



# A Bibliometric Analysis of Disinformation through Social Media

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## ABSTRACT

The study's purpose is to systematically review the scholarly literature about disinformation on social media, a space with enhanced concerns about nurturing propaganda and conspiracies. The systematic review methodology was applied to analyze 264 peer-reviewed articles published from 2010 to 2020, extracted from the Web of Science core collection database. Descriptive and bibliometric analysis techniques were used to document the findings. The analysis revealed an increase in the trend of publishing disinformation on social media and its impact on users' cognitive responses from 2017 onwards. The USA appears to be the most influential node with its more significant role in advancing research on disinformation. The content analysis identified five psychosocial and political factors: influencing individual users' perceptions, providing easy access to radicalism using personality profiles, social media use to influence political opinions, lack of critical social media literacies, and hoax flourish disinformation. Our research shows a knowledge gap in how disinformation directly shapes communal psychosocial narratives. We highlight the need for future research to explore and examine the antecedents, consequences, and impact of disinformation on social media and how it affects citizens' cognition, critical thinking, and well-being.

**Keywords:** social media, disinformation, misinformation, cognition

## INTRODUCTION

Social media platforms have served the definition of a global village through a click of an internet connection. It has also emerged as a significant source of information for its users. The interactive interface of social media platforms has enabled its users to influence the cognition of potential audiences. As *social* refers to the interaction with people for sharing and receiving information, *media* refers to an instrument to process that information. *Social media* is a "web-based communication tool that enable people to interact with each other by sharing and consuming information" (Nations, 2019). Social media, a vehicle driven by its passengers, has become a key influencer through its 2.77 billion users. Such virtual influencing was not the case before the launch of Facebook in 2004 and Twitter in 2006 (Barr, 2018; MacArthur, 2018). Disinformation or fake news on social media is an emerging research subject (Shu & Liu, 2019). Fake news is "endemic to information society" as social media has become an integral part of daily life patterns, a means of communication, and an influencer to shape the power dynamics (Marshall, 2017).

Since the information on social media platforms is the least authentic due to the unverified creation, it allows content creators to influence and control the cognition of fellow social media users in particular

directions. Notably, in the contexts of chaos and unrest, social media platforms receive an influx of disinformation at every moment, which influences their users' cognition. Cognition frequently functions to receive and process information to regulate behaviors. The users' freedom of content customization on social media platforms makes them susceptible to disinformation campaigns as they can quickly multiply the information by sharing without verifying its accuracy (DHS, 2019). Social media users often do not use rationality and look for reliable facts but consistent and comprehensible (Salter, 2018).

Governments and political figures have taken social media as an essential tool for public diplomacy at home and abroad. They issue their policy statements and opinions on their social media accounts, and their followers take those as official statements (Duncombe, 2019). Those interested in spreading disinformation use social media as a fertile ground for breeding their conspiracies and propaganda. Social media thus provides such groups the ability to manipulate facts and consequently coordinate inauthentic behaviors (Acker & Donovan, 2019). Hameleers et al. (2020) confirmed that the digital media amidst social media had become a fertile space to breed uncontrolled spread of disinformation with strategic usage of visuals and the limited tendency of fact-checking. Since social media users believe more in visual or graphics information than in textual, the dis-informant groups use multiple types of visual content like games and videos to penetrate their ideologies among the masses.

There has been an increasing number of studies on social media. However, less has been done in aggregating the findings of disinformation on social media. There is a lack of systematic literature review to specify what currently exists or what should be considered in the future to address the issues related to disinformation on social media. This paper intends to complement prior studies and compile existing knowledge by conducting systematic descriptive and bibliometric content analysis to highlight how various aspects of disinformation on social media have been explored and discussed over time. This study's motivation is to encourage further scholarly efforts to multiply the understanding of disinformation and identify models and approaches for monitoring, reporting, and countering misinformation on social media. This study also summarizes various strategies of countering the disinformation on social media as proposed by different scholars using informetric analysis containing bibliometric techniques. It explores a range of topics such as politics, religion, pandemics, and more, where social media has been used as a hub of disinformation in the hands of those seeking their interests. Lastly, trends in research are mentioned, and gaps for future research have been explored.

### **Theoretical Underpinning to Study Disinformation**

Theoretically, cognition is influenced by the amount and pattern of information received, but few people can examine it before processing their actions. The disinformation agents or groups use strategies altered for young social media users' cognitive and critical thinking inabilities. For instance, Pew Research Center (2018) reported, 95% teenagers (13-17) in the USA have access to smartphones and 45% of them remains online on their favorite social media platforms almost all the time.

Cho et al. (2022) designed a conceptual framework for social media literacy that requires to identify its two components, content, and competencies, and understand the interrelations between them. "Content refers to the awareness, understanding, and knowledge necessary to attain social media literacy, and competencies are the skills and abilities for demonstrating social media literacy". The content components identify levels of knowledge or understanding about a particular subject through the self, medium, or reality. Whereas the components of the competencies require the abilities of analysis, evaluation, and contribution. Furthermore, the family, peers, and educators have critical role in one's social media literacy which consists of cognitive and affective processing abilities.

