Original Article

Cyberactivism and Real-World Activism: Why Are Users Different?

Shalaleh Meraji Oskuie*
Sholeh Meraji Oskouie

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Abstract
Cyberactivism, as civic engagement, is enabled by social media, and has attracted many users to participate in leading social change. To shed more light on the relationship between cyberactivism and real-world (social) activism, within a quantitative approach, employing correlational research design, and a group comparison research design, the current research examined two linear regression models for the relationships among online sharing, homophily, attitudinal influenceability, and behavioral influenceability, and also, among behavioral influenceability, cyberactivism and social activism, and then examined the effects of sociodemographic characteristics of Iranian Instagram users on these variables in a 393-participant sample. The alternative hypotheses about the relationships among the variables in these two models, were retained. The results also showed that age, gender, and occupational status had effects on almost all variables. This study contributes to the existing literature by introducing attitudinal and behavioral influenceability as important factors influencing cyberactivism and social activism. It encourages governments to take full advantage of online activities and cyberactivism to promote social participation and real-world activism, especially among youth and females, to transcend society, and better solve societal and global problems with the collective wisdom.

Keywords: cyberactivism, homophily, influenceability, Iranian Instagram users, online sharing, social activism, sociodemographic factors.

Shalaleh Meraji Oskuie (*Corresponding author): Department of Media Management, Faculty of Management and Economics, Tehran Science and Research Branch, Islamic Azad University, Tehran, Iran. Email: shalaleh.meraji@srbiau.ac.ir, Orcid: https://www.orcid.org/0000-0002-7048-6638

Sholeh Meraji Oskouie: Department of Media Management, Faculty of Management and Economics, Tehran Science and Research Branch, Islamic Azad University, Tehran, Iran. Email: sholeh.oskouie@srbiau.ac.ir, Orcid: https://www.orcid.org/0000-0003-1316-0276

Introduction

Social activism, in the form of social actions organized by groups, or individuals such as celebrities, happens throughout social media (Li et al., 2021: 854). This form of technology-based civic engagement is called cyberactivism, or web-based/ digital activism, that although has become the first step of many real-world movements, yet, can be distinguished from real-world activism (Hennefer, 2013: i & 9). Receiving a broad scholarly and public attention, digital activism generally "refers to political activism on the Internet or political movements relying on it", that enables two-way or many-to-many mass communication. This high degree of interaction and networking across national and regional boundaries has changed movement dynamics through self-organizing and organizationally enabled networks (Özkula, 2021: 61).

"Social and political activism is one of the pillars of a country's political culture and democratic health" (Fernández-Prados et al., 2021a: 466). Especially, the adolescent digital activism can be a good model and pedagogical tool for a critical and active digital citizenship (Fernández-Prados et al., 2021b: 476), that can expand such participation into traditional spaces (Cortés-Ramos et al., 2021: 10). Hence, youth's transformational potential should be considered by public and private institutions, and youth activism and digital civic engagement should be promoted to enhance sustainable development (ibid).

Social media, as effective social transformation vehicles, are not only an informative resource, but also the instruments of expression and social mobilization for young people (ibid: 11), which are both the tool and target of cyberactivism, that enable participation in social movements. As public spaces that can bring social groups together and create identity, and having features of simultaneity, source verification possibilities and data sharing, new media enable people to establish political, cultural, religious or commercial organizations regardless of location (Gönç, 2022: 188, 174), and share diverse information and media content (Figeac & Favre, 2021).

Furthermore, the phenomenon of network homophily is an important feature in social media. Indeed, social psychology showed that individuals prefer to form groups with those they agree with, and network homophily shows "the degree to which pairs of individuals are similar in terms of certain attributes" (Medaglia & Zhu, 2017: 534). Influenceability of users is another important factor, that we, in the current study, separated it into two attitudinal and behavioral dimensions. Influenceability is defined as the fraction of actions that a user performs under the influence of at least one of its neighbors (Li et al., 2015: 194).

Besides, research in 46 countries showed that sociodemographic factors also affect face-to-face and digital alternative or unconventional political actions of citizens (Fernández-Prados et al., 2021a: 466). Another research (Fernández-Prados et al., 2021b) also showed that social media platforms (especially Instagram), and users' age and gender played significant roles in social movement leadership. In addition, another survey demonstrated generational differences in the use of web-based tools for social activism (Hennefer, 2013: i).

In a study on the factors affecting opinion leadership of social media users toward social actions, Meraji Oskouie, Soltanifar and Delavar (2023) showed that the Instagram users' social actions induced by opinion leaders, and influenced by these leaders' especial characteristics, were mediated by two attributes of the users, including "users' influenceability", and "dissemination of calls for social action". We, on the basis of their data set, examined two models of the relationships among online sharing, homophily, attitudinal influenceability, and behavioral influenceability, and also among behavioral influenceability, cyberactivism and real-world (social) activism, and the effects of sociodemographic characteristics of Iranian Instagram users on these variables.

Real-world activism

Social activism is the participation of a member of an organization in purposeful activities designed to promote social change and support the opposition, or to maintain the status quo, in order to improve political situations, or to achieve political or social change (Fernández-Prados et al., 2021b: 476; Demir & Köksoy, 2021: 1861).

There is often a conceptual overlap between activism and participation in political and social movements (Fernández-Prados et al., 2021b: 476). Social movement is collective informal interactions based on the plurality of individuals, groups and/or organizations who share common identities and views to address political or cultural conflicts. It generates social actions including political campaigns, petitions, or protests,

with the ultimate goal of systemically or non-systemically promoting or opposing social change (Li et al., 2021: 855-856). Three collective action frames within social movement literature can be recognized, including diagnostic (which defines a problem or assigns fault), prognostic (which details possible solutions), and motivational (which incites individuals to act or mobilize) (Williams, 2022: 24-25).

Advocacy and activism for social and political issues gained considerable attention due to the new technological developments that encourage diverse forms of participation with an engaged citizenry. Civic engagement is activities done by citizens with an expressed aim to improve conditions for others in a local or global community, which traditionally occurs face-to-face, but has recently progressed with digital technologies (Seelig et al., 2019: 15 & 17).

