolution at that time. The online participation in political discussions allows for a toleration study. As far as we know, there is no study that analyzed the toleration level on online social media in Egypt.

Egyptians have always been known for their high degree of toleration and accepting the others. They establish their own systems to resolve conflicts, through their traditions, moral and religious symbols that reflect norms of solidarity and tolerance.

However, tensions in the Egyptian society has increased during 2012 and 2013. The increase in demonstrations and the terrorists' attacks in Sinai and all over Egypt are all incidents showing a less tolerant society. But, the results of this study show that the toleration level is still high.

The study shows that Facebook users included in the sample tend not to work on demolition of religions (0% in the dataset) and that religious insult is the least frequently used category of intolerance. This result resides with what is known about the Egyptian culture and the respect for religion as an inherent value in the Egyptian society.

However, no generalizations about the Egyptians can be made because of sample bias to represent only that part of the Egyptian society that uses Facebook. Therefore, the dataset is biased to the younger age groups (48% of the Egyptian Facebook users lie in the age group of 13–24), the higher education level groups (more than 41% of the Egyptian Facebook users are graduated from college) and males (63% of the dataset in comparison to about 50% in Egypt).

This postulates the validity of the content analysis, as the results are consistent with previous research: higher education and younger age groups tend to have higher toleration levels (Mccabe, 2010; Boutros, 1998; Golebiowska, 1995; Sullivan *et al.*, 1981).

Although subjectivity is inevitable in content analysis studies, the research process used in this study has shown reliability and objectivity with a KALPHA between 0.7 and 0.9, the classification process is considered acceptable and reproducible. The coders are Egyptians and the toleration indicators are borrowed from an Egyptian study which decreases cognitive bias (Salah, 2008) to its lowest levels as the coders and indicators are from the same culture as the commenters such that terms can be correctly interpreted in context and a high level of the cultural specifications exists. The content analysis has been done carefully such that personal opinion of the coders was illuminated, there is no right/wrong political affiliation, and the categorization is based on keywords of toleration or intolerance. The coders were always kept in track by having a detailed manual with coding guidelines, instructions for solving a coding conflict and real examples from data.

Ethics of internet research has been taken into consideration in this study. No identities are published; no full-text comment has been reported; and no privacy restrictions have been penetrated.

The study mostly suffered from two things: suitable automatic content analysis software and complete information were absent. Content analysis and categorization were done manually, as there is a lack of suitable software to be able to categorize content in Arabic, Egyptian Slang, English, Internet slang, Franco and Franco inverse, as illustrated above. Content analysis also involves subjectivity in the judgments to draw suitable interpretations and understand the hidden meanings and involves understanding in context, as a word can have multiple meanings and the context as well as the culture of the country can make a certain word hold a completely different meaning rather than the dictionary's definition. This makes developing automatic content analysis software, a hard job (Ackland, 2013; Krippendorff, 2004).

Although these features make automation of the content analysis hard, continuous efforts are still being exerted to automate analysis of content, especially for online content. There are approaches to content and sentiment analysis. Methodologies are being reconsidered to account for the variables of latent content and human judgment that is relevant in the online research in specific. For example, Sjøvaag and Stavelin (2012) present a method for the quantitative content analysis of news online. They suggest that offline automatic content analysis methodologies are insufficient for online analysis, as online content is more varied. On the other hand, privacy settings and incomplete information about users (education, social status, economic status, location [. . .] etc.) hindered a better validation of the content analysis phase. Most Facebook users use restricted privacy setting for their personal details; they do not set their personal details as "Public" thus it cannot be extracted.

Note

1. Microsoft Data Connectivity and Data Preparation technology that enable business users to seamlessly access data stored in hundreds of data sources and reshape it to fit their needs, with an easy to use, engaging and no-code user experience (https://www.microsoft.com/en-us/download/details.aspx?id=39379).

References

Abbasi, M.A., Chai, S.K., Liu, H. and Sagoo, K. (2012), "Real-world behavior analysis through a social media lens", *Social Computing, Behavioral-Cultural Modeling and Prediction*, Springer Berlin Heidelberg, pp. 18-26.