Media systems dependency theory (MSDT) narrates "cognitive, behavioral, and affective consequences of media use are premised upon characteristics of both individuals and their social environment" (Ognyanova & Ball-Rokeach, 2015). Since individuals are at the center of MSDT, their level of dependency on social media information configures their cognition to support a particular narrative. The content triggered by the notion of freedom of expression is concerned for social media users with cognition levels of limited exposure or narrowed worldviews. The MSDT argues that individual users, media platforms like social media, and society form a triangle where users hold a central position. With this central position, individuals with

underdeveloped psychological abilities, such as limited exposure and social deprivation, live on the margins of being targeted by propaganda and conspiracies on social media platforms.

Mayer and Moreno (2003), in the cognitive theory of multimedia learning, identify three functions of the human mind: audio-visual, limited capacity of the human information-processing system, and substantial cognitive processing. Therefore, people with different cognitive abilities perceive the content on social media differently. The disinformation groups influence users with little critical thinking abilities comparatively easily. Often people cannot even distinguish between disinformation and systemic disinformation. The social cognitive theory views continuous interaction between behavioral, cognitive, and environmental factors as determinants of individual behaviors (Bandura, 1999).

### Contextual Definition of Disinformation

Although the development of the Internet was a blessing for society, its accessibility made it vulnerable of being skillfully abused. The literature frequently refers to the Internet as the “information highway” since it offers a platform for the quick dissemination of information (De Maeyer, 1997). The Internet’s connectivity has also been abused to promote propaganda, and numerous instances of incorrect information being circulated over social media have endangered humans’ lives.

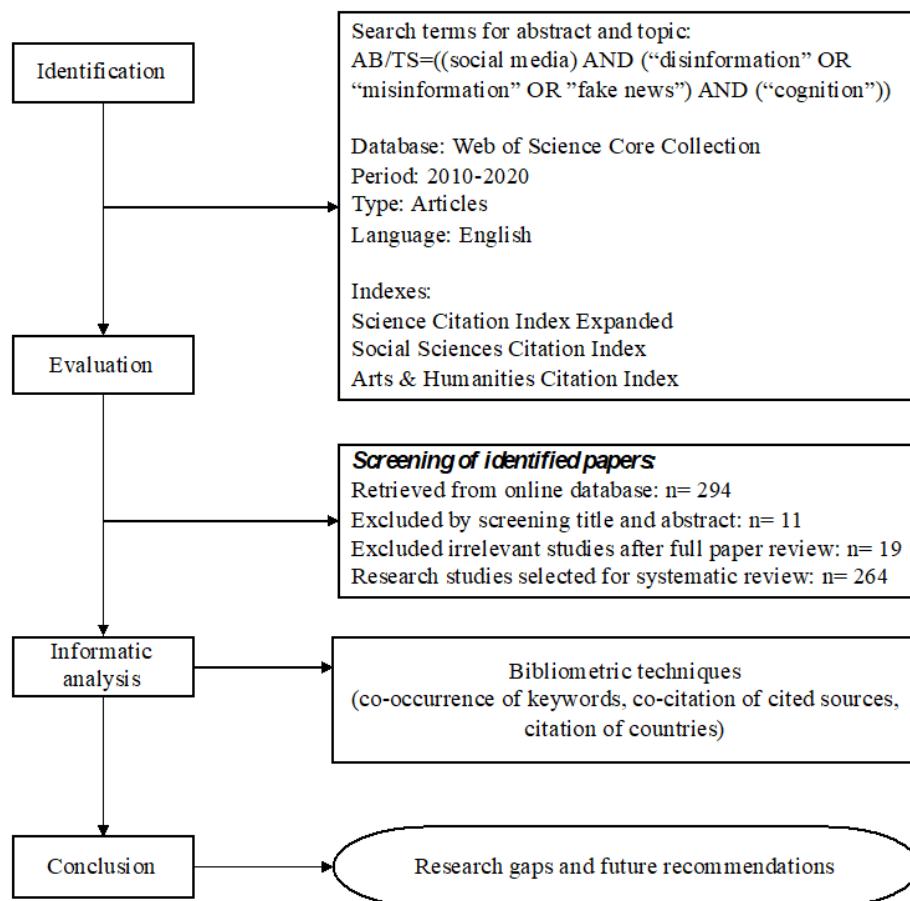
According to Floridi (1996, 2011), disinformation occurs when semantic content is erroneous. Disinformation is merely inaccurate information that has been purposely disseminated to deceive the recipients into thinking it is accurate information. In other words, a remark that is meant to mislead and that the speaker considers to be incorrect constitutes disinformation. Disinformation is a type of misleading information which has the potential to spread falsehoods (Fallis, 2015). Disinformation misleads individuals and have psychological effects. Nevertheless, if a piece of information is not likely to lead to mistaken beliefs, it does not pose a severe threat to the information accuracy (Shu et al., 2020). Disinformation must be misleading for a reason which sets it apart from less harmful types of false information, like honest errors and extremely subtle satire. We are in a better position to identify this particular type of misleading information if we concentrate on non-accidentally misleading information; for example, similar to lie-detection approaches, we can look for the aim to mislead instead of just looking for errors. Disinformation, then, is false information that has been intentionally spread to deceive the recipient. An information scientist Fallis (2009) defined disinformation as “misleading information that is intended to be (or at least anticipated to be) misleading.”