Cyberactivism

Tech-based activism and social movements that happen on social media are labeled as cyberactivism, digital activism, or with other synonyms such as hashtag activism, online activism, web activism, and even hacktivism (Li et al., 2021: 855; Hennefer, 2013: 1 & 3). Cyberactivism allows movements to spread globally in hours, by users' engagement in learning about the movement, increasing its popularity by liking, commenting, sharing, and reposting, and also with posting user-generated content on social media (Li et al., 2021: 856).

Social media has formed a centralized sphere of influence for activists. Cyberactivism is popular due to the social media's characteristics including its ease of use, convenience, widespreadness, security, weaker restrictions and control than mainstream media, fast sharing, accessibility from different places, and instant availability of a large target audience (Demir & Köksoy, 2021: 1861). In this context, celebrity cyberactivism has gained significance. Its immediacy, visibility, ability to command attention, the presumed absence of gatekeepers, illusions of liveness, and the synchronous interactions with fans, bypass the agenda-setting of mainstream media, and although it is seen as a "shallow expression of a consumer-led culture", it is conducive to creating collective support for a cause and issue-based connective action online and offline (Williams, 2022: 24-26). Another form of cyberactivism is cyber-artivism which is a social, political, activist and protestant social art on social media (Pirela Morillo et al., 2020: 81).

Digital activist actions can be classified as digital spectator activities (i.e., clicktivism, meta-voicing, assertion), digital transitional activities (i.e., political consumerism, digital petitions, botivism, e-financing), and

digital gladiatorial activities (i.e., data activism, disclosure, hacktivism) (Gönç, 2022: 175-176). Similarly, Özkula (2021: 71) mentioned some kinds of cyber-activities. She also classified cyberactivism under following categories: advocacy and political commentary; recruitment, movement-building and campaigns; organization and coordination; online direct action, hacktivism, and civil disobedience; and research and documentation. (Özkula, 2021: 67).

The new forms of cyberactivism have been complimented "for their wide reach, networkedness, immediacy, directness/ disintermediation, interactive potential, and potential for empowerment", but they have also been criticized for "low efficacy, the creation or reinforcement of political apathy, and potentially harmful consequences such as hacking and surveillance" (ibid: 61), and also for what is called slacktivism, clicktivism or armchair activism that derogatorily describes a superficial support for a cause by simply liking, tweeting, or sharing, without being engaged or devoted to making a change (Ralston, 2022).

Nevertheless, social movements are transitioning from collective actions to connective actions; hence, relying less upon established organizations and social groups, and more upon loose networks of social connections to organize grassroots and develop publics (Williams, 2022: 25). Previous studies found a direct relationship between Iranian users' social capital on Facebook and their real-world civil participation (Kermani & Pakdaman, 2016), and a significant effect of the amount of social network activity on the Iranian university students' political consumption (Rahbarqazi, 2017).

Homophily

The homophily principle in social networks, as a tie-generating and -strengthening mechanism over time, is the tendency to associate with similar others, based on sociodemographic similarities, such as gender and race, and cultural or media consumption similarities (Figeac & Favre, 2021). Users' fundamental and structural biases, which are more related to their education level or culture, such as confirmation biases, shape a preference for choosing social media friends with similar biases (Hakobyan & Koulovatianos, 2019: 3).

A study showed that interactions on Weibo, a Chinese social media platform, are characterized by homophily and polarization, even though its users perceive their interactions as deliberative, although, interactions on government-managed social media were less deliberative than other platforms (Medaglia & Zhu, 2017: 533).

New media rather than promoting social isolation, indeed, leads heavy social media users to feel closer to weak ties which they have

more interaction with, through liking, sharing, and commenting behaviors. Social media promotes a homophily-by-choice based on information-sharing similarities, especially in political news and entertaining content sharing, that can reinforce or weaken online friends' relationships, although, the social media algorithms contribute to shaping the very information-sharing behavior (Figeac & Favre, 2021).

Indeed, the interactions of individuals on a social platform are governed by undisclosed algorithms which decide what is visible to whom (Bolzern et al., 2020: 363). Although, social media use is expected to increase user's exposure to a variety of news and opinions, and maintain diverse social ties, but, getting likeminded news in a selective manner, news personalization and platform algorithms will result in disadvantageous political consequences for democracy such as intellectual isolation, echo chamber, filter bubbles, diversity exposure restrictions, political radicalization and polarization, less tolerance for disagreeing viewpoints, and hostility toward outgroups (Gil de Zúñiga et al., 2022: 581).

Online sharing

Social networking sites have revealed users' cultural tastes or political opinions (Figeac & Favre, 2021), and have enabled them to share, request, and acquire a variety of information online, or to have fun and resolve the problems in their daily lives (Lin & Wang, 2020: 45). What people post online can be conceptualized as a reflection of their personality (Kim & Jang, 2018: 90). A report in 2019 showed "that, every 60 s, 510,000 comments are posted, 293,000 statuses are updated, and 136,000 photos are uploaded [only] on Facebook" (Lin & Wang, 2020: 45).

User generated media are created by a myriad of users, and involve both creating and sharing content online. Users consume (i.e., browse, watch, read, or view), participate (i.e., like, add, share, post and comment) or produce (i.e., create and publish) such content. But previous research showed that most people use media as mere lurkers, i.e., passive users who do not contribute to an online community by their posts, and only consume media content by reading, watching and browsing online (Omar & Dequan, 2020: 122). Information sharing behavior is a significant source of collective value in online communities, and differs from "traditional, passive participation behaviors (e.g., viewing articles, visiting community websites)". Also, the universal social norm of reciprocity that requires people to return some benefits for any benefits they receive, is likely the key mechanism underlying online community members' information-sharing behavior (Pai & Tsai, 2016).