Abrahamson, M. and Carter, V.J. (1986), "Tolerance, urbanism and region", *American Sociological Review*, Vol. 51 No. 2, pp. 287-294.

Ackland, R. (2013), *Web Social Science: Concepts, Data and Tools for Social Scientists in the Digital Age*, Sage Publications, Thousand Oaks, CA.

Al-Khalil, S., Baldwin, T., Nicholson, P., Bober, C. and Ayer, A. (1992), *Toleration between East and West* (I. Al-Arees, Trans.). (Original work published 1991) (Arabic), Dar Al Saqi, Beirut, Lebanon.

Barbour, R. (2001), "Checklists for improving rigour in qualitative research: a case of the tail wagging the dog?", *BMJ*, Vol. 322 No. 7294, p. 1115, Web. 25 June 2015.

Boutros, H.A. (1998), "The cultural constituents for the civil society in Egypt: a study for the political toleration of the political elite (1982-1993)", PhD dissertation, Cairo University, Cairo.

Carter, E. (2005), *The Extreme Right in Western Europe: Success or Failure*?, Manchester University Press.

Chen, D.L. Schonger, M. and Wickens, C. (2015), "oTree – an open-source platform for laboratory, online, and field experiments".

Cohen, A.J. (2004), "What toleration is?", *Ethics*, Vol. 115 No. 1, pp. 68-95.

Cranston, M. (2006), "Toleration", in Borchert, D.M. (Ed.), *Encyclopedia of Philosophy*, 2nd ed., Vol. 9, Macmillan, Detroit, pp. 507-511, Reference USA, available at: http://ic.galegroup.com.library.aucegypt.edu:2048/ic/ovic/ReferenceDetailsPage/ReferenceDetailsWindow?failOverType=&query=&prodId=OVIC&windowstate=normal&contentModules=&mode=view&displayGroupName=Reference&limiter=&currPage=&disableHighlighting=false&displayGroups=&sortBy=&search_within_results=&p=OVIC&action=e&catId=&activityType=&scanId=&documentId=GALE%7CCX3446802035&source=Bookmark&u=aucairo&jsid=ea4b2fd4ca24a90168343581e3a30959

Dutton, W.H. (2013), *The Oxford Handbook of: Internet Studies*, 1st ed., Oxford University press, Oxford.

European University Institute (2013), “Tolerance, pluralism and social cohesion”, *The Accept Pluralism Tolerance Indicators Toolkit*, Florence.

Fielding, N.G., Lee, R.M. and Blank, G. (Eds) (2008), *The SAGE Handbook of Online Research Methods*, Sage.

Forst, R. (2003), *Tolerance in Conflict: History, Content and the Presence of a Disputed Term*, Suhrkamp Verlag GmbH.

Gibson, J.L. and Bingham, R.D. (1982), “On the conceptualization and measurement of political tolerance”, *American Political Science Review*, Vol. 76 No. 3, pp. 603-620.

Golebiowska, E.A. (1995), “Individual value priorities, education, and political tolerance”, *Political Behavior*, Vol. 17 No. 1, pp. 23-48.

Hookway, N. (2008), “‘Entering the blogosphere’: some strategies for using blogs in social research”, *Qualitative Research*, Vol. 8 No. 1, pp. 91-113.

Hruschka, D.J., Schwartz, D., John, D.C.S., Picone-Decaro, E., Jenkins, R.A. and Carey, J.W. (2004), “Reliability in coding open-ended data: lessons learned from HIV behavioral research”, *Field Methods*, Vol. 16 No. 3, pp. 307-331.

Krippendorff, K. (1989), “Content analysis”, in Barnouw, E. Gerbner, G., Schramm, W., Worth, T.L. and Gross, L. (Eds), *International Encyclopedia of Communication*, Vol. 1, pp. 403-407, Oxford University Press, New York, NY, available at: http://repository.upenn.edu/asc_papers/226

Krippendorff, K. (2004), *Content Analysis: An Introduction to Its Methodology*, 2nd ed., Sage Publications, Thousand Oaks, CA.