On the other hand, misinformation is the inaccurate and misleading information often shared unintentionally. Misinformation has critical role in creating communal polarization. People or their groups incorrectly classify to disagree with certain information sources simply because of their personal disagreements. Often their political and religious ideologies trigger biases in identifying what information are correct or otherwise which restrict them to draw a line between biased and fake information. (Ribeiro et al., 2017).

## METHOD AND MATERIALS

The study aims to systematically review the literature on disinformation on social media using bibliometric content analysis. It describes a connection of social media with cognitive response and conflict. The systematic literature review method identifies the gaps and potential research areas by developing themes, trends, and feebleness (Petticrew & Roberts, 2008; Wright et al., 2007). **Figure 1** depicts the process of a systematic review (Clark & Creswell, 2015).

The first phase included identifying scholarly journals using the Web of Science (WoS) core collection database. The search string used was (social media) AND (“disinformation” OR “misinformation” OR “fake news”) AND (“cognition”) to explore titles, abstracts, and keywords. Three indexes were selected Science Citation Index Expanded, Social Sciences Citation Index, Arts and Humanities Citation Index from 2010 to 2020. The search focused on peer-reviewed articles published in English. The second phase included an evaluation of 294 articles found in the initial search. At this stage, all the articles were screened by reading title, abstract and full-length. After screening, 30 articles were excluded due to irrelevancy and mismatch with the purpose of this study. In total, 264 articles were selected for a systematic review.



**Figure 1.** PRISMA chart: Systematic review process (Source: Authors' own elaboration)

The third phase included informatic analysis using VOSviewer software version 1.6.16 ([www.vosviewer.com](http://www.vosviewer.com)) for bibliometric analysis, freely available (van Eck & Waltman, 2010). Thematic analysis was performed manually using MS Excel. Bibliometrics provides a mathematical view of the published dataset, including authorship, regional affiliation, time, sources, and institutions. It encompasses the scientific mapping and visualization of datasets extracted for systematic review (van Eck & Waltman, 2010). In this study, three types of bibliometric analyses were performed:

- a) co-occurrence of keywords,
- b) citation of countries, and
- c) co-citation of cited sources.

This analysis has been applied in earlier studies (Borges-Tiago et al., 2020; Naeem et al., 2020; Wang et al., 2019). The fourth phase included a results presentation and discussion of findings extracted from a systematic review. A comparative analysis of critical social media literacy was performed to understand the differences in categories such as content acceptability, voice multiplication, disinformation spread trends, and arguments in denial or acceptance.

A systematic content analysis was conducted. The first step in content analysis is to segregate the data into useful categories or open codes. The research will eventually use the open codes to identify and label sub-categories, categories, and primary categories. The analytical procedure enables these codes to be phrases or even complete sentences (Elo & Kyngäs, 2008). The analytical procedure instead directs researchers to do an interpretational analysis with the overall goal of lowering initially discovered categories, rather than providing further instructions on how these sub-categories, categories, and primary categories should be formed (Kyngäs et al., 2020). The study concludes by highlighting the need for educational programs for critical media literacy to enhance people's critical social media literacy skills, which would enable them to authenticate and verify content on social media. It also presents future research areas.

**Table 1.** Occurrence of keywords

No	Keyword	Number of occurrences	Total link strength
1	Disinformation	136	654
2	Social media	120	591
3	Fake news	100	470
4	Misinformation	52	296
5	Media	42	221
6	Twitter	32	181
7	News	26	170
8	Information	23	164
9	Communication	28	151
10	Political communication	18	129

## ANALYSIS

The analysis of the study is comprised of two phases. The first part looks at the descriptive account of research on disinformation on social media. All the papers were organized manually using Excel by specifying the author(s) name, year of publication, research objectives or question(s), methodology, and context. Bibliometric analysis was performed using VoSviewer software. The second part consists of content analysis was performed based on the 264 articles extracted from the WoS database by organizing thematic descriptions.

### Descriptive Analysis

According to Lee and Su (2010), keywords show the basic content of articles and demonstrate knowledge areas within a particular domain. Two hundred sixty-four articles were imported to VOSviewer to produce a network of keywords. It presents a precise picture of the study domain with its identified patterns (van Eck & Waltman, 2014).

The data from the articles were extracted from the WoS core collection database collection in the .txt format. WoS provides two types of keywords; one is specified by authors, and the other is known as "keyword plus," extracted from the title of cited references in the 264 articles dataset. As suggested by Lee and Su (2010), keywords plus highlight new themes with a co-occurrence network. Normalization using fractional counting was performed to analyze published articles (van Eck & Waltman 2014). VOSviewer created a co-occurrence map based on the bibliographic data extracted from WoS. Due to the inherent limitation of mapping tools, the co-occurrence of keywords is run through WoS .txt file only.