Users use social media for social interaction; archiving their photos and videos by posting them online; self-expression, escapism (i.e., escaping or relieving from day-to-day pressures), and peeking into other people's lives (Omar & Dequan, 2020: 125). These motivations and reasons can be also explained through five types of following gratifications: entertainment, socializing, status seeking, information sharing, and pass time. Information sharing gratification is the "individuals' need to improve knowledge of their surrounding environments through sharing information for self-education", that on social media is linked to learning about events, businesses, or other people, and sharing links of news content. Even, two studies found that individuals share misinformation more for informational reasons than for entertainment. Previous studies found that status seeking, information sharing, socializing, and pass time gratifications have effects on users' news sharing (Thompson et al., 2019: 2-3 & 6).

Influenceability

Each individual's opinion is influenced by the opinions of the neighbors, and also by the other external sources of influence (such as media or everyday experiences) (Bolzern et al., 2020: 362). The influenceability of a user, from an activity-based perspective that considers the dynamic nature of network structure over time, can be measured "as the ratio between the number of actions for which the user was influenced, over the total number of actions performed by the user" (Safari et al., 2019).

From a skeptical view, the structural feature of the social media's design and business model is a behavioral vision which "encourages a conception of users as influenceable subjects, not knowledge agents". Social media are designed based on the manipulability of users' identities and desires via algorithmic mediations which associate users with others through homophilic networking, that promote echo chamber and confirmation bias (Cesarino, 2020).

Ng et al. (2021) divided the dissemination of posts into three patterns of centrality, dispersibility, and influenceability (which they defined as the reach of a post that is distributed through influential users). Influential users' forwarding behavior is largely affected by their reputational concerns, and also protecting the practice of free speech (Ng, 2021: 904-907).

In the current research, we separated influenceability into two attitudinal and behavioral dimensions. Attitudes, broadly defined as affective (favorable or unfavorable) evaluations with regard to particular objects or behaviors (Kroesen et al., 2017: 190), are determinants of behaviors. The theories of reasoned action and planned behavior suggested "that performance of a behavior follows from such proximal an-

tecedents as behavior-specific beliefs, attitudes, subjective norms, perceptions of control, and intentions… General attitudes toward policies, people, institutions, or events are found to correlate well with behavioral patterns but not with specific behaviors; to predict specific actions requires a measure of attitude toward the behavior itself" (Ajzen et al., 2018). Nevertheless, Kroesen et al. (2017) by arguing that researchers acknowledge the probable existence of a reverse relationship from behavior to attitude, showed that this relationship is mutual and the effects of behaviors on attitudes are much larger than vice versa, in the presence of cognitive dissonance (Kroesen et al., 2017: 190).

Sociodemographic influence

A national survey in 2022 showed that 78.5% of all Iranians, 96.9% of young people aged 18-29 years, 86.2% of people living in province capitals, and 95.3% of people with university education used at least one social media application. Instagram is the second most popular social media platform, after WhatsApp in Iran, and 49.4% of Iranians, 74.4% of young people aged 18-29 years, 56% of people living in province capitals, and 65.1% of Iranians with university education used this platform as of May 2022 (*ISPA*, 2022).

The social movements in the last decade demonstrated a strong presence and leadership of young adolescent on social media, especially acting on the climate change issue. A review showed that teenage, particularly female cyberactivists, from northern countries, engaged in any social movement, especially focused on environmental causes, and predominantly use Instagram rather than Twitter, and some of them are macro or mega-influencers who are close to celebrities (Fernández-Prados et al., 2021b: 478). Studies also showed that young people who participate in cyberactivism are more likely to engage in offline political participation, and also the volume of interactions on social media platforms such as Twitter, was a significant predictor of users' participation in social protests (Cortés-Ramos et al., 2021: 11).

Cortés-Ramos et al. (2021) showed that youth's motivation for social participation was usually associated with the concerns arising from their environment such as educational context, family environment, peer groups, or personal experiences such as racism, xenophobia, inequality, discrimination, gender violence, climate change, and also topics related to Sustainable Development Goals, such as "poverty, good health and wellbeing, gender equality, responsible consumption and production, reduced inequalities, life below water and on land, climate action, and peace" (ibid: 10).

Fernández-Prados et al. (2021a), based on a survey on alternative or unconventional face-to-face and digital political actions in 46 countries, including Iran, found that the most of the participants did not perform any kind of activism, although the more developed countries, and participants under 40 years of age were more active (i.e., a democratic gap). Respondents were more digitally active up to the age of 40, and a certain group of five "hyperdeveloped" countries had the most digitally active participants (i.e., a digital divide) (Fernández-Prados et al., 2021a 466 & 470).

Hennefer (2013) found that digital natives (who have grown up surrounded by technology) are more likely to use the Internet to engage in political discussion and activity, but in a passive manner. Digital immigrants (who used technology later in their lives) use web-based tools as supportive means for their in-person activism (Hennefer, 2013: i). For example, Turkish participants aged 18-24 years, high school and undergraduate students, and heavy Internet users (with more than 7 hours daily Internet use) were more active on signing online petitions than other participants. The extent of participation differed between Turkish males and females (Kırık et al., 2021: 312-313). Despite high awareness about online petitions, the Turkish participants had low levels of belief in the success of online petitions. Nevertheless, the majority of them signed petitions at least once, to contribute to solving problems (ibid: 321).

Studies also showed that the significant part of the activists in the Arab world's social and political movements were youth. But, due to some cultural reasons, Moroccan males used the Internet for political activism more than females, and they were also more active offline (Laouni, 2022). Although, another research showed that Tunisian, Egyptian, and Moroccan female cyberactivists employed social media to disrupt gender relations in their countries and demand social, economic, and political gender parity (Landorf, 2014: 5).

Previous studies have shown increasing evidence of the difference between females and males in their use of information technology (Lin & Wang, 2020: 45). Self-presentation behaviors on social networking sites differ between males and females (Kim & Jang, 2018: 90). Lin and Wang (2020) showed that women and men similarly grant importance for social presence, and they both want to be connected to others online in order to share information, but women emphasize more on social ties and commitment, place a significantly greater importance on privacy risk, and are more influenced by attitudes toward sharing. Both genders' information sharing behavior is affected by subjective norms, but, when males want to share information on social media, they are more concerned about other people's opinions (Lin & Wang, 2020: 52-53).