Krippendorff, K. (2013), *Content Analysis: An Introduction to Its Methodology*, 3rd ed., Sage Publications, Thousand Oaks, CA.

Mccabe, J. (2010), “Online news media use and political tolerance”, PhD dissertation, Wayne State University, MI.

Martensen, A., Brockenhuus-Schack, S. and Zahid, A.L. (2018), “How citizen influencers persuade their followers”, *Journal of Fashion Marketing and Management*, Vol. 23 No. 3.

Moore, H.K. and Walker, C.A. (2011), “Tolerance: a concept analysis”, *Journal of Theory Construction and Testing*, Vol. 15 No. 2.

Mukherjee, A., Venkataraman, V., Liu, B. and Meraz, S. (2013), “Public dialogue: analysis of tolerance in online discussions”, *Proceedings of the Annual Meeting of the Association for Computational Linguistics*, *Sofia, Bulgaria*, *August 4-9 2013*, *Association for Computational Linguistics (ACL-2013)*, pp. 1680-1690.

Müller, J.W. (2005), “Toleration in contexts”, *European Journal of Political Theory*, Vol. 4 No. 4, pp. 467-470.

Nagi, N., Tawadros, A. and Soliman, A. (2020), “Using internet-mediated research in studying toleration on social network sites”, *The National Review of Criminal Sciences*, Vol. 63 No. 2.

Peng, T.Q., Zhang, L., Zhong, Z.J. and Zhu, J.J. (2013), “Mapping the landscape of internet studies: text mining of social science journal articles 2000–2009”, *New Media and Society*, Vol. 15 No. 5, pp. 644-664.

Popper, K. (2012), *The Open Society and Its Enemies*, Routledge.

Salah, S. (2008), “Objectivity and bias: Salah Qonosa vs AbdelWahab El-Messiri”, *Philosophical Papers*, Vol. 19, pp. 371-382, (Arabic).

Scanlon, T.M. (2003), *The Difficulty of Tolerance: essays in Political Philosophy*, Cambridge University Press.

Sjøvaag, H. and Stavelin, E. (2012), “Web media and the quantitative content analysis: methodological challenges in measuring online news content”, *Convergence: The International Journal of Research into New Media Technologies*, Vol. 18 No. 2, pp. 215-229.

Sullivan, J.L., Marcus, G.E., Feldman, S. and Piereson, J.E. (1981), "The sources of political tolerance: a multivariate analysis", *American Political Science Review*, Vol. 75 No. 1, pp. 92-106.

Tan, K.C. (1998), "Toleration, diversity and global justice", PhD dissertation, University of Toronto, Toronto.

Tuch, S.A. (1987), "Urbanism, region, and tolerance revisited: the case of racial prejudice", *American Sociological Review*, Vol. 52 No. 4, pp. 504-510.

What is spam? | Facebook Help Center | Facebook (2016), "Facebook.com", available at: www.facebook.com/help/1461986764019121 (accessed 22 March 2016).

Witenberg, R.T. (2002), "Reflective racial tolerance and its development in children, adolescents and young adults: age related difference and context effects", *Journal of Research in Education*, Vol. 12 No. 1, pp. 67-79.

Further reading

Abou Farab, A.A. (1999), *Social Tolerance in the Egyptian Society*, American University in Cairo.

Mondak, J.J. and Sanders, M.S. (2005), "The complexity of tolerance and intolerance judgments: a response to Gibson", *Political Behavior*, Vol. 27 No. 4, pp. 325-337.

MRA/IMRO (2010), "MRA/IMRO guide to the top 16 social media research questions", available at: www.mra-net.org/rq/documents/mra_imro_smr16.pdf

Rains, S.A. and Brunner, S.R. (2014), "What can we learn about social network sites by studying Facebook? A call and recommendations for research on social network sites", *New media and society*, 1461444814546481.

Corresponding author
Amira S.N. Tawadros can be contacted at: amira.tawadros@gmail.com