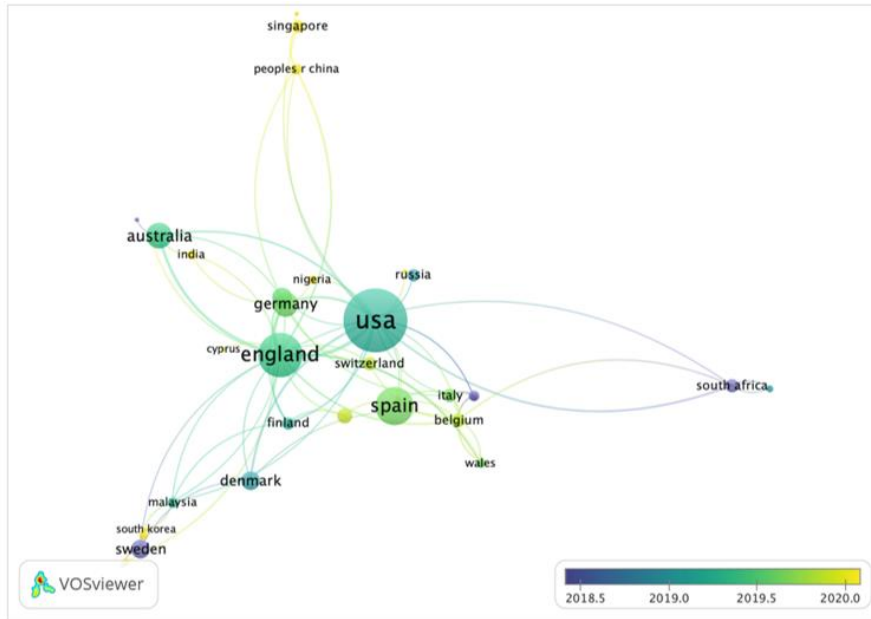
**Table 1** presents the occurrence of keywords and total link strength. As output comes in the form of a cluster diagram, it indicates the distance between nodes based on proximity. Simultaneously, word font size presents the level of concentration on the specific aspect (van Eck & Waltman, 2014).

The criterion was set for co-occurrence keywords a minimum of two times to create a map that resulted in 52 keywords appearing within six clusters that met the minimum level. The criterion setting has significant implications for findings. The lower number would result in several insignificant keywords. The higher number would result in few keywords hindering meaningful analysis.

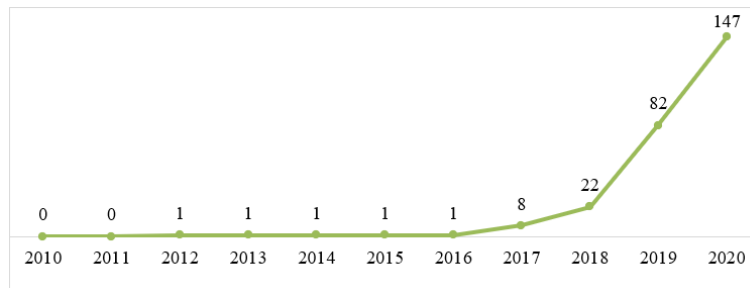
**Figure 2** depicts bibliometric mapping based on all keywords' co-occurrence along with a temporal scale from 2019 to 2020. The network visualization was based on the strength of links when scores were calculated on average normalized citations. The word font size represents several occurrences for a particular keyword; the larger the size indicates the most influential terms. The most recurring keywords were "disinformation and misinformation" followed by "fake news," "propaganda," "political communication," "Covid-19", and "journalism" through "Twitter social media." It indicates a greater level of significance of disinformation on social media. Several studies have addressed this issue in the field of science (Scheufele & Krause, 2019), politics (Farkas & Schou, 2018), Islamist propaganda (Farkas et al., 2017), election (Zimmermann & Kohring, 2020), and social media (Buchanan, 2020). Social media play a vital role in spreading fake news, directly influencing people's perceptions, attitudes, and ability to trust.

**Figure 3** depicts citation analysis based on the 264 selected studies. Co-citation analysis was performed by giving a weighted degree of cited documents. Fractional counting was used in creating a bibliographic map

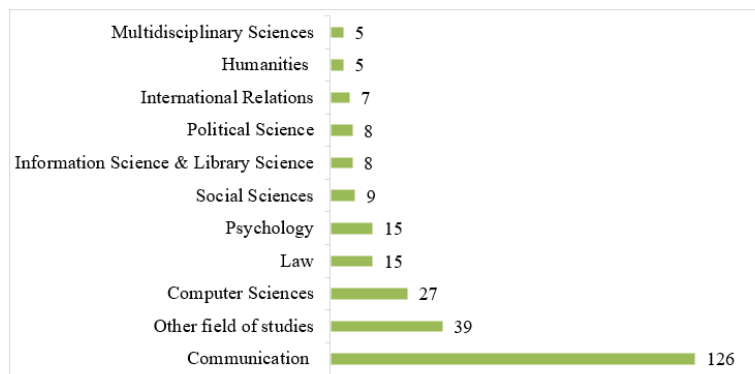




**Figure 4.** Country analysis subject to authors association and research produced (Source: Authors’ own elaboration)



**Figure 5.** Yearly trend of published articles (Source: Authors’ own elaboration)



**Figure 6.** Article published as per WoS categories (Source: Authors’ own elaboration)

**Figure 5** depicts the yearly publication trend in disinformation on social media from 2010 to 2020. As shown, a maximum number of articles were published from 2017 to 2020 with an increasing trend. The studies mention various reasons for the drastic increase in publication about dis/misinformation through social media such as high penetration of social media usage by news agencies, U.S. President (2016-20) being very active on social media (twitter), and COVID-19 pandemic in 2019. Hence, scholars paid more attention to researching dis/misinformation through social media platforms, and to identify ways addressing this issue. However, research on disinformation still needs to be investigated from multiple aspects.