Methodology

The current research adopted a Correlational Research Design (Seeram, 2019) and a Group Comparison Research design (Whitley, 2002), and employed a data set gathered from Iranian Instagram users (N= 48 million in 2021; *Beta*, 2022) by a non-probability convenience sampling technique (i.e., the researchers announce the study and participants self-select if they wish to participate; Stratton, 2021: 373). This data set was obtained from 393 Iranian Instagram users, via an online questionnaire on Google Forms, before the filtering of Instagram application (in September 2022 in Iran; *Tasnimnews*, 2022).

Instrument and Measures

The data set was gathered in a study on online opinion leadership and users' social action by Meraji Oskouie, Soltanifar, and Delavar (2023), through a self-administered questionnaire with 53 closed-ended items, including 6 sociodemographic items, and 47 Likert-type, 5-point items with response options of Extremely= 5; Very= 4; Moderately= 3; Slightly= 2; Not at all= 1. We employed their dataset to test our hypotheses for differently defined variables from theirs.

Table 1. Demographic variables' descriptive statistics

	Mean	Median	Mode	Std. Deviation	Variance	Range	Min.	Max.
Age	2.98	3.00	3	1.079	1.165	5	1	6
Gender	1.39	1.00	1	.489	.239	1	1	2
Residence location	1.28	1.00	1	.589	.347	3	1	4
Occupational status	1.90	2.00	1	1.185	1.405	4	1	5
Income level	2.46	3.00	3	.642	.412	3	1	4
Educational level	3.97	4.00	4	1.324	1.754	5	1	6

According to the steps described by Meraji Oskuie et al. (2022), we conducted exploratory factor analysis (using Principal Axis Factoring method, VARIMAX Rotation method, Eigenvalues > 1, Scree test, Item loading ≥ .50, and Communality statistics i.e., the percentage of the total item variance explained > 50%), and Cronbach's Alpha (α)> .70 to calculate mean scores of items, and build variables with the IBM SPSS Statistics V22.0 for further analysis. All mean-scored variables complied with the abovementioned criteria, except for one variable (i.e., homophily) that had an alpha slightly smaller than .70.

Table 2. Main variables

Variable and items	Factor loadings	% of variance	α	Scale's mean	Variance	Std. deviation
Homophily (H)	.567-.733	61.530	.686	7.83	7.062	2.657

I follow Instagram pages of 1. people who hold attitudes and opinions similar to mine; 2. people who are the same age or gender as I am; 3. people who have similar social status (such as social class, educational or occupational status) to mine.

Online Sharing (O-S)	.535-.696	52.307	.770	12.52	16.204	4.025

I mostly share the Instagram posts 1. of people who have knowledge and expertise in the areas I am interested in; 2. of people who their behaviors and posts are conforming to social norms and values; 3. of people with high social, economic, or political status; 4) that evoke my emotions; 5) that are logical and rational.

Attitudinal Influenceability (A-I)	.572-.757	51.597	.843	18.20	27.265	5.222

My way of thinking is influenced by the advices and suggestions of people on Instagram who 1. have knowledge and expertise in the areas of my interest; 2. their behaviors and posts are conforming to social norms and values; 3. have high social, economic, or political status; 4. hold attitudes and opinions similar to mine; 5. have similar social status (such as social class, educational or occupational status) to mine; 6. My way of thinking is influenced by Instagram posts and messages that evoke my emotions; 7) that are logical and rational.

Behavioral Influenceability (B-I)	.592-.753	51.651	.843	15.79	24.158	4.915

I act upon advices and suggestions of 1. people who their behaviors and Instagram posts are conforming to social norms and values; 2. Instagram pages of formal (mainstream) media (such as radio and television, newspapers, and news agencies); 3. People who hold attitudes and opinions similar to mine; 4. people who are the same age or gender as I am; 5. People who have similar social status (such as social class, educational or occupational status) to mine; 6. I act upon Instagram posts and messages that evoke my emotions; 7) that are logical and rational.

Cyberactivism (C-A)	.628-.834	65.508	.736	5.70	5.887	2.426

1. I share Instagram campaigns that I personally act upon; 2. I do simultaneous online collective actions with other users (such as changing profile picture, and collective online reporting) in response to Instagram campaigns and posts; 3. I encourage friends and acquaintances to participate in campaigns and collective actions, based on Instagram campaigns and posts.

Social Activism (S-A)	.556-.703	55.277	.724	8.00	8.814	2.969

1. I participate in charitable and humanitarian activities, or actions regarding environmental issues and animal rights, that are advised by Instagram campaigns and posts; 2. I change my personal and social behaviors, as advised by Instagram campaigns and posts; 3. I participate in simultaneous and coordinated collective actions (such as boycotting the purchase of a product or the use of a specific service) advised by Instagram campaigns and posts; 4. I attend in social or political gatherings that are advised by Instagram campaigns and posts.

Table 3. Descriptive statistics

Variable	Mean	Std. deviation	Range	Min.	Max.	Variance	Skewness		Kurtosis	
							Statistic	Std. error	Statistic	Std. error
H	2.6115	.88581	4.00	1.00	5.00	.785	.086	.123	-.525	.246
O-S	2.5038	.80509	3.60	1.00	4.60	.648	.039	.123	-.637	.246
A-I	2.5994	.74594	4.00	1.00	5.00	.556	.010	.123	-.115	.246
B-I	2.2552	.70216	3.71	1.00	4.71	.493	.378	.123	.000	.246
C-A	1.9016	.80878	4.00	1.00	5.00	.654	.929	.123	.762	.246
S-A	1.9994	.74220	3.50	1.00	4.50	.551	.646	.123	.027	.246

According to Demir (2022: 398), normality of data was tested by two components of normal distribution, i.e., skewness and kurtosis, that showed our data were not normally distributed. We also, according to Promes (2016: 286), assessed the linearity in the relationship between the independent and dependent variables, separately, by conducting regression curve estimation for each variable on at least one other variable. All variables were sufficiently linear because they had significant R-squared and F-values (although not always having the highest F-values among other types of equations, but having values close to them).

Results

All of the variables are correlated, at the 0.01 significance level, mostly with the moderate to high strengths, from .343 to .872 (Table 4). As the distributions of our data were non-normal, according to Akoglu (2018), the correlation coefficients were calculated with Spearman's rho.

Table 4. Correlation coefficients (Spearman's rho)

O-S↔ H	.512**	C-A↔ H	.350**	B-I↔ O-S	.696**
B-I↔ A-I	.872**	C-A↔ B-I	.497**	A-I↔ H	.660**
S-A↔ H	.343**	C-A↔ O-S	.469**	C-A↔ A-I	.491**
S-A↔ B-I	.527**	B-I↔ H	.641**	A-I↔ O-S	.722**
S-A↔ O-S	.437**	S-A↔ A-I	.497**	S-A↔ C-A	.774**

All variables' Sig. (2-tailed) = .000

**. Correlation is significant at the 0.01 level (2-tailed).

Regression models

We conducted a linear regression analysis with all the independent variables on social activism as dependent variable. The Stepwise method with the default criteria of the IBM SPSS Statistics V22.0 software

(i.e., Probability of F to enter ≤ .050, Probability of F to remove ≥ .100) showed that homophily, online sharing, and attitudinal influenceability should be removed from the model to fit the model. Therefore, due to the existence of the simple bivariate correlation between variables, we decided to analyze the relationship among our variables through two different linear regression models, separately.

Hypotheses for regression analyses were as follows: H_0: β=0 (LCI ≤ 0 ≤ UCI); H_1: β≠0 (0 < LCI < UCI; or LCI < UCI < 0); Confidence Level: 99%; P< .01. H_0 was accepted when zero fell between lower (LCI) and upper bounds (UCI) of 99% confidence interval for β.

A model for behavioral influenceability

As regression analysis is moderately robust to violation of the normality assumption (Seltman, 2018: 235), we employed a linear regression analysis using the Enter method, to analyze a model with online sharing, homophily, and attitudinal influenceability as independent variables and behavioral influenceability as dependent variable.

"A regression model fits well if the dependent variable y is explained more by the regressor x than by the residual" (Das, 2019: 76). The R^2 (R-Squared or coefficient of determination) is the most popular and extensively used goodness-of-fit measure for a linear regression model (Onyutha, 2022; Das, 2019: 79; Deb, 2017: 131). Also known as multiple correlation coefficient, it is a measure of the fraction (or percent if multiplied by 100) of the total variation in the outcome that can be explained by the explanatory variable, and ranges from zero (that means x provides no information about y) to 1 denoting perfect prediction of y from x (Seltman, 2018: 236-237). The adjusted R^2 also may be a good indicator after adjusting the degrees of freedom in estimating the parameters, and incorporating a penalty for adding more variables (Das, 2019: 79). The R^2 of .785 in the model showed that 78.5% of the total variation in the behavioral influenceability was explained by the three independent variables.

In simple regression, the closer the simple correlation of x and y is to 1 or -1, the stronger the association. R^2 in simple regression is equal to the square of the simple correlation. In multiple regression, R^2 is used to measure the overall strength of the regression. (Seltman, 2018: 236). The R^2 of .785 also shows a strong regression. The Standard Error of the Estimate is the best estimate of standard deviation (σ) from the model, and "represents how far data will fall from the regression predictions on the scale of the outcome measurements" (ibid: 235). This value for the model was .32654.

Table 5. Behavioral influenceability model

Model fit indices

Model	R	R square	Adjusted R square	Std. error of the estimate
1	.886[a]	.785	.784	.32654

a. Predictors: (Constant), Online sharing, Homophily, Attitudinal influenceability

ANOVA[a]

Model		Sum of squares	df	Mean square	F	Sig.
1	Regression	151.787	3	50.596	474.498	.000[b]
	Residual	41.479	389	.107		
	Total	193.266	392			

a. Dependent variable: Behavioral influenceability
b. Predictors: (Constant), Online sharing, Homophily, Attitudinal influenceability

Coefficients [a]

Model 1	Unstandardized coefficients		Standardized coefficients	t	Sig.	99.0% confidence interval for B		Collinearity statistics	
	B	Std. error	Beta			Lower bound	Upper bound	Tolerance	VIF
(Constant)	.003	.063		.043	.966	-.160	.165		
O-S	.117	.029	.134	3.990	.000	.041	.193	.488	2.049
H	.087	.025	.110	3.475	.001	.022	.152	.554	1.804
A-I	.667	.036	.708	18.341	.000	.572	.761	.370	2.702

a. Dependent variable: Behavioral influenceability (B-I)

The residual sum of squares provides a convenient basis for testing multiple hypotheses (Das, 2019: 91). It effectively explains the variation of modelling errors in a regression model. A large regression sum of squares in comparison to the residual sum of squares indicates that the model accounts for most of the variation in the dependent variable (Alam, 2021: 217). The residual sum of squares always increases when variables are dropped from the model (Das, 2019: 91). The regression sum of squares of 151.787 in comparison to the residual sum of squares of 41.479 demonstrated that the model accounted for most of the variation in the behavioral influenceability.

A large value of F (that is induced by a large value of R^2), and small P-value give evidence against the null hypothesis (Das, 2019: 93). Hence, F-statistic of 474.498 with the p-value of .000 rejected our null hypotheses. The abovementioned values demonstrated the very good goodness-of-fit of the model.

The t-statistics or t-value is a measure of the statistical significance of an independent variable X in explaining the dependent variable Y. "Any t-value greater than +2 or less than -2 is acceptable". A higher value demonstrates a greater confidence we have in the coefficient as a predictor, and a low value indicates the low reliability of the predictive power of that coefficient (Shim & Siegel, 2009). All t-values were greater than +2, and the highest value was for the attitudinal influenceability that strongly predicted the behavioral influenceability.

We also assessed multicollinearity by tolerance value, where a value of 0.1 or less indicates serious collinearity and a value close to 1 indicates little multicollinearity, and by variance inflation factor (VIF), where values exceeding 10 are regarded as indicating multicollinearity (Senaviratna & Cooray, 2019: 3), and such high VIF values "indicate that the linear regression model presents a significant degree of collinearity" (Salmerón-Gómez et al., 2020). We did not detect any collinearity problem in the variables.