**Figure 6** shows articles published as per WoS categories. Most of the articles are related to the communication and computer science fields.

**Table 2.** List of top-10 journals, where articles were published

No	Name of the journals	Total papers published out of 264
1	Social Media + Society	20
3	Profesional de la Informacion [Information Professional]	12
4	Political Communication	9
5	Information Communication & Society	8
6	New Media & Society	7
7	Digital Journalism	6
8	Revista Latina De Comunicacion Social [Latin Magazine of Social Communication]	5
9	International Journal of Press-Politics	4
10	African Journalism Studies	4

**Table 3.** List of top-10 most cited articles (listed from highest number of citations as of February 15, 2021)

No	Authors	Title	Year	Citation by WoS	WoS categories	Journal
1	Bennett, W. L., & Livingston, S.	The disinformation order: Disruptive communication and the decline of democratic institutions	2018	102	Communication	European Journal of Communication
2	Zubiaga, A., Aker, A., Bontcheva, K., Liakata, M., & Procter, R.	Detection and resolution of rumors in social media: A survey	2018	94	Computer science, theory, & methods	ACM Computing Surveys
3	Scheufele, D. A., & Krause, N. M.	Science audiences, misinformation, and fake news	2019	60	Multidisciplinary sciences	PNAS
4	Gelfert, A.	Fake news: A definition	2018	47	Logic & philosophy	Informal Logic
5	Chadwick, A., Vaccari, C., & O'Loughlin, B.	Do tabloids poison the well of social media? Explaining democratically dysfunctional news sharing	2018	36	Communication	New Media & Society
6	Farkas, J., & Schou, J.	Fake news as a floating signifier: Hegemony, antagonism, and the politics of falsehood	2018	34	Communication	Javnost-The Public
7	Farkas, J., Schou, J., & Neumayer, C.	Cloaked Facebook pages: Exploring fake Islamist propaganda in social media	2017	30	Communication	Media Culture & Society
8	Mejias, U. A., & Vokuev, N. E.	Disinformation and the media: The case of Russia and Ukraine	2017	30	Communication & sociology	New Media & Society
9	Kragh, M., & Åsberg, S.	Russia's strategy for influence through public diplomacy and active measures: The Swedish case	2017	29	International relations & political science	Journal of Strategic Studies
10	Mamlin, B. W., & Tierney, W. M.	The promise of information and communication technology in healthcare: Extracting value from the chaos	2016	28	Medicine, general, & internal	American Journal of the Medical Sciences

**Table 2** depicts a list of the top-10 journals where most articles were published; Social Media + Society journal comes first.

**Table 3** shows a list of the top-10 most cited articles, Bennett and Livingston (2018) secured 102 citations as per the WoS database.

**Table 4** summarized selected articles published in disinformation on social media.

## Content Analysis

The content analysis was conducted through NVivo version 12, which brought two major categories from the 264 studies published as below in **Table 5**.



**Table 4.** Sample of selected articles (listed alphabetically by authors' name)

No	Authors	Title	Year	Findings
1	Buchanan, T.	Why do people spread false information online? The effects of message and viewer characteristics on the self-reported likelihood of sharing social media disinformation	2020	Individual critical social media illiteracy tends to multiply disinformation with higher tendencies due to their aligned attitudes with disinformation content.
2	Cabañes, J. V. A	Digital disinformation and the imaginative dimension of communication	2020	The news updates on social media platforms have significantly lower journalistic effort but higher manipulation.
3	Freelon, D. & Wells, C.	Disinformation as political communication	2020	Major areas of political disinformation were identified as sociopolitical factors allowing disinformation and a short history of disinformation research.
4	Levitskaya, A. & Fedorov, A.	Analysis of manipulative media texts: World media literacy education experience	2020	Concludes that disinformant groups, agents of troll factories, & extremists have a higher level of social media competencies- but citizens' media competencies are not enough.
5	McKay, S. & Tenove, C.	Disinformation as a threat to deliberative democracy	2020	Details disinformation campaign led by Russian agents around 2016 elections in the USA.
6	Perez-Dasilva et al.	Fake news and coronavirus: Detecting key players and trends through analysis of Twitter conversations.	2020	Social network analysis was conducted to identify false news about coronavirus floating around social media platforms.
7	Rossini et al.	Dysfunctional information sharing on WhatsApp and Facebook: The role of political talk, cross-cutting exposure, and social corrections	2020	Closed nature of WhatsApp has a convincing tendency of influencing public opinion through disinformation campaigns.
8	Rodriguez-Fernandez, L.	Disinformation: Professional challenges for the communication sector	2019	There is no consensus to build a holistic strategy to counter disinformation on social media as social actors are afraid of freedom of expression being compromised.
9	Rubin, V. L.	Disinformation and misinformation triangle	2019	Translated three interacting causal factors into digital new context as virulent pathogens are falsifications, satirical fakes, & other deceptive or misleading news content; susceptible hosts are information-overloaded, time-pressed news readers lacking media literacy skills; & conducive environments are polluted poorly regulated social media platforms.
10	Shu et al.	FakeNewsNet: A data repository with news content, social context, and spatiotemporal information for studying fake news on social media	2020	Presented a comprehensive description of FakeNewsNet through exploratory analysis of perspectives.
11	Sánchez-Duarte, J.M. & Rosa, R.M.	Infodemia and COVID-19. Evolution and viralization of false information in Spain	2020	Highlights hoax trends on social media about the COVID-19 pandemic & how such disinformation spread internationally.
12	Treen et al.	Online misinformation about climate change	2020	With a focus on climate change, it views disinformation as a sub-field of misinformation
13	Vereshchaka et al.	Analyzing and distinguishing fake and real news to mitigate the problem of disinformation	2020	Fake news can be identified through fake news features' analysis & sociocultural characteristics of fake news acceptability.
14	Xia et al.	Disinformation, performed: Self-presentation of a Russian IRA account on Twitter	2019	Discusses how IRA team behind Abrams account disinformed persona across multiple platforms & their techniques performed for personal authenticity & cultural competence.
15	Zimmermann, F. & Kohring, M.	Mistrust, disinforming news, and vote choice: A panel survey on the origins and consequences of believing disinformation in the 2017 German parliamentary election	2020	Disinformation on social media has ability to influence political circumstances in a country.

**Table 5.** Thematic categories and sub-categories of content analysis

Theme	Categories	Sub-categories
Disinformation on social media & users' cognition	Psychosocial factors of disinformation on social media	<ul style="list-style-type: none"> <li>• Influencing individual users' perceptions</li> <li>• Easing radicalism access to the personality profiles</li> <li>• Social media used to influence political opinions</li> <li>• Lower level of critical social media literacies</li> <li>• Hoax flourishes disinformation</li> </ul>
	Remedial actions to deal with disinformation online	<ul style="list-style-type: none"> <li>• Improving digital media literacies</li> <li>• Awareness through cognitive response educational campaigns.</li> <li>• Entrepreneurs help develop technological systems to counter disinformation online</li> <li>• Increased monitoring of disinformation social media amidst pandemics</li> </ul>

## **Psychosocial Factors of Disinformation through Social Media**

### ***Influencing individual users' perceptions***

In this digital technology era, social media platforms have increasingly become a place where misinformation and disinformation float with limited control (Robledo & Jankovic, 2017). The individuals' increased interaction with social media platforms influences their cognition which has caused a significant rise in disinformation. This trend is comparatively higher in countries with democratic governance systems. Though social media is a recent technology, disinformation as political opinion for active citizenship has evolved rapidly through social media, which has increasingly victimized public opinions and perceptions about certain areas of their interest (Chadwick et al., 2018; Gelfert, 2018). Among social media, Facebook has been a powerful platform with massive outreach but disseminating a colossal volume of fake and unverified news in the name of freedom of expression. Facebook has limited content as verified, but it has the advanced tools to locate its users, their potential connections, and filling-in profile feeds with content to individual users' interests. (McClain, 2017). The algorithms of social media platforms are specifically designed to target individuals' cognition. For example, what type of content a user has paused while interacting on social media is registered, and then the user's profiles are flooded with related content. Such algorithms ensure social media users receive certain types of content; this is how disinformation sneaks in and influences the perceptions and worldviews of the user.

### ***Easing radicalism access to the personality profiles***

Social media have influenced journalism patterns, which has increased the citizens' dependence on social media platforms to be informed of the latest updates. Radical groups carry their disinformation campaigns on social media platforms to spread propaganda and conspiracies against mainstream institutions. Such groups tend to influence the public narratives to denounce the public trust in mainstream institutions and information sources to destabilize democratic values (Bennett & Livingstone, 2018). A common strategy the radical groups employ in their disinformation campaigns is the manipulated presentation of current affairs. Social media profiles help such groups find like-minded individuals and communities to build and strengthen their public support. Moreover, the unmoderated nature of social media, ironically also a strength, has been abused by certain groups to spread rumors. Social media users have a wide range of personalities, perceptions, and ideologies to govern their community life. Social media platforms provide space to spread particular ideologies that may resonate with extremist and radical ideas.

Some people or groups tend to spread rumors to gain support and followers on their social media accounts. Zubiaga et al. (2018) identified two types of rumors on social media: long-standing rumors staying for more extended periods and newly emerging rumors that often come in the name of breaking news. The rumors targeting individuals' belief systems leave long-lasting effects upon a community's cognition and need an effective counter-narrative strategy to overcome.