The results showed that attitudinal influenceability (β= .667) had the highest direct effect on behavioral influenceability, and farther, online sharing (β= .117), and homophily (β= .087) directly influenced this dependent variable, in a descending order.

To calculate the partial mediation effect of online sharing and homophily on behavioral influenceability through attitudinal influenceability variable, according to Newsom (2023), and Abu-Bader and Jones (2021), we conducted the steps shown in the table below, and to calculate the significance of the indirect effects we conducted a Sobel test using an online tool designed by Preacher and Leonardelli (n.d). The results demonstrated that online sharing (β= .312), and homophily (β= .227) indirectly affected behavioral influenceability, through attitudinal influenceability.

Table 6. Direct and indirect effects table

Path	Model	R	R square	Adjusted R square	Std. error of the estimate	Unstandardized coefficients		Standardized coefficients	t	Sig.
						B	Std. Error (S)	Beta		
	Regression Models									
a	O-S → A-I (Model: O-S & H → A-I)	.794	.630	.628	.45500	.468	.033	.505	14.055	.000
b	O-S → B-I (Model: O-S & H → B-I)	.774	.600	.598	.44534	.429	.033	.492	13.162	.000
c	H → A-I (Model: O-S & H → A-I)	.794	.630	.628	.45500	.341	.030	.405	11.279	.000
d	H → B-I (Model: O-S & H → B-I)	.774	.600	.598	.44534	.314	.030	.397	10.615	.000
b′	O-S → B-I (Model: O-S & H & A-I → B-I)	.886	.785	.784	.32654	.117	.029	.134	3.990	.000
e′	A-I → B-I (Model: O-S & H & A-I → B-I)	.886	.785	.784	.32654	.667	.036	.708	18.341	.000
d′	H → B-I (Model: O-S & H & A-I → B-I)	.886	.785	.784	.32654	.087	.025	.110	3.475	.001

Partial indirect effect	Sobel test						
Ba * Be′ or Bb – Bb′	**Ba**	**Be′**	**Sa**	**Se′**	**Sobel test statistic**	**Std. error**	***p*-value**
.312	.468	.667	.033	.036	11.2614726	0.02771893	.000
Bc * Be′ or Bd – Bd′	**Bc**	**Be′**	**Sc**	**Se′**	**Sobel test statistic**	**Std. error**	***p*-value**
.227	.341	.667	.030	.036	9.68868639	0.02347553	.000

A model for social activism

We also employed a linear regression analysis using the Enter method, to analyze a model with behavioral influenceability and cyberactivism as independent variables and social activism as dependent variable. The R^2 of .657 showed that 65.7% of the total variation in the social activism was explained by the two independent variables. This R^2 value demonstrated an adequately strong regression. The standard error of the estimate for the model was .43602. The regression sum of squares of 141.792 in comparison to the residual sum of squares of 74.145 indicated that the model accounted for most of the variation in the social activism. F-statistic of 372.912 with the p-value of .000 rejected our null hypotheses. With the abovementioned values, the model showed a good goodness-of-fit.

All t-values were greater than +2, and the highest value was for the cyberactivism that strongly predicted the social activism. We did not detect any collinearity problem in the variables.

The results showed that cyberactivism (β= .626) had far more direct effect than behavioral influenceability (β= .226) on social activism. To calculate the partial mediation effect of behavioral influenceability on social activism through cyberactivism variable, we conducted the steps shown in the table below, and to calculate the significance of the indirect effect we conducted a Sobel test. The findings showed that behavioral influenceability (β= .360) had indirect effect on social activism, through cyberactivism.

Group comparisons

To conduct group comparison tests, due to the nonnormality of the data, we employed Wilcoxon-Mann-Whitney, and Kruskal-Wallis tests that do not make assumptions about normality. Kruskal-Wallis test is the nonparametric equivalent of the one-way ANOVA, and is basically an extension of the Wilcoxon-Mann-Whitney two-sample test, that is used for more than two independent samples (Ostertagova et al., 2014: 115; Sawilowsky & Fahoome, 2014). Hypotheses for testing group differences were as follows: H_0: $\mu = \mu_0$; H_1: $\mu \neq \mu_0$; $P < .05$.

Kruskal-Wallis test's mean ranks showed an almost constant decline in homophily, attitudinal and behavioral influenceability with the increase in age. Online sharing also decreased with the increase in the age of participants. The mean ranks of age groups in cyberactivism and social activism showed differences among them, demonstrating the more cyberactivism and social activism among 18-24 and 35-44 age groups. To get the more analyzable results, we regrouped participants into three different age groups (i.e., under 18 to 24; 25- 44; and over 45). The new mean ranks significantly showed a constant decline in all variables by the increase in the age of the participants.

Table 7. Social activism model

Model fit indices

Model	R	R square	Adjusted R square	Std. error of the estimate
1	.810[a]	.657	.655	.43602

a. Predictors: (Constant), Cyberactivism, Behavioral influenceability

ANOVA[a]

Model		Sum of squares	df	Mean square	F	Sig.
1	Regression	141.792	2	70.896	372.912	.000[b]
	Residual	74.145	390	.190		
	Total	215.937	392			

a. Dependent variable: Social activism
b. Predictors: (Constant), Cyberactivism, Behavioral influenceability

Coefficients [a]

Model 1	Unstandardized coefficients		Standardized coefficients	t	Sig.	99.0% confidence interval for B		Collinearity statistics	
	B	Std. error	Beta			Lower bound	Upper bound	Tolerance	VIF
(Constant)	.300	.076		3.920	.000	.102	.498		
C-A	.626	.031	.682	19.915	.000	.545	.707	.750	1.333
B-I	.226	.036	.214	6.235	.000	.132	.319	.750	1.333

a. Dependent variable: Social Activism (S-A)