### ***Social media use to influence political opinion***

Fake news has significantly increased on social media platforms to mislead the public opinions about political narratives and manipulate people's behaviors towards certain political ideologies (Farkas & Schou, 2018). Since the dis-informant groups tend to destabilize the democratic institutions and values, they build narratives based on community psychology analyzed through their social media activity (Chadwick et al., 2018). The conflict between Russia and Ukraine is an example where disinformation spread through social media has insanely influenced community psychology to favor political ideologies in each country (Mejias & Vokuev, 2017). The case of Brexit serves as another example where social media was weaponized politically to disinform the citizens on the pros and cons of the Brexit deal (Bastos & Mercea, 2018). After analyzing nearly 50,000 political tweets, Brady et al. (2020) found that political conversations on social media utilize moral and emotional content with attractive visuals to influence the audience's perception. Chadwick et al. (2018) call it 'deep fake' when the dis-informants use attractive visuals such as animated videos to build and strengthen their political discourse online.

Social media is massively misused to build political narratives, particularly when a country has a fragile political system (Ejaz, 2013; Merloe, 2015). The dis-informant groups use centrally coordinated social media

campaigns to identify the content and delivery protocols like graphics, language, schedule, and audience engagement to influence the public's political behavior (Keller et al., 2020). Since the public tends to follow the content on current affairs (Humprecht, 2019), political disinformation online tends to influence an election campaign's political stage. The dis-informant groups aim to alter the public's political opinions and alienate the voters' choice for election outcomes. The tendency to denounce the mainstream media pushes voters to trust social media feeds for political news updates, increasing the opportunity for dis-informant groups to build and promote certain political conspiracies (Zimmermann & Kohring, 2020). Brady et al. (2020) also noted the vulnerability of social media platforms floating with disinformation for moral and political discourse to influence perceptions and elections.

### ***Lower level of critical social media literacies***

Since the disinformation campaigns aim to influence citizens' perceptions and opinions about a particular subject, they tend to seek citizens' voices as multipliers of their propaganda and conspiracies. For this purpose, understanding individual social media users' cognitive response to content on social media is taken as a major goal to ground dis-informant narratives and penetrate them into public opinions. Scheufele and Krause (2019) urge to understand the interaction patterns online if one needs to understand the disinformation dynamics. Though social media shapes dis-informant behaviors, it requires studying the macro-level variables like social media service providers letting disinformation float across their networks and influence the cognitions of its users. Spotting false information on social media is a skill for individual users but could not be practiced without cooperation from social media service providers.

Sometimes the disinformation campaigns at the macro-level, such as those led by the governments, penetrate to micro-levels. Citizens themselves become dis-informants and actively spread disinformation through social media posts, thus furthering the circulation of inaccurate information (Mejias & Vokuev, 2017).

According to Golovchenko et al. (2018), due to the lack of citizens' social media literacies, the active participation of citizens in disinformation can multiply the message by four times. A majority of social media users lack abilities to understand or identify online disinformation; they often do not realize they have been co-opted into being a part of disinformation campaigns and propaganda just by sharing such information on social media. Since disinformation is deliberately misleading or biased information or manipulated narratives/facts by an organized group or entity, access to digital media technologies has increased people's vulnerability to disinformation. Digital media illiteracy has been identified as a significant reason behind the inability to examine the information. Extensive research claims that digital media illiteracy is a reason for the victimization of disinformation (Guess et al., 2020). The engagements and discussions on social networking sites influence individual opinions on public interest topics (Hussain, 2014).

### ***Hoax flourishes disinformation***

Disinformation especially flourishes when there is a crisis or global emergency; human psychology is less likely to consider analysis or review information in such situations. COVID-19 pandemic is a recent example. Closed social media platforms like WhatsApp and Telegram became major sources for disseminating false and unscientific information about the pandemic. As closed social media are considered more personal, there is a relatively higher acceptance of disinformation on such channels. The misinformation stays on WhatsApp four times longer than the correct information because people continue arguments per individual perceptions and worldviews (Javed et al., 2020). Salaverria et al. (2020) listed four major types of hoaxes: a joke, exaggeration, decontextualization, and deception whose severity and acceptability vary per circumstances, nature of the pandemic, and individuals' cognitive levels. The hoaxes amidst disinformation follow the common narratives to ground public support by influencing public opinions. Farkas and Schou (2018) studied the Facebook pages in Denmark propagating against the Danish Muslims and immigrant communities and found that provoking racist and negative sentiments, and sometimes actions, towards refugees fleeing conflict and violence in their home countries. Another example is Eastern Europe, where citizens were disinformed about the COVID-19 vaccine, which created significant public resistance against medically recommended vaccinations (Žuk et al., 2019). The independence referendum in Catalonia can be another example where fake news and hoaxes were created to influence the public support dynamics (Aparici et al., 2019).

## Remedial Actions to Deal with Disinformation Online

### *Improving digital media literacies*

Schirch (2020) views digital media literacy as essential when social media is being heavily misused to spread divisive and hateful content. There is not an easy solution to counter disinformation that has become hybrid warfare to achieve political goals through subtle manipulations in one's favor. Disinformation needs a response driven with a systemic analysis of contextual and psychological dynamics of people and communities (Scheufele & Krause, 2019). Counter hashtags could help amidst trending topics on social media (Aparici et al., 2019). Zubiaga et al. (2018) propose a four-component rumor classification system to detect, track, stance, and veracity classify the rumors as the ability to detect rumors online for preventing the spread of fake news and conspiracies.

### *Awareness through educational campaigns*

Žuk et al. (2019) view potential in cognitive response education campaigns to counter the disinformation floating around social media platforms. Individual abilities should be built through grassroots awareness campaigns to help people identify and discourage disinformation online. El Rayess et al. (2018) documented the first known practice in Lebanon where students were prepared to verify the authenticity of information by distinguishing fake news from verified news. It is crucial to embed critical media literacies in the school curriculum and its delivery to the students per their cognitive abilities. Reading news with limited digital media literacy skills requires three interventions: automation, education, and regulation to counter online disinformation (Rubin, 2019). These interventions could be a holistic cognitive measure to identify, predict, and prevent the nurturing of fake news and disinformation.

### *Developing tech systems to counter disinformation online*

The social media platforms like Facebook and Twitter may allow social psychology researchers to access the content on their networks for extensive research on the psychology of the online community to guide public policy for the common good (Bastos & Mercea, 2018). The social entrepreneurs could help develop technological solutions for the detection of fake news on digital media to help individuals flag such content. For example, Huckle and White (2017) introduced a blockchain technological solution to identify any digital media content's origin by running an authenticity check to help counter and discourage the fake news attempting to mislead the digital media users. Keller et al. (2020) also developed a framework to detect centrally coordinated disinformation campaigns where participants portray normal citizens with the right to freedom of expression. Acker and Denovan (2019) highlighted the misuse of algorithms, metadata, and metrics to target the potential audience, manipulate information with customization, and influence the cognition of the audience towards propaganda or conspiracy. They emphasize the need to further research and identify the entry points of disinformation campaigns to understand the "coordinated inauthentic behavior."

### *Increased monitoring of disinformation amidst pandemics*

Disinformation on social media rose significantly amidst the COVID-19 pandemic. Several conspiracy theories are floating online, misguiding people. United Nation News (2020) indicated that "during this coronavirus pandemic, 'fake news' is putting lives at risk." Llewellyn (2020) stated that before believing in news, individuals should think twice by checking who sent information, what is the source, and how to know whether to trust it to be true? Amidst increasing reliance on social media platforms to cope with current affairs, there is a dire need to build and strengthen individual abilities to avoid being trapped into disinformation and fake news online. The UNESCO hashtags campaign also specifies #ThinkBeforeClicking, #ThinkBeforeSharing, and #ShareKnowledge (United Nation News, 2020). Thus, it is important to shape people's cognitive abilities to identify fake news or conspiracies online, believe in the information from authentic sources, and encourage them to stop spreading fake news online.

## CONCLUSION

More than half of the world's population has access to the internet, mainly social media platforms. There is a genuine rise in concerns about disinformation on social media. Social media platforms were invented and launched to offer social networking experiences to internet users. However, these platforms are being misused for propaganda and conspiracies by certain groups and governments. The dis-informant groups track social media users' activity online and customize their propaganda to attract an audience under the guise of providing psychosocial and political support groups. This rise in disinformation on social media rapidly increased during the last decade when various countries experienced political destabilizations, conflicts, and economic fragility. This review paper found political interests as the significant factor flooding social media platforms with systemic disinformation to influence individuals' cognitive abilities to build their political support networks and strengthen their political narratives.

### Implications

The lost trust of people in government institutions and mainstream media pushes them to believe in disinformation and conspiracies, often unknowingly floating around social media platforms. This review paper has identified that the disinformation agents study community psychology and then utilize the language and visuals on their social media accounts to attract potential audiences accordingly. The dis-informants create hoaxes and rumors about community interest current affairs and build their narratives, proxies, and propaganda by portraying themselves as community support groups. This paper concludes that critical social media literacy is vital for social media users to build their cognitive abilities to counter increasing disinformation. The social media service-providing companies also have the leading role in offering data access to psychosocial researchers, which may help improve analysis and enhance suggestions for cultivating cognitive abilities for countering disinformation online.

### Future Research

This review highlights a knowledge gap in empirical research on the direct role of disinformation on social media in shaping communal psychology. This study highlights some areas that need further research, for instance, the role of psychosocial factors that support and impede disinformation on social media, and the needs for corrective measures to cope with disinformation on social media. There are also research gaps about the association of cognition generated through disinformation and actions in their response. It is necessary to find out monitoring and control indicators to deal with disinformation on social media as it appears to strongly influence users' cognition. There is a need to conduct pilot studies to examine how to counter the misinformation on social media amidst limited social media literacies and cognition of users with limited worldviews. It could be important go beyond cognition studies and take into accounts further political, social, sociological, and psychological factors.

Furthermore, social media service providers like Facebook and Twitter should expand their systems of monitoring, tracking, and blocking the disinformation spreading through their platforms. They may utilize advance tools of artificial intelligence to embed such mechanisms in their platforms. Social media companies could offer unique access to their databases to the social science researchers for evidence-based research recommendations to track and counter the disinformation on social media platforms.

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