Table 8. Direct and indirect effects table

Regression models										
Path	**Model**	**R**	**R square**	**Adjusted R square**	**Std. error of the estimate**	**Unstandardized coefficients**		**Standardized coefficients**	**t**	**Sig.**
						B	**Std. error (S)**	**Beta**		
a	B-I → C-A	.500	.250	.248	.70144	.576	.050	.500	11.408	.000
b	C-A → S-A	.789	.622	.621	.45665	.724	.029	.789	25.387	.000
c	B-I → S-A	.555	.307	.306	.61843	.586	.044	.555	13.176	.000
a′	B-I → S-A (Model: B-I → C-A → S-A)	.810	.657	.655	.43602	.226	.036	.214	6.235	.000
b′	C-A → S-A (Model: B-I → C-A → S-A)	.810	.657	.655	.43602	.626	.031	.682	19.915	.000

Partial indirect effect				Sobel test			
Ba * Bb′ or Bc – Ba′	**Ba**	**Bb′**	**Sa**	**Sb′**	**Sobel test statistic**	**Std. error**	***p*-value**
.360	.576	.626	.050	.031	10.00625045	0.03603508	.000

Table 9. Ranks (Kruskal Wallis test)

Age (years)	N	Homophily Mean rank	Online sharing Mean rank	Attitudinal influenceability Mean rank	Behavioral Influenceability Mean rank	Cyberactivism Mean rank	Social Activism Mean rank
Under 18	20	224.08	226.65	214.55	207.48	204.30	185.55
18-24	120	245.88	213.98	221.91	223.95	212.62	215.30
25-34	144	184.82	197.32	191.92	193.39	191.59	190.66
35-44	78	177.64	187.03	199.83	196.82	206.04	204.87
45-54	20	107.85	143.00	131.18	121.08	137.63	156.40
Over 55	11	73.32	122.45	59.45	70.50	127.95	119.32
Total	393						

Test Statistics

	H	O-S	A-I	B-I	C-A	S-A
Chi-square	53.307	13.977	29.536	29.775	13.032	11.975
df	5	5	5	5	5	5
Asymp. sig.	.000	.016	.000	.000	.023	.035

The findings showed that females reported more homophily, attitudinal influenceability, behavioral influenceability, and cyberactivism than males. We could not detect any difference between females and males in online sharing and social activism that can be due to the lack of statistical power.

Table 10. Ranks (Mann-Whitney U)

Gender	N	Homophily Mean rank	Attitudinal Mean rank	Behavioral Mean rank	Cyberactivism Mean rank
Female	239	210.94	211.20	209.82	206.08
Male	154	175.37	174.96	177.10	182.90
Total	393				

Test statistics

	H	A-I	B-I	C-A	O-S	S-A
Mann-Whitney U	15071.50	15009.00	15339.00	16232.00		
Wilcoxon W	27006.50	26944.00	27274.00	28167.00		
Z	-3.050	-3.093	-2.793	-2.000		
Asymp. Sig. (2-tailed)	.002	.002	.005	.045	.125	.092

School/ university students, housewives, and retired participants were respectively ranked the first, the second, and the last, in homophily, online sharing, attitudinal and behavioral influenceability, among other types of occupational statuses, except for online sharing that housewives were in the first, and students in the second rank (with a slight difference). Employed participants in the third rank, reported more homophily, and attitudinal and behavioral influenceability than unemployed ones. But, unemployed participants in the third rank, reported slightly more online sharing than employed ones. We could not detect any difference among different occupational statuses in cyberactivism and social activism that can be due to the lack of statistical power.

Conducting Kruskal-Wallis independent samples test at the significance level of .05, we could not detect any differences in the distribution of homophily (Asymp. Sig.= .965; .992; .127), online sharing (Asymp. Sig.= .308; .251; .645), attitudinal influenceability (Asymp. Sig.= .619; .291; .573), behavioral influenceability (Asymp. Sig.= .728; .411; .308), cyberactivism (Asymp. Sig.= .605; .265; .566), and social activism (Asymp. Sig.= .644; .667; .449), across categories of residence location, income level, and educational level, respectively, that can be due to the lack of statistical power (calculated by G*Power 3.1.9.2 software).

Table 11. Ranks (Kruskal Wallis test)

Occupational status	N	Homophily: Mean rank	Online sharing: Mean rank	Attitudinal influenceability: Mean rank	Behavioral influenceability: Mean rank
Employed	194	174.86	185.21	187.64	185.08
School/ University student	127	240.84	217.70	222.33	224.90
Retired	14	84.07	135.43	88.75	96.46
Housewife	35	221.34	219.46	209.16	221.20
Unemployed	23	173.37	185.41	183.48	167.89
Total	393				

Test statistics

	H	O-S	A-I	B-I	C-A	S-A
Chi-square	43.269	12.092	21.149	23.963		
df	4	4	4	4		
Asymp. sig.	.000	.017	.000	.000	.126	.052

Residence location options were province capital, other province cities, rural area, abroad. Income level consisted low, lower-middle, upper-middle, high income. Educational level options included below high school diploma, high-school diploma, Associate's, Bachelor's, Master's degree, doctorate and higher.

Discussion

The current research examines two models of the relationships among online sharing, homophily, attitudinal influenceability, and behavioral influenceability, and also, among behavioral influenceability, cyberactivism and social (real-world) activism of Iranian Instagram users, and then examines the effects of users' sociodemographic characteristics on these variables.

In the Behavioral Influenceability Model, the results show that attitudinal influenceability has the highest effect, and online sharing, and homophily have both direct and indirect effects (through attitudinal influenceability) on behavioral influenceability, in a descending order. The impact of attitudinal influenceability on behavioral influenceability is consistent with the arguments of Ajzen et al. (2018) that introduce the attitudes as determinants of behaviors, and is also partially compatible with the findings of Kroesen et al. (2017) that found bidirectional relationships between

attitudes and behavior.

The online sharing variable's mean value in our study show that the participants moderately engage in online sharing. As Lin and Wang (2020) and Omar and Dequan (2020) argued, users engage in online sharing due to different motivations and reasons. Information sharing gratification is one of the reasons people use social media, and as Thompson et al. (2020) mentioned, information sharing, status seeking, socializing, and pass time gratifications affect users' news sharing behavior. Also, Rahbarqazi (2017) showed that the amount of social network activity has a significant effect on the Iranian university students' political consumption. Hence, as a routine activity, online sharing in our model influences attitudinal and behavioral influenceability, directly and indirectly, showing that the more users engage in sharing behavior online, the more they take influence from social media content both attitudinally and behaviorally.

The homophily variable's mean value in our study is moderate. It is consistent with the explanations and findings of Figeac and Favre (2021), Hakobyan and Koulovatianos (2019), and Medaglia and Zhu (2017) which argued that social media interactions of users are characterized by homophily. As Figeac and Favre (2021) mentioned, there is a homophily-by-choice on social media based on information-sharing similarities, which is resembled in our findings that homophily and online sharing have direct and indirect effects in the Behavioral Influenceability Model.

Our results about the direct and indirect effects of homophily and online sharing on the both types of the influenceability of users are also compatible with Bolzern et al. (2020) that argued each individual's opinion is influenced by the opinions of the neighbors, and other external sources of influence, such as information media or everyday experience.

In the Social Activism Model, we observe that cyberactivism has the highest effect, and behavioral influenceability has both direct and indirect effects (through cyberactivism) on social activism. Our study measures all these variables in the context and under the influence of social media use. Hence, its findings resemble Williams' (2022) notion of the transition of social movements from collective to connective actions, and relying more upon loose networks of social connections. It also somehow confirms the findings of Kermani and Pakdaman (2016) that Iranian users' social capital on social media has a direct effect on their real-world civil participation. Our findings are

also consistent with other studies that showed it is more likely that young people who participate in cyberactivism, also engage in offline political participation (Cortés-Ramos et al., 2021). With combining the results from our two models, we, compatible with Cortés-Ramos et al. (2021), can conclude that the volume of interactions on social media platforms can be a significant predictor of users' participation in social activism.

We observe a decline in online sharing, homophily, attitudinal and behavioral influenceability, and cyber and social activism by the increase in the age of participants, and also, more homophily, attitudinal influenceability, behavioral influenceability, and cyberactivism among females than males.

The mean values of cyberactivism and social activism variables in our study show an approximately low levels of cyber and social activism. It, along with our findings about the effects of age, is consistent with the findings of a study (Fernández-Prados et al., 2021a) conducted in 46 countries, including Iran, that showed the most of the participants did not perform any kind of activism, and participants under 40 years of age were more active. The high number of our participants in the age range of 18-34 years resembles the findings of *ISPA* (2022) that the majority of young people aged 18-29 years use at least one social media application, especially Instagram.

Our results are consistent with the findings of Hennefer (2013) that demonstrated generational differences in the use of web-based tools for social activism, and compatible with the previous research (Fernández-Prados et al., 2021a & 2021b) that showed the effects of sociodemographic factors on both face-to-face and digital political actions of citizens, and the impacts of users' age and gender on social movement leadership, and also are in many parts consistent with the findings of Laouni (2022) and Landorf (2014) in Arab world's cyber and social activism.

Our findings confirm the findings of Fernández-Prados et al. (2021b) that youngsters and females are more engaged in cyberactivism, and the findings of Kırık et al. (2021) about the higher participation of young people, and heavy internet users in signing online petitions, and the difference between males and females. Similar to our results, previous research (Lin & Wang, 2020; Kim & Jang, 2018) showed that female and male participants are different in the way they use information technology, social media, and how they share information.

Our results show differences among people with different occupational statuses in their homophily, online sharing, attitudinal

and behavioral influenceability. This can be partly due to the age of the participants that we observe school or university students at the highest rank, and the retired participants at the last rank in almost all of the abovementioned variables. These findings are consistent with the aforesaid previous research that show the impact of sociodemographic factors on the users' online behaviors.

Participation of people, especially youth and females, in transforming and transcending society, and leading change toward solving environmental, societal, cultural, economic, and political problems, is vital for every society. Hence, as Cortés-Ramos et al. (2021) also mentioned, youth activism and digital civic engagement should be promoted to enhance sustainable development. As Seelig et al. (2019) also argued, promoting face-to-face and digital civic engagement with the aim of improving conditions for others should be taken seriously, because, this, through different collective action frames mentioned by Williams (2022), can help governments to better diagnose and define a problem, prognose better possible solutions, and better incite individuals to act or mobilize to solve existing issues.

As Li et al. (2021) also argued, cyberactivism allows movements to rapidly spread throughout the globe, via users' diverse online activities. Hence, the strong link we found between attitudinal influenceability, online sharing, homophily, and behavioral influenceability, and also the strong link between cyberactivism, behavioral influenceability, and social activism, demonstrate that different online activities and cyberactivism can rapidly expand such activism into real-world society. Therefore, according to our findings, we suggest that every society, by taking full advantage of cyberactivism, can improve social situations and solve different local, regional, and global issues mentioned by Cortés-Ramos et al. (2021).

The findings of the current research are limited to the fact that we did not have enough statistical power to detect probable relationships between occupational statuses, and cyber and social activism; between gender and online sharing and social activism; and between residence location, income and educational level variables, and main variables. Hence, we suggest further research employing bigger sample sizes to detect these probable relationships. We also suggest future research to further examine the relationships between social media users' attitudinal and behavioral influenceability, and their relationships with cyber and social activism.

Conclusion

The current research focuses on the impacts of Instagram users' online behaviors, influenceability, and cyberactivism on their real-world activism, and also the effects of sociodemographic factors on these online and real-world variables. It contributes to the existing literature by introducing attitudinal and behavioral influenceability as important factors influencing cyberactivism and social activism. This study encourages governments to nurture and take full advantage of online activities and cyberactivism to promote social participation and real-world activism of society members, especially youth and females, to transcend sustainability, social justice, and wellbeing, and solve societal and global problems with the collective wisdom.

Ethical considerations

The authors have completely considered ethical issues, including informed consent, plagiarism, data fabrication, misconduct, and/or falsification, double publication and/or redundancy, submission, etc.

Conflicts of interests

The authors declare that there is no conflict of interests.

Data availability

The dataset generated and analyzed during the current study is available from the corresponding author on reasonable request.

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